

SECOND LANGUAGE LEARNING THEORIES

Rosamond Mitchell,
Florence Myles and
Emma Marsden

THIRD EDITION

Copyrighted material

ROUTLEDGE


THIRD EDITION

SECOND LANGUAGE LEARNING THEORIES

Rosamond Mitchell
Florence Myles
Emma Marsden

 **Routledge**
Taylor & Francis Group
LONDON AND NEW YORK

First published 1998 by Hodder Arnold
Second edition published 2004 by Hodder Education

This edition published 2013 by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

Simultaneously published in the USA and Canada by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

© 1998, 2004 Rosamond Mitchell and Florence Myles
© 2013 Rosamond Mitchell, Florence Myles and Emma Marsden

The right of Rosamond Mitchell, Florence Myles and Emma Marsden to be identified as authors of this work has been asserted by them in accordance with sections 77 and 78 of the Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

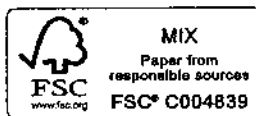
Trademark notice: Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data
A catalog record for this book has been applied for

ISBN: 978-1-444-163-100 (pbk)
ISBN: 978-0-415-82583-2 (hbk)
ISBN: 978-0-203-77079-5 (ebk)

Typeset in Kepler Light by Phoenix Photosetting, Chatham, Kent



Printed and bound in Great Britain by the MPG Books Group

To Paul, Francis, David, Katie and Claire

CONTENTS

List of illustrations	ix
Acknowledgements	xi
Preface	xiv
1 Second language learning: key concepts and issues	1
1.1 Introduction	1
1.2 What makes for a good theory?	2
1.3 Views on the nature of language	6
1.4 The language learning process	10
1.5 Views of the language learner	19
1.6 Links with social practice	25
1.7 Conclusion	26
2 The recent history of second language learning research	27
2.1 Introduction	27
2.2 The 1950s and 1960s	28
2.3 The 1970s	31
2.4 The 1980s: a turning point	46
2.5 Continuities in the research agenda	49
2.6 Second language learning timeline	50
3 Linguistics and language learning: the Universal Grammar approach	61
3.1 Introduction	61
3.2 Why a Universal Grammar?	62
3.3 What does Universal Grammar consist of?	69
3.4 Universal Grammar and first language acquisition	77
3.5 Universal Grammar and second language acquisition	83
3.6 Evaluation of Universal Grammar-based approaches to second language acquisition	94
4 Cognitive approaches to second language learning (1): general, implicit learning mechanisms	98
4.1 Introduction	98
4.2 Input-based emergentist perspectives	99
4.3 Processing-based perspectives	114
4.4 Evaluation of implicit, cognitive approaches	125
5 Cognitive approaches (2): the role of memory systems and conscious learning	130
5.1 Memory systems and their role in L2 learning	131
5.2 Explicit knowledge, information processing and skill acquisition	136
5.3 Awareness and attention in second language acquisition	146
5.4 Working Memory and second language acquisition	151
5.5 Evaluation of cognitive approaches (2): memory systems and conscious learning	156

6 Interaction in second language learning	160
6.1 Introduction	160
6.2 The revised Interaction Hypothesis (Long, 1996): an appeal to cognitive theory	162
6.3 Interaction and the learning of target L2 structures and vocabulary	163
6.4 The role of feedback	168
6.5 The Output Hypothesis and the role of prompts in corrective feedback	175
6.6 The problem of 'noticing'	179
6.7 Learner characteristics and engagement	182
6.8 Evaluation	184
7 Meaning-based perspectives on second language learning	188
7.1 Introduction	188
7.2 Early functionalist studies of second language learning	189
7.3 Functionalism beyond the case study: the European Science Foundation project	195
7.4 'Time talk': developing the means to talk about past time	201
7.5 The Aspect Hypothesis and the acquisition of past tense	203
7.6 Cognitive linguistics and 'thinking for speaking'	206
7.7 Second language pragmatics	210
7.8 Evaluation	216
8 Sociocultural perspectives on second language learning	220
8.1 Introduction	220
8.2 Sociocultural theory	220
8.3 Applications of sociocultural theory to SLL	227
8.4 Evaluation	246
9 Sociolinguistic perspectives	250
9.1 Introduction	250
9.2 Sociolinguistically driven variability in second language use	251
9.3 Second language socialization	260
9.4 Communities of practice and situated second language learning	269
9.5 Second language learning, agency and the (re)construction of identity	276
9.6 Affect, emotion and investment in second language learning	280
9.7 Evaluation: the scope and achievements of sociolinguistic enquiry	282
10 Conclusion	285
10.1 One theory or many?	285
10.2 Main achievements of recent second language learning research	286
10.3 Future directions for second language learning research	288
10.4 Second language learning research and language education	289
Glossary	292
References	308
Subject index	365
Name index	374

List of illustrations

Tables

4.1	Input profile of difficult and easy constructions	101
4.2	Miniature article system	112
4.3	Predicted and actual degree of difficulty based on isomorphism	124
5.1	Operationalizing the constructs of L2 implicit and explicit knowledge	137
5.2	Learners' reports about noticing and learning	149
6.1	Examples of interactional modifications in NS conversations	163
6.2	Immersion teachers' feedback moves	170
6.3	Negative feedback and modified output, by group	178
6.4	Question development by group	178
6.5	Correlations between grammatical accuracy in picture description and four cognitive variables	183
7.1	Pragmatic and syntactic modes of expression	190
7.2	Paratactic precursors of different TL constructions	195
9.1	[t]/[d] deletion in Detroit African-American speech	254
9.2	VARBRUL results for [t]/[d] deletion by African-American speakers from Detroit	255
9.3	[t]/[d] absence by grammatical category in Chinese-English interlanguage and in native English dialects	256
9.4	Optional <i>de</i> use by all groups	260

Figures

1.1	Spolsky's general model of second language learning	4
2.1	Acquisition hierarchy for 13 English grammatical morphemes for Spanish-speaking and Cantonese-speaking children	38
2.2	Comparison of adult and child acquisition sequences for eight grammatical morphemes	39
3.1	Parametric variation for a functional category in English and French	76
3.2	[_{NP} <i>my mother's holiday in the Caribbean Islands</i>] [_{VP} <i>was fantastic</i>]	78
3.3	[_{NP} <i>My brother</i>] [_{VP} <i>regularly wins the first prize</i>]	78
3.4	[_{VP} <i>She became</i>] [_{AP} <i>incredibly clever at making excuses</i>]	79
3.5	[_{VP} <i>He did this</i>] [_{PP} <i>quite without reason</i>]	79
3.6	Summary of the hierarchical structure of phrases in English shown in Figures 3.2 to 3.5	80
3.7	Hierarchical structure in languages such as Japanese	80
3.8	Hierarchical structure in languages such as Malagasy	80
4.1	Simple recurrent network	107
4.2	Learners gradually 'move up' the structure of a sentence	117
6.1	Mean accuracy of three groups on test of possessive determiners (oral picture description task)	172
6.2	Performance of 'low' and 'high' students on grammaticality judgement task (written error correction task)	173
6.3	Procedure for assessing 'noticing'	183

SECOND LANGUAGE LEARNING THEORIES

7.1	Expected direction of spread of preterit and imperfect forms in L2 Spanish across lexical classes	204
7.2	Diagrammatic representation of modal verb 'will'	207
7.3	Distribution of request types by learner group	213
8.1	Model of an activity system	226
8.2	Regulatory scale for error feedback – Implicit (strategic) to Explicit	237
8.3	Microgenesis in the language system	238
8.4	Teacher's mediating moves	240
8.5	Dynamic assessment in action	241
8.6	Methods of assistance occurring during classroom peer interaction	242
8.7	Didactic model for mood selection in Spanish	246
9.1	A typology of variation in interlanguage	252
9.2	Frequency of <i>de</i> use (Chinese NSs vs. CSL learners)	259

Acknowledgements

The authors would like to thank the following people for their willingness to make material available in advance of publication: Maria Arche, Laura Domínguez, Alison Mackey, Leah Roberts, Nicole Tracy-Ventura, and John Williams. We are grateful to Andrew Watts for his editorial work, and to Greg Marsden for his personal encouragement and support throughout the project.

The authors and publishers wish to thank the following for permission to use copyright material:

Academic Press/Elsevier: figure from 'From discourse to syntax: grammar as a processing strategy', by T Givón, in *Syntax and Semantics* 12, 1979.

Addison Wesley Longman/Pearson Education: extracts from *Achieving understanding: discourse in intercultural encounters*, by K. Bremer et al., 1996.

Cambridge University Press: table from 'Corrective feedback and learner uptake', R. Lyster and L. Ranta, *Studies in Second Language Acquisition* 19, 1996. Table from 'Measuring implicit and explicit knowledge of a second language: a psychometric study', by R. Ellis, *Studies in Second Language Acquisition* 27, 2005. Tables from 'Identifying the impact of negative feedback and learners' responses on ESL question development', by K. McDonough, *Studies in Second Language Acquisition* 27, 2005. Figures from 'One size fits all? Recasts, prompts and L2 learning', by A. Ammar and N. Spada, *Studies in Second Language Acquisition* 28, 2006.

Elsevier BV: extracts from 'Interactional routines and the socialization of interactional style in adult learners of Japanese', by A.S. Ohta, *Journal of Pragmatics* 31, 1999.

Equinox Publishing Ltd: figure from 'Revolutionary pedagogies: learning that leads (to) second language development' by E. Negueruela, in *Sociocultural theory and the teaching of second languages*, edited by J.P. Lantolf and M. Poehner, 2008.

Gunter Narr Verlag: extracts from *The syntax of conversation in interlanguage development*, by C. Sato, 1990.

SECOND LANGUAGE LEARNING THEORIES

John Benjamins Publishing Company: extracts from *Utterance structure: developing grammars again*, by W. Klein and C. Perdue, 1992, p. 76 and pp. 152–3. Table from 'Competing constraints on variation in the speech of adult Chinese learners of English' by R.J. Bayley, in *Second language acquisition and linguistic variation*, edited by R. Bayley and D.R. Preston, 1996, p. 109. Tables from 'Variationist perspectives on second language acquisition' by D.R. Preston, in *Second language acquisition and linguistic variation*, edited by R. Bayley and D.R. Preston, 1996, p. 4, p. 10. With kind permission by John Benjamins Publishing Company, Amsterdam/Philadelphia. www.benjamins.com.

John Wiley: figure from 'Rethinking the language of thought', by S. Schneider and M. Katz, *WIREs Cognitive Science* 3, 2012.

John Wiley/Blackwell Publishing: figure from 'Negative feedback as regulation and second language learning in the Zone of Proximal Development', by A. Aljaafreh and J.P. Lantolf, *Modern Language Journal* 78, 1994. Table from 'Some input on the easy/difficult grammar question: an empirical study', by L. Collins et al., *Modern Language Journal* 93, 2009. Figures from 'Sociolinguistic variation in the speech of learners of Chinese as a second language', by X. Li, *Language Learning* 60, 2010.

John Wiley/Teachers of English to Speakers of Other Languages Inc.: table from 'The impact of interaction on comprehension', by T. Pica, R. Young and C. Doughty, *TESOL Quarterly* 21, 1987.

Lawrence Erlbaum: extracts from *Second language acquisition processes in the classroom* by A. S. Ohta, 2001.

Oxford University Press: figures from *Language two* by H. Dulay, M. Burt and S. Krashen, reproduced by permission of Oxford University Press. Copyright © 1982 Oxford University Press, Inc. Figure from *The study of second language acquisition*, by R. Ellis, reproduced by permission of Oxford University Press. Copyright © Rod Ellis 2008. Figure from *Conditions for second language learning*, by B. Spolsky, reproduced by permission of Oxford University Press. Copyright © B. Spolsky 1989. Table from 'A note on canonical word order' by W. O'Grady, *Applied Linguistics* 26, 2005. Table from 'Feedback, noticing and instructed second language learning' by A. Mackey, *Applied Linguistics* 27, 2006. Figure from 'How effective are recasts? The role of attention, memory, and

analytical ability' by P. Trofimovich et al., in *Conversational interaction in second language acquisition*, edited by A. Mackey, 2007. Extracts from 'Interaction-driven L2 learning: characterizing linguistic development', in *Conversational interaction in second language acquisition*, edited by A. Mackey, 2007. Extracts from 'Proficiency and sequential organisation of L2 requests' by S. Al-Gahtani and C. Roever, *Applied Linguistics* 33, 2012.

Routledge/Taylor and Francis: extract from *Dialogue and the development of children's thinking: a sociocultural approach*, by N. Mercer and K. Littleton, 2007, p. 80. Figure from *The articulate mammal*, 5th edition, by J. Aitchison, 2008, p. 80. Figure from 'Cognitive linguistics and second language instruction', by K Tyler. In *The handbook of cognitive linguistics and second language acquisition*, edited by P. Robinson and N.C. Ellis, 2008, p. 473.

Sage Publications: figures from 'Dynamic assessment in the classroom: Vygotskian praxis for second language development', by J.P. Lantolf and M. Poehner, *Language Teaching Research* 15, 2010.

University of Hawaii Press: extracts from 'Artifacts and cultures of use in intercultural communication' by S. Thorne, *Language Learning and Technology* 7, 2003. Extracts from 'Second language socialization in a bilingual chat room: global and local considerations' by W.S.E. Lam, *Language Learning and Technology* 8, 2004.

Walter de Gruyter and Company: Figure from 'Pragmatic development in the Spanish as a FL classroom', by J. C. Félix-Brasdefer, *Intercultural Pragmatics* 4, 2007.

Preface

Aims of this book

This book is the result of collaboration between researchers interested in second language acquisition from a range of perspectives: linguistic (Myles), cognitive (Marsden) and social/educational (Mitchell). As in previous editions, our general aim is to provide an up-to-date, introductory overview of the current state of second language learning studies. Our intended audience is wide: undergraduates following first degrees in language/linguistics, graduate students embarking on courses in foreign language education/EFL/applied linguistics, and a broader audience of teachers and other professionals concerned with L2 education and development. Second language learning is a field of research with potential to make its own distinctive contribution to fundamental understandings, e.g. of the workings of the human mind or the nature of language. It also has the potential to inform the improvement of social practice in a range of fields, most obviously in language education. We ourselves are interested in second language learning (SLL) from both perspectives, and are concerned to make it intelligible to the widest possible audience.

All commentators recognise that while the field of second language learning research has been extremely active and productive in recent decades, we have not yet arrived at a unified or comprehensive view of how second languages are learned. We have therefore organised this book as a presentation and critical review of a number of different theories of SLL, which can broadly be viewed as linguistic, psycholinguistic and sociolinguistic. Indeed, the overall 'map' of the field we proposed in the first edition largely survives today, reflecting the fact that key strands of research already active 20 years ago have continued to flourish and develop. No single theoretical position has achieved dominance, and new theoretical orientations continue to appear. Whether this is a desirable state of affairs or not has been an issue of some controversy for SLL researchers (see discussion in Chapter 1). On the whole, while we accept fully the arguments for the need for cumulative programmes of research within the framework of a particular theory, we incline towards a pluralist view of SLL theorizing. In any case, it is obvious that students entering the field today need a broad introduction to a range of theoretical positions, with the tools to evaluate their goals, strengths and limitations, and this is what we aim to offer.

Previous editions (1998, 2004) were strongly influenced by the 1987 volume by McLaughlin, *Theories of second language learning*, which provided a selective and authoritative introduction to key L2 learning theories of the day. In this third edition, our primary aim remains the same: to introduce the reader to those theoretical orientations on language learning which seem currently most productive and interesting for our intended audience. But we have revised our text throughout to reflect the substantial developments that have taken place in the field in the last few years, so that the work aims to be fully up-to-date for a twenty-first-century readership. In particular, the new edition takes account of recent substantial developments in cognitive approaches to second language learning, and our treatment of this area has been split into two new chapters, with Emma Marsden as lead author for this domain. The rise of Minimalism in generative (Chomskyan) linguistics and its impact on generativist approaches to SLL is given thorough treatment; finally the strength of the ongoing 'social turn' in second language learning research has been acknowledged, with substantial revisions of later chapters dealing with functional, sociocultural and sociolinguistic perspectives. Throughout the book, key theoretical and methodological advances are presented and explained, greater attention has been paid to research on internet-based language learning, and new studies (in a range of languages) have been incorporated as examples. The evaluation sections in each chapter have been expanded and generally the book is rebalanced in favour of newer material.

As one sign of the vigour and dynamism of second language learning research, a good number of surveys and reviews are now on the market. Reflecting the variety of the field, these books vary in their focus and aims. Some are written to argue the case for a single theoretical position (e.g. Atkinson, 2011; Ayoun, 2003; Cook and Newson, 2007; Hawkins, 2001; Herschensohn, 2000; Lardiere, 2007; Leung, 2009; Mackey, 2007; Paradis, 2009; Thomas, 2004; White, 2003); some are encyclopaedic in scope and ambition (e.g. R. Ellis, 2008; Gass and Mackey, 2012; Herschensohn and Young-Scholten, 2013; Ritchie and Bhatia, 2009); some pay detailed attention to research methods and data analysis (e.g. Larsen-Freeman and Long, 1991; Mackey and Gass, 2012).

This particular book is intended as a unified introduction to the field, for students without a substantial background in linguistics. We begin with an introduction to key concepts (Chapter 1), and a historical account of how the

SECOND LANGUAGE LEARNING THEORIES

SLL field has developed (Chapter 2). In later chapters (3–9) we have made a selection from across the range of second language learning studies of a range of theoretical positions, which we believe are most active and significant. To represent linguistic theorising on SLL, we have concentrated on the Universal Grammar approach (Chapter 3). In Chapters 4 and 5 we deal with a selection of cognitive theories: in Chapter 4, we examine the application to SLL of general and implicit learning mechanisms, concentrating on emergentist and processing perspectives, while in Chapter 5, we explore the place of memory, explicit knowledge and attention in SLL, and their contribution to skill acquisition in particular. Chapter 6 explores the concept of interaction and its contribution to SLL, tracing earlier and later versions of the Interaction Hypothesis and related theories. Chapter 7 examines a range of theoretical positions which assume the centrality of meaning-making for SLL (functionalism, 'cognitive linguistics', L2 pragmatics). Chapter 8 deals with sociocultural theory and some of its more recent extensions (activity theory, dynamic assessment, concept-based instruction). In Chapter 9, we turn to the emergence of socially patterned variation in L2, and examine L2 socialization theory, as well as theories of identity, agency and investment as applied to SLL. Each of these theoretical positions is explained, and then illustrated by discussion of a small number of key empirical studies that have been inspired by that approach. We use these studies to illustrate: the methodologies that are characteristic of the different traditions in SLL research (from controlled laboratory-based studies of people learning artificial languages, to naturalistic observation of informal learning in the community); the scope and nature of the language 'facts' that are felt to be important; and the kinds of generalizations that are drawn. Where appropriate, we refer our readers to parallels in first language acquisition research, and also to more comprehensive treatments of the research evidence relevant to different theoretical positions. Each chapter concludes with an evaluation section (see below).

Other new features of this third edition which are intended to help the new reader build up an overall picture of the field include a timeline of important milestones in the development of SLL research, and a glossary explaining key terms used in the book.

Comparing SLL perspectives

We want to encourage our readers to compare and contrast the various theoretical perspectives we discuss in the book, so that they can get a better sense of the kinds of issues which different theories are trying to explain, and the extent to which they are supported to date with empirical evidence.

In reviewing our chosen perspectives, therefore, we evaluate each systematically, considering the nature and extent of empirical support and paying attention to the following factors:

- the claims and scope of the theory;
- the view of language involved in the theory;
- the view of the language learning process; and
- the view of the learner.

In Chapter 1 we discuss each of these factors briefly, introducing key terminology and critical issues that have proved important in distinguishing one theory from another.

11-11-11

1 | Second language learning: key concepts and issues

1.1 Introduction

This preparatory chapter provides an overview of key concepts and issues which will recur throughout the book. We offer introductory definitions of a range of terms, and try to equip the reader with the means to compare the goals and claims of particular theories with one another. We also summarize key issues, and indicate where they will be explored in more detail later in the book.

The main themes to be dealt with in the following sections are:

- 1.2 What makes for a 'good' explanation or theory?
- 1.3 Views on the nature of language
- 1.4 Views of the language learning process
- 1.5 Views of the language learner
- 1.6 Links between language learning theory and social practice.

First, however, we must offer a preliminary definition of our most basic concept, 'second language learning'. We define this broadly, to include the learning of any language, to any level, provided only that the learning of the 'second' language takes place sometime later than the acquisition of the first language.

Simultaneous infant **bilingualism** is a specialist topic, with its own literature, which we do not try to address in this book. For overviews see Döpke (2000), relevant sections in Bhatia and Ritchie (2004) and Müller (2009). However, we do take some account of growing research interest in interactions and mutual influences between 'first' languages and later-acquired 'second' languages, surveyed for example in Cook (2003) and Pavlenko (2011); aspects of this work are discussed in some later chapters.

For us, therefore, 'second languages' are any languages learned later than in earliest childhood. They may indeed be the second language the learner is working with, in a literal sense, or they may be his/her third, fourth, fifth language ... They encompass both languages of wider communication encountered within the local region or community (for example, in educational institutions, at the work place, or in the media), and truly foreign languages, which have no substantial local uses or numbers of speakers. We include 'foreign' languages under our more general term of 'second' languages because we believe that the underlying learning processes are essentially the same for more local and for more remote target languages, despite differing learning purposes and circumstances. (And, of course, such languages today are likely to be increasingly accessible via the internet, a means of communication which self-evidently cuts across any simple 'local'/'foreign' distinction.)

SECOND LANGUAGE LEARNING THEORIES

We are also interested in all kinds of learning, whether formal, planned and systematic (as in classroom-based learning), or informal and unstructured (as when a new language is 'picked up' in the community or via the internet). Following the proposals of Stephen Krashen (1981), some second language researchers have made a principled terminological distinction between formal, conscious learning and informal, unconscious acquisition. Krashen's distinctive 'Acquisition-Learning' Hypothesis is discussed further in Chapter 2; however, most researchers in the field do not sustain any principled distinction between the two terms. Unless specially indicated therefore, we ourselves will be using both terms interchangeably. (And in Chapters 4 and 5, where the distinction between conscious and unconscious learning is central, we will use the terms 'implicit' and 'explicit' learning to distinguish the two.)

1.2 What makes for a good theory?

Second language learning is an immensely complex phenomenon. Millions of human beings have experience of second language learning, and may have a good practical understanding of the activities which helped them to learn. But this practical experience, and the common-sense knowledge which it leads to, are clearly not enough to help us understand the process fully. We know, for a start, that people cannot reliably describe the language system which they have somehow internalized, nor the inner mechanisms which process, store and retrieve many aspects of that new language.

We need to understand second language learning better than we do, for two basic reasons:

- (a) Improved knowledge in this particular domain is interesting in itself, and can also contribute to more general understanding about the nature of language, of human learning, and of intercultural communication, and thus about the human mind itself, as well as how all these are interrelated and affect each other.
- (b) The knowledge will be useful; if we become better at explaining the learning process, and are better able to account for both success and failure in L2 learning, there will be a payoff for millions of teachers, and tens of millions of students and other learners, who are struggling with the task.

We can only pursue a better understanding of L2 learning in an organized and productive way if our efforts are guided by some form of theory. For our purposes, a **theory** is a more or less abstract set of claims about the entities which are significant within the phenomenon under study, the relationships which exist between them, and the processes which bring about change. Thus a theory aims not just at description, but at explanation. Theories may be embryonic and restricted in scope, or more elaborate, explicit and

1.2 What makes for a good theory?

comprehensive. They may deal with different areas of interest; thus a **property theory** will be primarily concerned with modelling the nature of the language system which is to be acquired, while a **transition theory** will be primarily concerned with modelling the change/developmental processes of language acquisition (Gregg, 2003b; Jordan, 2004, Chapter 5). (A particular transition theory for L2 learning may itself deal only with a particular stage or phase of learning or with the learning of some particular sub-aspect of language; or it may propose learning mechanisms which are much more general in scope.) Worthwhile theories are collaboratively produced, and evolve through a process of systematic enquiry, in which the claims of the theory are assessed against some kind of evidence or data. This may take place through a process of **hypothesis-testing** through formal experiment, or through more ecological procedures, where naturally occurring data is analysed and interpreted. (There are now many manuals offering guidance on SLL research methods in both traditions; for example, Mackey and Gass, 2012. We will provide basic introductions to a range of research procedures as needed, throughout the book, and also in the glossary.) Finally, the process of theory building is a reflexive one; new developments in the theory lead to the need to collect new information and explore different phenomena and different patterns in the potentially infinite world of 'facts' and data. Puzzling 'facts', and patterns which fail to fit in with expectations, in turn lead to new, more powerful theoretical insights.

To make these ideas more concrete, an early 'model' of second language learning is shown in Figure 1.1, taken from Spolsky, 1989, p. 28.

This model represents a 'general theory of second language learning', as the proposer describes it (Spolsky, 1989, p. 14). The model encapsulates this researcher's theoretical views on the overall relationship between contextual factors, individual learner differences, learning opportunities and learning outcomes. It is thus an ambitious model in the breadth of phenomena it is trying to explain. The rectangular boxes show the factors (or **variables**) which the researcher believes are most significant for learning, that is, where variation can lead to differences in success or failure. The arrows connecting the various boxes show directions of influence. The contents of the various boxes are defined at great length as consisting of clusters of interacting 'Conditions' (74 in all: 1989, pp. 16–25), which make language learning success more or less likely. These summarize the results of a great variety of empirical language learning research, as Spolsky interprets them.

How would we begin to 'evaluate' this or any other model, or even more modestly, to decide that this was a view of the language learning process with which we felt comfortable and within which we wanted to work? This would depend partly on the extent to which the author seems to have taken account of empirical evidence available in the field, and provided a synthetic account of

SECOND LANGUAGE LEARNING THEORIES

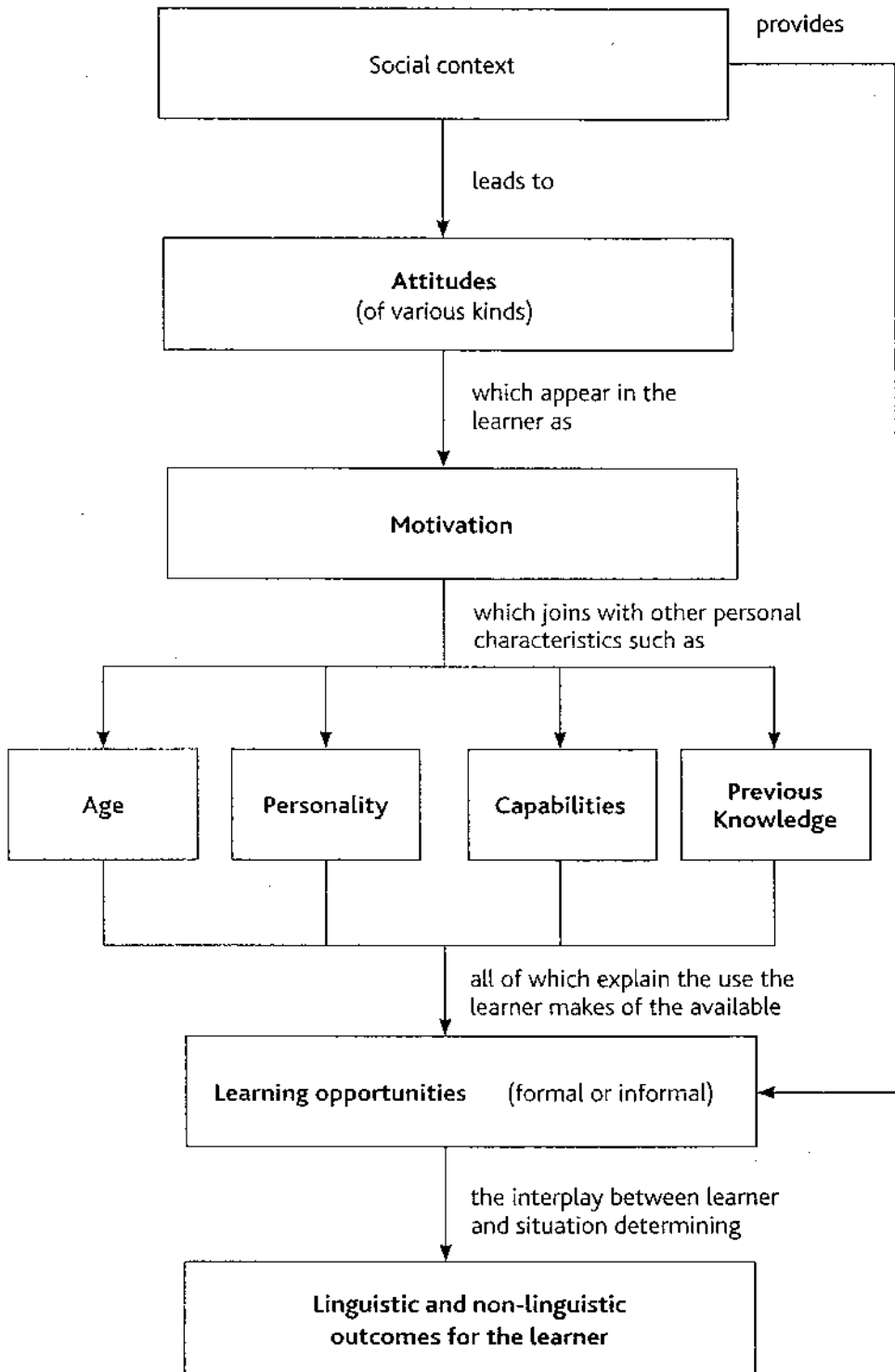


Figure 1.1 Spolsky's general model of second language learning (source: Spolsky, 1989, p. 28)

1.2 What makes for a good theory?

it. It would also depend on rather broader philosophical positions: for example are we satisfied with an account of human learning which sees individual differences as both relatively fixed, and also highly influential for learning? Finally, it would also depend on the particular focus of our own interests within second language learning; this particular model seems well adapted for the study of the individual learner, for example, but has relatively little to say about the social relationships in which they engage, the way they process new language, nor the kinds of language system they construct.

Since the mid-1990s, there has been increasing debate about the adequacy of the theoretical frameworks used to underpin research on second language learning. One main line of criticism has been that SLL research and theorizing (as exemplified by Spolsky, 1989) has historically been too preoccupied with the cognition of the individual learner, and sociocultural dimensions of learning have been neglected. From this perspective language is an essentially social phenomenon, and second language learning itself is a 'social accomplishment', which is 'situated in social interaction' (Firth and Wagner, 2007, p. 807), and discoverable through scrutiny of second language use, using techniques such as **conversation analysis** (Pekarek Doehler, 2010; Kasper and Wagner, 2011). A second – though not unrelated – debate has concerned the extent to which SLL theorizing has become too broad. Long (1993) and others argued that 'normal science' advanced through competition between a limited number of theories, and that the SLL field was weakened by theory proliferation. This received a vigorous riposte from Lantolf (1996) among others, advancing the postmodern view that knowledge claims are a matter of discourses, which 'cannot be extralinguistically described' (Lantolf, 1996, p. 734). From this point of view, all scientific theories are merely 'metaphors that have achieved the status of acceptance by a group of people we refer to as scientists' (p. 721), and scientific theory building is all about 'taking metaphors seriously' (p. 723). For Lantolf, any reduction in the number of 'official metaphors' debated could 'suffocate' those espousing different world views.

These debates about the nature of knowledge, theory and explanation in second language learning have persisted up to the present. It is probably fair to say that the majority of SLL researchers today adopt some version of a 'realist' or '**rationalist**' position (Jordan, 2004; Sealey and Carter, 2004; Long, 2007), grounded in the philosophical view that an objective and knowable world exists (that is, not only discourses), and that it is possible to build and test successively more powerful explanations of how that world works, through systematic programmes of inquiry and of problem-solving, and this is the position taken in this book. However, like others such as Jordan (2004) and Ortega (2011), we acknowledge that a proliferation of theories is necessary and desirable to make better sense of the varied phenomena of SLL, the agency of language learners, and the contexts and communities of practice in which they operate. We

SECOND LANGUAGE LEARNING THEORIES

believe that our understanding advances best where theories are freely debated and challenged among a community of scholars. As later chapters show, we accommodate a range of linguistic, cognitive, sociocultural and poststructuralist perspectives in our overall review. But whatever the particular focus of a given theory, we would expect to find the following:

1. Clear and explicit statements of the ground the theory is supposed to cover, and the claims which it is making.
2. Systematic procedures for confirming/disconfirming the theory, through data gathering and interpretation: the claims of a good theory must be testable/falsifiable in some way.
3. Not only descriptions of L2 phenomena, but attempts to explain why they are so, and to propose mechanisms for change.
4. Last but not least, engagement with other theories in the field, and serious attempts to account for at least some of the phenomena which are 'common ground' in ongoing public discussion (Long, 1990; VanPatten and Williams, 2007). Remaining sections of this chapter offer a preliminary overview of numbers of these.

(For fuller discussion of rationalist evaluation criteria, see Gregg, 2003a; Jordan, 2004, pp. 87–122; Sealey and Carter, 2004, pp. 85–106; and for a postmodern perspective on theory evaluation, see Lantolf, 1996, pp. 730–5.)

1.3 Views on the nature of language

1.3.1 Levels of language

Linguists have traditionally viewed language as a complex communication system which must be analysed on a number of levels: **phonology, syntax, morphology, lexis, semantics, pragmatics, discourse**. (Readers unsure about this basic descriptive terminology will find help from the glossary, and in more depth from an introductory linguistics text, such as Fromkin *et al.*, 2010.) They have differed about the degree of separateness/integration of these levels; for example, while Chomsky, for example, argued at one time that 'grammar is autonomous and independent of meaning' (1957, p. 17), another tradition initiated by the British linguist Firth claims that 'there is no boundary between lexis and grammar: lexis and grammar are interdependent' (Stubbs, 1996, p. 36). In examining different perspectives on second language learning, we will first of all be looking at the levels of language which they attempt to take into account. (Does language learning start with words, or with discourse?) We will also examine the degree of integration/separation which they assume, across the various levels. We will find that the control of syntax and morphology is commonly seen as somehow 'central' to language learning, and that most general SLL theories try to account for development in this area. Other levels of

1.3 Views on the nature of language

language receive much more variable attention, and some areas are commonly treated in a semi-autonomous way, as specialist fields. This is often true for SLL-oriented studies of pragmatics, lexical development and phonology for example: see Kasper and Rose (2002), Kasper (2009) or Bardovi-Harlig (2012) on pragmatics; Daller *et al.* (2007), Juffs (2009), Elgort and Nation (2010) or Laufer and Nation (2012) on vocabulary; Archibald (1998, 2005), Hansen (2006) or Moyer (2007) on phonology.

1.3.2 Competence and performance

Throughout the twentieth century, linguists also disagreed in other ways over their main focus of interest and of study. Should this be the collection and analysis of actual attested samples of language in use, for example by recording and analysing peoples' speech? The structuralist linguistics tradition of the early twentieth century leaned towards this view. Or, should it be to theorize underlying principles and rules which govern language behaviour, in its potentially infinite variety? The linguist Noam Chomsky has famously argued that it is the business of theoretical linguistics to study and model underlying language **competence**, rather than the **performance** data of actual utterances which people have produced (Chomsky, 1965). By competence, Chomsky is referring to the abstract and hidden representation of language knowledge held inside our minds, with its potential to create and understand original utterances in a given language. As we shall see in Chapter 3, this view has been influential in much second language learning research.

However, for linguists committed to this dualist position, there are difficulties in studying competence. Language performance data is believed to be an imperfect reflection of competence, partly because of the processing complications which are involved in speaking or other forms of language production, and which lead to errors and slips. More importantly, it is believed that in principle, the infinite creativity of the underlying system can never adequately be reflected in a finite data sample (for example, see Chomsky, 1965, p. 18). Strictly speaking, many researchers who set out to study language competence believe it can be accessed only indirectly, and under controlled conditions, through tasks such as sentence-completion, eye-tracking or **grammaticality judgement** tests (roughly, when people are offered sample sentences, which are in (dis)agreement with the rules proposed for the underlying competence, and invited to say whether they think they are grammatical or not: Sorace, 1996; Ionin, 2012).

This split between competence and performance has never been universally accepted, however, with, for example, linguists in the British tradition of Firth and Halliday arguing for radically different models in which this distinction between competence and performance does not appear. Firth himself described such dualisms as 'a quite unnecessary nuisance' (Firth, 1957, p. 2n, quoted

in Stubbs, 1996, p. 44). In the Firthian view, the only option for linguists is to study language in use, and there is no opposition between language as system and observed instances of language behaviour; the only difference is one of perspective.

Of course, the abstract language system cannot be 'read' directly off small samples of actual text, any more than the underlying climate of some geographical region of the world can be modelled from today's weather (a metaphor of Michael Halliday, quoted in Stubbs, 1996, pp. 44–5). The arrival of corpus linguistics has challenged the competence-performance distinction and has revitalized the writing of observation-based, 'probabilistic' grammars (Conrad, 2010). In this form of linguistics, very large corpora (databases) comprising millions of words of running text are collected, stored electronically and analysed with a growing range of software tools. New corpus-based grammars of English have provided enhanced accounts of spoken language and of variation among spoken and written genres (Biber *et al.*, 1999; Carter and McCarthy, 2006). In first language acquisition research, the CHILDES project has made extensive child language corpora available in an increasing number of languages, and is a central tool in contemporary research (MacWhinney, 2000, 2007). Within the field of second language acquisition, the more recent creation of learner corpora is also making it possible to analyse large databases of learner language, both from a 'bottom-up' perspective (to find patterns in the data), and from a 'top-down' perspective (to test specific hypotheses) (Myles, 2007, 2008; Granger, 2012).

In making sense of contemporary perspectives on SLL, then, we will also need to take account of the extent to which a competence/performance distinction is assumed. This will have significant consequences for the research methodologies associated with various positions, for example the extent to which these pay attention to naturalistic samples and databases of learner language, spoken and written, or rely on more controlled and focused – but more indirect – testing of learners' underlying knowledge. (For further discussion of the relationship between language use and language learning, see Section 1.4.8.)

1.3.3 Formalist and functionalist models of language

A further debate in contemporary linguistics which is relevant to SLL research and theorizing has to do with whether language is viewed primarily as a formal or a functional system. From a formal linguistics perspective such as that adopted in structuralist or Chomskyan theory, language comprises a set of elements (parts of speech, morphosyntactic features, phonemes etc.) which are combined together by a series of rules or procedures. Semantics form part of this formal system but do not drive it (for example, see Rispoli, 1999).

1.3 Views on the nature of language

From a functionalist perspective, research and theorizing must start with the communicative functions of language, and functionalists seek to explain the structure of language as a reflection of meaning making. For example, a speaker's intention to treat a particular piece of information as already known to their **interlocutor**, or alternatively as new for them, is seen by theories such as Halliday's systemic functional grammar as motivating particular grammar phenomena such as **clefting** (that is, fronting a piece of information within a sentence: *it was my mother who liked jazz*). Theoretical linguists who have adopted this perspective in varying ways, and whose work has been important for both first and second language learning research, include Givón (for example, 1979, 1985), Halliday (for example, Halliday and Matthiessen, 2004), Lakoff (1987), Langacker (1987, 2008) and L. Talmy (2000, 2008).

1.3.4 The language target

Much twentieth-century linguistics has followed the Chomskyan notion that the object of study should be the underlying competence of an 'ideal speaker-listener' of each given language, and that the intuitions of the (educated) native speaker provide access to this. In turn, much SLI research has assumed that native speaker competence provides a convergent, single target for L2 development. 1970s researchers urged that learners' developing L2 competence should be seen as a language system in its own right, and not merely a defective copy of the target. However the term **interlanguage** proposed for L2 systems implied an 'in-between' system in transition towards a native-like target.

These ideas were challenged in some quarters in later twentieth-century linguistics, and in turn they have also been challenged in SLL research. Corpus linguistics and sociolinguistics have highlighted aspects of **variability** within 'native speaker' usage, and complexity theorists have emphasized the dynamic nature of all language knowledge, defined as a 'dynamic-set of graded patterns emerging from use', with some 'emergent stabilities', but by definition never fully acquired (Larsen-Freeman, 2011a, pp. 52–3). Proponents of 'multicompetence' have argued that multilingualism involves a merged language system, in which different languages (L1, L2, L3 ...) mutually influence each other (Cook, 2008a).

Finally, an increasing number of researchers concerned with the learning of English as a global language have rejected altogether the notion of a standard native speaker target, instead arguing that English as a **lingua franca** (ELF) is the prime target for most learners, with its own distinctive expert 'end point' (Jenkins, 2006, p. 141). Duff (2012, p. 410) points out that a range of new terminology has emerged, reflecting this more open view of language learning goals: advanced L2 users, lingua franca speakers, multi-competent speakers, etc. These changing views of language are important for how we understand the learning process, to which we now turn.

1.4 The language learning process

1.4.1 Nature and nurture

Discussions about second language learning have always been coloured by debates on fundamental issues in human learning more generally. One of these is the nature–nurture debate. How much of human learning derives from innate predispositions, that is, some form of genetic pre-programming, and how much of it derives from social and cultural experiences which influence us as we grow up? In the twentieth century, the best-known controversy on this issue concerning first language learning involved the behaviourist psychologist B.F. Skinner and the linguist Noam Chomsky. Skinner took the view that language in all its essentials could be and was taught to the young child by the same mechanisms which he believed accounted for other types of learning. (In Skinner's case, the mechanisms were those envisaged by general behaviourist learning theory – essentially, the shaping of 'habits' through repeated trial, error and reward. From this point of view, language could be learned primarily by imitating caretakers' speech. The details of the argument are discussed further in Chapter 2.)

Chomsky on the other hand has argued consistently for the view that human language is too complex to be learned in its entirety from the performance data actually available to the child; we must therefore have some innate predisposition to expect natural languages to be organized in particular ways and not others. For example, all natural languages have word classes such as Noun and Verb, and operations which apply to these word classes. It is this type of information which Chomsky doubts children could discover from scratch, in the speech they hear around them. Instead, he argues that there must be some innate core of abstract knowledge about language form, which pre-specifies a framework for all natural human languages. This core of knowledge is currently known as **Universal Grammar** (see Chapter 3).

Here, it is enough to note that child language specialists now generally accept the basic notion of an innate predisposition to language, though views continue to differ as to whether the underlying grammatical core of language is learned by the distinctive mechanisms of Universal Grammar, or 'emerges' through language use and the application of more general learning mechanisms. Other aspects of language development, not least which language(s) is/are actually learned, and many aspects of vocabulary and pragmatics, clearly must result from an interaction between innate and environmental factors. Whatever view is taken of the learning of the grammatical core, active involvement in language use is essential for the overall development of **communicative competence**. (See Foster-Cohen, 2009, for an overview of this debate.)

How does the nature–nurture debate impact on theories of second language learning? If humans are endowed with an innate predisposition for language,

then perhaps they should be able to learn as many languages as they need or want to, provided (important provisos!) that the time, circumstances and **motivation** are available. On the other hand, the environmental circumstances for L2 learning differ systematically from L1 learning, except where infants are reared in multilingual surroundings. Should we be aiming to reproduce the 'natural' circumstances of L1 learning as far as possible for the L2 learner? This was a fashionable view in the 1970s, but one which downplayed some very real social and psychological obstacles. In recent decades there has been a closer and more critical examination of 'environmental' factors which seem to influence L2 learning; some of these are detailed briefly in Section 1.4.8, and elaborated in later chapters (especially Chapters 6–9).

1.4.2 Modularity vs. unitary views of cognition

A further issue of controversy for students of the human brain and mind has been the extent to which the mind should be viewed as **modular** or unitary. That is, should we see the mind as a single, flexible organism, with one general set of procedures for learning and storing different kinds of knowledge and skills? Or, is it more helpfully understood as a bundle of modules, with distinctive mechanisms relevant to different types of knowledge (for example, Fodor, 1983; Smith and Tsimpli, 1995; Lorenzo and Longa, 2003)?

The modular view has found significant support from within linguistics, most famously in the further debate between Chomsky and the child development psychologist, Jean Piaget. This debate is reported in Piatelli-Palmarini (1980); a helpful summary is offered by Johnson (1996, pp. 6–30). Briefly, Piaget argued that language was simply one manifestation of the more general skill of symbolic representation, acquired as a stage in general cognitive development; no special mechanism was therefore required to account for first language acquisition. Chomsky's general view is that not only is language too complex to be learned from environmental exposure (his criticism of Skinner), it is also too distinctive in its structure to be learnable by general cognitive means. Universal Grammar is thus endowed with its own distinctive mechanisms for learning (so-called parameter-setting; see Chapter 3 below).

There are good numbers of linguists today who support the concept of a distinctive **language module** in the mind, the more so as there seems to be a dissociation between the development of cognition and of language in some cases (Bishop and Mogford, 1993; Smith and Tsimpli, 1995; Bishop, 2001; Lorenzo and Longa, 2003). There are also those who argue that language competence itself is modular, with different aspects of language knowledge being stored and accessed in distinctive ways. However there is still no general agreement on the number and nature of such modules, nor on how they relate to other aspects of cognition. The alternative view, that language 'emerges' as a symbolic system among others through the working of general cognitive processes, has also

been significantly further developed by numerous child language acquisition researchers (for example, see Tomasello, 2003; Vihmann, 2009; Peters, 2009).

1.4.3 Modularity and second language learning

The possible role of an innate, specialist language module in second language learning has been much discussed. If distinctive language learning mechanisms indeed exist, there are four logical possibilities:

1. That they continue to operate during second language learning, and make key aspects of second language learning possible, in the same way that they make first language learning possible.
2. That after the acquisition of the first language in early childhood, these mechanisms cease to be operable, and second languages must be learned by other means.
3. That the mechanisms themselves are no longer operable, but that the first language provides a model of a natural language and how it works, which can be 'copied' in some way when learning a second language.
4. That distinctive learning mechanisms for language remain available, but only in part, and must be supplemented by other means. (From a Universal Grammar (UG) point of view, this would mean that UG was itself modular, with some modules still available and others not.)

The first position was popularized in the second language learning field by Stephen Krashen in the 1970s, in a basic form (see Chapter 2). This strand of theorizing has been revitalized by the continuing development of Chomsky's Universal Grammar proposals (see Chapter 3).

On the other hand, thinking about those general learning mechanisms which may be operating at least for adult learners of second languages has also developed considerably further, since, for example, the original proposals of McLaughlin (1987, pp. 133–53). For example, the work of the cognitive psychologist J.R. Anderson on human learning, from an **information processing** perspective, and related proposals for a distinction between declarative and procedural forms of knowledge, have been applied to various aspects of second language learning by different researchers (O'Malley and Chamot, 1990; Towell and Hawkins, 1994; Ullman, 2005). There has also been a significant recent revival of interest in neo-behaviourist (associative) theories of learning with reference to SLL, especially in what has come to be called **connectionism** or 'statistical learning' (N.C. Ellis, 2003). This is 'a strongly empiricist and emergentist approach that sees acquisition as the absorption of statistical regularities in the environment through implicit learning mechanisms' (Williams, 2009, p. 328). Such statistical learning effects have been demonstrated for phonology, and for the identification of words and of phrase structures. These general cognitive theories are discussed further in Chapters 4 and 5.

1.4.4 Systematicity and variability in L2 learning

When the utterances produced by L2 learners are examined and compared with traditionally accepted target language norms, they are often condemned as full of errors or mistakes. Indeed, language teachers have often viewed learners' errors as the result of carelessness or lack of concentration. If only learners would try harder, surely their productions could accurately reflect the target language rules which they had been taught! In the mid-twentieth century, under the influence of behaviourist learning theory, errors were often viewed as the result of 'bad habits', which could be eradicated if only learners did enough rote learning and **pattern drilling** using target language models.

As will be shown in more detail in Chapter 2, one of the big lessons learned from early SLL research is that though learners' L2 utterances may depart from target language norms, they are by no means lacking in system. So-called errors and mistakes are patterned, and though some recurring errors are due to the influence of the first language, this is by no means true of all of them. Instead, there is a good deal of evidence that learners work their way through a number of **developmental stages**, from apparently primitive and deviant versions of the L2, to progressively more elaborate and target-like versions. Just like fully expert users of a language, their language productions can be described by a set of underlying 'rules', which have their own integrity and are not just inadequately applied versions of the target language rules.

One clear example, which has been studied for a range of target languages, has to do with the formation of negative sentences. It has commonly been found that learners start off by tacking a negative particle of some kind on to the beginning or the end of an utterance (*no you are playing here*). Next, they learn to insert a negative particle of some kind into the verb phrase (*Mariana not coming today*); and finally, they learn to manipulate modifications to auxiliaries and other details of negation morphology (*I can't play that one*) (English examples from R. Ellis, 2008, pp. 92–3). This kind of data has commonly been interpreted to show that, at least for key parts of the L2 grammar, learners' development follows a common **route**, even if the speed (or **rate**) at which learners actually travel along the route may be very different.

This **systematicity** in the language produced by L2 learners is of course paralleled in the early stages through which first language learners also pass, described more fully in Chapter 2. Many commentators identify it as one of the key features which L2 learning theories are required to explain (for example, VanPatten and Williams, 2007, pp. 10–11), and we will refer to it repeatedly throughout the book.

However, learner language (or **interlanguage**: Selinker, 1972) is not only characterized by systematicity. Learner language systems are frequently unstable and in course of change; they are characterized also by high degrees

of **variability** (VanPatten and Williams, 2007, p. 11). Most obviously, learners' utterances may vary from moment to moment, in the types of 'errors' which are made, and learners seem liable to switch between a selection of 'optional' forms over lengthy periods of time (Sorace, 2005). A well-known example offered by R. Ellis involves a child learner of L2 English who seemed to produce the utterances *no look my card*, *don't look my card* interchangeably over an extended period (1985a). Myles *et al.* (1998) reported similar data from a classroom learner of L2 French, who variably produced forms such as *non animal*, *je n'ai pas de animal* within the same 20 minutes or so (to say that he did not have a pet; the correct French form should be *je n'ai pas d'animal*). Here, in contrast to the underlying systematicity earlier claimed for the development of rules of negation, we see performance varying quite substantially from moment to moment.

Like systematicity, variability is also found in child language development. However, the variability found among L2 learners is undoubtedly greater than that found for children; in later chapters we will see various attempts to account for this phenomenon. These will include explanations in terms of linguistic optionality/indeterminacy (discussed in Chapter 3), and psycholinguistic factors such as processing constraints, **short-term memory** load, planning time available etc., to be discussed in Chapters 4 and 5. They will also include explanations in terms of sociolinguistic factors such as speech style, to be discussed in Chapter 9.

1.4.5 Creativity and routines in L2 learning

In the last section, we referred to evidence which shows that L2 learners' utterances can be described as systematic, at least in part. This systematicity is linked to another key concept, that of originality or **creativity**. Learners' surface utterances can be linked to underlying rule systems, even if these cannot be matched neatly with the target language system. It logically follows that learners can generate original utterances, which they have never heard before.

There is, of course, plenty of commonsense evidence that learners can put their L2 knowledge to creative use, even at the very earliest stages of L2 learning. It becomes most obvious that this is happening when learners produce utterances like *non animal* (no animal = 'I haven't got any pet'), which we cited before, and which they are unlikely to have heard from any French interlocutor. It seems most likely that the learner has produced it through applying a very early interlanguage mechanism for marking negation, in combination with some basic vocabulary.

But how did this same learner manage to produce the near-target *je n'ai pas de animal*, with its negative particles correctly inserted within the verb phrase, within a few minutes of the other form? One likely explanation is that at this point the learner was reproducing an utterance which they have indeed heard

1.4 The language learning process

before (and probably rehearsed), which has been memorized as an unanalysed whole, that is a **formulaic sequence** or a chunk.

Work in corpus linguistics has led to the increasing recognition that formulaic sequences play an important part in everyday language use; when we talk, our L1 utterances are a complex mix of creativity and prefabrication (Sinclair, 1991). L1 acquisition research has documented the use of unanalysed chunks by young children (Wray, 2002, 2008; Lieven and Tomasello, 2008), though for L1 learners the contribution of chunks seems limited by processing constraints. For older L2 learners, however, memorization of lengthy sequences is much more possible. (Think of those singers who successfully memorize and deliver entire songs, in different languages.)

Analysis of L2 data produced by classroom learners in particular seems to show extensive and systematic use of chunks to fulfil communicative needs in the early stages (Myles *et al.*, 1998, 1999; Myles, 2004). Studies of informal learners also provide some evidence of chunk use, and the phenomenon is now receiving more sustained attention among theorists (Wray, 2002, 2008; N.C. Ellis, 2008b; Bardovi-Harlig, 2009).

1.4.6 Incomplete success, fossilization and ultimate attainment

Young children learning their first language embark on the enterprise in widely varying social situations. Yet with remarkable uniformity, at the end of five years or so, they have achieved a very substantial measure of success. Teachers and students know that this is by no means the case with second languages, embarked on after these critical early years, and that few, if any, adult learners ever come to blend indistinguishably with the community of target language 'native speakers', even if they are strongly motivated to do so.

If the eventual aim of the second language learning process is to adopt native speaker usage, therefore, it is typified by incomplete success. Indeed, while some learners go on learning, and arrive very close to the target language norm, others seem to stabilize as users of an alternative language system, no matter how many language classes they attend, or how actively they continue to use their second language for communicative purposes. The term **fossilization** has been proposed to describe this phenomenon (Selinker, 1972; Han and Selinker, 2005), though this term has been seen as objectionable by some (for example, Jenkins, 2007), and more neutral terms such as '**end state**', 'ultimate attainment' are also regularly used.

These phenomena of incomplete success, at least with reference to native speaker norms, are also significant 'facts' about the process of L2 learning, which SLL theory needs eventually to explain. As we will see, explanations of two basic types have been offered. The first group of explanations are **psycholinguistic**:

the learning mechanisms available to the young child simply cease to work for older learners, at least partly, and no amount of study and effort can recreate them. The second group of explanations are **sociolinguistic**: older L2 learners do not have the social opportunities, or the motivation, to identify completely with the native speaker community, but may instead value their distinctive **identity** as learners, as members of an identifiable minority group, or as 'lingua franca' speakers (Block, 2007; Jenkins, 2006, 2007). These ideas are discussed in more detail in relevant chapters.

1.4.7 Cross-linguistic influences in L2 learning

Everyday observation tells us that learners' performance in a second language is influenced by the language, or languages, that they already know. This is routinely obvious from learners' 'foreign accent', that is pronunciation which bears traces of the phonology of their first language. It is also obvious when learners make certain characteristic mistakes, for example when a native speaker of English says something in French like *je suis douze*, an utterance parallel to the English 'I am twelve'. (The correct French expression would be *j'ai douze ans* = I have twelve years.)

This kind of phenomenon is often called **language transfer**. But how important is it, and what exactly is being transferred? Second language researchers have been through several 'swings of the pendulum' on this question, as Gass put it (1996). Behaviourist theorists of the 1950s and 1960s viewed language transfer as an important source of error and interference in L2 learning, because L1 'habits' were so tenacious and deeply rooted. The interlanguage theorists who followed in the 1970s downplayed the influence of the L1 in L2 learning, however, because of their preoccupation with identifying creative processes at work in L2 development; they pointed out that many L2 errors could not be traced to L1 influence, and were primarily concerned with discovering patterns and developmental sequences on this creative front.

Theorists today, as we shall see, would generally accept once more that cross-linguistic influences play an important role in L2 learning, on all language levels from phonology to discourse (Ortega, 2009, pp. 31–54). However, we will still find widely differing views on the extent and nature of these influences. In Chapter 7 below we visit the issue from a functionalist perspective, and find an important group of researchers studying informal adult learners, who argue that L1 influence is weak (Klein and Perdue, 1992). However, other researchers have claimed that learners with different L1s progress at somewhat different rates, and even follow different acquisitional routes, at least in some areas of the target grammar. For example, Ringböm has shown that L1 Swedish speakers can learn many aspects of L2 English at a faster rate than L1 Finnish speakers; he attributes this to the fact that Swedish and English are typologically close (Ringböm, 2007). A more general effect has also been observed in some recent

multilingualism research (commonly known as 'L3 acquisition research'), whereby learners of any third or fourth language seem to do so with added efficiency, and to be able to draw on all of the previous languages they may know as sources of support for the newest language (Hufeisen and Jessner, 2009).

From a Universal Grammar perspective, the language transfer problem is looked at somewhat differently. If second language learners have continuing direct access to their underlying Universal Grammar, L1 influence will affect only the more peripheral areas of L2 development. If on the other hand learners' only access to UG is indirect, via the working example of a natural language which the L1 provides, then L1 influence lies at the heart of L2 learning. We review these alternatives in detail in Chapter 3.

1.4.8 The relationship between second language use and second language learning

In Section 1.3.2, we considered the distinction between language competence and performance. Here, we look more closely at the relationship between using (that is, performing in) an L2, and learning (that is, developing one's competence in) that same language.

We should note first of all, of course, that 'performing' in a language not only involves speaking it. Making sense of the language data which we hear around us is an equally essential aspect of performance. It is also obviously necessary to interpret and to **process** (= analyse) incoming language data in some form for language development to take place.

There is thus a consensus that language **input** of some kind is essential for normal language learning. During the late 1970s and early 1980s, the view was argued by Stephen Krashen and others that input (at the right level of difficulty) was all that was necessary for L2 acquisition to take place (Krashen, 1982, 1985: see fuller discussion of the Comprehensible Input Hypothesis in Chapter 2). Input, and what learners do with it, has remained a central issue in L2 theorizing ever since.

Krashen was unusual in not seeing any central role for language production in his theory of second language acquisition. Most other theoretical viewpoints support in some form the commonsense view that speaking a language is helpful for learning it, though they offer a wide variety of explanations as to why this should be the case. For example, behaviourist learning theory saw regular (oral) practice as helpful in forming correct language 'habits'. A directly contrasting view to Krashen's is the so-called Comprehensible Output Hypothesis, argued for by Merrill Swain and colleagues (for example, Izumi, 2003; Swain, 2005). Swain originally pointed out (1985) that much L2 input is comprehensible, without any need for a full grammatical analysis. If we don't need to pay attention to the grammar in order to understand the message, why should we be compelled to

SECOND LANGUAGE LEARNING THEORIES

learn it? On the other hand, when we try to say something in our chosen second language, we are forced to try out our ideas about how the target grammar actually works.

Other contemporary theorists continue to lay stress on the 'practice' function of language production, especially in building up **fluency** and control of an emergent L2 system (DeKeyser, 2007b). For example, information processing theorists commonly argue that language competence consists of both a knowledge component ('knowing that') and a skill component ('knowing how'). Researchers in this perspective agree in seeing a vital role for L2 use/L2 performance in developing the second, skill component. (See Chapter 5 for fuller discussion.)

So far in this section, we have seen that theorists can hold different views on the contribution both of language input and language **output** to language learning. However, another way of distinguishing among current theories of L2 learning from a 'performance' perspective has to do with their view of L2 interaction – when the speaking and listening in which the learner gets engaged are viewed as an integral and mutually influential whole, for example in everyday conversation. Two major perspectives on interaction are apparent, one psycholinguistic, one sociolinguistic.

From a psycholinguistic point of view, L2 interaction is mainly interesting because of the opportunities it seems to offer to individual L2 learners to fine-tune the language input they are receiving. This ensures that the input is well adapted to their own internal needs (that is, to the present state of development of their L2 knowledge). What this means is that learners need the chance to talk with native speakers in a fairly open-ended way, to ask questions, and to clarify meanings when they do not immediately understand. Conversational episodes involving the regular **negotiation of meaning** have been intensively studied by many of the interactionist researchers whose work is discussed in Chapter 6.

Interaction is also interesting to linguistic theorists because of recent controversies over whether the provision of **negative evidence** is necessary or helpful for L2 development. By 'negative evidence' is meant some kind of input which lets the learner know that a particular form is *not* acceptable according to target language norms, such as, for example, a formal correction offered by a teacher.

Why is there a controversy about negative evidence in L2 learning? The problem is that correction often seems ineffective – and not only because L2 learners are lazy. It seems that learners often cannot benefit from correction, but continue to produce the same forms despite **feedback** being offered. For some current theorists, any natural language must therefore be learnable from **positive evidence** alone, and corrective feedback is largely irrelevant. Others continue to see value in corrections and negative evidence, though it may have to be

accepted that these will be useful **only** when they relate to 'hot spots' currently being restructured in the learner's emerging L2 system.

These different (psycho)linguistic views have one thing in common, however; they view the learner as operating and developing a relatively autonomous L2 system, and see interaction as a way of feeding that system with more or less fine-tuned input data. Sociolinguistic views of interaction are very different. Here, the language learning process is viewed as essentially social; both the identity of the learner, and his/her language knowledge, are collaboratively constructed and reconstructed in the course of interaction (Duff and Talmy, 2011; Duff, 2012). The details of how this is supposed to work vary from one theory to another, as we shall see in Chapters 8 and 9.

1.5 Views of the language learner

Who is the second language learner, and how are they introduced to us, in current SLL research?

We have already made it clear that the infant bilingual is not the subject of this book. Instead, 'second language' research generally deals with learners who embark on the learning of an additional language at least some years after they have started to acquire their first language. So, second language learners may be children, or they may be adults; they may be learning the target language formally in school or college, or 'picking it up' in the playground, the internet or the workplace. They may be learning a highly localized language, which will help them to become insiders in a local **speech community**; or the target language may be a language of wider communication relevant to their region, which gives access to economic development and public life.

Indeed, in the first part of the twenty-first century, the target language is highly likely to be English; estimates suggest that while around 5 per cent of the world's population (approximately 350 million) speak English as their first language, between one and two billion are using it as a second language or a lingua franca, or learning to do so (Graddol, 2006, p. 98). Consequently, much research on second language learning, whether with children or adults, is concerned with the learning of English, or with a small number of other languages with global reach (French, German, Japanese, Mandarin, Spanish ...). There are many multilingual communities today (for example, townships around fast-growing mega-cities) where L2 learning involves a much wider range of languages. However, these have been comparatively little studied.

It is possible to distinguish three main points of view, or sets of priorities, among SLL researchers as far as the learner is concerned: the linguistic and psycholinguistic perspective which is concerned with modelling language structures and processes within the mind; the social psychological perspective, which is concerned with modelling individual differences among learners,

SECOND LANGUAGE LEARNING THEORIES

and their implications for eventual learning success; and the sociocultural perspective, which is concerned with learners as social beings and members of social groups and networks. These different perspectives are briefly introduced in following sections.

1.5.1 The learner as language processor

Linguists and psycholinguists have typically been concerned primarily with analysing and modelling the inner mental mechanisms available to the individual learner, for processing, learning and storing new language knowledge. As far as language learning in particular is concerned, their aim is to document and explain the developmental route along which learners travel, and their degree of ultimate success. Researchers for whom this is the prime goal are less concerned with the speed or rate of development. Thus they tend to minimize or disregard social and contextual differences among learners; their aim is to document universal mental processes available to all normal human beings.

As we shall see, however, there is some controversy among researchers in this psycholinguistic tradition on the question of age. Do child and adult L2 learners learn in essentially similar ways? Or, is there a critical age which divides younger and older learners, a moment when early learning mechanisms atrophy and are replaced or at least supplemented by other compensatory ways of learning? Many second language researchers agree with some version of a view that 'younger = better in the long run' (Singleton, 1995, p. 3), while others argue that this debate is far from resolved (for recent accessible overviews, see Abrahamsson and Hyltenstam, 2009; Herschensohn, 2007; Muñoz and Singleton, 2011). However, explanations of why this should be are still debated: for example, see Chapter 3 below.

1.5.2 Differences between individual learners

Real-life observation quickly tells us, however, that even if L2 learners can be shown to be following a common developmental route, they differ greatly in their rate of learning and eventual success. Psychologists have argued consistently that these differences in learning outcomes must be due to **individual differences** among learners, and many proposals have been made concerning these. For full overviews of these proposals, and surveys of related research, we refer the reader to sources such as Robinson (2002), Dörnyei (2005), R. Ellis (2008, pp. 643–724) and Dewaele (2009). As Dewaele remarks, nobody has yet come up with any 'Grand Unified Theory of Individual Differences' (2009: p. 625). Here we introduce a selection of the most prominent cognitive and affective (emotional) factors which have been claimed to influence aspects of the second language learning process, and/or ultimate learning success.

Language aptitude

Is there really such a thing as a 'gift' for second language learning, distinct from general intelligence, as folk wisdom often holds? The most famous formal test of **language aptitude** was designed in the 1950s, by Carroll and Sapon (1957, in Skehan, 2012, p. 393). This 'Modern Language Aptitude Test' (MLAT) was grounded in a four-factor view of language learning aptitude developed by the social psychologist John B. Carroll. The aptitude factors proposed by Carroll were: (a) phonetic coding ability, (b) grammatical sensitivity, (c) inductive language learning ability and (d) associative memory abilities. The Carroll view of aptitude reflected the behaviourist language learning theory of the day, and its view of memory in particular has been replaced in current SLL theorizing by more current cognitive models of memory (see Chapters 4 and 5). However, the MLAT and similar tests have remained broadly robust predictors of second language learning success for learners instructed using varying methods, including **communicative approaches**, and also for informal language learners.

The general claim that a distinctive language aptitude exists has gained further support from research investigating the relationship between L1 development, L2 proficiency and L2 aptitude, in classroom contexts. An early **longitudinal** study by Skehan (1986) demonstrated a significant relationship between early L1 development measures and L2 aptitude measures for the same children when learning a foreign language ten years later. Research by Sparks and associates has also tracked a cohort of American children through early L1 literacy instruction and later foreign language learning. These scholars have shown through a series of repeated tests (including MLAT) that L1 literacy skills are strong predictors of both L2 aptitude and eventual L2 proficiency, at least in a classroom context, while factors such as general intelligence and classroom anxiety played a much more limited role. (See Sparks, 2012, for review.) Finally, new studies of classroom language learning by identical and non-identical twins have also suggested the existence of a specific L2 aptitude somewhat distinct from both L1 ability and from intelligence (Dale *et al.*, forthcoming).

More recent theoretical work has set out to relate language aptitude more closely to the processes of second language learning, rather than to ultimate attainment. Thus, for example, Skehan (2002, 2012) has made proposals which show how greater working memory capacity should facilitate specific aspects of L2 processing, from **parsing** longer stretches of L2 input, to monitoring production and paying attention to feedback. Robinson (2002) has pursued the idea that learners may possess a number of different aptitude profiles (or 'aptitude complexes', p. 119) which make them more or less likely to learn effectively under different conditions (grammar study, oral communication, text-based learning etc.). However, these attempts to re-theorize language aptitude are so far supported by only a limited amount of empirical research.

SECOND LANGUAGE LEARNING THEORIES

Language learning strategies

Do more successful language learners set about the task in some distinctive way? Do they have at their disposal some special repertoire of ways of learning, or strategies? If this were true, could these even be taught to other, hitherto less successful learners? From the 1970s onwards, numerous researchers have set out to conceptualize and categorize the strategies supposedly used by learners at different levels. Early research was grounded in observation and interviews with successful learners (for example, Naiman *et al.*, 1978). Subsequent research developed more detailed taxonomies of learning strategies, the best known being those of Rebecca Oxford (1990, 2011a) and of O'Malley and Chamot (1990). Oxford has defined learning strategies as: 'the learner's goal-directed actions for improving language proficiency or achievement, completing a task, or making learning more efficient, more effective, and easier' (2011b, p. 167). Her original taxonomy included six groups of strategies, illustrated below:

Memory strategies	e.g. 'creating mental images'
Cognitive strategies	e.g. 'analysing and reasoning', 'practising' (both repetition and natural practice)
Compensation strategies	e.g. 'guessing intelligently', 'adjusting the message'
Metacognitive strategies	e.g. 'setting goals and objectives', 'self-evaluating'
Affective strategies	e.g. 'taking risks wisely', 'rewarding yourself'
Social strategies	e.g. 'cooperating with peers', 'asking for clarification or verification'

(Oxford, 1990, pp. 18–21)

Research on the usefulness of learning strategies for language development has been partly informed by information processing theory, and is discussed further in Chapter 5, Section 5.2.3.2.

Language attitudes

Social psychologists have long been interested in the idea that the attitudes of the learner towards the target language, its speakers and the learning context may all play some part in explaining success or lack of it. Research on L2 language attitudes has largely been conducted within the framework of broader research on motivation, of which attitudes form one part, and empirical research has shown – unsurprisingly – that favourable attitudes alone are not a strong predictor of achievement, unless accompanied by active engagement and learning effort (Masgoret and Gardner, 2003).

Motivation

Research into L2 motivation was dominated from the 1970s by the work of the Canadian social psychologist Robert C. Gardner and associates (for example,

1.5 Views of the language learner

Gardner, 1985, 2010). For these researchers, motivation is a complex construct, defined by three main components: 'desire to achieve a goal, effort extended in this direction, and satisfaction with the task' (Gardner and MacIntyre, 1993, p. 2). Gardner and his Canadian colleagues carried out a long programme of work on motivation with English Canadian school students learning French as a second language, and have developed a range of questionnaires to measure motivation. Over the years consistent relationships have been demonstrated between language attitudes, motivation and L2 achievement, with the strongest relationships obtaining between motivation and achievement (Masgoret and Gardner, 2003). These researchers also proposed the well-known distinction between integrative and instrumental motivation. Integrativeness has been defined as 'an open and accepting orientation toward the other language community and other communities in general' (Gardner, 2010, p. 202); in combination with motivation it has consistently shown itself to be a powerful predictor of L2 learning success. Instrumental motivation reflects the belief that language learning will bring concrete benefits (for example, a better job).

Some other motivation theorists have critiqued the Gardner tradition in a number of respects, using ideas from general educational psychology. Greater attention has been given to the importance of the learning context in shaping motivation, in particular through 1990s work on the motivation of classroom learners (Dörnyei, 1994, 2001; Williams and Burden, 1997). Increasing attention has also been given to the idea that L2 motivation is dynamic and alterable, has a close relationship with learner identity and needs to be studied longitudinally using interview and observation (for example, by Ushioda, 2009). Indeed, Dörnyei and Ushioda now propose that motivation cannot be studied discretely, but is best viewed within a broader **complex dynamic systems** perspective on L2 learning (Dörnyei and Ushioda, 2009; Dörnyei, 2009b; Dörnyei and Ushioda, 2011). In line with increased questioning of 'native speaker' competence as the ultimate target for L2 learning, the concept of integrative motivation has also been questioned, and it is now acknowledged that learners may be strongly motivated by a desire for an international identity as an ELF (English as a lingua franca) speaker, for example, rather than specific aspirations to integrate with a native speaker community. (For example, see Lamb, 2004; the motivation-identity link is discussed further in Chapter 9.) Finally, Dörnyei and associates have recently tried to sum up these developments through a new model, the 'L2 motivational self system' (Dörnyei, 2005; Csizér and Dörnyei, 2005). This model proposes that learners make their decisions about how to act primarily with reference to an ideal self, that is, the imagined person that they would like to be; when this ideal self is a proficient L2 user, whether for integrative and/or for instrumental reasons, learners are more likely to invest the necessary effort to become so.

Self-confidence, anxiety and willingness to communicate

Heightened anxiety is a commonly reported experience for the L2 learner, whether in the classroom or outside it. But is this anxiety solely a temporary phenomenon, attaching to particular situations? Some social psychologists have viewed **language anxiety** as 'a stable personality trait referring to the propensity for an individual to react in a nervous manner when speaking in the second language' (Gardner and MacIntyre, 1993, p. 5). The anxious learner is also less willing to speak in class, or to engage target language speakers in informal interaction. This issue has typically been investigated through questionnaire-based studies, for example using the Foreign Language Classroom Anxiety Scale (Horwitz *et al.*, 1986). There are numerous studies which suggest that language anxiety has a negative relationship with learning success (see review by MacIntyre, 2002). However, some researchers have queried whether anxiety actually causes reduced success, and suggested that it is equally likely that poor achievers/communicators will be anxious, a debate which is difficult to resolve through questionnaire-based studies. In a longitudinal study which tracked L1 literacy development among American schoolchildren as well as their L2 aptitude, proficiency and anxiety, Sparks and Ganschow (2007) showed that early L1 literacy achievement is a very strong predictor of both L2 proficiency and L2 anxiety in later schooling; from this they conclude that anxiety arises primarily from poor achievement, and not the other way around. More work of this type is needed to resolve such debates.

Finally, a broad overarching construct 'willingness to communicate' (WTC) has also been proposed as a mediating factor in both L2 use and L2 learning (MacIntyre *et al.*, 2002; Clément *et al.*, 2003). The WTC construct includes anxiety and confidence alongside a range of other variables which together produce 'the intention to initiate communication, given a choice' (MacIntyre *et al.*, 1998, p. 369, cited in R. Ellis, 2008, p. 697). WTC is clearly relevant to current versions of motivation theory and again reflects a growing tendency in 'individual differences' research to seek more integrated models of learner development.

1.5.3 The learner as social being

The two perspectives on the learner which we have highlighted so far have concentrated (a) on universal characteristics and (b) on individual characteristics. But to understand second language learning it is also necessary to view the L2 learner as essentially a social being, taking part in structured social networks and social practices, and we will encounter later in this book many of the researchers who do just that. Indeed, after early decades when psycholinguistic and individualist perspectives on L2 learners predominated, recent research is redressing the balance through the so-called 'social turn' in second language learning research (Block, 2003: see Chapters 8 and 9).

Two major characteristics distinguish this social view of the learner from the 'individual differences' view which we have just dipped into.

First, interest in the learner as a social being leads to central concern with the concept of multilingual identity, including a range of socially constructed dimensions of that identity, and their relationship with learning – so, for example, social class, power, ethnicity and gender make their appearance as potentially significant for L2 learning research. Identity itself may be seen as in flux: 'a dynamic and shifting nexus of multiple subject positions or identity options' (Pavlenko and Blackledge, 2004, p. 35).

Second, the relationship between the individual learner and the social context of learning is also viewed as dynamic, reflexive and constantly changing, a matter of engagement in social and discourse practices. The classic 'individual differences' tradition saw that relationship as being governed by a bundle of learner traits or characteristics (such as aptitude, anxiety etc.), which were relatively fixed and slow to change. More socially oriented researchers increasingly lay stress on learner agency, that is, the learner's capacity to choose learning goals, and to shape their environment and learning opportunities (Duff, 2012). Thus they view motivation, learner anxiety etc. as constantly evolving through ongoing L2 experience and L2 interaction, as part of a wider process of identity (re)construction. These views are most clearly expressed by 'post-structuralist' researchers such as Norton (2000, 2010), whose work is discussed more fully in Chapter 9. However, as we have seen earlier in this chapter, many other areas of research are taking on board the need for greater conceptual flexibility and integration of longitudinal and dynamic perspectives.

1.6 Links with social practice

Is second language learning theory 'useful'? Does it have any immediate practical applications in the real world, most obviously in the L2 classroom? In our field, theorists have been and remain divided on this point. Beretta and associates have argued for 'pure' theory-building in SLL, uncluttered by requirements for practical application (1993). Van Lier (1994), Rampton (1995) and others have argued for a socially engaged perspective, where theoretical development is rooted in, and responsive to, social practice and language education in particular. Yet others have argued that L2 teaching in particular should be guided systematically by SLL research findings (for example, Krashen, 1985).

This tension has partly been addressed by the emergence of 'instructed language learning' and of **task-based learning** as distinct sub-areas of research (for example, see surveys by Robinson, 2001; Doughty, 2003; R. Ellis, 2005a and c; Samuda and Bygate, 2008; Cook, 2008b). Some of the research traditions surveyed in later chapters also explicitly promote pedagogic applications of

their espoused theories; this is especially true of social psychological research on motivation (discussed earlier in this chapter), of **cognitive linguistics** (Chapter 7) and increasingly of **sociocultural theory** (Chapter 8). Overall, we think that language teachers, who will form an important segment of our readership, will themselves want to take stock of the relations between the theories we survey, and their own beliefs and experiences in the classroom. They will, in other words, want to make some judgement on the 'usefulness' of theorizing in making sense of their own experience and their practice, while not necessarily changing it. In our general conclusions to this book, therefore, we end by some brief consideration of the connections we ourselves perceive between learning theory and classroom practice.

1.7 Conclusion

This chapter has introduced a range of recurrent concepts and issues which most theorists agree will have to be taken into account if we are to arrive eventually at any complete account of second language learning. In Chapter 2 we provide a brief narrative account of the recent history of second language learning research, plus a chronological timeline of key publications in the field. We then move in remaining chapters of the book to a closer examination of a number of broad perspectives, or families of theories, with their distinctive views of the key questions which must be answered and the key phenomena which need to be explained. In each case, these theories are illustrated with a small number of empirical research studies, and are followed by some evaluative commentary. In making these choices we have inevitably been selective, with the overall result that some areas (such as L2 vocabulary and L2 phonology) receive limited treatment. The book concludes with a short overall evaluation of the field, and a glossary providing brief definitions of key terminology.

2 | The recent history of second language learning research

2.1 Introduction

In order to understand current developments in second language learning research, it is helpful to retrace its recent history. We will see throughout this chapter that the kind of questions researchers are asking today are for the most part firmly rooted in earlier developments in the fields of linguistics, psychology, sociology and pedagogy.

The aim of the first part of this chapter is to explore in general terms the theoretical foundations of today's thinking. More detailed reviews can be found in other sources, for example Dulay *et al.* (1982), Selinker (1992), Thomas (2004) and Gass (2009). We will limit ourselves to the period since the 1950s, which has seen the development of theorizing about second language learning from an adjunct to language pedagogy, to an autonomous field of research. This period can itself be divided into three main phases.

We will start with the 1950s and 1960s and a short description of how second languages were believed to be learned at the time. We will then describe the impact of the 'Chomskyan revolution' in linguistics on the field of language acquisition, initially on the study of first language acquisition, and subsequently that of second language acquisition. This had a huge impact on psycholinguistics in the 1970s, and we will see that its influence is still very much felt today.

We will then briefly consider the 1980s, which witnessed the development of second language acquisition theorizing as a relatively autonomous field of enquiry (a 'coming of age', as Sharwood Smith put it: 1994, p. ix). During this period, the impact of Chomskyan linguistics developed considerably, though with SLL researchers sometimes struggling to adapt their empirical programmes in line with changes in Chomskyan theorizing. However, ideas coming from fields such as cognitive psychology also became increasingly significant. Research strands initiated in the 1980s will then systematically be reviewed and evaluated in the rest of the book, as well as some newer trends which made their appearance in the 1990s and developed further in the 2000s. On the one hand, cognitive and psycholinguistic theorizing about SLL have developed considerably. On the other hand there has emerged what has been described as the 'social turn' in SLL (Block, 2003), with greatly increased interest in learner identity and agency, and the social context for SLL.

The last part of the chapter comprises a 'timeline' of significant publications which have advanced the second language learning field, from the 1950s up to the present.

2.2 The 1950s and 1960s

In the 1950s and early 1960s, theorizing about second language learning was still very much an accompaniment to the practical business of language teaching. However, the idea that language teaching methods had to be justified in terms of an underlying learning theory was well established, since the pedagogic reform movements of the late nineteenth century at least (see Howatt, 2004, pp. 187–227 for an account of these). The writings of language teaching experts in the 1950s and 1960s include consideration of learning theory, as preliminaries to their practical recommendations (for example, Lado, 1964; Rivers, 1964, 1968).

As far as its linguistic content was concerned, 'progressive' 1950s language pedagogy drew on a version of **structuralism** developed by the British linguist Palmer in the 1920s, and subsequently by Fries and his Michigan colleagues in the 1940s. Howatt sums up key features of this approach as follows:

- Learning the spoken language meant acquiring a set of appropriate speech habits
- Courses of instruction should be built round a graded syllabus of structural patterns to ensure systematic step-by-step progress ...
- Grammar should be taught inductively through the presentation and practice of new patterns ... with visual and/or textual support ...
- Error should be avoided through adequate practice and rehearsal.

(Howatt, 2004, pp. 299–300)

Howatt's summary makes it clear that language teaching experts and reformers were appealing at this time to the general learning theory then dominant in mainstream psychology, **behaviourism**, which we explain more fully in the next section.

2.2.1 Behaviourism

In the behaviourist view (Bloomfield, 1933; Skinner, 1957; Thorndike, 1932; Watson, 1924), language learning is seen like any other kind of learning, as the formation of habits. It stems from work in psychology which saw the learning of any kind of behaviour as being based on the notions of stimulus and response. Human beings are exposed to numerous stimuli in their environment. The response they give to these stimuli will be reinforced if successful, that is if some desired outcome is obtained. Through repeated reinforcement, a certain stimulus will elicit the same response time and again, which will then become a habit. The learning of any skill is seen as the formation of habits, that is, the creation of stimulus–response pairings which become stronger with reinforcement. Applied to language learning, a certain situation will call for a certain response; for example, meeting someone will call for some kind of greeting, and the response will be reinforced if the desired outcome is obtained (that is, if the greeting is understood); in the case of communication breakdown,

the particular response will not be reinforced and the learner will hopefully abandon it.

From this point of view, when learning a first language the process is relatively simple: all we have to do is learn a set of new habits as we learn to respond to stimuli in our environment. When learning a second language, however, we run into problems: we already have a set of well-established responses in our mother tongue. The second language learning process therefore involves replacing those habits by a set of new ones. The complication is that the old L1 habits interfere with this process, either helping or inhibiting it. If structures in the L2 are similar to those of the L1, then learning will take place easily. If, however, structures are different, then learning will be difficult. As Lado put it:

We know from the observation of many cases that the grammatical structure of the native language tends to be transferred to the foreign language ... we have here the major source of difficulty or ease in learning the foreign language ... Those structures that are different will be difficult. (Lado, 1957, pp. 58–9, cited in Dulay *et al.*, 1982, p. 99)

Take the example of an English L1 learner of French as a second language wanting to say *I am twelve years old*, which in French is realized as *J'ai douze ans* (= I have twelve years), and now consider the same learner learning to express the same meaning in German, which is realized as *Ich bin zwölf Jahre alt* (= I am twelve years old). According to a behaviourist view of learning, the German structure would be much easier and quicker to learn, and the French one more difficult, the English structure acting as a facilitator in one instance, and an inhibitor in the other. Indeed, it may well be the case that English learners have more difficulty with the French structure than the German one, as many French teachers would testify after hearing their pupils repeatedly saying **Je suis douze*¹ (=I am twelve), but more about that later.

From a teaching point of view, the implications of this approach were twofold. First, it was strongly believed that practice makes perfect; in other words, learning would take place by imitating and repeating the same structures time after time. Second, teachers needed to focus their teaching on structures which were believed to be difficult, and as we saw above, difficult structures would be those that were different in the L1 and the L2, as was the case for the English/French pair cited above. The teacher of French, in our example, would need to engage his/her pupils in many drilling exercises in order for them to produce the French structure correctly.

The logical outcome of such beliefs about the learning process was that effective teaching should concentrate on areas of difference, and therefore of difficulty. Researchers embarked on the huge task of comparing pairs of languages in order to pinpoint these areas. This work was termed **Contrastive Analysis** (or CA for

¹Asterisks are traditionally used in linguistics in order to indicate ungrammatical sentences.

SECOND LANGUAGE LEARNING THEORIES

short) and can be traced back to Fries, who wrote in the introduction to his book *Teaching and learning English as a foreign language*: 'The most effective materials are those that are based upon a scientific description of the language to be learned, carefully compared with a parallel description of the native language of the learner' (Fries, 1945, p. 9, cited in Dulay *et al.*, 1982, p. 98). Work in this tradition has some continuing influence on second/foreign language pedagogy, in spite of many emerging criticisms which we will now discuss.

2.2.2 Behaviourism under attack

Starting in the 1950s and continuing in the 1960s, both the fields of linguistics and of psychology witnessed major developments. Linguistics saw a shift from structural linguistics, which was based on the description of the surface structure of a large corpus of language, to **generative linguistics**, which emphasized the rule-governed and creative nature of human language. This shift was initiated by the publication in 1957 of *Syntactic structures*, the first of many influential books by Noam Chomsky.

In the field of psychology, the pre-eminent role for the environment – as argued by Skinner and others – in shaping the child's learning and behaviour was losing ground in favour of more developmentalist views of learning, such as Piaget's cognitive developmental theory, in which inner forces drive the child, in interaction with the environment (Piaget, 1970; Piaget and Inhelder, 1966; Piatelli-Palmarini, 1980).

The clash of views about the way in which we learn language came to a head at the end of the 1950s with two publications. These were Skinner's *Verbal behavior* in 1957 which outlined in detail his behaviourist view of learning as applied to language (summarized above in Section 2.2.1), and Chomsky's critical review of Skinner's book, published in 1959.

Chomsky's criticisms centred around a number of issues:

1. The creativity of language: children do not learn and reproduce a large set of sentences, but they routinely create new sentences that they have never heard before. This is only possible because they internalize rules rather than strings of words; extremely common examples of utterances such as *it breaked* or *Mummy goed* show clearly that children are not copying the language around them but applying rules.
2. Given the complexity and abstractness of linguistic rules (for example, the rules underlying the formation of questions in many languages, or the rules underlying the use of reflexive pronouns in English, discussed in Chapter 3), it is amazing that children are able to master them so quickly and efficiently, especially given the limited input they receive. This has been termed 'Plato's problem' (Chomsky, 1987), and refers specifically to the idea that some of the structural properties of language, given their complexity, could not

possibly be learned on the basis of the samples of language which children are exposed to. Furthermore, children are not very often corrected on the form of their utterances, but rather on their truth values. When correction of form does take place, it seems to have very little effect on the development of language structure.

For the above reasons, Chomsky claimed that children have an innate faculty which supports them in their learning of language. Given a body of speech, children are programmed to discover its rules, and are guided in doing so by an innate knowledge of what the rules should look like. We will leave fuller discussion of Chomsky's ideas until Chapter 3. Suffice to say for now that this revolutionary approach gave a great stimulus to the field of psycholinguistics, and especially to the study of language acquisition. The next section reviews work in the 1970s, which was heavily influenced by these new ideas.

2.3 The 1970s

2.3.1 First language acquisition

The work outlined above led to investigations of the acquisition of language in young children, by researchers such as Edward Klima and Ursula Bellugi (1966), Dan Slobin (1970) or Roger Brown (1973). They found striking similarities in the language learning behaviour of young children, whatever the language they were learning. It seemed that children all over the world go through similar stages, use similar constructions in order to express similar meanings, and make the same kinds of errors. The stages can be summarized as follows (Aitchison, 2008, p. 80):

<i>Language stage</i>	<i>Beginning age²</i>
Crying	Birth
Cooing	6 weeks
Babbling	6 months
Intonation patterns	8 months
One-word utterances	1 year
Two-word utterances	18 months
Word inflections	2 years
Questions, negatives	2 years 3 months
Rare or complex constructions	5 years
Mature speech	10 years

²The ages are given as a very rough guideline only; children vary considerably both in the age of onset of a given phase, and in how fast they proceed from one phase to another. All children normally go through the stages in the order indicated, however.

SECOND LANGUAGE LEARNING THEORIES

The research emphasis of the time was on the universal nature of these stages, which were claimed to be followed by children learning any language.

Similarly, when studying children's learning of particular languages, a consistent **order of acquisition** was found for the emergence of new structures. Roger Brown's (1973) so-called 'morpheme study' is probably the best known L1 study of that time, and was to be very influential for second language acquisition research. In an in-depth study of three children of different backgrounds, Brown compared the development of 14 grammatical morphemes in English. He found that although the rate at which children learnt these morphemes varied, the order in which they acquired them remained the same for all children, as listed below in a simplified form:

Present progressive	<i>boy singing</i>
Prepositions	<i>dolly in car</i>
Plural	<i>sweeties</i>
Past irregular	<i>broke</i>
Possessive	<i>baby's biscuit</i>
Articles	<i>a car</i>
Past regular	<i>wanted</i>
Third singular	<i>eats</i>
Auxiliary <i>be</i>	<i>he is running.</i>

As well as acquiring a number of grammatical morphemes in a fixed order, children were also shown to follow fairly rigid stages during the acquisition of a given area of grammar. For example, children all over the world not only acquire negatives around the same age, but they also mark the negative in similar ways in all languages, initially attaching some negative marker to the outside of the sentence: for example, *no go to bed* and *pas faut boire* (= not need to drink), and gradually moving the negative marker inside the sentence. These stages are illustrated below for English (R. Ellis, 2008, p. 71, based on Klima and Bellugi, 1966, and Cazden, 1972):

Stage 1: Negative utterances consist of a 'nucleus' (that is, the positive proposition) either preceded or followed by a negator.

wear mitten no
not a teddy bear

Stage 2: Negators are now incorporated into affirmative clauses. Negators at this stage include *don't* and *can't*, used as unitary items. Negative commands appear.

there no squirrels
you can't dance
don't bite me yet

Stage 3: Negators are now always incorporated into affirmative clauses. The 'Auxiliary + not' rule has been acquired, as *don't*, *can't* etc. are now analysed. But some mistakes still occur (for example, copula *be* is omitted from negative utterances and double negatives occur).

I don't have a book

Paul can't have one

I not crying

no one didn't come

These stages are not unlike the stages followed by second language learners which were outlined in Chapter 1 (Section 1.4.4). Similar phenomena can be observed for the acquisition of interrogatives and other structures.

Another important characteristic of child language which started to receive attention was that it seemed to be rule-governed, even if initially the 'rules' children create do not correspond to adult ones. As early as the two-word stage, children express relationships between elements in a sentence, such as possession, negation or location, in a consistent way. Also, it has been demonstrated convincingly that when children produce an adult-like form which reflects the application of a rule, such as for example adding *-s* to *dog* in order to produce the plural form *dogs*, they are not merely imitating and repeating parrot-fashion the adult language around them. Two kinds of evidence show that very clearly. First, children commonly produce forms such as *sheeps* or *breads*, which they have never heard before. Second, some ingenious and now famous experiments were carried out with very young children back in the 1950s (Berko, 1958) in which children were shown a picture of a strange bird-like creature and told, for example, *this is a wug*; they were then shown a picture of two of those creatures and told *Now there's another one. There are two of them. There are two ...?* The children almost invariably replied *wugs* (91 per cent of them), showing that they do not merely learn plurals by remembering each plural form they hear, but that they somehow extract a plural rule from the language they hear, and then apply that rule to their own productions. This experiment contained not only a series of nonsense nouns, but also nonsense verbs; for example, children were shown a picture of a person doing some strange action and told *This person knows how to gling. He is glinging. Yesterday, he did the same thing. Yesterday, he ...?* Children consistently answered *glinged* (77 per cent), again showing that they had created a rule for forming the past tense. In fact, children go through an early stage when they supply irregular past-tense forms such as *took* or *went*, on the basis of having learnt these forms individually,³ before having created the past-tense rule. When they do so, they

³ It is important to note that a large proportion of the verbs which are commonplace in the linguistic environment of the child have irregular past tense forms. For example, verbs such as *give*, *run*, *do*, *come*, *sit*, *sleep*, *fall*, *find*, *eat*, *hit*, *break*, will form part of both the early vocabulary used by the child, and of the typical verbs used by adults when addressing children.

SECOND LANGUAGE LEARNING THEORIES

start producing forms such as *taked* and *goed* which can persist a very long time in spite of any attempts at correction by worried parents who might think their child is regressing. It can take considerable time for children to be able to take on board exceptions to rules.

The fact that children do not seem susceptible to adult correction is well documented in the first language acquisition literature. The psycholinguist Martin Braine once tried for several weeks to stamp out one of his daughter's grammatical errors. Here is an example (quoted in Pinker, 1994, p. 281):

Child: Want other one spoon, Daddy
Father: You mean, you want THE OTHER SPOON
Child: Yes, I want other one spoon, please, Daddy
Father: Can you say 'the other spoon'?
Child: Other ... one ... spoon
Father: Say ... 'other'
Child: Other
Father: 'Spoon'
Child: Spoon
Father: 'Other ... spoon'
Child: Other ... spoon. Now give me other one spoon?

This famous example is typical of such unsuccessful attempts, and this child is neither slow in her development, nor particularly stubborn; it is as if she cannot make the alternative proposed by her father fit within her current grammar.

From this necessarily brief and oversimplified account of 1970s first language acquisition research, the following characteristics emerged:

- children go through stages
- these stages are very similar across children for a given language, although the rate at which individual children progress through them is highly variable
- these stages are similar across languages
- child language is rule-governed and systematic, and the rules created by the child do not necessarily correspond to adult ones
- children are resistant to correction.

These findings seemed to support Chomsky's claims that children followed some kind of pre-programmed, internal route in acquiring language. However, psycholinguists as well as theoretical linguists were taking an interest in this kind of evidence. For example, the psycholinguist Dan Slobin made proposals about language **acquisition orders** which were grounded in a set of Operating Principles supposed to characterize the way in which children perceive their

environment, and try to make sense of it and organize it. Slobin's early principles were as follows (Slobin 1979, pp. 108–10):

- Operating Principle A: Pay attention to the ends of words.
- Operating Principle B: there are linguistic elements that encode relations between words.
- Operating Principle C: avoid exceptions.
- Operating Principle D: underlying semantic relations should be marked overtly and clearly.
- Operating Principle E: the use of grammatical markers should make semantic sense.

2.3.2 Second language learning: the birth of Error Analysis and the concept of interlanguage

The findings reported above soon came to the attention of researchers and teachers interested in second language learning. This was the case, not only because of their intrinsic interest, but also because the predictions made by Contrastive Analysis did not seem to be borne out in practice. Teachers were finding out in the classroom that constructions that were different in pairs of languages were not necessarily difficult, and that constructions that were similar in two languages were not necessarily easy either. Moreover, difficulty sometimes occurred in one direction but not the other. For example, the placement of unstressed object pronouns in English and French differs: whereas English says *I like them*, French says *Je les aime* (= I **them** like). Contrastive Analysis would therefore predict that object pronoun placement would be difficult for both English learners of French and French learners of English. This is not the case, however; whereas English learners of French do have problems with this construction and produce errors such as **J'aime les* in initial stages, French learners of English do not produce errors of the type **I them like*, as would be predicted by CA. The task of comparing pairs of languages in order to design efficient language teaching programmes now seemed to be disproportionately huge in relation to its predictive powers: if it could not adequately predict areas of difficulty, then the whole enterprise seemed to be pointless.

These two factors combined – developments in first language acquisition and disillusionment with CA – meant that researchers and teachers became increasingly interested in the language produced by learners, rather than the target language or the first language. This was the origin of **Error Analysis**, the systematic investigation of second language learners' errors. The language produced by learners began to be seen as a linguistic system in its own right, which was worthy of description. Corder (1967) was the first to focus attention on the importance of studying learners' errors, as it became evident that they

SECOND LANGUAGE LEARNING THEORIES

did not all originate in the first language by any means. The predictions of Contrastive Analysis, that all errors would be due to interference from the L1, were shown to be unfounded, as many studies showed convincingly that the majority of errors could not be traced to the L1, and also that areas where the L1 should have prevented errors were not always error-free. For example, Hernández-Chávez (1972) showed that, although the plural is realized in almost exactly the same way in Spanish and in English, Spanish children learning English still went through a phase of omitting plural marking. Such studies became commonplace, and a book-length treatment of the topic appeared (Richards, 1974; see Timeline).

In a review of studies looking at the proportion of errors that can be traced back to the first language, R. Ellis (1985a) found that there was considerable variation in the findings, with results ranging from 3 per cent of errors attributed to the L1 (Dulay and Burt, 1973), to 51 per cent (Tran-Chi-Chau, 1975), and a majority of studies finding around a third of all errors traceable to the L1. Error Analysis thus showed clearly that the majority of the errors made by second language learners do not come from their first language.

The next question therefore was: where do such errors come from? They are not target-like, and they are not L1-like; they must be learner-internal in origin. Researchers started trying to classify these errors in order to understand them, and to compare them with errors made by children learning their mother tongue. This was happening at the same time as the developments in first language acquisition research described above, whereby child language was now seen as an object of study in its own right, rather than as an approximation of adult language. In second language learning research, coupled with the interest in understanding learner-internal errors, interest in the overall character of the L2 system was also growing.

The term *interlanguage* was coined in 1972, by Selinker, to refer to the language produced by learners, both as a system which can be described at any one point in time as resulting from systematic rules, and as the series of interlocking systems that characterize learner progression. In other words, the interlanguage concept relies on two fundamental notions: the language produced by the learner is a system in its own right, obeying its own rules, and it is a dynamic system, evolving over time. Interlanguage studies thus moved a major step beyond Error Analysis, by focusing on the learner system as a whole, rather than only on its non-target-like features. The term 'interlanguage' has proved descriptively useful up to the present (as in, for example, Gass and Selinker, 2008).

2.3.3 Morpheme studies and second language learning

As far as second language acquisition research is concerned, the most important empirical findings of this period were probably the results of the so-called

morpheme studies, and, at a conceptual level, Krashen's Monitor Model, which was a logical theoretical development arising from such studies.

The L2 morpheme studies of the 1970s were inspired by the work of Roger Brown (1973) in L1 acquisition which we introduced above. Brown had found a consistent order of emergence of 14 grammatical morphemes in English in his longitudinal study. The same order was confirmed by other researchers, for example by De Villiers and De Villiers (1973) in their **cross-sectional**⁴ study of 20 children acquiring English as a first language.

Researchers in second language acquisition set about investigating the acquisition of the same grammatical morphemes by L2 learners. Dulay and Burt (1973, 1974, 1975) were the first to undertake such studies, reporting first of all on the accuracy of production of eight of Brown's morphemes in Spanish-speaking children acquiring English as an L2 (1973). Their study was cross-sectional, and was based on the speech of three groups of Spanish-speaking children who had been exposed to English for different lengths of time as immigrants in the United States.

There were 151 children in the study, and the method used for eliciting speech was the Bilingual Syntax Measure, a structured conversation based on cartoons and designed to elicit certain grammatical constructions. The researchers found that 'the acquisition sequences obtained from the three groups of children were strikingly similar. This was so even though each group on the whole was at a different level of English proficiency' (Dulay *et al.*, 1982, p. 204). Dulay and Burt (1974) then carried out a similar study, but this time using children from different L1 backgrounds, namely Chinese and Spanish. They found very similar acquisition orders for 11 of Brown's grammatical morphemes, for both groups. Dulay and Burt (1975) then extended their study to include 536 Spanish- and Chinese-speaking children of varying levels of proficiency in English as a second language, and they investigated 13 of Brown's original morphemes. They found a clear hierarchy for the acquisition of these morphemes, with four different groups of morphemes being acquired in a set order, no matter the L1, as shown in Figure 2.1 (from Dulay *et al.*, 1982, p. 208).

Dulay *et al.* (1982, pp. 207–9) conclude: 'It is highly probable that *children of different language backgrounds learning English in a variety of host country environments acquire eleven grammatical morphemes in a similar order.*'

To investigate whether adults would also exhibit the same order of acquisition, Bailey *et al.* (1974) conducted a similar study with adults. They used the same

⁴A longitudinal study is where a (usually small) group of subjects is studied over a period of time. A cross-sectional study, on the other hand, investigates a (usually large) group of subjects at one point in time. In the case of developmental studies, cross-sectional studies take representative samples of subjects at different stages of development and compare their behaviour, inferring development when behaviour changes between two stages.

Both types of studies have their advantages and disadvantages, and have been used extensively in language acquisition research.

SECOND LANGUAGE LEARNING THEORIES

SAMPLE:			
N:	<u>536</u>	Research design:	<u>Cross-sectional</u>
Age:	<u>5-9 years old</u>	Elicitation technique:	<u>Structured conversation</u>
L1:	<u>461 Spanish</u>	L2 environment:	<u>Host</u>
	<u>55 Chinese</u>		
L2:	<u>English</u>		

Acquisition hierarchy observed

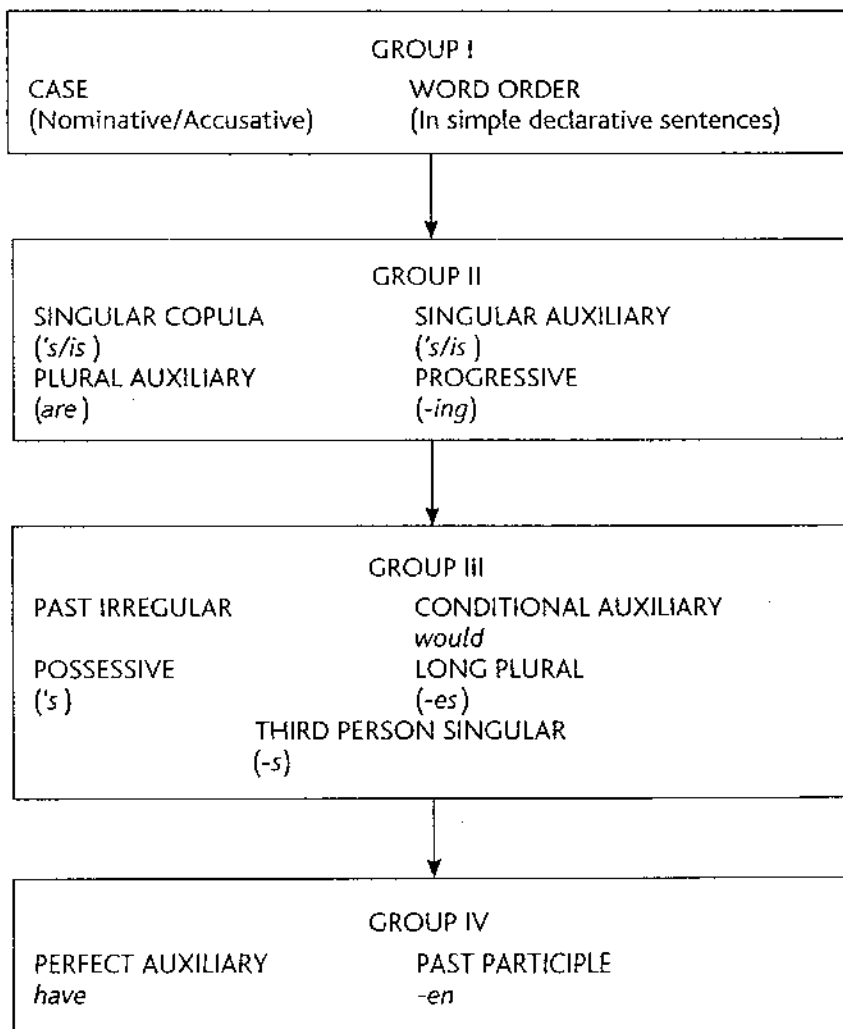
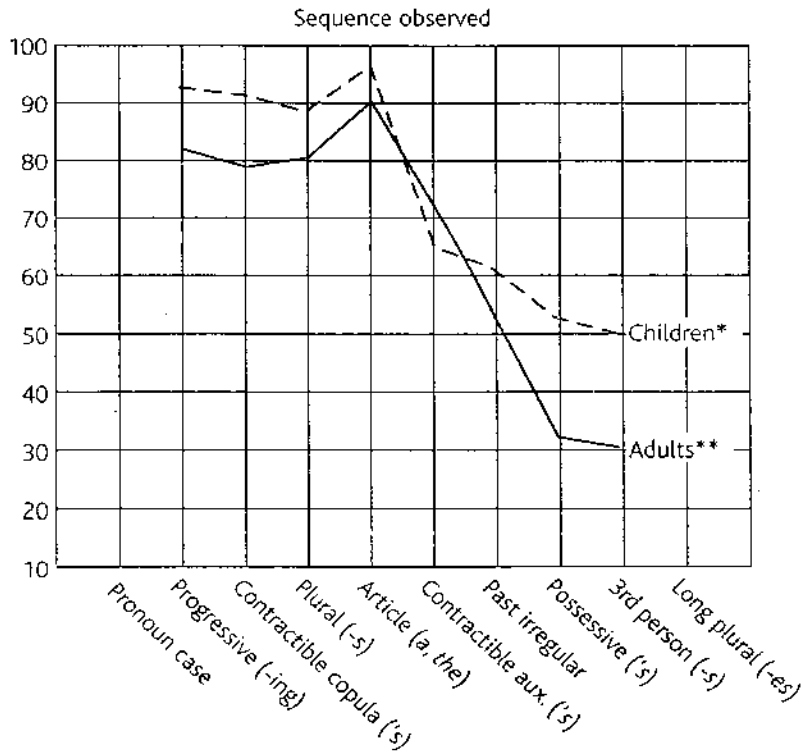


Figure 2.1 Acquisition hierarchy for 13 English grammatical morphemes for Spanish-speaking and Cantonese-speaking children (source: Dulay *et al.*, 1982, p. 208)

elicitation method (Bilingual Syntax Measure) in order to investigate the accuracy of production of the eight morphemes studied in Dulay and Burt (1973), in 73 adult learners of English from different L1 backgrounds. Their results were very similar to those reported in the case of children, as shown in Figure 2.2 (taken from Dulay *et al.*, 1982, p. 210).

SAMPLE:	
N: <u>73</u>	Research design: <u>Cross-sectional</u>
Age: <u>17-55 years old</u>	
L1: <u>Greek, Persian, Italian, Turkish, Japanese, Chinese, Thai, Afghani, Hebrew, Arabic, Vietnamese</u>	Elicitation technique: <u>Structured conversation</u>
L2: <u>English</u>	Second-language environment: <u>Host</u>



Correlation coefficients and significance levels:

	Adults (Spanish Ss)
Children	$\rho = 0.976$ ($p < 0.01$) (Spearman)

Figure 2.2 Comparison of adult and child acquisition sequences for eight grammatical morphemes (source: Dulay *et al.*, 1982, p. 210)

SECOND LANGUAGE LEARNING THEORIES

These morpheme acquisition studies attracted criticism, both at the time and subsequently. (The criticisms are mainly about the elicitation technique used in these early studies – thought to bias the results – and also about the assumption that relative accuracy of production reflects acquisition sequences: see review in Gass and Selinker, 2008, pp. 132–5.)⁵ However, the basic argument that both child and adult learners of English as an L2 developed accuracy in a number of grammatical morphemes in a set order, no matter what the context of learning (classroom, naturalistic, mixed), survived the critique. The fact that this set order did not match the order found by L1 acquisition researchers is neither here nor there. The existence of such an order suggested that L2 learners are guided by internal principles which are largely independent of their first language; this was a serious blow for Contrastive Analysis.

Moreover, soon after, a number of studies were reported which strongly suggested that systematic staged development could be found in a number of syntactic domains as well. For example, the acquisition of negative structures in English L2 was shown to occur in well-defined stages by several early studies reviewed by R. Ellis (2008, pp. 92–3). Similar stages were also noted in the acquisition of negatives in German L2 (R. Ellis, 2008, p. 94). Moreover, the acquisition of negatives in English by L2 learners is not dissimilar to that of children acquiring English as their L1 (see Section 2.2.1 above).

The acquisition of other syntactic structures such as interrogatives and relative clauses in English, or word order in German, are also well documented as exhibiting uniform patterns of acquisition, whatever the L1 of the learner (R. Ellis, 2008, pp. 94–8, provides an overview of early studies). Moreover, the stages followed by L2 learners in the various areas studied show similarities to those followed by children learning their first language.

Thus, the 1970s witnessed a wealth of studies investigating development in L2 learners which seemed to show convincingly that it is systematic, that it is largely independent of the L1 of the learner and that it presents many similarities with L1 acquisition, even though there are differences. These were major empirical findings which undermined classic behaviourist beliefs about how second languages are acquired.

Before moving to examine the theoretical proposals advanced to explain such findings, let us pause for an instant on the last point, namely the finding that acquisitional patterns in L1 and L2 learning were both similar and different, as this issue is still debated today. Remember that the discovery of acquisition sequences

⁵The morpheme studies measured the accuracy of production of their subjects on the grammatical morphemes studied. Subjects were deemed to have acquired a morpheme if they supplied it correctly in at least 90 per cent of the obligatory contexts (for example, if they produced the morpheme –s in at least 90 per cent of the cases when the context required a plural noun). Researchers then equated accuracy of production with acquisition, and have been criticized for doing that.

in first language acquisition was linked to the theory that children are endowed with a language faculty which guides them in the hypotheses they make about the language around them. Brown's order of acquisition of grammatical morphemes was seen as evidence to support this view. So, what can we make of the finding that L2 learners also seem to follow an order of acquisition, but that this order is different? The existence of such an order suggests that they are indeed guided by some set of internal principles, as children are. On the other hand, the fact that this order varies from that found for L1 suggests that these internal principles are different, in some respects at least.

A somewhat confused picture therefore emerges from the empirical work characteristic of the 1970s, and the 1980s research agenda tried to address some of these issues. But before we turn to later agendas, we need to consider Krashen's Monitor Model, an influential first attempt to bring together a range of post-behaviourist findings in a comprehensive model of second language acquisition.

2.3.4 Krashen's Monitor Model

Krashen developed his ideas in the late 1970s in a series of articles (1977a, 1977b, 1978), building on the findings outlined above. He then refined and expanded his theoretical claims in the early 1980s in a series of books (Krashen, 1981, 1983, 1985).⁶ While many of his specific proposals have been overtaken today, they opened up a range of research agendas of ongoing importance.

Krashen based his general theory around a set of five basic hypotheses:

1. The Acquisition-Learning Hypothesis
2. The Monitor Hypothesis
3. The Natural Order Hypothesis
4. The Input Hypothesis
5. The Affective Filter Hypothesis.

We shall briefly outline each of these in turn.

2.3.4.1 The Acquisition-Learning Hypothesis

This hypothesis attracted considerable attention and, albeit in a different form, still remains the source of much debate today. The basic premise is that language acquisition on the one hand, and learning on the other, are separate processes. For Krashen, acquisition refers to the 'subconscious process identical in all important ways to the process children utilize in acquiring their first language', and learning refers to the 'conscious process that results in "knowing about" language' (1985, p. 1). In other words, acquisition is the result of natural interaction with the language via meaningful communication, which sets

⁶ For a critique of Krashen's work, see McLaughlin (1987, 19–58).

SECOND LANGUAGE LEARNING THEORIES

in motion developmental processes akin to those outlined in first language acquisition, and learning is typically the result of classroom experience in which the learner is made to focus on form and to learn about the linguistic rules of the target language.

The contrast between the naturalistic environment and the classroom environment is not the crucial issue, however. What is claimed to be important is the difference between meaningful communication on the one hand, which can very well take place in the language classroom, and which will supposedly trigger subconscious acquisition processes, and conscious attention to form on the other hand, which can also take place in naturalistic settings, especially with older learners who might explicitly request grammatical information from people around them. Krashen has been criticized for his vague definition of what constitutes conscious vs. subconscious processes, as they are very difficult to test in practice: how can we tell when a learner's production is the result of a conscious process and when it is not? Nonetheless, this conceptual contrast between acquisition and learning has been very influential, especially among foreign language teachers who saw it as an explanation of the lack of correspondence between error correction and direct teaching on one hand, and their students' (in)accuracy of performance on the other. If there was some kind of internal mechanism constraining learners' development, then perhaps it could account for the fact that some structures, even simple ones like the third person singular *-s* in English (*he likes*), can be so frustrating to teach, with learners knowing the rule consciously, but often being unable to apply it in spontaneous conversation. In Krashen's terminology, learners would have learned the rule, but not acquired it.

Another problematic issue is Krashen's claim that learning cannot turn into acquisition: that is, that language knowledge acquired/learned by these different routes cannot eventually become integrated into a unified whole (Krashen and Scarcella, 1978). Other 1980s researchers disagreed (for example, Gregg, 1984; McLaughlin, 1987), and the debate about whether different kinds of knowledge interact or remain separate, has been a long-standing one, even though the terms used might differ. (For example, see Schwartz, 1993; Towell and Hawkins, 1994; Zobl, 1995; Myles *et al.*, 1999; Krashen, 2003, and also Chapters 4 and 5 below, for a review of contemporary thinking about implicit and explicit knowledge and the interactions between them in SLL.)

2.3.4.2 The Monitor Hypothesis

According to Krashen, 'learning' and 'acquisition' are used in very specific ways in second-language performance. The Monitor Hypothesis states that 'learning has only one function, and that is as a Monitor or editor' and that learning comes into play only to 'make changes in the form of our utterance, after it has been "produced" by the acquired system' (1982, 15). Acquisition 'initiates' the speaker's utterances

and is responsible for fluency. Thus the Monitor is thought to alter the output of the acquired system before or after the utterance is actually written or spoken, but the utterance is initiated entirely by the acquired system. (McLaughlin, 1987, p. 24)

The above quotation summarizes Krashen's view that conscious 'learning', with attention to L2 form, contributes only to the development of an editor or 'Monitor', which does not operate all the time. Given enough time, when a focus on form is important for learners, and when the relevant grammatical rule has consciously been learned, Krashen believed they might make use of the Monitor in order to modify their own output (for example, to self-correct and apply target language norms). However, early studies investigating learners' performance when given more time (Hulstijn and Hulstijn, 1984), or being made to focus on form (Houck *et al.*, 1978; Krashen and Scarcella, 1978), failed to provide evidence of Monitor use. The same applied to studies checking whether learners who are able to explain the rules perform better than learners who do not (Hulstijn and Hulstijn, 1984).

Krashen also appealed to the concept of the Monitor in order to explain individual differences in learners. He suggests that it is possible to find Monitor 'over-users' who do not like making mistakes and are therefore constantly checking what they produce against the conscious stock of rules they possess. On the other hand, Monitor 'under-users' do not seem to care very much about the errors they make, and for them speed and fluency are more important. In between the two are the supposed 'optimal' Monitor users who use the Monitor when it is appropriate, that is, when it does not interfere with communication. These early claims remained underdeveloped and difficult to test empirically. However, elsewhere in this book we see how later research has pursued some of the ideas 'opened up' by the Monitor Hypothesis, in particular exploring interactions between implicit and explicit learning, with a new range of methodologies (Chapter 5).

2.3.4.3 The Natural Order Hypothesis

We acquire the rules of language in a predictable order, some rules tending to come early and others late. The order does not appear to be determined solely by formal simplicity and there is evidence that it is independent of the order in which rules are taught in language classes. (Krashen, 1985, p. 1)

There is evidently some truth in such a statement, which was grounded in the concept of interlanguage and the research into Morpheme Acquisition Orders we have briefly reviewed in Section 2.3.3 above. The idea of a natural order received further support from later claims about systematicity in L2 syntactic development (for example, for domains such as negation, relative clauses or word order, also discussed in Section 2.3.3). However, as will be seen in following chapters, later research has seen a revival of interest in the nature of

SECOND LANGUAGE LEARNING THEORIES

L1 influence on L2 learning, from new and varied theoretical perspectives, and has also re-acknowledged the existence of variability in L2 systems. Krashen's Natural Order Hypothesis represents the universalism of 1970s theorizing, and has no place for concepts such as language transfer and **cross-linguistic influence**. In addition, it makes primarily a descriptive claim, which provides little help in understanding why 'natural orders' should be apparent in L2 development. Again, later theories invest considerable effort in trying to provide explanations for observed developmental sequences (for example, see the discussion of Pienemann's Processability Theory in Chapter 5).

2.3.4.4 The Input Hypothesis

The Input Hypothesis is linked to the Natural Order Hypothesis in that it claims that we move along the developmental path by receiving and processing comprehensible input. Comprehensible input is defined as L2 input just beyond the learner's current L2 competence. If a learner's current competence is i , then comprehensible input is $i + 1$, that is, input still understandable by the learner, but containing linguistic evidence relevant for the next step in the developmental sequence. Input which is either too simple (that is, containing only language material which has been already acquired) or too complex ($i + 2 / 3 / 4 \dots$ that is, input including linguistic material too complex for learner comprehension) will not be useful for acquisition. A key claim of the Input Hypothesis is the proposal that learners do not need to produce L2 utterances (output) in order to develop; the opportunity for regular parsing and interpretation of suitable input $i + 1$ will be sufficient to develop the interlanguage system.

Krashen views the Input Hypothesis as central to his model of second language acquisition:

- (a) Speaking is a result of acquisition and not its cause. Speech cannot be taught directly but 'emerges' on its own as a result of building competence via comprehensible input.
- (b) If input is understood, and there is enough of it, the necessary grammar is automatically provided. The language teacher need not attempt deliberately to teach the next structure along the natural order – it will be provided in just the right quantities and automatically reviewed if the student receives a sufficient amount of comprehensible input. (Krashen, 1985, p. 2)

Krashen's Input Hypothesis has been frequently criticized for being vague and imprecise: how do we determine level i , and level $i + 1$? Nowhere is this vital point made clear. Moreover, Krashen's claim is somewhat circular: acquisition takes place if the learner receives comprehensible input, and comprehensible input is claimed to have been provided if acquisition takes place. The theory

becomes impossible to verify, as no independently testable definitions are given of what comprehensible input actually consists of and therefore of how it might relate to acquisition. Nor, of course, does the theory specify the internal workings of the 'Language Acquisition Device' where acquisition actually takes place – this remains an opaque black box. Nonetheless, the emphasis placed by the Input Hypothesis on the importance of naturalistic and meaning-oriented exposure to the target language was one of the underpinnings of the 'communicative approach' to language pedagogy, which facilitated its rise in place of the audiolingual pattern drilling associated with behaviourist learning theory. The Input Hypothesis also launched a tradition of empirical research and theorizing about learner interaction which continues strongly up to the present (see Section 2.4.3 and Chapter 6 below).

2.3.4.5 The Affective Filter Hypothesis

As we have just seen, Krashen believed that the availability of *i + 1* comprehensible input is the prime requirement for language acquisition to take place and that learner production (and grammar explanation) were non-essential. However, learners also need to 'let that input in', as it were. This is the role of the so-called Affective Filter, which supposedly determines how receptive to comprehensible input a learner is going to be:

The Affective Filter Hypothesis captures the relationship between affective variables and the process of second language acquisition by positing that acquirers vary with respect to the strength or level of their affective filters. Those whose attitudes are not optimal for second language acquisition will not only tend to seek less input, but they will also have a high or strong affective filter – even if they understand the message, the input will not reach that part of the brain responsible for language acquisition, or the Language Acquisition Device. Those with attitudes more conducive to second language acquisition will not only seek and obtain more input, they will also have a lower or weaker filter. They will be more open to the input, and it will strike 'deeper'. (Krashen, 1982, p. 31)

Krashen's Affective Filter was a strong early affirmation of the view that emotion plays an important role in second language learning. Once again, this idea has been followed up in later research on motivation, on emotion and on individual learner differences. However, Krashen's Affective Filter concept itself remained vague and atheoretical. For example, many self-conscious adolescents suffer from low self-esteem and therefore presumably have a 'high' filter. Are they therefore all bad language learners? And are all confident and extrovert adults (with a 'low' filter) good language learners? Clearly not. Moreover, how does the Affective Filter actually work? All these issues remained largely unexplored.

While presenting Krashen's five hypotheses, we have also reflected criticisms which have been current almost since Krashen first advanced

SECOND LANGUAGE LEARNING THEORIES

them. Nonetheless, it remains true that Krashen's ideas have shaped later research agendas; the Input Hypothesis, for example, stimulated indirectly a major ongoing tradition of theorizing and empirical research on input and interaction, reviewed below in Chapter 6. Krashen's main overall weakness was the presentation of what were just hypotheses that remained to be tested, as a comprehensive model that had empirical validity, as well as pedagogical implications.

2.3.5 Schumann's pidginization/acculturation model

Other models appeared in the 1970s which attempted similarly to theorize SLA findings. We will mention very briefly here one other model, as it views second language acquisition from a radically different angle, taking account of the sociocultural setting in a new way.

John Schumann first proposed his **pidginization/acculturation** model in the late 1970s (1978a, 1978b, 1978c). This work was an important early attempt to study the language learning of adult immigrants, who were learning a surrounding majority language informally. On the basis of naturalistic studies of untutored learners, he noticed that early interlanguages resemble **pidgin languages** (that is, simplified trading languages which lack native speakers: see Sebba 1997), with characteristic features such as fixed word order and lack of inflections. Second language acquisition was compared to the **complexification** of pidgins, and this process was linked to degree of acculturation of the learners. The closer they feel to the target language speech community, according to Schumann, the better learners will 'acculturate', and the more successful their L2 learning will be. The greater the social and psychological distance between the learner and the majority community, the more pidgin-like their L2 will remain. Schumann discussed a learner named Alberto as a case study, and tried to account for his apparent 'fossilization' in terms of the model.

This model opened up alternative lines of research comparing SLA with other language change processes (pidginization and **creolization**, that is, the process whereby pidgins become elaborated as full natural languages), and also brought to the fore social psychological variables and their role in SLA. For a substantial period of time, Schumann's proposals were the most theoretically ambitious claims about SLA which drew on sociolinguistic thinking, though they received only limited empirical support. In Chapter 9 we explore other, newer sociolinguistic approaches which build on some of this early work.

2.4 The 1980s: a turning point

Partly in response to developments in linguistics and in first language acquisition research, partly in reaction to the 1970s proposals of Burt, Dulay, Selinker, Krashen and others, and partly in response to the continuing great

postwar expansion of second/foreign language education, the 1980s were a period of strong development for SLL theorizing and empirical research. Many of the main strands of research which continue today can trace their origins to this period. Here, we introduce some key 1980s ideas and names only: more detail can be found in the Timeline which follows, and subsequent developments are followed up in later chapters. (A book-length discussion of the 1980s can be found in Larsen-Freeman and Long, 1991.)

2.4.1 The impact of Chomskyan linguistics

As we have seen, Krashen's various hypotheses assumed the existence of a Language Acquisition Device (LAD) which would analyse L2 input and ensure interlanguage development, without conscious awareness on the part of the learner. However, Krashen himself never set out to specify in detail the contents or functioning of the LAD: it remained a 'black box'. In the 1980s, however, researchers such as Suzanne Flynn (1983, 1987) and Lydia White (1989) began to draw upon Chomskyan generative linguistics and the concept of Universal Grammar to model learners' formal language knowledge. In particular, Chomsky's **Government and Binding Theory** (1981, 1986a, 1986b) specified Universal Principles applying to all languages, and a limited set of Parameters which accounted for variation between languages. This 'Principles and Parameters' model gave much greater elaboration and power to the concept of an innate language faculty, and its possible role in L2 acquisition, including the role played by the L1 when parameters are set differently in the L2 being learnt. These ideas gave impetus to an extensive research programme described in Chapter 3.

2.4.2 Information processing models of SLL

One of Krashen's 1980s critics was the psychologist Barry McLaughlin, who addressed some perceived gaps in Krashen's account by reintroducing into second language research ideas about learning from general psychology. In the latter part of the twentieth century, cognitive psychology offered much more elaborate models of the mind than did the behaviourism of the mid-twentieth century. McLaughlin (1987) viewed the mind as a limited capacity processor, with different memory stores; from this view, learning involved moving from controlled processing to automatic processing of language, and the transfer of new knowledge from the (very limited capacity) short-term memory, to long-term memory. Other 1980s SLL researchers borrowed different models of knowledge and of learning from cognitive psychology: thus for example the distinction between declarative and procedural knowledge was popularized by the learning strategy researchers O'Malley and Chamot (1990), and Slobin's proposals for Operating Principles (1979) were adapted to SLA by Andersen and associates (Andersen, 1991; Andersen and Shirai, 1994). As can be seen

in Chapters 4 and 5 below, these cognitive beginnings have led to major developments in second language transition theories and now provide a powerful addition to linguistic perspectives.

2.4.3 The Interaction Hypothesis and the Output Hypothesis

In response to Krashen's Input Hypothesis, a number of 1980s researchers also proposed alternative ideas about the role of environmental language in second language learning. Foremost among these was Michael Long, with his proposal of the so-called **Interaction Hypothesis** (Long, 1981, 1983a, 1983b).

In the 1980s, Long shared the underlying assumptions of Krashen regarding the existence of some form of LAD, but shifted attention from comprehensible input, as a means of stimulating acquisition, towards more interactive aspects of second language discourse. Long's early research showed that native speaker–non-native speaker interactions when performing tasks such as informal conversation or game-playing was rich in meaning negotiations, including repetitions, **confirmation checks** or **clarification requests**. Long argued that these adjustments made L2 speech more comprehensible, and thus increased its usefulness for L2 acquisition; a number of controlled studies, in which learners undertook oral problem-solving tasks, provided evidence showing that negotiation of meaning did indeed lead to greater problem-solving success (for example, Pica *et al.*, 1987; Gass and Varonis, 1994). Later formulations of the Interaction Hypothesis, and associated research, are discussed in detail in Chapter 6.

A different alternative to the Input Hypothesis was proposed by the Canadian researcher Merrill Swain, based on her experience of studying learners of French L2 in the context of **immersion** schooling. Swain's observations of these students led her to question the claim that comprehensible L2 input was sufficient to ensure all-round interlanguage development.

Swain argued that students could often succeed in comprehending L2 texts while only partly processing them; that is, concentrating on semantic processing. She took the view that only production (that is, output) really forces L2 learners to undertake full grammatical processing, and thus drives forward most effectively the development of L2 syntax and morphology. The Output Hypothesis has been further developed by Swain and associates (Swain, 1995, 2005; Izumi, 2003), and has led to a continuing strand of research also discussed in Chapter 6 below.

2.4.4 Other 1980s developments

The 1980s saw a range of other 'new beginnings' in SLL research, attached to rather diverse theoretical positions; for this reason, we postpone description

2.5 Continuities in the research agenda

of these until the relevant chapters, where we have space to ‘unpack’ the theoretical perspectives first of all. Thus ‘functionalist’ models of language, introduced in Chapter 1, Section 1.3.3, began to be drawn upon, to study the interlanguage produced by informal learners such as adult migrants, and how it reflected their communicative needs. In Chapter 7, we begin by briefly presenting some pioneering studies of this type (Huebner, 1983; Dittmar, 1984). Another group of researchers, primarily interested in instructed learners, were attracted by the learning theories of Lev Vygotsky being popularized in general education from the 1970s onward, and started to publish neo-Vygotskian accounts of SLL (the very first being the study of Frawley and Lantolf, 1984); this work has also flourished in following decades and is described in Chapter 8. Lastly, ideas from social psychology drove 1980s research on learner motivation, and on ‘individual differences’ more generally (Gardner, 1985; Skehan, 1989). A ‘gap’ in 1980s research and theorizing which seems obvious today, however, is the marginal attention given to sociolinguistic concepts and methods (with, for example, the work of Schumann very much the exception) – these had to wait until the 1990s, to take a central place in the SLL field.

2.5 Continuities in the research agenda .

While methods and theories have become more diverse and sophisticated, the SLA research agenda continues to focus on a number of fundamental issues carried forward from the 1970s, as follows:

2.5.1 The role of internal mechanisms

- (a) **Language-specific:** how similar are the first and second language acquisition processes, and how far are the similarities due to language-specific mechanisms still being activated? If language-specific mechanisms are important, how can they best be modelled? How relevant is the current Chomskyan conception of Universal Grammar?
- (b) **Cognitive:** In what respects are both first and second language learning and processing similar to the learning and processing of any other complex skill?

2.5.2 The role of the first language

Theorists subsequent to Krashen, from a number of different perspectives, have revived the idea that cross-linguistic influences from the first and other languages are operating in second language acquisition. However, it is also clear that such language transfer is selective: some L1 properties transfer and others do not. An important aspect of today's research agenda is still to understand better the phenomenon of cross-linguistic influence, including transfer from other languages that have been learnt (L2s, L3s, L4s ...).

2.5.3 The role of psychological variables

How do individual characteristics of the learner, such as motivation, personality, language aptitude, working memory etc. affect the learning process?

2.5.4 The role of social and environmental factors

How does the overall socialization of the second language learner relate to the language learning process? What is the impact of learner agency and learner identity on language learning opportunity and language learning success? What impact does language status have in an increasingly globalized world?

2.5.5 The role of the input

What is the role of instruction in shaping or speeding up development? What is the relationship between the input and internal mechanisms? Do certain interaction patterns facilitate learning?

In following chapters we examine how L2 theories and research programmes have evolved to investigate these issues since the 1980s. However, before proceeding to these narrative accounts, we introduce a timeline of major publications in the field, from the 1950s to the present, with brief accounts of their significance in framing and shaping second language learning theory.

2.6 Second language learning timeline⁷

Year	Text	Comment
1945	Fries, C. (1945). <i>Teaching and learning English as a foreign language</i> . Ann Arbor, MI: University of Michigan Press.	Fries develops a pedagogy of language based on behaviourism, which claims that repetition and practice lead to accurate and fluent foreign language habits, and that teaching must be based on careful comparison of the L1 and L2 of the learner, in order to teach what is different in the L2 – and therefore difficult for that learner.
1957	Skinner, B.F. (1957). <i>Verbal behavior</i> . New York: Appleton-Century-Croft.	In a detailed account of behaviourism applied specifically to language, Skinner argues that language learning, like any other learning, takes place through stimulus–response–reinforcement leading to the formation of habits.
1957	Lado, R. (1957). <i>Linguistics across cultures: applied linguistics for language teachers</i> . Ann Arbor, MI: University of Michigan Press.	In keeping with behaviourist thinking, Lado compares pairs of languages in order to identify differences, as these will be the areas which will be difficult for the learner and which the teacher must concentrate on, in order to avoid transfer from the first language. This is termed 'Contrastive Analysis'.

⁷This timeline is an adapted version of Myles (2010), reprinted with permission from Cambridge University Press.

2.6 Second language learning timeline

Year	Text	Comment
1959	Chomsky, N. (1959). Review of B.F. Skinner <i>Verbal behavior</i> . <i>Language</i> 35, 26–58.	Chomsky writes a fierce critique of Skinner (1957), arguing that children have an innate faculty guiding them in acquiring language, as they do not merely imitate the language around them, but routinely generate novel sentences and rules. This innate language faculty will subsequently become known as Universal Grammar (UG). Chomsky does not deal with L2 acquisition, but his ideas have had a major impact on the field.
1964	Lado, R. (1964). <i>Language teaching: a scientific approach</i> . New York: McGraw Hill.	Following from his previous work (Lado 1957), Lado draws on then-current science (structuralist linguistics and behaviourist psychology) in order to develop an audiolingual approach to language teaching.
1966	Newmark, L. (1966). How not to interfere in language learning. <i>International Journal of American Linguistics</i> 32, 77–87.	Newmark (in contrast to Lado (1964) and the then-dominant behaviourist thinking) argues that teachers should let the learning process in the classroom take its course, rather than try to directly shape it as in audiolingualism. This represents a major departure in conceptualizing the learning process.
1967	Corder, S.P. (1967). The significance of learners' errors. <i>International Review of Applied Linguistics</i> 5, 161–9.	Corder draws attention to the significance of studying learners' errors, as it becomes evident that a great number do not originate in the L1 of learners, and that learners seem to have an in-built syllabus of their own, as suggested by Chomsky (1959) for L1 acquisition.
1967	Lenneberg, E. (1967). <i>Biological foundations of language</i> . New York: Wiley.	In the wake of the Chomskyan 'revolution', Lenneberg suggests that there must be a biologically triggered, innate language faculty in order to explain why L1 children seem to 'grow' language spontaneously, as long as language is around them, in the same way as they will learn to walk or grow teeth, without the need for any intervention or teaching.
1972	Selinker, L. (1972). Interlanguage. <i>International Review of Applied Linguistics</i> 10, 209–31.	Selinker coins the term INTERLANGUAGE to refer to the L2 learner's developing system (both the L2 system of a learner at a given point in time and the series of interlocking systems developing over time). This term captures the imagination of L2 researchers, keen to move away from contrastive analysis (see Lado, 1957), for both theoretical and empirical reasons.
1972	Gardner, R.C. & Lambert, W.E. (1972). <i>Attitudes and motivation in second language learning</i> . Rowley, MA: Newbury House.	In this book Gardner & Lambert launch the influential proposal that motivation for L2 learning can be integrative (that is, reflecting a wish to integrate with the L2-using community), or instrumental (that is, reflecting pragmatic needs). They argue for the power of integrative motivation in particular.

SECOND LANGUAGE LEARNING THEORIES

Year	Text	Comment
1973	Dulay, H. & Burt, M. (1973). Should we teach children syntax? <i>Language Learning</i> 23, 245–58.	Dulay & Burt report the first major study of learners' errors. They argue that only 3 per cent of errors L2 children make can be traced back to their L1, and that most errors are developmental rather than the result of 'habit formation'. They follow up Brown's (1973) findings that L1 children go through a well-defined order of acquisition of grammatical morphemes in English, and find similar patterns in L2 learners (the so-called 'morpheme studies'; see Dulay <i>et al.</i> , 1982).
1974	Bailey, N., Madden, C. & Krashen, S. (1974). Is there a 'natural sequence' in adult second language learning? <i>Language Learning</i> 24, 235–43.	Bailey et al. carry out morpheme studies with adult L2 learners and find very similar results to Dulay & Burt (1973). The morpheme studies show for the first time that L1 and L2 acquisition might not be as different from one another as commonly believed, and are both driven by learner internal creative mechanisms rather than behaviourist principles.
1974	Richards, J. (ed.) (1974). <i>Error analysis: perspectives on second language learning</i> . London: Longman.	Richards takes the findings on learners' errors beyond the research laboratory into the classroom, in this first book-length analysis of L2 learners' errors, which becomes a highly influential textbook for SLA researchers and teachers alike.
1978	Schumann, J. (1978). <i>The pidginisation process: a model for second language acquisition</i> . Rowley, MA: Newbury House.	With the focus now firmly on the study of L2 production, Schumann notices that early interlanguages resemble pidgins before becoming more complex in ways similar to the creolization process. He also claims that L2 learners who feel closer to the target language community are likely to make the most progress beyond the pidgin stage. He terms this process 'acculturation'.
1978	Bialystok, E. (1978). A theoretical model of second language learning. <i>Language Learning</i> 28, 69–84.	Bialystok is the first to draw a distinction between implicit (subconscious) and explicit (conscious) knowledge in SLA, arguing that the two interact, a dichotomy which has led to much subsequent theorizing and research.
1979	Givón, T. (1979). From discourse to syntax: grammar as a processing strategy. In Givón, T. (ed.) <i>Syntax and semantics</i> . New York: Academic Press, 81–112.	Givón argues that learner speech in early stages resembles the 'pragmatic mode' typical of informal speech, relying heavily on context. He contrasts this with the 'syntactic mode' of more formal styles which rely more on grammatical coding. Authors such as Huebner (1983), Dittmar (1984) or Sato (1990) apply and develop this model in a range of detailed small-scale L2 studies, in what becomes the functionalist tradition.

2.6 Second language learning timeline

Year	Text	Comment
1980	Long, M. (1980). <i>Input, interaction and second language acquisition</i> . Ph.D. dissertation, University of California, Los Angeles.	Long's Ph.D. thesis shows that learners are active partners in L2 interactions rather than mere recipients of input, negotiating the input in order to maximize its comprehensibility, given their current developmental level. This work represents a new departure from the initial focus on contrastive analysis (Lado, 1957), then on learner productions and errors (Corder, 1967) to a focus on the input learners receive and how they engage with it.
1981	Krashen, S. (1981). <i>Second language acquisition and second language learning</i> . Oxford: Pergamon.	At a theoretical level, Krashen develops and refines his influential Monitor Model, which claims that 'learning' and 'acquisition' are different processes. Acquisition is the subconscious process whereby the learner constructs the grammar of the L2 and conscious learning (of, for example, grammar rules) cannot impact on this process. It can only be used to 'monitor' (and, if necessary, modify) output once an utterance has been produced by the acquired system.
1981	Meisel, J., Clahsen, H. & Pienemann, M. (1981). On determining developmental stages in natural second language acquisition. <i>Studies in Second Language Acquisition</i> 18, 109–35.	On the basis of a large-scale study of Italian, Spanish and Portuguese immigrant workers in Germany, Meisel et al. find a clear developmental route in the acquisition of German word order, unrelated to the L1 of learners. Given the criticisms the morpheme studies (Dulay & Burt, 1973) had received, and the fact that all research to date had been on English, this large-scale study involving hitherto unresearched languages confirmed that developmental orders were not just an artefact of the earlier studies.
1982	Dulay, H., Burt, M. & Krashen, S. (1982). <i>Language two</i> . New York: Oxford University Press.	Dulay et al. extend the morpheme studies work (Dulay & Burt, 1973) to larger groups of children and a range of different L1s. They conclude that children follow a similar order in their acquisition of 13 English grammatical morphemes, irrespective of L1 or host environment. They also conclude that the L1 plays a minor role in the L2 acquisition process, and that most errors produced are developmental.
1983	Flynn, S. (1983). A study of the effects of principal branching direction in second language acquisition: the generalization of a parameter of Universal Grammar from first to second language acquisition. Ph.D. dissertation, Cornell University.	One of the very first to apply a generative model to SLA is Flynn . Her doctoral dissertation investigates the implications of UG theory for L2 acquisition, by testing whether L2 learners can reset their L1 parameters to the L2 values. She concludes that, in the case of the Head parameter (which dictates the ordering of constituents within a language) at least, resetting is possible and occurs very early on. This new line of research provides a principled framework for investigating similarities and differences in L1 and L2 acquisition, and opens a new vein of empirical research.

SECOND LANGUAGE LEARNING THEORIES

Year	Text	Comment
1984	Hyltenstam, K. (1984). The use of typological markedness conditions as predictors in second language acquisition: the case of pronominal copies in relative clauses. In R. Andersen (ed.) <i>Second language: a crosslinguistic perspective</i> . Rowley, MA: Newbury House, 39–58.	Other theoretical frameworks are also resorted to in the attempt to account for developmental patterns. For example, Hyltenstam relates developmental patterns in L2 acquisition to universal typological tendencies of the world's languages. He shows that L2 learners acquire subject relative clauses before object relative clauses, which in turn are acquired before indirect object, oblique object, genitive, and finally object of a comparison relative clause, mirroring how common each of these are in the world's languages. Resorting to typological universals for explaining L2 acquisition becomes a fairly productive line of enquiry (see Ramat, 2009).
1984	Pienemann, M. (1984). Psychological constraints on the teachability of languages. <i>Studies in Second Language Acquisition</i> 6, 186–214.	Pienemann is the first to link developmental stages to learnability and teachability issues, suggesting that it is only when a given stage has been acquired that learners will be able to learn the following one.
1985	Krashen, S. (1985). <i>The input hypothesis: issues and implications</i> . Harlow: Longman.	Krashen further develops his Input Hypothesis, arguing that all learners need in order to acquire an L2 is to be exposed to comprehensible input just beyond their current developmental level ($i + 1$). The hypothesis is later criticized for being untestable and circular.
1985	Swain, M. (1985). Communicative competence: Some roles of comprehensible input and comprehensible output in its development. In Gass, S. & Madden, C. (eds) <i>Input in second language acquisition</i> . Rowley, MA: Newbury House, 235–53.	Swain argues that learners not only need comprehensible language input, but that they also need to produce output in order to develop their communicative abilities in the L2 to a high standard. This follows research on immersion students in Canada (who are taught their academic subjects through the medium of L2 French), who become close to native-like in comprehension, but not in production.
1987	McLaughlin, B. (1987). <i>Theories of second language learning</i> . London: Arnold.	After the disillusionment with behaviourism, McLaughlin introduces new ideas from cognitive psychology to SLL theorizing. Specifically he uses Anderson's information processing model (called ACT; Anderson 1985) to argue that L2 learning involves processes controlled by the short-term memory initially, which through repeated activation become automatized and move to the long-term memory, from which they can be retrieved quickly and effortlessly, and without conscious attention. As new linguistic structures are incorporated within the system, restructuring takes place.

2.6 Second language learning timeline

Year	Text	Comment
1989	Bley-Vroman, R. (1989). What is the logical problem of foreign language learning? In Gass, S. & Schachter, J. (eds) <i>Linguistic perspectives on second language acquisition</i> . Cambridge: Cambridge University Press, 41–68.	Giving further legitimacy to general models of learning from psychology, Bley-Vroman argues that there are too many important differences between L1 and L2 acquisition to claim that UG underpins both. His 'fundamental difference hypothesis' claims that L1 acquisition can be explained by UG, but that L2 acquisition is the result of general cognitive mechanisms. This line of enquiry leads to the application of constructionist or emergentist models of language learning to the L2 context.
1989	White, L. (1989). <i>Universal grammar and second language acquisition</i> . Amsterdam: John Benjamins.	White's detailed analysis of the various options for the role of UG in L2 acquisition provides the theoretical foundations for much later research within this highly prolific framework.
1989	Johnson, J. & Newport, E. (1989). Critical period effects in second language learning: the influence of maturational state on the acquisition of ESL. <i>Cognitive Psychology</i> 21, 60–99.	An important question underlying much of the work within the generative framework is whether UG underpins both L1 and L2 acquisition, or whether there is a 'critical period' during which it needs to be activated. Johnson & Newport compare L2 ultimate attainment on a number of English grammatical structures by learners who vary in terms of age of arrival in the United States. They conclude that there is a clear and strong advantage for earlier arrivals over the later arrivals and argue for the 'Critical Period Hypothesis' to be extended to L2 learners.
1989	Skehan, P. (1989). <i>Individual differences in foreign language learning</i> . London: Arnold.	Skehan brings together the role of individual differences in L2 learning, in the first book-length treatment. Constructs such as language aptitude, motivation, personality and anxiety among others become more widely researched thereafter.
1990	Schmidt, R. (1990). The role of consciousness in second language learning. <i>Applied Linguistics</i> 11, 129–58.	Also turning to psychological constructs to explain the L2 acquisition process, Schmidt argues that (comprehensible) input is not sufficient; it needs to become intake, and this is done through 'noticing', that is, registering a form in the input.
1991	Cook, V.J. (1991). The poverty-of-the-stimulus argument and multi-competence. <i>Second Language Research</i> 7.2, 103–17.	Cook argues that the bilingual mind is not merely two monolingual minds added together. Not only does the L1 have an impact on the L2, but the L2 also impacts on the first, and this has important implications for a view of the mental grammar as one (and only one) instantiation of UG.

SECOND LANGUAGE LEARNING THEORIES

Year	Text	Comment
1992	Klein, W. & Perdue, C. (1992). <i>Utterance structure: developing grammars again</i> . Amsterdam: John Benjamins.	The functionalist tradition (Givón, 1979) receives a major impetus through an ambitious L2 project funded by the European Science Foundation between 1982 and 1986 and involving research teams in 5 European countries and 10 language pairs. Klein & Perdue find that all learners, irrespective of L1 and L2, go through similar developmental stages, and propose a common 'Basic Variety' for all uninstructed learners. The project provides a very rich dataset widely used by other researchers.
1992	Sokolik, M. & Smith, M. (1992). Assignment of gender to French nouns in primary and secondary language: a connectionist model. <i>Second Language Research</i> 8, 39–58.	For the first time, researchers resort to computer-modelling to account for L2 development. Sokolik & Smith develop a connectionist network model which was able to learn the gender of French nouns solely on the basis of associative patterns (N.C. Ellis, 2003; Hawkins, 2008c).
1993	VanPatten, B. & Cadierno, T. (1993). Explicit instruction and input processing. <i>Studies in Second Language Acquisition</i> 15, 225–44.	VanPatten's input processing model and associated processing instruction pay fresh attention to links between learning and teaching, arguing that learners initially tend to process grammatical information most when it is needed to retrieve meaning. For example, in <i>He played in the garden yesterday</i> , learners do not need to process the <i>-ed</i> inflection for the meaning of 'pastness' as they tend to retrieve it from the word <i>yesterday</i> . Processing Instruction activities avoid redundancy such as 'yesterday', forcing learners to process grammatical information to extract meaning.
1994	Lantolf, J.P. (ed.) (1994). <i>Socio-cultural theory and second language learning: Special Issue of The Modern Language Journal</i> 78.4.	In this special issue of the <i>MJL</i> , as well as in an edited volume the same year (Lantolf & Appel, 1994) and in many publications since, Lantolf applied the Vygotskyan sociocultural framework to L2 acquisition, arguing that language learning is quintessentially a mediated social process rather than individual. Concepts such as regulation, scaffolding, Zone of Proximal Development, microgenesis, private and inner speech, and activity theory are at the core of sociocultural analyses of L2 learning.
1994	Bayley, R. (1994). Interlanguage variation and the quantitative paradigm: past tense marking in Chinese–English. In Tarone, E., Gass, S. & Cohen, A. (eds), <i>Research methodology in second language acquisition</i> . Hillsdale, NJ: Lawrence Erlbaum, 157–81.	Theorizing from the field of sociolinguistics makes an entry into SLA. In the Labov sociolinguistic tradition, Bayley applies a quantitative model based on statistical probabilities (VARBRUL) to the analysis of L2 variation. This methodology is then used by a range of authors in a range of L2s, showing how far L2 learners appropriate target sociolinguistic norms.

2.6 Second language learning timeline

Year	Text	Comment
1995	Duff, P. (1995). An ethnography of communication in immersion classrooms in Hungary. <i>TESOL Quarterly</i> 29, 505–37.	Continuing the emergence of sociolinguistic concerns in SLA, Duff conducts one of the first substantial ethnographic studies of L2 socialization, in the context of English immersion in Hungarian high school.
1996	Schwartz, B. & Sprouse, R. (1996). L2 cognitive states and the Full Transfer/Full Access model. <i>Second Language Research</i> 12.1, 40–72. Vainikka, A. & Young-Scholten, M. (1996). Gradual development of L2 phrase structure. <i>Second Language Research</i> 12.1, 7–39.	Within UG approaches to SLA, questions centre around whether L2 learners start with their L1 parameters initially, and whether they are able to reset them to the L2 values (see Flynn, 1983; White, 1989). Schwartz & Sprouse argue for 'Full Transfer'/'Full Access', that is, L2 learners initially transfer all their L1 parameter settings, thereafter resetting them on the basis of positive evidence in the input. Vainikka & Young-Scholten argue that learners start with 'minimal trees', that is, lexical projections only (content words), before being able to project functional categories such as complementizer phrases, tense, etc., with L2 parameters coming on-line gradually.
1997	Lyster, R. & Ranta, E. (1997). Corrective feedback and learner uptake: negotiation of form in communicative classrooms. <i>Studies in Second Language Acquisition</i> 19.1, 37–61.	In a much-cited study, Lyster & Ranta investigate systematically the type of error feedback provided by teachers in L2 classrooms and conclude that recasts (where the teacher repeats what the learner has produced, but without the mistake and without any explanation) are the most common but also the least effective in so far as they seldom lead to self-correction by the students.
1997	Larsen-Freeman, D. (1997). Chaos/complexity science and second language acquisition. <i>Applied Linguistics</i> 18, 141–65.	Larsen-Freeman first develops the argument that language is a complex adaptive system, and ascribes the particular characteristics of learner language to its conditions of emergence.
1997	Firth, A. & Wagner, J. (1997). On discourse, communication and some fundamental concepts in SLA research. <i>Modern Language Journal</i> 81, 285–300.	In their contribution to a special issue of <i>Modern Language Journal</i> , Firth & Wagner argue for a reconceptualization of SLA to take account of interactional and sociolinguistic views of language and language development. This article made a significant contribution to the emerging 'social turn' in SLA research.
1998	Pienemann, M. (1998). <i>Language processing and second language acquisition: processability theory</i> . Amsterdam: John Benjamins.	Pienemann develops his model of L2 development based on processing (Pienemann, 1984), stating that learners are initially only able to process linguistic information in local domains before more distant ones, for example, at word level before lexical phrase level, before clause level, before sentence level, and finally discourse level. His model is applied to the acquisition of a range of L2s (Arabic, Chinese, English, Italian, Japanese and Swedish; see Pienemann, 2005).

SECOND LANGUAGE LEARNING THEORIES

Year	Text	Comment
1998	Lardiere, D. (1998). Dissociating syntax from morphology in a divergent L2 end-state grammar. <i>Second Language Research</i> 14.4, 359–75.	Within the UG tradition and on the basis of the study of an end-state learner, Lardiere argues that the ability to acquire syntax is unimpaired in L2 learners and that they still have access to UG parameters for the L2. What is impaired is the ability to map morphological paradigms onto the relevant syntactic categories. She shows that after 18 years living and working in the US, this learner has no problem with syntax but persistently fails to provide inflections on verbs. This much-cited study took place over a very long time-span, with the first recordings after 10 years of residence and the second after 18 years.
1998	Archibald, J. (1998). <i>Second language phonology</i> . Amsterdam: John Benjamins.	Archibald brings the development of L2 phonology to the attention of SLA researchers. The late 1990s/early 2000s see a diversification of the object of enquiry in SLA, which had primarily been morphosyntax to this date, with studies of L2 vocabulary, phonology, discourse and pragmatics becoming commonplace.
1999	Birdsong, D. (ed.) (1999). <i>Second language acquisition and the critical period hypothesis</i> . Mahwah, NJ: Lawrence Erlbaum.	Birdsong reviews the evidence relating to a Critical Period in the context of L2 acquisition (Lenneberg, 1967; Johnson & Newport, 1989). The results are somewhat inconclusive, with many studies supporting the CPH but others refuting it. There are maturational effects in SLA, but these seem to be gradual rather than resulting from a discrete cut-off point.
2000	Carroll, S. (2001). <i>Input and evidence: the raw material of second language acquisition</i> . Amsterdam: John Benjamins.	Carroll proposes an ambitious model outlining the role of processing mechanisms and interaction in SLA. Her 'Autonomous Induction' theory is the first complex model linking language representation, processing and learning.
2000	Herschensohn, J. (2000). <i>The second time around: minimalism and second language acquisition</i> . Amsterdam: John Benjamins.	Developments in generative linguistics, in the shape of Chomsky's (1995) 'Minimalist Program', have important implications for SLA theorizing. In a far-reaching new model, Herschensohn outlines these implications and argues that L2 learners use a coalition of resources (UG, L1 transfer, primary linguistic data, input and intake, instructional bootstrapping) in order to construct the L2 vocabulary and grammar.
2000	Norris, J. & Ortega, L. (2000). Effectiveness of L2 instruction: a research synthesis and quantitative meta-analysis. <i>Language Learning</i> 50, 417–528.	This systematic review and meta-analysis set new standards of reviewing, reporting and analysis for journals and research design standards for those wishing to inform language teaching. It defined and reopened debate into methodological issues such as different types of language knowledge and measures of language.
2000	Norton, B. (2000). <i>Identity and language learning: gender, ethnicity and educational change</i> . Harlow: Pearson Education	In her study of women migrants living and working in Canada, Norton proposes a dynamic, poststructuralist view of learner identity, and is concerned with learner agency and investment as central to learning success.

2.6 Second language learning timeline

Year	Text	Comment
2001	Ohta, A. (2001). <i>Second language acquisition processes in the classroom: learning Japanese</i> . Mahwah, NJ: Lawrence Erlbaum.	The sociocultural framework sees its first very detailed longitudinal study. Ohta's investigation of adult Japanese learners of English enables her to gain insights into the role of private speech in L2 learning processes, and to document mutual scaffolding, which, she argues, plays a crucial role in L2 development.
2001	Hawkins, R. (2001). <i>Second language syntax: a generative introduction</i> . Oxford: Blackwell.	Within the generative tradition, Hawkins' Modulated Structure Building model argues that learners start with lexical projections only, gradually building functional categories, and that they cannot acquire through UG functional features (for example, grammatical gender) not instantiated in their L1. See White, 1989; Schwartz & Sprouse, 1996; Vainikka & Young-Scholten, 1996b; Lardiere, 1998b for alternative generative models.
2001	Ullman, M. (2001a). The neural basis of lexicon and grammar in first and second language: the declarative/procedural model. <i>Bilingualism: Language and Cognition</i> 4, 105–22.	Ullman's articulation of the declarative/procedural model of memory, with supporting neuroanatomical evidence, has been influential in explaining differences between how language is stored, processed and accessed in a first and second language. His account focuses on the observation that L1/L2 differences are more pronounced for syntactic than for lexical phenomena.
2002	Kasper, G. & Rose, K. (2002). <i>Pragmatic development in a second language</i> . Oxford: Blackwell.	Kasper & Rose carry out a survey of studies of L2 pragmatic development since the early 1980s, putting this hitherto-neglected aspect of development firmly on the SLA map.
2003	Ellis, N.C. (2003). Constructions, chunking, and connectionism: the emergence of second language structure. In Doughty, C. & Long, M. (eds) <i>The handbook of second language acquisition</i> . Oxford: Blackwell, 63–103.	N.C. Ellis has long been one of the strongest advocates of emergentism, arguing that the acquisition of the L2 is as a result of the analysis of patterns in the language input, through associative learning processes. In this view, there are no pre-existing 'rules' underpinning the grammars of languages, only probabilistic patterns (see also Sokolik & Smith, 1992; Hawkins, 2008a).
2004	Paradis, M. (2004). <i>A neurolinguistic theory of bilingualism</i> . Amsterdam: John Benjamins.	New and increasingly sophisticated technologies (for example, ERPs [Event Related Potential], fMRI [functional Magnetic Resonance Imaging]) are enabling researchers to investigate the neurobiological foundations of language in the brain, in a very fast-growing field. Paradis reviews neuroimaging studies of the multilingual brain, proposing a linguistic theory of bilingualism integrating a neurofunctional model and a set of hypotheses about language processing.

SECOND LANGUAGE LEARNING THEORIES

Year	Text	Comment
2004	Truscott, J. & Sharwood Smith, M. (2004). Acquisition by processing: a modular perspective on language development. <i>Bilingualism: Language and Cognition</i> 7, 1–20.	Truscott & Sharwood Smith outline their model of language development, MOGUL [Modular On-line Growth and Use of Language]. It is a processing model based on a modular view of language, in which competence is embodied in the processing mechanisms. They argue that the development of language (first or second) occurs as a natural product of processing activity, without any acquisition mechanisms as such.
2005	Dörnyei, Z. (2005). <i>The psychology of the language learner: individual differences in second language acquisition</i> . Mahwah, NJ: Lawrence Erlbaum.	Dörnyei proposes a new approach to conceptualizing second language motivation, the 'L2 motivational self system'. This model is grounded in psychological research on the self, and proposes the imagined 'ideal L2 self' as an alternative to the concept of integrative motivation. (See Gardner & Lambert, 1972.)
2005	O'Grady, W. (2005). <i>Syntactic carpentry: an emergentist approach to syntax</i> . Mahwah, NJ: Lawrence Erlbaum.	O'Grady's book gives a full account of his emergentist approach to explaining language structure and learning, using the notion of a computational processing device that is driven by the need for efficiency.
2006	Lantolf, J. and Thorne, S. (2006). <i>Sociocultural theory and the genesis of second language development</i> . Oxford: Oxford University Press.	In this book-length treatment, Lantolf & Thorne provide an authoritative overview of sociocultural theory and its application to L2 development, including newer strands such as concept-based instruction and dynamic assessment.
2007	DeKeyser, R. (ed.) (2007b). <i>Practice in a second language: perspectives from applied linguistics and cognitive psychology</i> . Cambridge: Cambridge University Press.	DeKeyser has been one of the main proponents of Skill Acquisition approaches to adult L2 learning, around which the early information processing models were built. DeKeyser proposes that adult L2 learners tend to use explicit learning mechanisms resulting in age-related differences. This volume brings together studies underpinned by the notion that controlled knowledge gradually becomes automatized via practice.
2008	Hawkins, R. (ed.) (2008c). Current emergentist and nativist perspectives on second language acquisition: Special Issue of <i>Lingua</i> 118.	In this special issue of <i>Lingua</i> , Hawkins brings together leading researchers to debate the strengths and weaknesses of nativist accounts of SLA (believing UG constrains SLA; see White, 1989; Hawkins, 2001; Lardiere, 1998b) vs. emergentist explanations (where SLA is an associationist process: see N.C.Ellis, 2003)

3 | Linguistics and language learning: the Universal Grammar approach

The problem that has virtually defined the serious study of language since its ancient origins, if only implicitly, is to identify the specific nature of this distinctive human possession. (Chomsky, 2007a, p.1)

Evidently each language is the result of the interplay of two factors: the initial state and the course of experience. We can think of the initial state as a 'language acquisition device' that takes experience as 'input' and gives the language as an 'output' – an 'output' that is internally represented in the mind/brain. (Chomsky, 2000, p. 4)

3.1 Introduction

In this chapter, we start to consider individual theoretical perspectives on second language learning in greater detail. Our first topic is the Universal Grammar approach (the generative linguistics approach), developed by the American linguist Noam Chomsky and numerous followers over the last few decades. We have concentrated on this particular approach because it has been much the most influential linguistic theory in the field, and has inspired a great wealth of publications, both empirical and theoretical (for full-length treatments, see Ayoun, 2003; Cook and Newson, 2007; Hawkins, 2001; Herschensohn, 2000; Lardiere, 2007; Leung, 2009; Thomas, 2004; White, 2003).

The main aim of linguistic theory is twofold: firstly, to characterize what human languages are like (descriptive adequacy), and secondly, to explain why they are that way (explanatory adequacy). In terms of second language acquisition, a linguistic approach sets out to describe the evolving language produced by second language learners, and to explain its character. Universal Grammar (UG) is therefore a property theory (as defined in Chapter 1), that is, it attempts to characterize the underlying linguistic knowledge in L2 learners' minds. In contrast, a detailed examination of the learning process itself (transition theory) will be the main concern of the cognitive approaches which we describe in Chapters 4 and 5.

First, in this chapter, we will give a broad definition of the aims of the Chomskyan tradition in linguistic research, in order to identify the aspects of second language acquisition to which this tradition is most relevant. Second, we will examine the concept of Universal Grammar itself in some detail, and finally we will consider its application in second language learning research.

3.2 Why a Universal Grammar?

3.2.1 Aims of linguistic research

The main goals of linguistic theory, as defined by Chomsky (1986a), are to answer three basic questions about human language:

1. What constitutes knowledge of language?
2. How is knowledge of language acquired?
3. How is knowledge of language put to use?

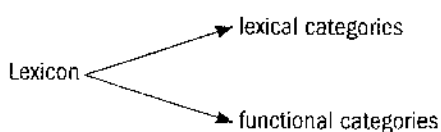
(‘Knowledge of language’ is an ambiguous term. Here, it means the subconscious mental representation of language which underlies all language use.)

All three questions are also of concern to SLA researchers. They can be briefly developed as follows:

3.2.1.1 What constitutes knowledge of language?

From a generative perspective, linguistic theory aims to describe the representations of language which are stored in the human mind. It aims to define what all human languages have in common, as well as the distinctive characteristics which make human language different from other systems of communication. It also needs to specify in what ways individual human languages can differ from one another, as they clearly do. However, Chomsky (for example, 2000) argues that to a Martian landing on Earth, the differences between human languages would seem like variations on a single theme.

The Universal Grammar (UG) approach views language as a genetic endowment, claiming that all human beings inherit a universal set of abstract **principles and parameters** which constrain (limit) the shape human languages can take, and which make human languages similar to one another. In his Government and Binding Theory, Chomsky (1981, 1986a, 1986b) argues that the core of human language must comprise these two components. His proposed principles are unvarying and apply to all natural languages (see Section 3.3.1). In contrast, parameters possess a limited number of open values which characterize differences between languages (parametric variation; see Section 3.3.2). In recent years, the notion of parameter has undergone major re-conceptualization following Chomsky’s **Minimalist Program** (1995, 2000, 2005, 2007a, 2007b), in which he argues that the core of human language is the lexicon (the word store). The **lexicon** itself consists of two elements:



3.2 Why a Universal Grammar?

We will define these elements in more detail later (in Section 3.3). Basically, **lexical categories** include 'content' words such as verbs and nouns, and **functional categories** include 'grammatical' words such as **determiners** or auxiliaries, as well as abstract grammatical features such as Tense or Agreement.

In the Minimalist Program, parametric variation is located within the lexicon, primarily within functional categories. These are characterized by a bundle of so-called **functional features** which vary from language to language, causing the various surface differences in word order, morphology etc. which we are familiar with. UG in this view is thought to consist of a computational system (called narrow syntax) which specifies how words can combine to form syntactic units, and a universal inventory of features. These combine together in different ways in different languages to form functional categories, which are then assembled into lexical items (Domínguez, in press; Sorace, 2011; White, 2009b; Lardiere, 2012).

UG is a general theory of language, which should therefore apply to learner language, alongside other language varieties. In practice, one of the main interests of the UG approach for SLA research is that it provides a detailed descriptive framework which enables researchers to formulate well-defined hypotheses about the task facing the learner, and to analyse learner language in a more focused manner.

3.2.1.2 How is knowledge of language acquired?

How does the child create the mental construct that is language? Chomsky first resorted to the concept of Universal Grammar because he believed that children could not learn their first language so quickly and effortlessly without the help of an innate language faculty to guide them. The so-called 'logical problem of language learning' is that on the basis of highly complex and often messy input (spoken language is full of false starts, unfinished sentences, slips of the tongue etc.) children create a mental representation of language which not only goes beyond the input they are exposed to, but is also strikingly similar to that of other speakers of the same language variety. Children achieve this at an age when they have difficulty grasping abstract concepts, yet language is among the most abstract pieces of knowledge they will ever possess. If there is a biologically endowed Universal Grammar, this would make the task facing children much easier, by providing a genetic blueprint which predetermines much of the shape which language will take.

If we now turn to the problem of second language learning, learners are faced with the same logical problem of having to construct abstract representations of the new language on the basis of the limited samples of language they actually encounter. But this does not mean to say that L2 learners necessarily set about the learning challenge in the same way as children. After all, their needs are very different, if only because they are already successful communicators in one

SECOND LANGUAGE LEARNING THEORIES

language, and because they already have a mental representation of language, with the parameters set to the values of their native language. Moreover, second language learners are cognitively mature and therefore presumably much better equipped to solve problems and to deal with abstract concepts. From a theoretical point of view, therefore, different possible scenarios are open to consideration:

- **L2 grammars are fully constrained by UG.** The L2 is one example of a natural language, and it is constrained by UG in the same way as native grammars. Within this view, there is a range of different possibilities. For example, some researchers believe that L2 learners start off with the parameter settings of their L1, and reset them on the basis of input. Others believe that L2 learners have the full range of UG parameters available to them from the beginning, like L1 children, and do not resort to L1 parameter settings in the first instance. Others still believe that L2s gradually draw on UG, and that (for example) functional categories are not available to learners at the beginning of the learning process. All these approaches believe that the L2 grammar is constrained by UG and can (but does not necessarily) become native-like (Schwartz and Sprouse, 1996; White, 2003, 2009a, 2009b; Lardiere, 2000, 2007, 2009, 2012; Hawkins, 2008a).
- **UG does not constrain L2 grammars OR UG is impaired.** Some researchers believe that L2 grammars are fundamentally different from L1 grammars because they are not constrained any longer by UG, and learners have to resort to general learning mechanisms, giving rise to **wild grammars**, that is grammars which do not necessarily conform to the general rules underlying natural human languages (for example, Meisel, 1997). Others believe that only the parameters instantiated (activated) in the learners' L1 will be available, and that parameter re-setting is impossible. Within this view, the L2 grammar does not violate UG principles and parameters (it is not 'wild'), but it cannot become the same as that of L1 speakers of the same language (Hawkins, 2001, 2009; Hawkins and Chan, 1997; Hawkins and Franceschina, 2004).

There is considerable controversy around all these issues, and we revisit them below in Section 3.5.

3.2.1.3 How is knowledge of language put to use?

The UG approach is concerned with the abstract mental representation of language and the computational mechanisms associated with it which all human beings possess, which is commonly called competence. It is not about performance, about how language is used in real life. Performance requires a theory of language use, in which linguistic competence is only one aspect, and psycholinguistic factors such as the brain's information processing capacity also come into play. Although Chomsky acknowledges that this is an important

area for research, he has been concerned almost exclusively with exploring linguistic competence, and this is also true for UG-inspired research in SLA. Recently, however, generative linguists have been increasingly concerned with how different language modules (syntax, phonology, semantics) interface with one another, and with non-linguistic modules such as the sensory-motor system (SM – involved in perception and production of language) and the conceptual-intentional system (CI – involved in thought and information structure). In turn, this has led to somewhat increased attention to the domain of performance (Chomsky, 2005, 2007b; Domínguez, in press; de Villiers and Roeper, 2011; Di Sciullo *et al.*, 2010; Lardiere, 2012; White, 2009a, 2009b; Sorace and Serratrice, 2009; Serratrice *et al.*, 2004; Tsimpli and Sorace, 2006). We will illustrate recent research on **interfaces** in Section 3.5.2.3.

3.2.2 Arguments for UG from L1 acquisition

In this section, we will review in more detail the arguments which support the existence of an innate language faculty in children. We will start from the characteristics of L1 acquisition outlined in Chapter 2, and summarized below:

1. Children go through developmental stages.
2. These stages are very similar among children learning the same language, although individual children's rate of progress is variable.
3. These stages are similar across languages.
4. Child language is rule-governed and systematic, though the rules created by the child do not necessarily correspond to adult ones.
- 5. Children are resistant to correction.
6. Children's processing capacity limits the number of rules they can apply at any one time, and they will revert to earlier hypotheses when two or more rules compete.

Universalists could not conclude from such evidence alone that there must be a specific language module in the brain. These regularities, although very striking, could be due to the more general cognitive make-up of human beings. After all, children learning maths or learning to play the piano also go through fairly well-defined stages, although not at such a young age, and not necessarily so successfully. Indeed, many non-UG researchers believe that language acquisition uses the same kind of information processing as other kinds of learning, as we will see in Chapters 4 and 5.

However, another striking feature of child language is that it does not seem to be linked in any clear way to intelligence. Children do vary in the age and speed at which they go through each developmental step. By age 3 or 4, though, individual differences have largely disappeared, and the late starter has usually caught up with the precocious child.

SECOND LANGUAGE LEARNING THEORIES

Not only is language development not directly linked to intelligence, but it also involves mastering a highly complex and abstract kind of knowledge. To give an example of the complexities which children have to disentangle, consider the following English reflexive sentences, some of them grammatical and others ungrammatical (indicated by an asterisk):

- a. *John saw himself.*
- b. **Himself saw John.*
- c. Looking after *himself* bores *John*.
- d. *John* said that *Fred* liked *himself*.
- e. **John* said that *Fred* liked *himself*.
- f. *John* told *Bill* to wash *himself*.
- g. **John* told *Bill* to wash *himself*.
- h. *John* promised *Bill* to wash *himself*.
- i. *John* believes *himself* to be intelligent.
- j. **John* believes that *himself* is intelligent.
- k. *John* showed *Bill* a picture of *himself*.

(Examples are taken from White, 1989, cited in Lightbown and Spada, 2006, p. 16. In all these sentences, the noun and the pronoun which refer to the same person are printed in italics.)

Now imagine you are the child trying to work out the relationship between the reflexive pronoun and its antecedent. You might conclude from (a) and (b) that the reflexive pronoun must follow the noun it refers to, but (c) disproves this. Sentences (d), (e), (f) and (g) might lead you to believe that the closest noun is the antecedent, but (h) shows that this cannot be right either. It is also evident from (h) that the reflexive and its antecedent do not have to be in the same clause. Furthermore, the reflexive can be in subject position in (i), an untensed clause, but not in (j), a tensed clause. Moreover, the reflexive can sometimes have two possible antecedents, as in (k) where *himself* can refer to either *John* or *Bill*.

These few sentences illustrate the magnitude of the task facing children; how can they make sense of data like this, and invariably arrive at the correct rule? In support of the view that language is not linked to intelligence, there is also a large body of evidence from children with cognitive deficits who nonetheless develop language normally (Bishop and Mogford, 1993; Bishop, 2001; Bartke and Siegmüller, 2004). For example, Bellugi *et al.* (1993) studied children suffering from Williams syndrome, a rare metabolic disorder which causes mental impairment, as well as other physical symptoms. They demonstrated that individuals whose overall mental development is otherwise very slow and

3.2 Why a Universal Grammar?

remains below that of a 7-year-old can make sophisticated use of language with complex syntax and adult-like vocabulary.

Smith and Tsimpli (1995; Smith *et al.*, 2011) have studied in detail the extraordinary case of a brain-damaged man, Christopher, who is institutionalized because he is unable to look after himself, but who can read, write and communicate in many languages:

The most salient feature is a striking mismatch between his verbal and non-verbal abilities, supported by test results over a prolonged period and with recent documentation across a wide range of different tests. The basic generalisation is that he combines a relatively low performance IQ with an average or above average verbal IQ. (Smith and Tsimpli, 1995, p. 4)

Evidence of the opposite is also found: children who are cognitively 'normal', but whose language is impaired, sometimes severely. This condition, known as **Specific Language Impairment (SLI)**, is characterized by '(persistent) difficulties with the productive rules of word-formation, the morphosyntactic prerequisites of feature agreement and the construction of complex phonological units' (Lorenzo and Longa, 2003, p. 645; see also van der Lely, 1998; Paradis *et al.*, 2008). One English-speaking family has been studied, in which 16 out of 30 members in the last three generations suffer from SLI, suggesting that it is an inherited disorder, and that some aspects of language at least might be genetically controlled (Gopnik and Crago, 1991; Pinker, 1994). Recently, the gene FOXP2 has been discovered, whose mutation apparently leads to SLI (Lai *et al.*, 2001; Vargha-Khadem and Liegeois, 2007; Pinel *et al.*, 2012).

We find further evidence in brain-damaged adults to support the view that language is separate from other kinds of cognitive faculties; people who suffer strokes or other localized injuries to the brain will have very different symptoms depending on the location of their injury. Damage to the left hemisphere of the brain will usually result in language deficit, as in the vast majority of people (around 90 per cent) it is the left hemisphere which controls language.

Moreover, the exact location of the injury within the left hemisphere is often linked to particular kinds of language deficit. Damage to the region in front of and just above the left ear (**Broca's area**) usually results in effortful, hesitant and very non-fluent speech, with virtually no grammatical structure in evidence, consisting largely of specific nouns with few verbs, and poorly articulated. The comprehension of speech, in contrast, usually remains good. This condition is called Broca's aphasia, and is in many respects the mirror image of Wernicke's aphasia, which usually results from an injury to the region of the brain around and under the left ear (**Wernicke's area**). In the case of Wernicke's aphasia, patients produce effortless, fluent and rapid speech which is generally grammatically complex and well-structured, but which is lacking in content words with specific meaning; these patients produce very general nouns and

SECOND LANGUAGE LEARNING THEORIES

verbs such as *something, stuff, got, put* or *did*, and their speech is so vague that it is usually totally incomprehensible. In this condition, the comprehension of speech is severely impaired. This kind of evidence is used to suggest that even within language itself, different 'modules' are at least partly independent of one another.

The picture we have just outlined of the relationship between brain and language is necessarily very oversimplified. (For more detailed accounts, see for example Jenkins, 2000; Lorenzo and Longa, 2003; Caplan, 2012.) Nonetheless it shows clearly that specific areas of the brain deal with specific aspects of language. Recent advances in brain imaging techniques have also supported this view, although the picture is becoming more complex as techniques become more sophisticated (Carter, 1998; Dörnyei, 2009b; Paradis, 2004).

All this evidence put together has been used by universalists to posit that there must be some kind of innate language faculty which is biologically triggered, in order to explain why language in children just seems to 'grow', in the same way as teeth develop and children start walking. An influential book by Lenneberg (1967) called *Biological foundations of language* outlined the characteristics which are typical of biologically triggered behaviour and argued that language conforms to these.

Aitchison (2008, p. 71) presents Lenneberg's criteria as a list of six features:

1. 'The behaviour emerges before it is necessary'. Children start talking long before they need to: they are still being fed and looked after, and therefore do not need language for their survival.
2. 'Its appearance is not the result of a conscious decision'. It is quite obvious that children do not get up one morning and decide to start talking, whereas they might consciously decide to learn to ride a bike or play the piano.
3. 'Its emergence is not triggered by external events (though the surrounding environment must be sufficiently "rich" for it to develop adequately)'. Although children need language around them in order to learn it, there is no single event which will suddenly trigger language development.
4. 'Direct teaching and intensive practice have relatively little effect'. We have seen in Chapter 2 how oblivious children seem to be to correction.
5. 'There is a regular sequence of "milestones" as the behaviour develops, and these can usually be correlated with age and other aspects of development'. In the same way as a baby will sit up before standing up before walking before running, we have seen how children go through well-defined stages in their language development, which tend to run parallel to physical development. The onset of the first words usually roughly corresponds to the onset of walking for example.
6. 'There may be a "critical period" for the acquisition of the behaviour'. It is often argued that human beings have to be exposed to language before

3.3 What does Universal Grammar consist of?

puberty in order for language to develop. This is a controversial issue; the evidence from children who have been deprived of language in their early years is difficult to interpret, as it is not usually known whether they were normal at birth or had suffered some kind of brain-damage (Curtiss, 1977, 1988; Eubank and Gregg, 1999; Smith, 1999). We will examine later in this chapter the evidence that adult second language learners bring to this ongoing debate.

After having reviewed the kind of argumentation used by universalists in order to propose the existence of a language-specific module in the brain, let us now turn to the question of what this so-called language faculty or Universal Grammar might be like.

3.3 What does Universal Grammar consist of?

The aim of this section is to illustrate Universal Grammar sufficiently to understand how it has been applied to the study of language acquisition. Generative linguistics has changed considerably in the last 50 years or so, from the early phase of phrase structure rules to the recent Minimalist Program. However, its primary goal has remained the same: to characterize the innate language faculty. The varying emphases over the years have essentially been the result of tension between descriptive and explanatory adequacy. In the case of UG, the search for 'descriptive adequacy' has attempted to account for the details of increasing numbers of typologically unrelated languages, while the search for 'explanatory adequacy' has aimed to make effective cross-language generalizations:

A theory of language must show how each particular language can be derived from a uniform initial state under the 'boundary conditions' set by experience ... The search for descriptive adequacy seems to lead to ever greater complexity and variety of rule systems, while the search for explanatory adequacy requires that language structure must be invariant, except at the margins. (Chomsky, 2000, p. 7)

Next, we will examine more concretely some examples of principles and parameters, that is, the content of Universal Grammar.

3.3.1 Principles

We have seen earlier that, according to the generative view, the L1 learner's initial state is supposed to consist of a set of universal language principles. Individual languages vary in limited ways, expressible in terms of innate parameters which need to be fixed in one of a few possible settings on the basis of exposure to language evidence (White, 2009a; Lardiere, 2012).

What does this mean in practice? The general idea is that language learning is highly constrained in advance, thus making the task for the child much

SECOND LANGUAGE LEARNING THEORIES

more manageable. In the following section, we will work our way through one concrete example of a principle and its associated parameters, in order to see how these concepts have been applied to the problem of language learning (de Villiers and Roeper, 2011; Meisel, 2011).

Our first example is the well-known principle of structure-dependency which states that language is organized in a way that depends on the structural relationships between elements in a sentence (such as words and morphemes). That is to say, individual words are regrouped into higher level abstract structures which are the building blocks of language. Intuitively, we know that this is the case. In the following sentences:

- (a) She bought a new car yesterday
- (b) My friend bought a new car yesterday
- (c) The friend that I met in Australia last year bought a new car yesterday
- (d) The friend I am closest to and who was so supportive when I lost my job two years ago bought a new car yesterday

we know that *she*, *my friend*, *the friend that I met in Australia last year*, and *the friend I am closest to and who was so supportive when I lost my job two years ago*, are groupings which play the same role in the sentence, and in fact might refer to one single individual. Moreover, we also know that we could carry on adding details about this friend more or less ad infinitum by using devices such as *and*, *that*, *which* etc., running the risk of boring our listener to tears! We also know that the crucial word in these groupings is *friend*, or *she* if we have already referred to this person earlier in the conversation. This kind of grouping is called a **Phrase**; in the examples above, we are dealing with a Noun-Phrase, as the main or central element (the head) of this phrase is a noun (or pronoun). It turns out that all languages in the world are structured in this way, and are made up of sentences which consist of at least a Noun-Phrase (NP) and a Verb-Phrase (VP), as in [_{NP}Paul][_{VP}sings], which in turn may optionally contain other phrases or even whole sentences, as in (d) above.

This knowledge – that languages are structure-dependent – is a crucial aspect of all human languages which has many implications; it is a principle of Universal Grammar which explains many of the operations we routinely perform on language. For example, when we ask a question in English, we change the canonical (that is, basic) order of the sentence:

	<i>Your cat</i>	<i>is</i>	<i>friendly</i>
	Subject	Verb	Complement
<i>is</i>	<i>your cat</i>		<i>friendly?</i>
↑	Subject		Complement
Verb			

3.3 What does Universal Grammar consist of?

This movement is not based on the linear order of the sentence, but is structure-dependent. We do not move the first verb we encounter, or, say, the third word in the sentence, rules which would work in the above example, but would generate ungrammatical sentences in the following example:

The cat who is friendly is ginger

**Is the cat who friendly is ginger?*

**Who the cat is friendly is ginger?*

The correct question here is of course *Is the cat who is friendly ginger?*, where the second *is* is moved to the beginning of the sentence. Note that there is no immediately obvious reason why this should be the case; computers would have no problems dealing with either of the two artificial rules above. In fact, computers find it considerably more difficult to apply a rule which is based on a hierarchical structure, as is the case in this natural-language example. As Cook and Newson put it: 'Movement in the sentence is not just a matter of recognising phrases and then of moving the *right* element in the *right* phrase: movement depends on the structure of the sentence' (1996, p. 8). In our example, the *is* which moves is the one belonging to the main clause, not the one in the relative clause.

To take another example, the same restrictions apply to passive sentences. The sentence *The car hit the girl* can be made into a passive by raising the object Noun-Phrase (NP) to the subject position: *The girl was hit by the car*. Notice that it is the whole NP which is moved to the front; it could just as well have been *Lisa*, or *The girl with the blue trousers*, or *The girl who won first prize in the creative writing competition*. French passive constructions work in exactly the same way: *L'enfant chatouille le nounours* (= the child tickles the teddy) becoming *Le nounours est chatouillé par l'enfant* (= the teddy is tickled by the child). The general claim can be made that:

structure-dependency can therefore be put forward as a universal principle of language: whenever elements of the sentence are moved to form passives, questions, or whatever, such movement takes account of the structural relationships of the sentence rather than the linear order of words. (Cook and Newson, 1996, p. 11)

The movement we have just described, underlying the formation of interrogative and passive sentences, is another UG principle, called **Move α** . Universal Grammar contains many such principles. One further example of a principle found in all languages is the A over A condition, which limits the application of rules to a small subset of the logical possibilities. If a category (such as Noun-Phrase) includes as part of its structure another instance of the same category (that is, another Noun-Phrase) then any rule that mentioned 'Noun-Phrase' must be understood as referring to the more inclusive instance (Smith, 1999). So the sentences

SECOND LANGUAGE LEARNING THEORIES

Harry stirred the stew and the pudding

Harry stirred the stew that tasted of turnips

can give rise to the following questions and answers:

What did Harry stir?

- *the stew and the pudding*
- *the stew that tasted of turnips*

but not to:

What did Harry stir the stew and - ?

What did Harry stir - and the pudding?

What did Harry stir the stew that tasted of - ?

(examples from Smith, 1999, p. 64)

Finally, according to this theory, the lexical and functional categories used in language also form part of our UG endowment, and do not have to be learned. UG includes a universal inventory of categories which the child selects from on the basis of the input, as not all languages will necessarily make use of all categories or their features.

The task for second language learners, then, is to identify which syntactic categories are required in the L2, where the selection might be different from that of their L1. For example some syntacticians argue that Japanese lacks the functional category Det [Determiner] (Fukui and Speas, 1986). The features associated with syntactic categories might also be different; for example, the French determiner phrase has a **grammatical gender** feature, whereas the English determiner phrase does not. The way in which features are 'assembled' or packaged to form functional and lexical categories can vary from language to language. Thus, the French determiner phrase has gender and number features, while the German determiner phrase has gender, number and case features. Features might also vary in strength: for instance, Infl [Inflection] is said to be 'strong' in French and 'weak' in English, which leads to different word orders in these two languages in the context of negative structures, interrogatives and adverb placement (White, 2003, p. 10). The L2 learner has to 'identify, select, and redistribute the required features among the lexical items of the L2' (Lardiere, 2012, p. 110).

We will come back to these sources of variation shortly. Before doing so, let us define in more detail what is meant by these functional categories.

3.3.1.1 Functional categories

What we call lexical categories are groups such as nouns, verbs and adjectives; that is, so-called 'content words' that carry a specific meaning. The kind of

3.3 What does Universal Grammar consist of?

items we are now turning our attention to are grammatical words or ‘function’ words, such as determiners (for example, *the, my*), and **complementizers** (for example, *whether*), or grammatical morphemes such as plural *-s*, past tense *-ed*. Another way of conceptualizing the difference between lexical and functional categories is in terms of an open class of language items, and a closed class. An open class (a lexical category) is one to which you can add new items quite freely; for example, in the lexical categories Noun or Verb, words such as *email, fracking, to text* are being added all the time. A closed class (a functional category) is one to which items cannot easily be added. For example, you cannot add new determiners or new past-tense morphemes to a language, in the straightforward way in which you can add new nouns or new adjectives.

In itself, this distinction between content words and functional items is not new to linguistics. However, generative theory claims that these ‘functional’ items, whether words or morphemes, also have phrases attached to them in the same way as ‘lexical’ words do. From this point of view, these functional phrases are organized in the same way as any other phrase, with the function word or morpheme as head of that phrase. Therefore, we will have Determiner-Phrases (DP), and Complementizer-Phrases (CP), with determiners such as *the* or complementizers such as *whether* as their heads, and also Inflection-Phrases (IP) made up of Tense-Phrases (TP) and Agreement-Phrases (AgrP), which carry tense and agreement markers such as past tense *-ed* or third person singular *-s* in English. The structure of these functional phrases is basically the same as that of lexical phrases, such as Noun-Phrases, and they can be represented in the same way.

3.3.2 Parameters

The structure-dependency principle which we discussed earlier is common to all languages, as they are all organized hierarchically in terms of phrases (Noun-Phrases, Verb-Phrases, Prepositional-Phrases etc.). From a UG perspective, such a principle would form part of the innate computational module and will therefore not have to be learnt. However, we also know that all languages do not behave in the same way in terms of their structural properties. This is where parameters come in. Let us now turn our attention to an often-discussed example of a parameter, which is going to determine one of the ways in which languages can vary. This particular parameter is called the head parameter. (For more detailed analyses of both the structure-dependency principle and the head parameter, see for example Cook and Newson, 1996, 2007; Hawkins, 2001; Herschensohn, 2000; Towell and Hawkins, 1994.)

The head parameter deals with the way in which phrases themselves are structured. It applies to phrases headed by both lexical and functional categories. Each phrase has a central element, called a **head**; in the case of a Noun-Phrase, the head is the noun, in the case of a Verb-Phrase it is the

SECOND LANGUAGE LEARNING THEORIES

verb, in the case of a Determiner-Phrase, it is the determiner, and so on. One dimension along which languages vary is the position of the head in relation to other elements inside the phrase, called complements. For example, in the Noun-Phrase *(the) girl with blue trousers*, the head-noun *girl* appears to the left of the complement *with blue trousers*; in the Verb-Phrase *hit the girl*, the head *hit* appears to the left of its complement *the girl*; similarly, in the Prepositional-Phrase *with blue trousers*, the head *with* is on the left of its complement *blue trousers*; in the Complementizer-Phrase *whether he is too old*, the complement *he is too old* follows the head *whether*. In fact English is a head-first language, because the head of the phrase normally appears before its complements.

Japanese, on the other hand, is a head-last language, because the complements precede the head within the phrase. The following example is taken from Cook and Newson (2007):

E wa kabe ni kakatte imasu

(picture wall on is hanging)

'The picture is hanging on the wall.'

The head verb *kakatte imasu* occurs on the right of the verb complement *kabe ni*, and the *postposition ni* (on) comes on the right of the PP complement *kabe*. (Cook and Newson, 2007, pp. 42–3)

Japanese is a head-last language, and all Japanese phrases will be ordered in that way. So, the head parameter tells us how the head and its complements are ordered in relation to one another in a given language, and it has two possible settings: head-first (like English), or head-last (like Japanese).

From an acquisitional point of view, what this means is that children, equipped with Universal Grammar, do not need to discover that language is structured into phrases, as this principle forms part of the blueprint for language in their mind. They also 'know' that all phrases in the language they are learning are going to be consistently ordered in relation to the head. The only task remaining is to learn which parameter-setting actually applies in the language which the child is learning. (In this case, is it head-first, or head-last?) In theory, the only input the child needs in order to set the head parameter to the correct value is one example of one phrase, and they will then automatically 'know' the internal structure of all other phrases. In this view, the task facing children is considerably simpler than if they had to discover the order of constituents within each type of phrase. Moreover, they only need minimal exposure in order to make wide-ranging generalizations which affect different parts of the syntax of the language they are learning. In fact, Radford claims that 'young children acquiring English as their native language seem to set the head parameter at its appropriate *head-first* setting from the very earliest multiword utterances they produce (at around age 18 months), and

3.3 What does Universal Grammar consist of?

seem to know (tacitly, not explicitly, of course) that English is a *head-first* language' (1997, p. 22).

Remember also the puzzle which we posed in Section 3.2.2, when we asked how children could possibly figure out the precise relationships which apply between reflexives such as *himself* and their NP antecedents, in English? The answer offered by UG theory to this problem is that universal principles, in this case the Binding principles, and their associated parameters stating which binding domains are possible (the Governing Category parameter), are pre-existing in the child's language module, and only need to be 'set' in a certain way to generate this particular bit of language-specific knowledge. For example, in English, the reflexive must be bound within a local domain (such as a clause), which means that in the sentence *Mark wanted Tom to treat himself*, 'himself' can only refer to Tom and not to Mark. In other languages which allow long-distance binding (across clause boundaries), such as Chinese for example, 'himself' could refer to either Tom or Mark. In other words, acquiring a highly complex area of grammar is reduced to the simple matter of picking the appropriate binding domain out of a restricted set of possibilities (for further details, see Hawkins, 2001; Herschensohn, 2000; Schachter, 1996).

3.3.2.1 Parameters in the Minimalist Program

In Chomsky's most recent work on UG (1995, 2000, 2002, 2005, 2007a and b), called the Minimalist Program, he suggests that the language faculty consists of a computational procedure (sometimes called 'narrow syntax'), which is virtually invariant across languages, and a lexicon (2000, p. 120). The principles proposed in the Minimalist Program are even more powerful than in previous incarnations of generative theory. But probably the biggest changes proposed in the Minimalist Program concern parameters. Instead of being linked to specific principles and contained in the structural part of the grammar, parameters are now contained within the lexicon. This departure was the result of research attempting to describe principles and parametric variation in growing numbers of the world's languages; for UG to be able to account adequately for cross-linguistic variation, the number of parameters attached to core principles was becoming very large. The Minimalist Program's endeavour, therefore, was to propose more abstract and invariant computational principles, such as 'merge' (the operation by which two syntactic objects are combined to form a new syntactic unit, for example a verb and its complement combine to form a Verb-Phrase) or Move α which we have described above. In this view, languages are different from one another only because their lexicons are different (Lardiere, 2012; Domínguez, in press).

According to Minimalism, the abstract principles underlying all human languages will already be specified in the computational module, and the task facing children (or L2 learners) is therefore to learn the lexicon of the language around them, including the settings of the parameters applying to that

SECOND LANGUAGE LEARNING THEORIES

language. This idea is the 'Lexical Parameterization Hypothesis', and it suggests that the parameters are contained primarily in the functional categories. For example, the functional category Agr, which governs agreement phenomena, contains a gender feature in languages such as French or Italian, but not in others such as English.

In line with the newer thinking of the Minimalist Program, let us now illustrate parametric variation for another functional category, Inflection (Infl, or I). Inflection is the functional category which contains the tense and agreement features of verbs (tense, person, number; whence its name, as these features are often realized through an inflectional paradigm). Just as nouns and verbs can head NPs and VPs, Infl can also head an Inflectional-Phrase (IP). Features associated with functional categories can be either weak or strong, with implications for syntactic properties of that language. For example, Infl in English is weak, whereas in French it is strong. This parametric variation (+/-strong) has consequences for word order: in languages like French, finite verbs have to move to the I position for **feature checking** (that is, to 'collect' their tense, number and agreement features), resulting in the verb preceding the adverb, as illustrated in the tree diagrams below:

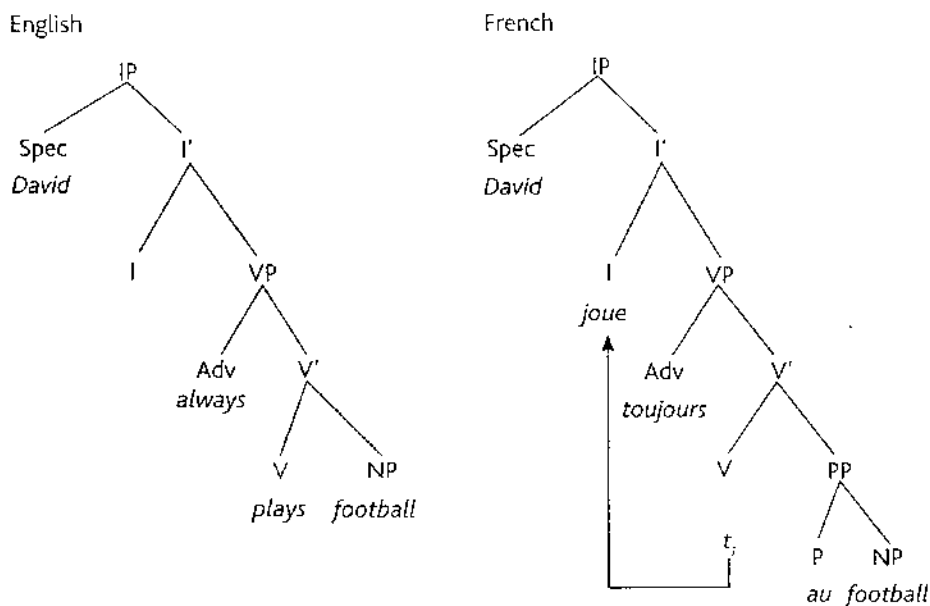


Figure 3.1 Parametric variation for a functional category in English and French

In languages like English, however, where Infl is weak, the verb remains in VP. This parametric variation in feature strength has important consequences for other areas of grammar, and explains a number of word order differences between French and English, which otherwise have very similar structures. These differences are summarized below:

3.4 Universal Grammar and first language acquisition

	English	French
Declaratives	<i>Patrick reads the newspaper</i> S V O	<i>Patrick lit le journal</i> S V O
Adverb- placement	<i>Patrick often reads the newspaper</i> S A V O	<i>Patrick lit souvent le journal</i> S V A O
Negation	<i>Patrick doesn't read the newspaper</i> S neg V O	<i>Patrick (ne) lit pas le journal</i> S V neg O
Questions	<i>Does he read the newspaper?</i> S V O	<i>Lit-il le journal?</i> V S O (pronominal subjects only)

Within this view of learning, all learners have to do is set the parameter (called the verb movement parameter for obvious reasons) to either weak or strong, on the basis of the input (French or English), and all these properties will be in place. (For fuller treatments, see Hawkins, 2001; Herschensohn, 2000; White, 2003.)

According to Chomsky, 'a language is not, then, a system of rules, but a set of specifications for parameters in an invariant system of principles of Universal Grammar'. He proposes a network metaphor for the whole 'language faculty':

We can think of the initial state of the faculty of language as a fixed network connected to a switch box; the network is constituted of the principles of language, while the switches are the options to be determined by experience. When the switches are set one way, we have Swahili; when they are set another way, we have Japanese. Each possible human language is identified as a particular setting of the switches – a setting of parameters, in technical terminology. If the research program succeeds, we should be able literally to deduce Swahili from one choice of settings, Japanese from another, and so on through the languages that humans can acquire. The empirical conditions of language acquisition require that the switches can be set on the basis of the very limited information that is available to the child. Notice that small changes in switch settings can lead to great apparent variety in output, as the effects proliferate through the system. These are the general properties of language that any genuine theory must capture somehow. (Chomsky, 2000, p. 8)

But let us now turn specifically to the way in which UG explains language acquisition data.

3.4 Universal Grammar and first language acquisition

So, what is the evidence in the child acquisition literature for the UG viewpoint: do children indeed build phrase-structure by applying principles and setting parameters in the way we have described above?

SECOND LANGUAGE LEARNING THEORIES

Before we can deal with this question, we need to first examine in more detail the structure of phrases (see Towell and Hawkins, 1994, pp. 61–8; Hawkins, 2001, pp. 13–16). We have seen already that the world's languages are made up of phrases which have an invariant structure consisting of a head category (the core element of the phrase) and of complements which optionally modify the head. Another type of modifier – also optional – is called a specifier, as shown in the example of a Noun-Phrase in English given below (Figure 3.2). Here the head-noun *holiday* is modified by its complement *in the Caribbean Islands*, and the grouping *holiday in the Caribbean Islands* is itself modified by the specifier *my mother's*.

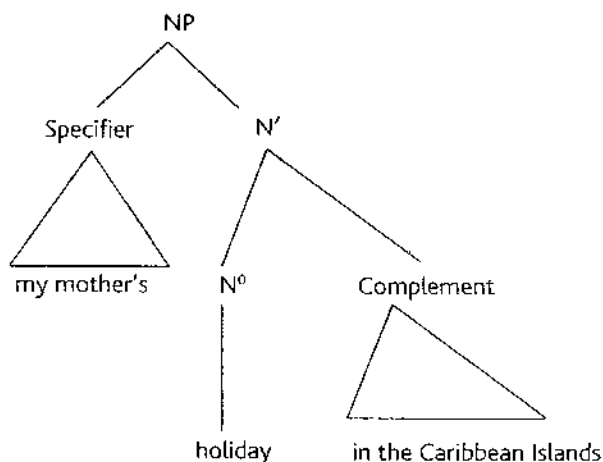


Figure 3.2 [_{NP} *my mother's holiday in the Caribbean Islands*] [_{VP} *was fantastic*]

It is claimed in UG theory that the same underlying structural configuration of head, complement and specifier applies to all phrases in a given language. The following examples show how this works in English for the Verb-Phrase (Figure 3.3), the Adjectival-Phrase (Figure 3.4) and the Prepositional-Phrase (Figure 3.5):

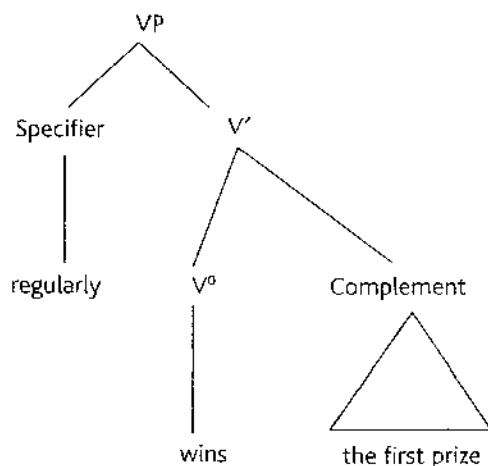


Figure 3.3 [_{NP} *My brother*] [_{VP} *regularly wins the first prize*]

3.4 Universal Grammar and first language acquisition

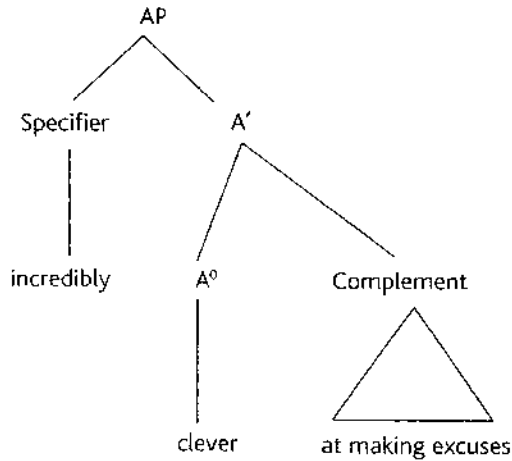


Figure 3.4 [_{VP} *She became*] [_{AP} *incredibly clever at making excuses*]

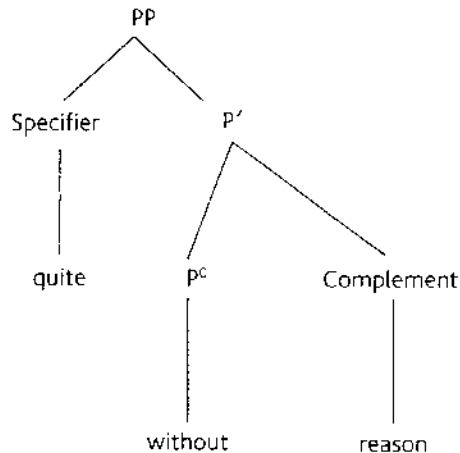


Figure 3.5 [_{VP} *He did this*] [_{PP} *quite without reason*]

All phrases are organized in this hierarchical manner, with an optional specifier modifying an X', itself consisting of an X⁰ (the head) modified by an optional complement, where X can be any of the head-categories: N⁰ (noun), V⁰ (verb), A⁰ (adjective), P⁰ (preposition), D⁰ (determiner), Infl⁰ (inflection). (The notation X', X⁰ is used to indicate the different levels in the hierarchical structure of phrases, with X⁰ representing the head-element on its own, X' representing the unit 'head-element + complement' and so on.) The only possible variant is the situation of head, specifier and complement in relation to one another. Thus in a language such as English, the general configuration illustrated in Figures 3.2–3.5 above can be summed up in Figure 3.6 as follows (Towell and Hawkins, 1994, p. 64):

SECOND LANGUAGE LEARNING THEORIES

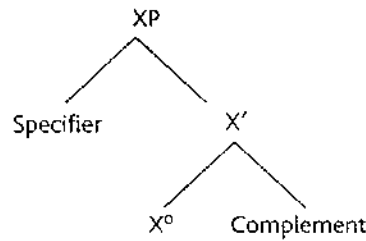


Figure 3.6 Summary of the hierarchical structure of phrases in English shown in Figures 3.2 to 3.5

That is, in the case of English, in all types of phrase, the specifier typically precedes the head-element, and the complement follows it. However, in languages such as Japanese, Turkish and Burmese, both specifier and complement precede the head (Hawkins, 2001, p. 15):

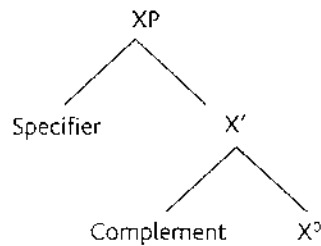


Figure 3.7 Hierarchical structure in languages such as Japanese

Following this pattern, a literal translation of the examples given above would be *my mother's in the Caribbean Islands holiday, incredibly at making excuses clever, and quite reason without*.

The last possible ordering which is found in natural languages comprises head followed by both complement and specifier:

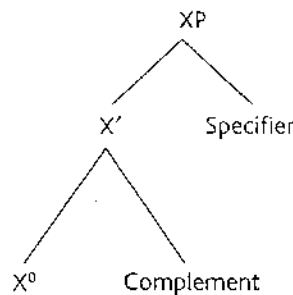


Figure 3.8 Hierarchical structure in languages such as Malagasy

This would give rise to the following reordering of our examples: *holiday in the Caribbean Islands my mother's, clever at making excuses incredibly, and without reason quite*. This configuration is found in languages such as Malagasy, Gilbertese and Fijian (Hawkins, 2001, p. 15).

3.4 Universal Grammar and first language acquisition

In terms of first language acquisition, what does this mean? Remember that we have said that the structure of phrases is an invariant principle of Universal Grammar. Children would therefore know that sentences are made of phrases which consist of (specifier)-head-(complement), and would not have to work this out. However, they would not know the precise ordering of these elements which is found in their own language; that is, they would have to 'set' the head parameter on the basis of language input. Notice, though, that the number of possibilities is constrained, as there are only two possible settings; specifiers either precede or follow X' categories, and complements either follow or precede X^0 categories (Hawkins, 2001, p. 16).

There is indeed evidence from first language acquisition research that children have set the head parameter as early as the two word stage (Radford, 1997, p. 22), and that they 'know how to project productively X^0 categories into X' categories, and X' categories into XP categories' (Towell and Hawkins, 1994, p. 65), at least as far as lexical categories are concerned. This is shown in the examples below (in Radford, 1990, cited in Towell and Hawkins, 1994, p. 66):

X^0	<i>Complement</i>		
cup	tea	(N')	'a cup of tea'
ball	wool	(N')	'a ball of wool'
open	box	(V')	'open the box'
get	toys	(V')	'get my toys'
(put) in	there	(P')	'put it in there'
(get) out	cot	(P')	'I want to get out of the cot'
<i>Specifier</i>	X'		
Mummy	car	(NP)	'Mummy's car'
Hayley	dress	(NP)	'Hayley's dress'
Dolly	hat	(NP)	'Dolly's hat'
Daddy	gone	(VP)	'Daddy has gone'
Hayley	draw (boat)	(VP)	'Hayley is drawing (a boat)'
Paula	play (with ball)	(VP)	'Paula is playing (with a ball)'

Universal Grammar theory would predict this to be the case, as the result of the general principle underlying phrase structure. However, it would also predict that children have to learn the particular parameter settings for the language they are exposed to, on the basis of language input rather than these being 'inbuilt'.

There is also evidence that the kind of parametric variation found in functional features which we have illustrated earlier (strong vs. weak Infl) is acquired in children in a cluster-like fashion. That is to say, when French children start to

SECOND LANGUAGE LEARNING THEORIES

project the Inflection-Phrase (IP), that is, when they start to use inflected verbs, all properties linked to the 'strong Infl' parameter setting fall into place. Notably, the verb rises to I, past adverbs, negators etc. We find L1 French children producing sentences such as the following, in which IP has not yet been projected and the verb is therefore non-finite and has not moved from its VP-internal position: *Pas aller dodo* (no go bed). They may almost simultaneously produce sentences in which IP has been projected and the verb is therefore finite and has risen past negators etc., such as: *bébé va pas dodo* (baby goes not bed). What we do not find, however, are sentences in which non-finite verbs have risen past adverbs or negators, for example **bébé aller pas dodo* (baby go not bed), or in which the finite verb does not rise, for example **bébé pas va dodo* (baby not goes bed) (Pierce, 1992).

Guasti (2004, p. 147), reviewing the available evidence, claims that 'from the earliest syntactic productions there is evidence that children have assigned the correct value to the parameters that govern clausal structure (head direction parameter, verb movement parameter, V2 parameter¹). Overall, the notion of parameter remains an important tool for L1 acquisition researchers.

This simplified account has illustrated, with the help of a few concrete examples, the kinds of predictions a Universal Grammar approach can offer, in the context of children acquiring their mother tongue. Controversies remain, not least regarding how soon functional categories are acquired. It has been suggested that children in the early stages only have access to lexical categories and lack functional categories, which would explain the telegraphic nature of their early utterances (for example, *daddy go; mummy hat*). More specifically, the debate centres around whether functional categories are available from the start but are not in evidence because of external factors (Weissenborn, 1992; Penner and Weissenborn, 1996); whether they mature over time, that is, come 'on line' at specific ages (Haegeman, 1996; Harris and Wexler, 1996); or whether children 'build' their grammar gradually as they learn the lexicon of their language and project the relevant structure: the 'structure-building' approach (Radford, 1990, 1996). For a discussion of these issues, and for wider accounts of the UG approach to first language acquisition, see Guasti (2004, 2009), Snyder (2007), Ambridge and Lieven (2011), Meisel (2011) and de Villiers and Roeper (2011).

Following this short UG account of L1 acquisition, we next consider how far the approach can also be applied to second language acquisition.

¹The V2 parameter in languages like German or Dutch specifies that the finite verb must appear in second position.

3.5 Universal Grammar and second language acquisition

3.5.1 Theoretical relevance of Universal Grammar to second language learning

To address the potential of the UG model for second language acquisition, we need to go back to the 1970s developments outlined in Chapter 2, and the observation that L1 and L2 acquisition were similar in many ways. For example, we outlined similarities in the development of a number of English morphemes and of English negative and interrogative structures in first and second language acquisition. Not only do children learning negative (or interrogative) constructions in their first language go through well-defined stages, but their productions are also unlike the language around them. In L1 acquisition, the UG explanation was that there was some kind of language blueprint in the brain. This is the work we have summarized so far in this chapter.

If, as we have seen, L2 learners also go through fairly rigid stages when acquiring certain constructions in the L2, which are unlike both their L1 and the L2 they are exposed to, and which are not unlike the stages children go through, then a similar explanation is surely worth investigating. However, the situation is complicated by a number of factors:

- L2 learners are cognitively mature
- L2 learners already know at least one other language
- L2 learners have different motivations for learning a L2 (language learning does not take place in order to answer the basic human need to communicate).

These points have important implications, and even if the UG hypothesis is correct for L1 learning, there are still a number of logical possibilities concerning its role in L2 learning:

1. **L2s are not UG-constrained:** Second languages are not constrained by UG principles and parameters, and they do not behave like natural languages.
2. **L2s are UG-constrained:**
 - **Full Access:** the whole of UG is available to L2 learners, as it is to L1 learners. Within this view, there are different hypotheses about the initial grammars of L2 learners, which we will review shortly.
 - **Partial Access:** some parts of UG are not available any longer. For example, functional features which are not activated in the L1, cannot be acquired. Within this view, L2 grammars are UG-constrained, that is they do not violate principles and parameters, but learners might not be able to reset parameters, and therefore continue to operate with L1 settings for some parts of the new language.

3.5.2 Principles and parameters in SLA

3.5.2.1 The head parameter

To begin to address these possibilities, let us return to the first examples which we used to illustrate first language acquisition, namely the structure-dependency principle and the head parameter.

First, there seems to be no evidence in L2 grammars that learners ever violate the structure-dependency principle. From the very onset of L2 development, learners seem to know that the L2 will be hierarchically structured in terms of phrases.

Second, we saw that there are two possible settings for the head parameter, head-first and head-last. Both French and English are head-first languages, that is, the head precedes its complements. However, in French, although all phrases normally exhibit this order, there is one instance when this order changes (Towell and Hawkins, 1994, p. 68; Hawkins, 2001, pp. 11–12). This is in the case of unstressed object pronouns, as exemplified below:

1. *Le chat* [_{VP}*mange* [_{NP}*la souris*]] (the cat eats the mouse)
2. *Le chat* [_{VP}[_{NP}*la*] *mange*] (the cat it eats = 'the cat eats it')

In Verb-Phrases in French where the complement is a full Noun-Phrase (1), the head verb precedes its complement as normal; however when the complement is an unstressed pronoun (2), the head verb follows it.² Note that in English, the head direction is the same whether the complement is a full NP or a pronoun. From an acquisitional point of view, we have seen that children quickly set the head-direction parameter, as all phrases in a given language normally follow the same order. For French children, there is ample evidence in the language around them that French is head-first. We would therefore expect French children to set the parameter early on, and to always place the head before its complement. This is in fact the case, and children produce utterances such as **Le chat mange la*, before going through a stage of omitting the pronoun altogether **Le chat mange* →, and later still inserting it in its target position *Le chat la mange* (Clark, 1985; Hamann *et al.*, 1996).

If French children follow this developmental sequence for the head parameter, then we should expect the same to happen for L2 learners of French, if UG is still available to them, as the task facing them is exactly the same. There is indeed evidence to support this:

²in fact, this is not a violation of this parameter-setting, but it occurs because unstressed pronouns in French cliticize onto the verb (that is, attach themselves to the verb). In other words, object pronouns originate after the verb as expected given that French is head-first, and subsequently move to a preverbal position.

3.5 Universal Grammar and second language acquisition

In fact, the stages of development that L1 English speakers go through in acquiring this pattern in L2 French are very similar to the stages that child L1 learners of French go through in acquiring it. Following an initial stage where learners leave object pronouns postverbally in the position occupied by full noun phrases, e.g. *Le chien a mangé les*, 'The dog has eaten them' (Zobl, 1980; Clark, 1985), they go to a stage of omission of the pronoun: *Le chien a mangé* → (Adiv, 1984; Schlyter, 1986; Véronique, 1986) before eventually acquiring preverbal object pronouns: *Le chien les a mangés*. (Towell and Hawkins, 1994, p. 69)

On the other hand, French L1 learners of English L2 do not have problems in acquiring object pronouns in English, and do not go through a stage of preposing the pronoun (**the cat it eats*) nor through a stage of omitting the pronoun (Zobl, 1980). This is to be expected if we assume that, on the basis of ample evidence in English that it is head-first, L2 learners set the head-direction parameter early on and apply it consistently.

Because both French and English are head-first languages, we cannot say whether these observations are due to the fact that L2 learners reset the parameter to its correct value, or simply transfer their L1 parameter value. What is interesting, however, is that French learners do not transfer the idiosyncratic property of French for pronoun placement.

In order to know whether the head parameter can be reset, it is necessary to investigate the acquisition of, say, a head-first language by learners whose L1 is head-last. Flynn has studied the role of this parameter in Japanese learners of English. (We have already seen that Japanese is a head-last language.) She concludes 'that, from the earliest stages of acquisition, Japanese speakers learning English as a Second Language (ESL), are able to acquire the English value of the head-direction parameter' (Flynn, 1996, p. 135).

The evidence presented here therefore seems to suggest that, in the case of the head parameter at least, L2 learners have access to Universal Grammar in the same way as children do. We cannot draw hasty conclusions on the basis of evidence relating to one structure only, however, and other explanations which do not involve UG have indeed been put forward.

3.5.2.2 Strong/weak Infl (I)

We have explained earlier that functional categories are now seen as the main site for parametric variation (although headedness is an exception as it applies to both lexical and functional categories). Here we return to the example of strong/weak Infl in French and English, introduced earlier in Section 3.2.2.1.

Remember that in French, Infl is strong and forces the verb to rise past adverbs, negators etc., unlike in English where Infl is weak and the verb remains within the verb-phrase (except for auxiliaries and modals, which do rise to SpecIP). French learners of English therefore have to reset the verb movement parameter

SECOND LANGUAGE LEARNING THEORIES

located in Infl to [-strong], and English learners of French have to reset it to [+strong]. Several studies have investigated this property (see White, 2003, for a review). Yuan (2001) studied the acquisition of L2 Chinese (weak Infl) by French (strong Infl) and English (weak Infl) learners. He found that all learners, regardless of their L1 or their proficiency level, realized the ungrammaticality of verb-raising in Chinese, suggesting that they were able to reset this parameter. Rogers (2009), in her study of English learners of French, shows that they are also able to reset this parameter. Another study by White (1992), however, found somewhat different results. She studied the acquisition of verb-raising in questions, negatives and adverb placement, by French learners of English L2. Her learners (beginners) seemed to have realized that English has weak Infl in the context of questions and negatives, but not in the context of adverbs. Learners rejected sentences such as:

Like you pepperoni pizza?

The boys like not the girls

with a high degree of accuracy. However, they commonly accepted:

Linda takes always the metro.

White argues this might be because we are dealing with two different parameters underlying these properties (2003, pp. 129–32), though results to date are somewhat inconclusive.

3.5.2.3 Current debates about the role of UG in SLA

It should be clear by now that the question which has generated so much research over the last 20 years or so, namely whether UG is available to L2 learners or not, is now being replaced by more focused questions about which subcomponents of UG might be available or not to the second language learner, and how UG interacts with other modules involved in language learning. Principles are generally thought to be available, as L2 learners do not seem to produce interlanguages which violate them, and most of the work has concentrated on testing the role played by parametric variation between languages, and the role played by L1 parametric settings, with as yet somewhat inconclusive results. However, recent reviews and book-length treatments of the L2 acquisition of syntax reflect considerable advances in attempts to understand the role of UG within SLA (White, 2003, 2009a; Hawkins, 2001, 2008b, 2009; Herschensohn, 2000; Leung, 2009; Thomas, 2004).

The Initial State

One area of active debate concerns what is termed the **Initial State** (the subconscious linguistic representations L2 learners have at the onset of L2 learning). As in L1 acquisition (see Section 3.4), some SLA researchers have

3.5 Universal Grammar and second language acquisition

argued that functional categories are absent in the very early stages of adult L2 acquisition (Vainikka and Young-Scholten, 1996b, 1998, 2007; White, 2003; Hawkins, 2001, 2009; Myles, 2005), this phenomenon manifesting itself by a lack of morphological markings and of syntactic movement. Other researchers, however, have argued that functional categories are indeed present in the early stages in child L2 (Haznedar, 2001; Grondin and White, 1996) and also in adult L2 (Schwartz and Sprouse, 1996; Prévost and White, 2000; Prévost and Paradis, 2004) and that the lack of morphological markings is not a syntactic issue. Some accounts argue for a structure-building approach to L2 development (Hawkins, 2001; Herschensohn, 2000). This debate is likely to go on for some time, complicated by the fact that functional features and categories themselves are not yet very clearly defined in UG theory, and that L1 influences have to be taken into account (Lardiere, 2012).

Ultimate attainment/steady state

Another area which has attracted much interest is that of the **ultimate attainment** or steady state in L2 learning. These terms are used to refer to the well-documented fact that the vast majority of L2 learners stop short of native-likeness, even when the context is optimal, that is input and interaction are plentiful, as might be the case for immigrants who operate in their L2 on a daily basis. This is, of course, in stark contrast to children who always become native-like in their L1. Another difference in the steady state of L2 learners is that it is less stable than L1 grammars, with learners sometimes applying a rule, other times not; this is referred to as **optionality** (Sorace, 2005, 2011; Sorace and Serratrice, 2009). For example, Lardiere (1998a, 1998b, 2007) has investigated in detail a very proficient Chinese learner of English, Patty, who has lived and worked in the USA for 18 years and whose morphological system is still unstable and deviates from the target in specific ways. Researchers within the generative paradigm have argued that it is important to study such learners whose development has reached its end point, in order to be able to assert that certain linguistic features are or are not acquirable by L2 learners. Recent research has generally found systematic differences between end-state L2 learners and native speakers (Abrahamsson and Hyttenstam, 2009; Birdsong, 2009; DeKeyser, 2012a), especially when the age of onset of learning is post-puberty. These findings have been used to inform the **Critical Period Hypothesis**, which claims that UG is no longer available to adult L2 learners, although no consensus has yet been reached about how to interpret these results, as we will discuss in Section 3.5.3.

The role of functional features

Under the Minimalist Program, we have seen how the research focus has shifted to the investigation of the role of functional categories in parametric variation. Acquiring an L2 grammar in this view not only involves the selection

SECOND LANGUAGE LEARNING THEORIES

of new features which might not be present in the L1. It also involves the reassembling of individual features into new bundles, giving rise to lexical items with distinctive meaning-to-form mappings in different languages (Lardiere, 2000, 2007, 2009; Dekydtspotter and Renaud, 2009; Montrul and Yoon, 2009; Domínguez, 2013).

Under Minimalism, the locus of such 'varied and intricate' cross-linguistic grammatical differences has been shifted to the lexicon – in particular, to grammatical features (such as [+/- wh], [+/- past], or [+/- definite]. These features are considered part of UG – specifically, part of a universal feature-set or inventory. Since not all languages make use of every feature in the inventory, 'parameter-setting' within this framework consists of the learner identifying and selecting only that subset of features used in the target language. The selected features are assembled into language-specific morpholexical items, including free and affixal forms (e.g., *whether*, *-ed*, *the* in English). In other words, the burden of accounting for the acquisition of the features, categories and constraints of particular languages is largely shifted from the genetic endowment to language-independent mechanisms of data processing and computational efficiency (Lardiere, 2012, p. 110)

The role of interfaces

Another departure from previous work focusing primarily on the availability of UG in SLA has been the recent interest in interfaces. This shift occurred as a result of research findings showing that some areas of syntax which require parameter resetting are acquired by L2 learners without undue difficulty, yet learners have persistent problems in reaching native-like levels in their use of those same structures in appropriate discourse contexts. For example, so-called pro-drop languages such as Italian or Spanish allow the subject to be omitted, giving rise to sentences such as:

(egli) mangia la mela

(he) eats the apple (s/he eats the apple)

piove

rains (it's raining)

Selection of the + pro-drop value on this parameter is usually linked in those languages to other properties such as much freer word order and richer inflectional morphology:

la mangia il ragazzo

it eats the boy (the boy eats it)

Languages like English and French, on the other hand, do not allow subjects to be dropped in this way, and their word order is much more rigid. This property does not seem to pose many problems for L2 learners. For example, English or

3.5 Universal Grammar and second language acquisition

French learners do not have difficulties with dropping the subject or inverting the verb and its subject in Italian or Spanish. However, even at very advanced levels, they have continuing problems with knowing when to do it. Native speakers obey discourse constraints when choosing or not to omit the pronoun: they prefer to omit the subject pronoun when there is no change in topic, and to have an overt subject pronoun when there is a change of topic.

Here is another Italian example:

*Mia madre ha comprato un dolce perche *lei/Ø aveva fame*

My mother bought a cake because she was hungry

In this case native speakers would omit the pronoun if 'mother' is the subject of 'was hungry', as the topic remains constant.³ If a different (female) person was the subject of 'was hungry', however, they would produce the pronoun. L2 users have been shown to produce the overt pronoun optionally, in both cases, suggesting that they are insensitive to the relevant discourse constraints.

The Interface Hypothesis has been proposed to explain findings like this. The suggestion is that 'language structures involving an interface between syntax and other cognitive domains are less likely to be acquired completely than structures that do not involve this interface' (Sorace, 2011). (For detailed discussion of this issue, see Sorace and Filiaci, 2006; Sorace and Serratrice, 2009; Rothman and Slabakova, 2011; Montrul, 2011; Belletti *et al.*, 2007; White, 2009a; Domínguez, in press.)

3.5.3 Empirical evidence

After having illustrated, in the context of SLA, how to apply a UG framework, taking the example of one principle (structure-dependency) and of two parameters (head-direction and strength of Infl), and having introduced some newer theoretical debates and concepts, we can now turn to the reassessment of the theoretical positions we outlined in Section 3.5.1. The various theoretical positions have to attempt to reconcile somewhat contradictory facts about the second language acquisition process:

- Learners do not seem to produce 'wild' grammars, that is, grammars which would not be constrained by UG. Does that suggest that at least principles of UG are available to them? Additionally, learners have grammatical knowledge that does not appear to derive from experience (Hawkins, 2004, 2008a).
- Learners produce grammars which are not necessarily like either their L1 or their L2. Does this suggest that parameter settings other than those realized in their L1 or L2 are available to them?

³*Lei* can also be used in this sentence for emphasis; for example, if the speaker wants to stress that she was the only one to be hungry.

SECOND LANGUAGE LEARNING THEORIES

- Some principles and parameters seem to be unproblematic to reset (for example, the head parameter), others more difficult, or even impossible. Why?
- Learners sometimes fail to fully acquire properties of the L2 in spite of abundant evidence in the input and after extended exposure to the L2 (as for Lardiere's subject Patty: Lardiere, 2007).

3.5.3.1 Hypothesis 1: UG does not play a role in SLA

UG theorists who are proponents of the view that UG is no longer available to adult L2 learners argue that there is a 'critical period' for language acquisition during children's early development, and that adults have to resort to other learning mechanisms. The reasons for adopting such a position are several (for a review, see Slabakova, 2009; Bley-Vroman, 1989, 2009), but perhaps the most convincing one is the commonsense observation that immigrant children generally become native-like speakers of their L2, whereas their parents rarely do. For example, an influential study (Johnson and Newport, 1989) found a **correlation** between age of arrival in the United States and native-like judgements on a number of grammatical properties of English. Immigrants who had arrived in the States before age 7 performed in a native-like way, and the older learners were on arrival, the more errors they made in the test. More recently, Abrahamsson and Hytenstam (2009) have conducted very detailed analyses of the L2 of advanced adult learners who pass as native speakers, and suggest that they still differ from native speakers in subtle ways. This study failed to find a clear cut-off point, however, which would be the best indicator of a critical period for the availability of UG. (Some UG researchers have challenged the Johnson and Newport study, arguing their evidence is compatible with continuing availability of UG: Hawkins, 2001; White, 2003. See Chapter 5 for further discussion of age effects in SLA, from a different theoretical perspective.)

In an extensive study of the acquisition of negation in French and German by L1 and L2 learners, Meisel (1997, p. 258) concluded: 'I would like to hypothesize that second language learners, rather than using structure-dependent operations constrained by UG, resort to linear sequencing strategies which apply to surface strings'. Here, Meisel was claiming that one of the most fundamental principles of UG (structure-dependency) is not available to L2 learners any more. It must be said, however, that most studies conducted within a generative framework would argue very strongly that L2 grammars are UG-constrained, and Meisel himself (2011) reviewed his position, claiming that 'L2 learners' *hybrid systems* are indeed natural grammars' (p. 251), and that 'L2 knowledge and acquisition processes are in large part domain-specific and share with native grammars the crucial property of structure dependency' (p. 252).

Researchers from outside the UG framework, and in particular proponents of the 'emergentist' position, of course also compare more broadly whether

a nativist account or an emergentist account better explain some of the facts of SLA, and conclude that UG is not involved in SLA (see discussion in Chapter 4).

3.5.3.2 Hypothesis 2: UG is fully available to second language learners

Full access/no transfer

Some early work from the UG perspective adopted this position. For example, Flynn (1996) argued that UG continues to underpin L2 learning, for adults as well as children, and that there is no such thing as a critical period after which UG ceases to operate. If it can be shown that learners can acquire principles and/or parameter settings of the L2, which differ from those of their L1, she claimed, the best interpretation is the continuing operation of UG. She went on to review a range of empirical work with L2 learners moving from Japanese to English (pp. 134–48). We have already met her claim that adult Japanese learners of English L2 can successfully reset the head-direction parameter (that is, from head-last to head-first). She also claimed that similar learners can instantiate (activate) principles which do not operate in Japanese, such as the Subjacency principle (which controls *wh*-movement in English; that is, the way in which we move the *wh*-phrase to the beginning of the sentence, which is subject to certain constraints); and can acquire functional categories, supposedly non-existent in Japanese. Flynn concluded her review thus:

It appears that L2 learners do construct grammars of the new TLs [target languages] under the constraints imposed by UG; those principles of UG carefully investigated thus far indicate that those not instantiated or applying vacuously in the L1 but operative in the L2, are in fact acquirable by the L2 learner.

We are thus forced to the conclusion that UG constrains L2 acquisition; the essential language faculty involved in L1 acquisition is also involved in adult L2 acquisition. (Flynn, 1996, pp.150–1)

Other researchers who have argued that UG is still available to L2 learners include Thomas (1991), on the basis of work on the acquisition of reflexive binding, and White *et al.* (1992), also on the basis of work on *wh*-movement. However, more recent research which argues for full access to UG usually acknowledges that the L1 is involved in shaping initial hypotheses at least.

(Full transfer)/full access

This position agrees that L2 learners have full access to UG principles and parameters, whether they are present in the learners' L1 or not (Ionin *et al.*, 2008; Schwartz and Sprouse, 1994, 1996). But in this view, L2 learners are thought to begin by transferring all the parameter-settings from their L1, and

SECOND LANGUAGE LEARNING THEORIES

to subsequently revise their hypotheses when the L2 fails to conform to these L1 settings. Learners then develop new hypotheses which are constrained by Universal Grammar. For example a study of the acquisition of English articles by Spanish and Russian learners (Ionin *et al.*, 2008) found that Spanish learners (whose article system encodes **definiteness** and **specificity** in the same way as English) transfer their L1 settings. Russian learners, however, whose L1 does not have articles, access the semantic universals of definiteness and specificity, and initially fluctuate between them before adopting the correct setting for English. This suggests that they have full access to universal features not realized in their L1. For a review of studies supporting the full transfer/full access hypothesis, see White (2003).

Full access/impaired early representations

Some researchers also believe that learners can reset parameters to the L2 values, but that, initially, learners are lacking functional categories altogether. The Minimal Trees⁴ approach (Vainikka and Young-Scholten, 1996b, 1998) forms the starting point for a number of accounts of the development of syntax: only lexical categories are projected initially, via transfer from the L1. Functional categories develop later, but are not transferred from the L1. A similar approach is the Valueless Features Hypothesis (Eubank, 1996). In this view, both lexical and functional categories are transferred early on (with a short stage in which only lexical projections are present), but functional categories lack values such as tense, agreement etc. and are present as syntactic markers only (that is, inflections may be lacking, but the syntactic operations linked to these categories will be in place).

These views have much in common with the approaches we will review next, but crucially they believe that all parameters can be reset.

3.5.3.3 Hypothesis 3: Some parts of UG constrain L2 grammars (for example, principles), others not (for example, functional features)

No parameter resetting

Proponents of this position claim that learners only have access to UG via their L1. They have already accessed the range of principles applying to their L1, and set parameters to the L1 values, and this is the basis for their L2 development. Other principles and parameter-settings are not available to them, and if the L2 possesses parameter-settings which are different from those of their L1, they

⁴Vainikka and Young-Scholten have renamed their approach as Organic Grammar in more recent work (2007, 2011), but the basic arguments remain the same.

3.5 Universal Grammar and second language acquisition

will have to resort to other mechanisms in order to make the L2 data fit their internal representations. These mechanisms will be rooted in general problem-solving strategies, rather than being UG-based.

For example, Schachter studied Korean L1 learners of English as L2, who performed randomly in grammaticality judgement tests of *wh*-movement (Schachter, 1990, cited in Schachter, 1996). In English, *wh*-movement is allowed, but is restricted by the Subjacency principle (the extracted *wh*-word can move only across certain structural boundaries). In Korean, there is no *wh*-movement, so the Subjacency principle is presumably not operative. If all the principles of UG are still available to the learner, the absence of this particular principle from their L1 should not matter, and Subjacency should still be acquirable in English L2. Schachter claims that the Korean subjects' failure to recognize *wh*-movement constraints reflects the non-availability to them of UG principles which were not already operative in their L1 – that is, that UG principles are accessible only if they are realized in the L1.

Schachter does accept that UG may be available for child L2 learners, but argues that there is a critical period (or periods) for the successful acquisition of L2 principles and/or parameter settings, if these have not been operative in the learner's L1 (1996). In support, she cites a study by Lee (1992) which tested Korean-English bilinguals on a particular parameter, the Governing Category parameter, which is set differently in the two languages. (As we have seen already, this parameter has to do with the binding of items such as reflexives; the English reflexive must refer to the subject within its own clause, while in Korean it may refer to a more remote subject: Schachter, 1996, p. 178.)

In Lee's study, the Korean learners of English were of different ages; the youngest and oldest subjects had not acquired the English setting for the GC parameter, while the older children had apparently succeeded in doing so. Schachter concludes that these findings show a Window of Opportunity not yet operative for the youngest learners, but available to the older children. As far as adult learners are concerned, she concludes that the only principles and parameter-settings easily available to the adult L2 learner are those already activated in the course of L1 learning.

Impaired functional features

Finally, we will review influential approaches which believe that L2 grammars are UG-constrained, but that not all parameter-settings will be available to learners. Different terms have been used over recent years to describe this approach first put forward by Hawkins and Chan (1997): the Failed Functional Features Hypothesis (Hawkins and Chan, 1997; Hawkins, 2001); the Representational Deficit Hypothesis (Hawkins and Liszka, 2003); the Interpretability Hypothesis (Hawkins and Hattori, 2006; Tsimpli and Dimitrakopoulou, 2007). This approach argues that uninterpretable functional

features⁵ cannot be reset in the L2. For example, Cantonese learners of English studied by Hawkins and Chan failed to acquire properties linked with *wh*-movement, which does not exist in Cantonese.

Among alternative views, Lardiere has proposed the Feature Reassembly Hypothesis which argues that the persistent problems L2 learners have with morphology is due to mapping problems: functional categories in different languages not only select different functional features from the universal set provided by UG, but they also bundle features in different ways when mapping onto specific morphosyntactic forms (1998a, 1998b, 2000, 2007, 2009, 2012). The task facing L2 learners is therefore not only to realize which features are operational in the L2, but also to discover how they map onto specific forms in the L2. This mapping or reassembling of features is what Lardiere claims is the source of persistent difficulties.

What these accounts have in common is that they believe that L2 acquisition is UG-constrained, but that the acquisition of parametric options might be limited and unlike L1 acquisition. However, they have different views on the Initial State, on the role of the L1, on the possibility of parameter resetting, on the Steady State, or on the role of non-UG constrained mechanisms.

To round off this section, it is fair to say that the argument concerning access to UG in L2 learning is not concluded, and that defenders of all these positions can still be found. Often, they seem to be arguing about the best technical interpretation of admittedly indirect and tantalizing evidence. Research in this area has shifted from the initial question of the availability vs. non-availability of UG, towards a more modular view of language and the language faculty, with UG itself being viewed as modular (Smith and Tsimpli, 1995). As a result, the questions that studies in second language acquisition have been addressing are increasingly testing the availability of sub-modules of UG rather than UG itself.

3.6 Evaluation of Universal Grammar-based approaches to second language acquisition

3.6.1 The scope and achievements of the Universal Grammar approach

Universal Grammar is a well-established theory which aims to describe and explain human language. As such, even if its prime concern is not second language acquisition, it is nonetheless directly relevant to the study of second languages, which are assumed to be natural languages.

⁵Functional features are divided into interpretable and uninterpretable features; interpretable features carry semantic content and are therefore required for interpretation (for example, plural marker in English), whilst uninterpretable features do not carry semantic content (for example, grammatical gender in French).

3.6 Evaluation of Universal Grammar-based approaches to SLA

In evaluating UG, however, we must remember that it is a linguistic theory, and not a learning theory. Although one of Chomsky's stated objectives mentioned earlier on in this chapter is to understand how knowledge of language is acquired, and how knowledge of language is put to use, most of the work to date has focused on his first question: what constitutes knowledge of language? These questions are related though, and language acquisition data, both first and second, has increasingly been used to refine and test hypotheses about the nature of human language. Additionally, the UG descriptive framework has been used by researchers to draw up sophisticated hypotheses about a range of issues which are central to our understanding of SLA, such as the exact nature of the language system (the learner system as well as the L1 and L2 systems), the interplay between the first and second language in L2 learners, the linguistic knowledge learners bring to the task of L2 acquisition etc.

As a general theory of language therefore, the scope of UG is potentially very broad. It would be fair to say, however, that UG research has been primarily concerned with the description and explanation of the formal system underlying language, with a main focus on **morphosyntax**. The UG contribution to our understanding of the acquisition of morphosyntactic properties in second language acquisition has indeed been outstanding. However, its scope does not include a theory of processing, nor a theory of learning. It has very little to say about what triggers development in either L1 or L2 acquirers. It is a property theory and not a transition theory, and must therefore be evaluated as such.

3.6.2 The UG view of language

The UG approach views language as a mental framework underlying all human languages. Until very recently, as we have seen, syntax was the privileged object of study. UG is primarily concerned with the sentence and its internal structure, rather than any larger unit of language. Work at the level of smaller units (words, morphemes, phonemes) has also been concerned with structure and how different elements relate to one another. This is one of the major criticisms of work in this tradition; it studies language somewhat clinically, in a vacuum, as a mental object rather than a social or psychological one. Moreover, it separates rigidly language knowledge and language use, and many linguists disagree with this dichotomy, as we see elsewhere in this book.

Following from this, the methodologies used by UG theorists have sometimes been criticized for lack of ecological validity. The theory is preoccupied with the modelling of linguistic competence, and the study of naturalistic performance is not seen as a suitable window into mental representations of language (Towell and Hawkins, 2004). We have seen (Chapter 1), that grammaticality judgement tests used to be thought to be the most appropriate methodology to access native

SECOND LANGUAGE LEARNING THEORIES

speakers' intuitions about their native language, and that native speakers usually agree about what is grammatical or ungrammatical in their language. L2 learners' intuitions, however, are much more likely to be unstable, and therefore less reliable; for example, their responses to GJTs may also be influenced by explicit knowledge. We have seen in earlier sections how often data on L2 competence deriving from grammaticality judgement tests is disputed and reinterpreted. (For discussion of these issues, see Chaudron, 2003; Sorace, 1996; Ionin, 2012.)

UG theorists have taken criticisms about the lack of reliability of L2 judgements seriously, and recent work in this tradition has used a much wider range of elicitation techniques. The problem of drawing inferences about mental representations from such data remains. However, in spite of these criticisms, UG is probably the most sophisticated tool available for analysing language today, whether native or second languages.

3.6.3 The UG view of language acquisition

When applied specifically to the problem of second language acquisition, how successful can the UG theory claim to be?

UG-based approaches to SLA have been criticized for exactly the same reasons as the theory itself. First, linguistically, this approach has until recently been almost exclusively concerned with morphosyntax. This is changing, however, and recent interest in phonology, morphology and the lexicon has redressed the balance somewhat; additionally semantics, pragmatics and discourse are now a central concern in the work on interfaces. Second, the UG approach has been exclusively concerned with documenting and explaining the nature of the L2 linguistic system. Social and psychological variables which profoundly influence the learning process are beyond its remit and therefore ignored.

Bearing the above in mind, there is little doubt that the UG approach to research into second language acquisition has greatly enhanced our understanding of L2 morphosyntactic development. It has enabled researchers to formulate well-defined and focused hypotheses which could then be tested in empirical work. This powerful linguistic tool has been useful in describing not only the language produced by learners, but also the language to be acquired as well as the first language of the learner. In addition to establishing some of the facts about second language acquisition, the UG approach has also proposed explanations for such facts. For example, it has enabled L2 researchers to theorize language transfer/cross-linguistic influence in a new way, in terms of principles and parametric variation, and this has led to a programme of empirical research on whether or not parameters can be reset, and features reassembled.

3.6.4 The UG view of the language learner

The UG approach is only interested in the learner as the possessor of a mind which contains language; the assumption is that all human beings are endowed

3.6 Evaluation of Universal Grammar-based approaches to SLA

with such a mind, and variations between individuals are of little concern to UG theorists. The emphasis is very much again here on language as the object of study, rather than on the speaker or learner as a social being, and the focus is on what is universal within this mind.

Overall, there is little doubt that the UG approach to second language research meets the criteria for a good theory as defined in Chapter 1, by making clear and explicit statements of the ground it aims to cover and the claims it makes, by having systematic procedures for theory-evaluation, by attempting to explain as well as describe at least some L2 phenomena, and finally by engaging increasingly with other theories in the field. As one of the most active and developing theories, it can be expected to continue to make highly valuable contributions to the field, within its self-determined limitations.

4 | Cognitive approaches to second language learning (1): general, implicit learning mechanisms

4.1 Introduction

The basic question asked by researchers adopting a cognitive perspective on L2 is: to what extent can general cognition explain SLA phenomena, without the need to define a predetermined linguistic architecture within the brain? Chapters 4 and 5 address different aspects of this issue, drawing on a wide range of recent research and theorizing. This chapter focuses on theories that propose that the same kind of implicit mechanisms are at play in L1 and L2 learning. In Chapter 5, we turn our attention to theories that claim that L2 learning is fundamentally different to, and tends to be more explicit than, L1 learning.

We think this division is helpful in acquiring a good understanding of the logic of cognitive theory, a range of major constructs and the research methods typical of cognitively oriented SLL research. Inevitably however we have been selective, and in particular we have not dealt here with the wide-ranging new field of complexity theory (Larsen-Freeman and Cameron, 2008; Larsen-Freeman, 2011a and b). We have also not dealt with proposals to synthesize cognitive thinking about language processing with forms of generative linguistic theory (for example, Towell and Hawkins, 1994; Sharwood Smith, 2008; Truscott and Sharwood Smith, 2011). We will revisit these attempts to integrate a wider range of theoretical perspectives in Chapter 10.

In this chapter, therefore, we describe cognitive accounts of L2 learning that draw on systems that every normal human has access to, that are thought to function without awareness (that is, implicitly), and that do not require explicit knowledge about language. The assumption is that language learning, be it first, second or third, taps into the same, general, cognitive mechanisms and architecture that drive basic human learning. 'Learning' here does not mean the kind of learning that results from conscious effort and study, but extraction of meaningful patterns from environmental stimuli, including all types of sensory perception. In this view, the outcome of second language learning is different from that of first language learning because: a first language and a basic understanding about how the world functions are already established; learners are more socially, personally, interactionally and cognitively mature; and the learning environment and motivations to learn are usually very different.

In the first part of the chapter, we introduce research that examines how features of the language input affect learning, drawing on general theories of learning. These approaches are transition theories, rather than property

4.2 Input-based emergentist perspectives

theories. In the second part of the chapter, we look at research perspectives that investigate whether **processing constraints** influence what learners can do, and when. Our first example (Piennemann's Processability Theory) focuses on a particular transition theory whereby developmental stages in L2 learning are determined by the growth of the L2 language processor. Our second example (O'Grady's Efficiency-Driven Processor) argues that language acquisition and language structure are both dependent on characteristics of our language processing capacities, thus eliminating the distinction between transition and property theories of language learning.

4.2 Input-based emergentist perspectives

The term **emergentism** is used here as an umbrella term (covering similar terms such as usage-based or frequency-based perspectives), for research sharing the underlying view that L2 learning is 'bottom up', that is, that learners use general learning mechanisms in order to extract structure and patterns from the language input they are exposed to. From this perspective, the basic idea is that grammatical rules and other formal aspects of language 'emerge' (that is, are constructed and abstracted) from language use and experience, rather than being either innate, or learned as abstract structures.

Influencing this process are many factors, which, for the sake of presentation, are grouped here into input-related factors (such as frequency and salience of target features in the L2 input) and learner-related mechanisms (such as associative learning and L1 transfer). Of course, input-related factors and learner-mechanisms are highly interdependent, as learning mechanisms work on the input and are therefore affected by it, but we will introduce them separately below.

4.2.1 Input-related factors

There is now an extensive research agenda which is investigating how far particular characteristics of L2 input can predict whether particular linguistic features are acquired early or late. In such studies, samples of L2 input are coded for a range of physical and linguistic characteristics, including for example: **frequency** (how often the item occurs in the input), **salience** (how prominent/easy the feature is to hear), **redundancy** (whether the item is essential or not, for conveying meaning) and the lexical and semantic contexts in which the feature occurs. These input characteristics are then compared with L2 acquisition orders for those same features. Two such studies are described below: one using a reference corpus compiled from naturalistic input (parent-child talk), and another using a corpus from classroom instruction.

SECOND LANGUAGE LEARNING THEORIES

The first study is a **meta-analysis** of 12 naturalistic studies of L2 English, pooling together data from over 900 learners (children and adults, regardless of the type of instruction or prior exposure) with 29 different L1s (Goldschneider and DeKeyser, 2001). The researchers focused on English morphemes that have robust evidence for their acquisition order (as we saw in Chapter 2), that is, progressive *-ing*, plural *-s*, possessive *'s*, articles *a*, *an*, *the*, third person singular present *-s* and regular past *-ed*. The 12 studies had used different elicitation methods, but they had all scored learners' oral production of the target morphemes using 'accurate suppliance in obligatory contexts' (for example, producing a plural marker in plural contexts) as their criterion for acquisition. In such studies, a morpheme is deemed to have been acquired if it is produced in a given percentage of expected contexts (usually 90 per cent, see Pallotti, 2007).

Goldschneider and DeKeyser coded each target morpheme according to its perceptual salience (how easy it is to hear); semantic complexity (number of meanings); morphophonological regularity (how regular and distinctive it is); syntactic category (lexical or functional word; free or bound morpheme); and frequency (in an existing reference corpus of naturalistic parent-child L1 talk: Brown, 1973, p. 358). They then merged the results of the 12 studies, taking account of the different number of participants in each, and worked out which morphemes were generally easier/more difficult to learn.

The researchers found that no single input feature predicted learner accuracy really well, but that all five input features in combination predicted a significant proportion of the accuracy scores. They argued for the overall importance of salience for acquisition, including both prominence of meaning and salience of form. However, the authors acknowledged that they did not take the influence of the L1 into account; as Spanish was by far the most dominant L1 ($N = 354$), this may have biased the results.

The second study (Collins *et al.*, 2009) investigated a 110,000-word corpus of instructional talk to 11- and 12-year-old Francophone learners of L2 English in Quebec. The researchers' aim was to investigate the input characteristics associated with English structures known already to be easier/harder to acquire, and to discover whether ease of acquisition could be related to these. They focused on three English structures, progressive *-ing* (known to be acquired early), the regular simple past *-ed*, and possessive determiners *his/her* (both known to be later acquired). They analysed the frequency of these forms in the classroom corpus, their lexical and morphosyntactic properties, and their perceptual salience.

On the basis of this analysis, Collins *et al.* showed that raw frequency counts (**token** frequency) could not explain ease/difficulty of acquisition (none of these items was particularly frequent in the corpus). However, progressive

4.2 Input-based emergentist perspectives

-ing occurred with a greater range of moderately frequent verbs than simple past (**type** frequency), and in a greater variety of situations (semantic scope). In contrast, noun-phrases such as *his mother*, critical for working out the relationship between the possessor and the possessed because the determiner and noun refer to different genders, were rare and occurred with a restricted set of nouns. They argue that together these factors can explain why *-ed* and *his/her* are acquired later than *-ing*, as illustrated in Table 4.1.

Table 4.1 Input profile of difficult and easy constructions (source: Collins *et al.*, 2009, p. 346)

	Difficult: Simple Past:	Difficult: Possessive Determiner <i>His/Her</i>	Easy: Progressive
Token frequency*	Low	Low	Low
Type frequency**	Low	Low	High
Semantic scope	Low	Low	Moderate
Perceptual salience	Low	Low	High

*Token frequency counts all occurrences of every relevant word/morpheme

**Type frequency counts the range of different words/morphemes

An important advantage of Collins *et al.*'s study over Goldschneider and DeKeyser's is that the input data was of a type which L2 learners are actually exposed to, and not only a reference corpus. On the other hand, both studies used acquisition orders taken from other studies, which have received some criticism (see Chapter 2). Ideally, future research will track actual input and acquisition patterns. Additionally, some researchers have argued that you cannot measure salience independently of other variables, and that what might be salient for one learner in one context might not be so in another (N.C. Ellis, 2006c). Online measures are needed, which tap more directly into learners' perception of salience, and the immediate effects this has on analysis of the input stream and on word identification (Carroll, 2012).

Luk and Shirai (2009) carried out another meta-analysis which investigated a dimension neglected in these corpus studies, that is, the influence of L1 on acquisition orders for L2 English articles, plural *-s* and possessive *-s*. They were concerned to discover whether semantic and structural similarity/dissimilarity between L1 and L2 morphemes affected how easily they were learned. Their meta-analysis reviewed seven L1 Japanese studies, two L1 Chinese studies, two L1 Korean studies and seven L1 Spanish studies. The authors found that Spanish L1 learners followed the so-called natural order (Krashen, 1977a and b, described in Chapter 2), but that L1 Japanese, Korean and Chinese learners mostly did not: they acquired plural *-s* and articles later, probably because these morphemes do not exist in their L1, and possessive *-s* earlier, probably because this is structurally similar to their L1 (p. 721).

SECOND LANGUAGE LEARNING THEORIES

Although the findings are not completely clear cut, the overall picture challenges notions of invariant acquisition orders (p. 737), promoted by the 1970s and 1980s morpheme studies (see also Collins, 2004). Together with the corpus studies, the evidence suggests that morpheme acquisition orders could be dependent on interactions among a range of factors including L1 influence, input characteristics and learners' individual differences.

A further issue, which makes the analysis of input more complex, is how reliably a particular morpheme expresses a particular meaning; for example, English *-s* is used to mark the plural, possessive case and third person singular. Additionally, some meanings might have different forms to express them; for example, the meaning 'past' can be realized in a range of different ways. There is much redundancy of this kind in human languages, and learners have to use the different – and sometimes competing – 'cues' in the input (such as word order, case marking, agreement, intonation, or semantic features such as **animacy**) in order to make decisions about how best to process it (N.C. Ellis, 2006b, 2006c).

One theoretical framework that has particularly focused on this phenomenon is the **Competition Model**, now known as the Unified Competition Model (MacWhinney, 2012). In this model, the learner's task is to discover the 'strength' of particular form-function relationships in the language system. A typical experiment within this framework will try to determine the strength of different cues by making them contradict one another. For example, in *the ball are chasing the boys* (MacWhinney, 2012, p. 213), the word order implies *ball* is subject of chase, yet the semantic properties of the word 'ball' tell us it cannot be subject, and the plural form of the verb does not allow singular ball as subject. The extent to which such competing cues influence which noun is interpreted as the subject is called their cue strength.

L2 researchers interested in the Competition Model have been investigating the influence of L1 cues in learning L2 cue strength. For example, in Italian the subject can follow the verb, so both *la mangiano i ragazzi* (it eat the boys) and *i ragazzi la mangiano* (the boys it eat) are grammatical, and both mean 'the boys eat it', making the word order cue strength much weaker in Italian than in languages like English or French which do not normally allow the subject to follow the verb. If L1 cue strengths do indeed impact on the L2 learning process, then French word order should be easier for English L1 learners than Italian word order. For studies investigating similar issues, see Isabelli (2008), Jackson (2007, 2008) and MacWhinney (2012).

In recent versions of the Competition Model (MacWhinney, 2008), learning is accounted for by general cognitive mechanisms, by social interaction and by drawing on neurolinguistic evidence. Essentially, MacWhinney, in

line with other cognitively oriented researchers, sees input driving first and second language learning; the validity, detectability and reliability of cues play a major role, and the learner's ability to recover from errors and pre-empt over-generalizations is related to the competition between different cues for expressing particular meanings. Learners must track the probabilities with which input cues such as word order or morphology are associated with specific interpretations, while for L2 learning, cue strength is also influenced by expectations entrenched by the L1. These are key features of associative learning, described next.

4.2.2 Learner-related factors: associative learning

We now describe some of the general cognitive mechanisms thought to operate in SLA, on the learner's side, when processing and learning from L2 input. These mechanisms, and the methodologies used to investigate them, are generally adopted from cognitive psychology. For accounts of L1 learning from an emergentist (usage-based) perspective, see Elman *et al.* (1996), Tomasello (2003), Lieven and Tomasello (2008) and Ambridge and Lieven (2011). In L2 learning, N.C. Ellis (2006a, 2006b, 2006c, 2007) has drawn some of these cognitive mechanisms together into a theoretical framework which he calls the 'associative-cognitive CREED', proposing that language learning is Construction-based, Rational, Exemplar-driven, Emergent and Dialectic (see also Robinson and Ellis, 2008). Each of these interrelated terms is briefly described here, and sections below focus in more depth on key features of associative learning: frequency-biased probability calculations; overshadowing and attention blocking; statistical (or sequence) learning; construction learning; and implicit learning of form-meaning connections.

Construction-based

Learning involves learning and recycling 'constructions' – these are symbolic units that associate morphological, syntactic and lexical form with particular semantic, pragmatic and discourse functions. Constructions are highly diverse, and can include: concrete lexical items; formulae such as *once upon a time*; slot-and-frame constructions such as *give [someone] [something]*; and more open abstract schemata such as [noun stem + plural] and [Subj V Obj Obj2].

Rational

This refers to the idea that language representations in the mind are 'tuned' to predict the linguistic constructions that are most likely to be relevant in the ongoing discourse context (N.C. Ellis, 2007, p. 81). Frequency, recency of occurrence and context of particular constructions influence the development of these representations.

SECOND LANGUAGE LEARNING THEORIES

Exemplar-driven

Learners abstract regularities from groups of similar constructions (in the special sense explained above), encountered one by one. For example, learners will notice that adverbs in English often occur after the main verb (for example, *I run slowly*) and they will abstract from this statistical observation and apply it to all adverbs (sometimes erroneously; for example, producing structures such as *I run always*); similarly, they will notice that verbs in the past tense often end in *-ed* and they will apply it to all verbs (sometimes producing structures such as *he drived*).

Emergent

Language regularities emerge as learners determine structure from language usage. Crucially, learning responds to and emerges out of the learner's experiences of the language as it is used, rather than being the result of innately constrained rules or of rules that linguists use to describe those patterns (Bybee, 2008; Bybee and Hopper, 2001).

Dialectic

Interactions with other speakers, teachers or instructional events such as conscious learning help to mitigate the aspects of associative learning that cause L2 learning problems, for example transfer (see Chapter 5 for a fuller discussion).

4.2.2.1 Learners' use of frequency in the input

Frequency is argued to play a large role in shaping language acquisition, for both L1 and L2 (Schmitz, 2010). This claim is partly based on evidence from general cognitive psychology that 'the more times a stimulus is encountered, the faster and more accurately it is processed' (N.C. Ellis, 2006b, p. 5), so that more frequent features in the input are more likely to be identified and learnt. Another, perhaps more important, reason is that frequency is a critical component used in the calculation of probabilities, which drives language acquisition in this view. Humans are claimed to have innate abilities to pick out cues and to calculate statistical probabilities implicitly (without awareness): 'Learning language can thus be viewed as a statistical process in that it requires the learner to acquire a set of likelihood-weighted associations between constructions and their functional/semantic interpretations' (N.C. Ellis, 2006b, p. 12).

4.2.2.2 Overshadowing, attention blocking and the role of the L1

Clearly, frequency alone does not fully explain L2 learning (highly frequent forms are not necessarily acquired first or most successfully). Also, salience and

4.2 Input-based emergentist perspectives

reliability of cues in the input affect L1 acquisition and SLA alike, and so cannot explain the differences between them. To explain the limited end state typical of SLA, other associative learning processes are responsible. These include overshadowing and attention blocking, which we will now define.

Where a feature in the input is redundant, that is, when meaning can be satisfactorily extracted without it, the feature may not be processed in a way that is useful for learning (see also VanPatten, 2002, 2004). For example, in the sentence *Yesterday, I carried that heavy box* the learner does not have to process the past-tense form of the verb to understand that the sentence is in the past, as s/he can process 'yesterday'. This processing failure is thought to happen when other features are more salient (for example, a content word is more salient than *-ed*), when world knowledge is likely to predict a communicatively satisfactory meaning, or when other features have been activated many more times before, in the L1. Thus, a feature is said to 'overshadow' another. In our example, the temporal adverb 'yesterday' overshadows the past-tense marking (N.C. Ellis, 2008a). Overshadowing can, over time, lead to learned selective attention, known as attention blocking. Essentially, if *x* has always expressed a particular meaning (or function), it is difficult to associate *x* with another meaning (or function); if a particular meaning (or function) has reliably been expressed using *x*, it is difficult to associate a different or an additional language feature with that same meaning. The prior association, established through learned attention to specific cues, essentially blocks further associations with new cues in the input.

Overshadowing and attention blocking are thought to affect L2 learning because an L1 is already established. The idea of L1 influence is not new, but recent cognitive descriptions of these processes go beyond the mid-twentieth-century behaviourist view of learning presented in Chapter 2.

In a series of **experimental studies**, N.C. Ellis and Sagarra (2010, 2011) used Latin (an inflection-rich dead language) to investigate how far inflectional morphology is attended to. In a first experiment (2010), they trained L1 English participants in different ways to interpret the past in Latin sentences, with one group being trained on adverbs, another on verb morphology and a third **control group** receiving no training. Some members of the verb morphology group showed sensitivity to that cue. However, all groups were sensitive to the (lexical) adverb cue, even those who had received no training on it.

A further experiment included participants from a range of L1s. Learners from L1s without verb morphology (Chinese, Malay, Indonesian) were found to be less sensitive to cues on the verb than the other learners, and the researchers conclude that 'sensitivity to these cues is, therefore, a matter of degree' (Ellis and Sagarra, 2011, p. 611).

These studies demonstrated the associative principle of entrenchment: that frequency of exposure increases the chances of learning. However, they also

demonstrated that regardless of how frequent a particular cue is, learners' sensitivity to it can be reduced by increased reliance on another cue. The studies provide convincing evidence that attention blocking influences processing of a written language, taught and tested with access to explicit knowledge. However, future research would be needed to generalize these findings to spoken language and real-time language processing.

4.2.2.3 Statistical learning and connectionist accounts

Laboratory research in the 1990s involved demonstrations that humans could extract word-like structures from streams of syllables such as ba-bu-pu-du-ta-ba-bu-pa (Saffran *et al.*, 1996b, cited in Williams, 2009; Mirman *et al.*, 2008; Misyak and Christiansen, 2012). This kind of statistical learning (also referred to as chunking, or artificial language learning) is central to associative learning (Shanks, 1995, 2005). In this view, acquisition occurs when statistical regularities are absorbed via implicit learning, learners unconsciously tallying the likelihood that one 'form' will follow another.

In this section we focus on the use of computer simulations to study statistical learning. One rationale behind this is that if patterns similar to human learners' productions can be generated by a computer that has no pre-programmed linguistic constraints, then human learning could also be driven by computing statistical probabilities.

Statistical learning is often investigated using **connectionist computer models**, such as a simple recurrent network (SRN). Connectionist models simulate how links between information nodes become strengthened or weakened through repeated activation or non-activation, that is, their weightings change. (See Figure 4.1 for an example of SRN.)

For example, a string of target grammar to be learnt might be ABCD, where C follows B but only if B follows A. (Here, letters represent noncc words or categories, sometimes called an artificial grammar.) The network learns by being exposed to input cues that enter from outside the network; that is, a new letter, phoneme, word or phrase is fed in. The network then makes a prediction of an 'outcome', that is, the next item in the string (or, sometimes, an interpretation of meaning). This prediction is forwarded to the 'output layer'. Programmed into this output layer is the correct prediction, so that feedback for every prediction is available. Initially the network's predictions are entirely random. But, after repeated cycles and after discovering each time whether its prediction was correct or not, the network adjusts the weightings of connections between processing units (often called the 'hidden layer', representing synaptic strengths). This means that the network can make a more accurate prediction of outcome when provided with the same input again. (For fuller descriptions, see N.C. Ellis, 2006b, p. 12; Ellis and Larsen-Freeman, 2009, pp. 110–13; Williams, 2009.)

4.2 Input-based emergentist perspectives

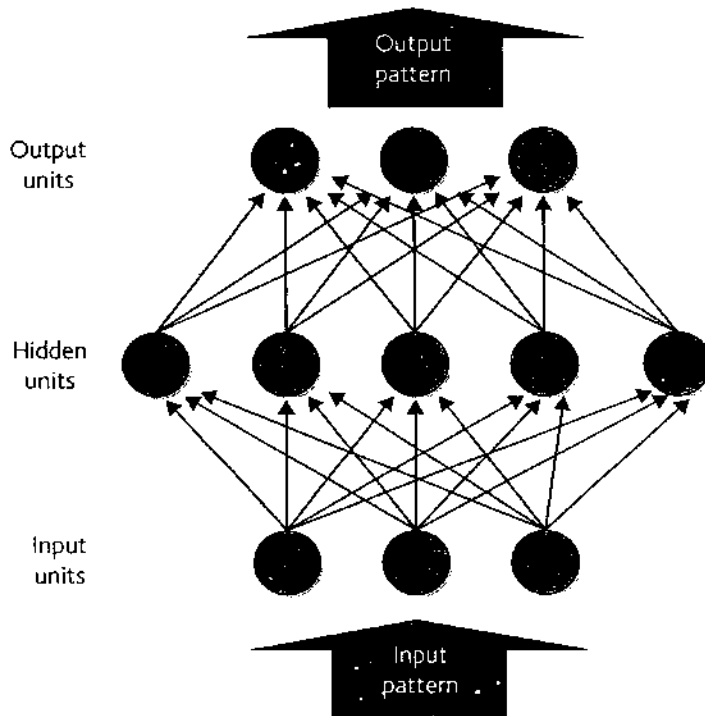


Figure 4.1 Simple recurrent network (source: Schneider and Katz, 2012)

Computer simulations have modelled the acquisition of a number of L2 features such as verb argument constructions, **recursion** and the constraints governing phoneme combinations in English (see Williams, 2009, and Cleeremans and Dienes, 2008, for overviews). Simulations have also been used widely in L1 acquisition research. However, statistical learning and computer-based simulations have been the subject of some criticism, some of which are considered here.

A first criticism is that statistical learning of artificial grammars does not draw on the same processes as, or reflect, natural language processing (Robinson, 2005b). Researchers over the last decade have attempted to address this criticism in a number of ways. For example, Christiansen *et al.* (2012) investigated the way in which participants process anomalies in a natural language by measuring brain activity (using **event-related brain potentials**) and compared it to the way in which they process anomalies in an artificial grammar. They conclude that similar neurocognitive mechanisms are at play (see also Conway *et al.*, 2010).

A second criticism is that statistical learning and modelling is not relevant to L1 or L2 learning because the measures used as evidence that learning has happened do not test a generalizable grammatical system, but rather elicit how

SECOND LANGUAGE LEARNING THEORIES

familiar learners are with surface (form-level) characteristics of specific, trained items. Recent connectionist studies have addressed this criticism by ensuring that they test generalizable rules (Williams and Kuribara, 2008; Williams, 2010; Ellis and Larsen-Freeman, 2009).

A third criticism is that statistical learning and modelling do not engage with property theories of language (Hawkins, 2008b). Some researchers in this area have addressed this criticism by directly engaging with UG accounts of language structure, and trying to provide alternative explanations for phenomena studied using UG. For example, Freudenthal *et al.* (2006, 2007) modelled children's production of 'optional infinitives', a phenomenon explained using UG by Harris and Wexler (1996). Other researchers in this framework adopt a constructionist view of language which believes that a property theory is not warranted, as language emerges from its use (Ellis and Larsen-Freeman, 2009).

A fourth criticism questions how closely these models simulate actual learning, as they work their way towards accurate predictions. For example, when the networks are 'told' whether their predictions are correct, does this represent a moment when human learners associate a heard sequence with meaning? When the model's predictions are not successful, what stage of human learning is represented? Do the computer simulations produce 'wild grammars' during their initial predictions (that is, grammars that violate universal characteristics of human languages)? If so, to what extent can such simulations be said to model human learning? In answer to such questions, some researchers accept that SRNs do not model actual learning processes (Williams, 2010, p. 238). However, the information available for computation and statistical learning is similar across computer modelling and natural language learning, suggesting analogous processors may be at work.

A final criticism is that statistical learning does not account for what learners do not produce. The extent to which statistical learning can explain how language learning is constrained is receiving increasing attention in L1 learning (Ambridge *et al.*, 2009; Boyd and Goldberg, 2011; Stefanowitsch, 2008; Goldberg, 2011). For example, Goldberg addresses the issue by appealing to the notion of statistical pre-emption: 'How is that we know we should use *went* instead of *goed*? Clearly it is because we consistently hear *went* in contexts where *goed* would have been at least as appropriate' (2011, p. 133). However, how and why L2 learners do not always seem to be able to use the same mechanism requires further explanation.

4.2.2.4 Construction learning

The constructionist perspective holds that to learn a language one must learn a very diverse array of constructions, that is, conventionalized form-meaning mappings of all kinds (abstract and concrete), which become schematized over time in users' minds, as by-products of language use. Much work in this area

4.2 Input-based emergentist perspectives

relates to L1 learning (Goldberg, 2006; Tomasello, 2003; Auer and Pfänder, 2011), but interest in construction learning in L2 is increasing (Collins and Ellis, 2009; Ellis and Cadierno, 2009; Boyd and Goldberg, 2009; Tyler, 2012). These studies typically investigate whether learners are assisted by factors such as frequency or **prototypicality**¹ when extracting various constructions from the language they are exposed to.

For example, Ellis and Ferreira-Junior (2009) examined the effects of frequency, prototypicality and generality of meaning on the L2 acquisition of three verb–argument constructions (VACs) over a period of two to three years. The study used naturalistic data from the ESF adult learner corpus (described in Chapter 7: Klein and Perdue, 1992). Data from seven adult learners of English was used, along with data from their NS interlocutors during oral tasks such as conversations, role plays and picture descriptions. The authors found that particular expressions were highly preferred by both learners and native speakers, accounting for the majority of total productions for each VAC. In the case of verb **locatives**, the first and most common construction was *go somewhere*; for verb object locatives, it was *put something somewhere*; and for **ditransitives**, it was *give someone something*. The researchers argue that high-frequency verbs such as *go*, *put* and *give* provided the learners with a prototypical exemplar for each particular construction, and acted as an entry point for learning it. Such verbs are useful, and learned early, not only because of their prototypicality in particular constructions, but also because of their very generic meanings. As Ellis and Larsen-Freeman (2009) note: ‘Before learners can use constructions productively, they have to encounter useful exemplars and analyze them, to identify their linguistic form and to map it to meaning and use’ (p. 109).

A naturalistic, correlational study like this can suggest the importance of **prototypes**, but it cannot demonstrate conclusively that they cause construction learning. It is possible that the early learning of an apparent prototype is simply due to their frequency and high semantic generalizability. Disappointingly for the stronger predictions of constructionist learning, an experimental study (Year and Gordon, 2009) found that skewed input including a high proportion of the prototype construction *give [someone] [something]* did not help Korean speakers to learn the English ditransitive construction in an instructed setting. Similarly, Nakamura (2012) found little evidence to support prototype learning in L2 learners. It seems the particular contribution of prototype constructions to the abstraction of structure requires further investigation, and longitudinal analyses of L2 prototype use (such as the L1 learning research by Pine *et al.*, 2007) offer one such possibility.

¹Prototypicality is the term used to refer to the fact that some members of a group are seen as more typical of that group than others. For example, a sparrow is considered as more prototypical of a bird than an ostrich, that is, more ‘bird-like’.

4.2.2.5 Implicit learning of form-meaning connections

The statistical L2 learning literature, investigating, for example, artificial grammar learning (where reactions to 'made-up' grammars are observed), or serial reaction time studies (where participants have to predict the position of a stimulus on screen) (French and Cleeremans, 2002), has focused on the abstraction of form-form regularities without taking account of meaning or function. More attention has recently been directed towards the implicit learning of form-meaning connections, likely to be critical for natural language learning, and we now turn to this research (see Williams, 2009 for an overview). The term implicit learning usually refers to situations in which the learning was both incidental (the learner did not intend to learn the feature) and without awareness. Finding out whether a learner was or was not aware of the feature presents a considerable challenge to researchers, though is essential if we are to know whether language can be learnt without awareness and whether conscious awareness is necessary or merely helpful. Williams (2009) suggests three indicators of whether knowledge is implicit: it influences behaviour without awareness; it is used automatically (as measured by time-constrained behavioural tasks and/or by neurological measures); and it is served by different brain systems. These indicators are briefly summarized here, and some of the ideas are revisited in Chapter 5.

To determine a lack of awareness researchers need to probe learners' consciousness, an inherently difficult construct to define. For example, Norman *et al.* (2007) describe 'fringe consciousness' as 'a situation in which behaviour is driven in a flexible manner by consciously accessible feelings, but where there is no conscious access to the antecedents of those feelings' (p. 833, cited in Williams, 2009, p. 322). To tease out any such antecedents of feelings, researchers can elicit confidence ratings and 'knowledge source' reports from participants about their responses during tests. For example, Dienes and Scott (2005) asked subjects taking part in an artificial grammar learning experiment to say whether each judgement they made in a test was based on a guess, intuition, memory or rule. Judgements based on memory and rule were considered to reflect explicit knowledge; judgements based on guess and intuition suggested a contribution of implicit knowledge (Williams, 2009, p. 323). This method has been used in SLA research, for example, by Marsden, Williams and Lin (2013).

Automaticity is best understood as fluent language processing, and researchers assume that tasks conducted under time pressure are more likely to tap automatized responses. For example, R. Ellis and associates (R. Ellis, 2005b; Ellis and Loewen, 2007) found that an **elicited imitation** test (where subjects have to repeat a sentence and answer a question to ensure they are paying attention to the meaning), a timed grammaticality judgement test and an oral narrative tended to produce the same pattern of scores, whereas an untimed grammaticality judgement test and a **metalinguistic knowledge** test showed

4.2 Input-based emergentist perspectives

another pattern of scores. Statistical analysis produced two clear factors that R. Ellis argued to be implicit (automatized) and explicit (non-automatized) knowledge respectively. (For further discussion, see R. Ellis *et al.*, 2009, and Erlam, 2006.) Researchers also use reaction times during online processing to provide evidence of implicit knowledge use, sometimes in combination with knowledge source reports (for example, Marsden *et al.*, 2013). Others use neurological techniques, for example Event Related Potentials, to measure responses to specific stimuli in the brain (Tokowicz and MacWhinney, 2005). Researchers have tended to investigate implicit learning in SLA mainly in laboratory settings, with artificial or semi-artificial languages, principally because the learning tasks and contexts can be controlled to a greater extent (see, for example, studies in Hulstijn, 2005). Some research has been undertaken in classrooms, with real learners and natural languages (for example, studies reported in R. Ellis *et al.*, 2009). However, it is difficult to be certain that learners in a classroom-based study are not engaged in some degree of explicit learning (for discussion, see Shintani and Ellis, 2010). For this reason, we focus on a series of laboratory-based studies here.

One line of investigation has asked whether awareness of a form and/or meaning is necessary for learning to take place, that is, whether wholly implicit L2 learning is possible. (See Chapter 5 for discussion of the construct of attention, and how it is used in SLA theories.) DeKeyser (1995) tested this idea when he exposed participants to a miniature artificial language with rich inflectional morphology for marking biological gender, number and thematic role. In the implicit learning condition, participants heard sentences in the new language, and viewed pictures illustrating these. After over eight hours of exposure, participants did not perform at above chance in a test applying the implicitly presented structures to new sentences, even for structures that were present in their L1 (subject-verb agreement). In contrast, Robinson (1996) did find some evidence for the generalization of the highly constrained structure of pseudo-clefts of location (*Where my favourite place is is Spain*) under implicit learning conditions. However, Robinson (2005b) found no evidence for the learning of Samoan morphosyntax by Japanese participants when they focused on comprehension of meaning.

Following these negative or, at best, mixed results, Williams designed several laboratory studies that aimed to control and monitor level of awareness and orientation of attention more tightly. In Williams (2004), participants' attention was drawn to novel forms (artificial determiners) and their meaning (animacy), but they were not made aware of the connection between them (that is, that the form of the determiner changed with animacy). Learners in this study were able to generalize the rule to novel contexts in one experiment but not in another.

In another 'artificial determiners' study, Williams (2005) explored whether a form-meaning connection could be learnt when participants' attention was

SECOND LANGUAGE LEARNING THEORIES

drawn to a form and to a particular form-meaning connection (determiner-distance associations) but not to the connection between the same form and a different meaning (determiner-animacy). During the training phase, the noun-phrases (for example, *gi dog* 'near dog') were presented orally; after training, participants' knowledge of the artificial determiner system was tested through a multiple choice sentence completion test. Participants then had to describe how they had arrived at their decisions during the test, and if they did not mention 'any references to living or nonliving, moves or does-not-move, and so forth' (p. 283), they were classified as unaware of the animacy connection. Many of these 'unaware' participants nonetheless could complete test items correctly – provided, that is, they had some previous knowledge of a natural language with grammatical gender (such as French or German). It seemed that even though none of the participants' L1s expressed animacy, those participants whose L1 had gender were more sensitive to agreement information while processing the input. Another study (Hama and Leow, 2010) extended this work but found somewhat different results: the 'non-aware' participants had not generalized the rule. However, several critical differences (such as the use of participants without gender in their L1) make comparison difficult. Of methodological importance in Hama and Leow's study is that the probes of awareness carried out during learning, and those carried out during the post-test, picked up almost the same number of aware participants. However, these were different individuals, indicating the need for both these kinds of probes when eliciting awareness.

A limitation of these studies is the method used to check on participants' (un)awareness of the focal language feature (that is, self-report). Even if participants do not report awareness, does this really mean they did not hold any information fleetingly within their consciousness? To address this, Leung and Williams (2011) sought **reaction time** evidence for implicit learning. Participants carried out interpretation tasks on computer, and the time taken between presentation of an item and their response was measured very accurately. Participants were expected to learn the mapping between a set of novel determiners and thematic sentence roles (such as 'agent', the doer of an action, and 'patient', the receiver of an action). The stimuli presented to participants were English lexicon-based with a miniature article system, as in Table 4.2.

Table 4.2 Miniature article system (source: Leung and Williams, 2011)

Person	Agent	Patient
Adult	<i>Gi</i>	<i>Ro</i>
Children	<i>U/</i>	<i>Ne</i>

All training sentences followed the pattern V + NP1 + NP2 + PP. NP1 was always a proper name and NP2 was always a common noun. But NP1 or NP2 could

4.2 Input-based emergentist perspectives

be agent or patient depending on the preceding article. V was always in its infinitive form. So, for example, two possible sentence constructions could be used to describe a picture of a girl kissing a boy:

- (1) *Kiss ul Mary a boy on the face.*
V NP1 (Agent) NP2 (Patient) PP
- (2) *Kiss ne David a girl on the face.*
V NP1 (Patient) NP2 (Agent) PP

During the training phase (88 sentences), participants always saw a picture of two people, one of whom was named. Their task was to click 'Left' or 'Right', depending on the position in the picture of the named person. The researchers assumed that where the articles were processed correctly, reaction times would be quicker (because these provided advance clues, as to which person would be named – the Agent as in sentence (1) above, or the Patient, as in sentence (2) above). After each reaction time response, the participants had to reformulate the sentence into correct English order but retaining the article, to force processing of both the form (articles) and the related meaning (thematic roles).

In the testing phase (32 sentences), some items were used in which the 'rules' were broken, that is, the mapping between articles and thematic roles was reversed so that *gi* and *ul* were used with patients and *ro* and *ne* were used with agents. For these items therefore, the articles no longer provided an advance cue as to which person would be named.

Finally, participants were asked if they had any feelings about when *gi* vs. *ro* and *ul* vs. *ne* were used, and any conscious knowledge was elicited. Participants were classified as being aware or unaware on the basis of their reported knowledge of the target form-meaning mapping: 20 out of 25 participants (80 per cent) remained unaware of the system at the end of the experiment. For these unaware participants, there was a general trend for reaction times to decrease throughout the experiment. However, there was a sudden statistically significant increase in reaction times for the items which broke the rules. This was interpreted as evidence that implicit learning of the form-meaning connection between articles and thematic roles had occurred. Leung and Williams conclude that this 'learning process ... is of very wide generality ... It could thus underlie naturalistic acquisition of grammatical form-meaning connections in the domains of, for example, definiteness or tense and aspectual distinctions' (2011, p. 52).

Williams and colleagues are producing a range of evidence that implicit learning does indeed have a role in acquiring L2 morphosyntax, at the phrase and sentence level, moving the implicit learning agenda beyond the processing of meaningless strings, or computer simulations. They have opened up many avenues for future research, such as whether rules learned implicitly can be

transferred to different tasks, and in particular to spontaneous production tasks, without awareness of the relevant form-meaning mappings. One limitation is that the miniature systems used generally contain known lexical items but novel grammatical features. This is equivalent to a situation in which a learner has a thoroughly established lexicon, with native-like recognition, before any (implicit) learning of the grammar happens. In natural language learning there is mutual support between lexical and morphosyntactic growth, and so it is possible that implicit learning is influenced by the extent to which constituents are novel. When participants were exposed to novel suffixes on novel words, Marsden *et al.* (2013) found that participants without awareness were indeed sensitive to these word endings; however, the word endings seemed to be represented at a purely orthographic level, rather than having morphological status. Researchers do not yet have a clear understanding of whether, and if so when, L2 morphosyntactic systems can be picked out from entirely novel input strings without awareness.

The studies reviewed above have shown cases where implicit learning occurs. Researchers recently have been interested in finding out where implicit learning does *not* occur (Leung and Williams, 2012). For example, it has been suggested that implicit learning may not occur in the context of long-distance dependencies (where an item and its co-referent are far apart from one another), at least in the absence of other cues (Williams and Kuribara, 2008; Williams 2010). Other researchers have suggested that implicit learning in adult SLA may not occur for more abstract features such as grammatical gender, though see Gerken *et al.* (2005). And yet other researchers have suggested that implicit learning may be constrained according to learners' individual differences (Chapters 1 and 5). There is some evidence that individual differences influence artificial grammar learning (Karpicke and Pisoni, 2004, cited in Williams, 2009). Misyak and Christiansen (2012) found that statistical learning ability varies between individuals, interrelating with verbal working memory (WM), and predicting language comprehension. On the other hand, Robinson (2005b) found that higher intelligence among experienced L2 learners seemed to interfere with implicit learning, because these learners voluntarily tended to analyse the novel input strings.

Overall, challenges for future research into implicit learning include ensuring that: the system-to-be-learned reflects a natural language, with all its varied constructions and relationships; any learning is generalizable to new items and ungrammatical items are rejected; and that there is sufficient quantity and quality of input for statistical learning to happen.

4.3 Processing-based perspectives

The term 'processing' is used with many meanings, and we have just reviewed the specialist use of the term by emergentist and constructionist researchers

(Elman *et al.*, 1996; Bybee and Hopper, 2001). However, with the broader meaning of ‘the online attempt to understand streams of input’, it is generally thought to play an active role in learning, from a wide range of different perspectives. Within non-emergentist views, Carroll’s (2001) Autonomous Induction Theory proposes that one driver of learning is when online parsing fails. Within the Full Access to UG view (see Chapter 3), Ionin *et al.* (2008) and Schwartz and Sprouse (1994, 1996) propose the resetting of parameters occurs when the learner fails to assign a representation to the input within their current grammar. VanPatten’s **Input Processing Theory** claims that learning requires form-meaning connections to be made during online processing.

In this part of the chapter, we present two further theories linked to ‘processing’: Processability Theory (Pienemann) and the Efficiency-Driven Processor (O’Grady). Both are concerned with relationships among the nature of language, human processing constraints and learning phenomena. One major difference between them is that in Pienemann’s framework language and processing are separate systems, whereas O’Grady proposes that language itself derives its structure from the need for efficiency during comprehension. However, what brings them together in this section of the book is the notion that the development of the second language is influenced by the nature of internal processing.

A central question for the transition theories reviewed in this chapter is how learners are able to process increasingly complex language. Perhaps, better comprehension, due to improving lexical storage and access, may release attentional resources to establish new representations of morphosyntax (Bates and Goodman, 1997; Thordardottir *et al.*, 2002). Perhaps, once a prototypical construction is established, implicit tallying of occurrences in the input may occur, in line with accounts of data-driven learning (N.C. Ellis, 2002; Robinson, 1995; Schmidt, 2001). Perhaps, as sentences become easier to understand, communicatively redundant forms are more likely to be processed (Sagarra, 2008; VanPatten, 2004). Overall, there is good evidence for the general notion that what has been learned affects what can be processed (Corder, 1978; Gass, 1988).

Here, we have chosen to review two processing-related theories which address in different ways this idea that learning is shaped by what learners can process. They share with the theories discussed in Section 4.2 the assumption that language learning is implicit, hence their inclusion in this chapter.

4.3.1 Processability Theory

Processability Theory (Pienemann, 1998, 2003, 2005, 2010; Pienemann and Kessler, 2011) claims we need to use both a theory of grammar and a processing component in order to understand L2 acquisition. However, the theory focuses on the acquisition of the procedural skills required for processing the formal properties of second languages. The theory of grammar used in the theory is Lexical Functional Grammar (LFG: Kaplan and Bresnan, 1982). Unlike UG, LFG

SECOND LANGUAGE LEARNING THEORIES

is a theory of grammar which attempts to represent both linguistic knowledge and language processing within the same framework. Consequently, LFG aims to be psychologically plausible, that is, to be in line with the cognitive features of language processing.

Processability Theory aims to clarify how learners acquire the computational mechanisms which operate on the linguistic knowledge they construct.

Pienemann believes that language acquisition itself is the gradual acquisition of these computational mechanisms, that is, the procedural skills necessary for the processing of language. It is limitations in the processing skills at the disposal of learners in the early stages of learning that prevent them from attending to some aspects of the L2.

The processing challenge facing learners within this framework is that they must learn to exchange grammatical information across elements of a sentence. (This process of sharing grammatical information is called 'feature unification' within the LFG model.)

In other words, the unification of lexical features, which is one of the main characteristics of LFG, captures a psychologically plausible process that involves (1) the identification of grammatical information in the lexical entry, (2) the temporary storage of that information and (3) its utilisation at another point in the constituent structure. (Pienemann, 1998, p. 73)

Thus, language users have to ensure that a verb and its subject have the same number feature, or that a noun and its article have the same gender, number and case features, in languages where this is appropriate. For example, the sentence **Peter walk a dogs* is ungrammatical because *walk* and *Peter* do not have the same person and number feature (third person singular), and *a* and *dogs* also do not share the same number feature. In L2 learning, the ability to match features across elements in a sentence develops gradually. The basic logic behind Processability Theory is that learners cannot access hypotheses about the L2 which they cannot process. They are claimed to have a Hypothesis Space, which develops over time according to the following hierarchy of processing resources (1998, p. 87):

- Level 1: **lemma** access; words; no sequence of constituents
- Level 2: category procedure; lexical morphemes; no exchange of information – canonical word order
- Level 3: phrasal procedure; phrasal morphemes
- Level 4: simplified S-procedure; exchange of information from internal to salient constituent
- Level 5: s-procedure; interphrasal morphemes; exchange of information between internal constituents
- Level 6: subordinate clause procedure.

Quoting Piennemann again:

The hierarchical nature of this list arises from the fact that the procedure of each lower level is a prerequisite for the functioning of the higher level: a word needs to be added to the L2 lexicon before its grammatical category can be assigned.

The grammatical category of a lemma is needed before a category procedure can be called. Only if the grammatical category of the Head phrase is assigned can the phrasal procedure be called. Only if a phrasal procedure has been completed and its value is returned can Appointment Rules determine the function of the phrase. And only if the function of the phrase has been determined can it be attached to the S-node and sentential information be stored in the S-holder. (Piennemann, 1998, p. 80)

What this means in practice is that learners will only gradually become able to share information across elements in a sentence. Initially, they will not be able to produce any structures that require the matching of L2 grammatical information using syntactic procedures, for example, to mark both nouns and articles within a noun-phrase as +feminine (until Level 3: phrasal procedure), or to match person in subject and verb (Level 4: inter-phrasal information exchange). We can represent this visually by suggesting that in the following (simplified) diagram, learners will gradually move 'up' the structure, first accessing words, then their syntactic category, then joining them in a phrase etc., all the way up the tree:

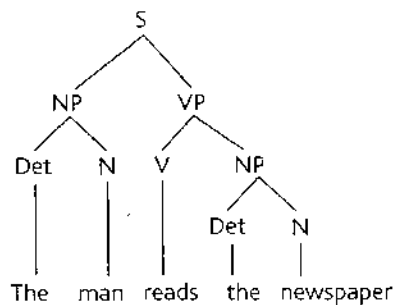


Figure 4.2 Learners gradually 'move up' the structure of a sentence

The predictions for acquisition will therefore be as follows (1998, pp. 83–6):

1. During the first stage, the learner has no syntactic information about the L2 lexical item, and is only able to map conceptual structures onto individual words and fixed phrases.
2. Once lexical items have been assigned a grammatical category, lexical morphological markers can be produced (but no grammatical information can be exchanged yet). At this stage too, because learners cannot exchange grammatical information, they will rely, for the mapping of semantic roles

SECOND LANGUAGE LEARNING THEORIES

onto surface form, on procedures which do not require this. For example, they might rely on strictly serial word order, for example agent + action + patient.

3. Phrasal procedures are developed, which enable the sharing of information at phrase level, that is, between a Head and its modifiers. No information can be exchanged yet across phrases.
4. Once phrasal procedures are present, the functional destination of phrases can be determined and phrases can be assembled into sentences, with each phrase playing a clear function within the sentence as a whole (for example, subject of S).
5. Once the syntactic information at the level of the sentence is available for processing by learners, subordinate clauses can develop.

Pienemann and his collaborators (Pienemann, 1998, 2005, 2007, 2010; Pienemann and Kessler, 2011) have applied his model to a range of developmental phenomena which have been observed in L2 acquisition, in both morphology and syntax, and across languages (Arabic, Chinese, English, German, Italian, Japanese, Spanish, Swedish, Turkish). We will review here his explanation of the well-documented acquisition of word order in German, based on the findings of the ZISA project (Zweitspracherwerb Italienischer, Spanischer und Portugiesischer Arbeiter: see Meisel *et al.*, 1981). This project worked with Italian, Spanish, Portuguese and later Turkish L1 (Clahsen and Muysken, 1986) learners of German in an untutored setting (they were all migrant workers). One of the major findings is that there is a clear developmental route in the acquisition of German word order (a complex and much studied feature of German), found in both naturalistic and classroom learners.

The developmental stages which Pienemann and his colleagues describe are as follows:

- Stage 1: Canonical Order (SVO)
Die kinder spielen mit ball (= the children play with the ball)
Learners' initial hypothesis is that German is SVO, with adverbials in sentence-final position.
- Stage 2: Adverb preposing
Da kinder spielen (= there children play)
Learners now place the adverb in sentence-initial position, but keep the SVO order (no verb-subject inversion yet).
- Stage 3: Verb separation
Aller kinder muß die pause machen (= all children must the break have)
Learners place the non-finite verbal element (here *machen*) in clause-final position.

- Stage 4: **Verb second**
Dann hat sie wieder die knoch gebracht (= then has she again the bone brought)
Learners now place the finite verb element (*hat*) in sentence-second position, resulting in verb–subject inversion.
- Stage 5: **Verb final in subordinate clauses**
Er sagte daß er nach hause kommt (= he said that he to home comes)
Learners place the finite verb (*kommt*) in clause-final position in subordinate clauses.

Processability Theory accounts for these stages as follows:

- Stage 1: **Strict SVO order.** This does not involve any feature unification and therefore corresponds to level 2 of the processing hierarchy.
- Stage 2: **Adverb preposing.** The adverb is topicalized; in line with a **saliency** principle there is still no exchange of grammatical information.
- Stage 3: **Verb separation.** For this split-verb construction to occur, both parts of the verb have to be unified, that is, the participle value of the main verb and the auxiliary entry. This exchange of information occurs across constituent boundaries. However, the non-canonical position involved is perceptually salient (it is in final position).
- Stage 4: **Verb second.** This rule involves the unification of the feature requiring inversion of the verb and its subject across V and another phrase, and cannot rely on saliency principles.
- Stage 5: **Verb final in subordinate clauses.** In the LFG framework, features of embedded clauses which distinguish them from main clauses are acquired after word order constraints in the main clause have been acquired.

We can see from the above explanation of the stages that they are due primarily to the hierarchy of processing procedures which Pienemann has outlined, in terms of the exchange of grammatical information. This is the main principle of his theory. He also relies, however, on a second principle, that of **perceptual saliency**, a concept we encountered earlier, when discussing emergentism. The feature of perceptual saliency that Pienemann resorts to in the explanation of the stages above, is that the beginning and end of stimuli are easier to remember and therefore to manipulate. This means that learners will first be able to move elements from inside the sentence to the outside, that is, to sentence-initial or -final positions, then from outside to inside, before being able to move elements within the sentence.

One further aspect of Pienemann's theory has attracted interest because of its potential pedagogical implications: his Teachability Hypothesis. Pienemann developed his Processability Theory in order to explain the well-documented

SECOND LANGUAGE LEARNING THEORIES

observation (see Chapter 2) that second language learners follow a fairly rigid route in their acquisition of certain grammatical structures. This notion of route implies that structures only become 'learnable' when the previous steps on this acquisitional path have been acquired. For Pienemann, at any given point in time, learners can only operate within their Hypothesis Space, which is constrained by the processing resources they have available to them at that time. This led him to develop his Teachability Hypothesis (Pienemann, 1984, 1987, 1989, 1998), in which he considers the pedagogical implications of the learnability/processability model, and draws precise conclusions about how some structures should be taught.

The predictions of the Teachability Hypothesis are as follows:

- stages of acquisition cannot be skipped through formal instruction
- instruction will be most beneficial if it focuses on structures from 'the next stage' (1998, p. 250).

A number of empirical studies have provided some support for this hypothesis (see Pienemann, 1998, 2010; Pienemann and Kessler, 2011 for details), but possibly its most interesting aspect is the attempt to establish a link between learning and teaching.

4.3.2 The Efficiency-Driven Processor

Over the last decade cognitive theorists have increasingly argued that language itself is shaped by general human learning capacities and limitations. They aim to provide explanations for language itself and for L1 acquisition that rest on evolutionary, biological and neurological factors, and on pragmatic principles, rather than internal linguistic constraints; see Christiansen and Chater (2008) for a review. We describe O'Grady's Efficiency-Driven Processor model as an example of one such framework.

O'Grady (2005, 2008b, 2010a) and O'Grady *et al.* (2011) present an account in which language structure arises from an efficiency-driven online linear computational processor, and in which language structure, processing and acquisition are all interdependent. His proposal aims to account for three sets of phenomena: language structure; typological differences between languages; and acquisition phenomena (both L1 and L2). O'Grady's core claim is that 'a single, efficiency driven linear computational system, not a grammar, offers the best hope of understanding why sentences have the particular properties they do ... and the best way to engage the classic problems confronting both the theory of sentence structure and the theory of sentence processing' (O'Grady, 2005, pp. 181-2).

O'Grady proposes that 'the key properties of a language's syntax reflect a neurophysiologically motivated drive for efficiency in the interests of minimizing the burden on working memory [WM]' (2005, p. 193). The

4.3 Processing-based perspectives

computational processor strives to interpret incoming language and produce outgoing language so that as little information as possible needs to be stored before it can be 'discarded', having been satisfactorily incorporated into the ongoing utterance. This is expressed as the 'Efficiency Requirement' (2005, p. 3): an increased burden is caused by having to hold on to information before its co-dependency with other elements of the sentence can be properly computed. For example, in the sentence *the girl with the dark hair laughed loudly*, the noun-phrase *the girl* needs to be kept in the working memory until we reach the verb *laughed* in order for it to be assigned a role as subject of the verb. Processing costs are caused by having to revise an interpretation and so reactivate representations within WM; by not knowing which elements of a sentence resolve a co-dependency; or by having an item left unresolved in the sentence. The computational system is driven to 'combine functors with their arguments one at a time, left to right, at the first opportunity' (p. 208).

Co-dependencies could be thought of as the 'glue' that holds a sentence together to create a meaningful proposition. Information about co-dependencies is stored within the representation for each item. The lexicon includes information about the category membership (N, V, etc.) of words and morphemes, and their combinatorial propensities. For example, the lexical entry for *drink* would, over time, come to indicate that it is a verb that can have two nominal arguments, for example a subject and a direct object, such as *he drinks red wine*:

drink: V, <N N>

The co-dependencies are resolved online via computational routines, or 'Combine and Resolve' operations. These computational routines are real-time processes, that describe how structures are built, and syntactic representations are 'just fleeting residual records of how the computational system goes about its work' (2005, p. 9). As the processor works its way through a sentence, it immediately assigns each NP an interpretation, based on available cues such as position, determiner, case marker, context, etc. The same applies to all lexical items; for example, verbs of motion look to the right for a prepositional argument (for example, *move to London*), prepositions combine with a nominal argument to the right (for example, *in the box*), copulas and auxiliaries look rightward for their first argument in *yes-no* questions. 'As these and other routines are strengthened, the morphosyntactic phenomena that they subtend become increasingly familiar' (p. 196). That is, computational routines become stronger as they prove useful, in line with the emergentist principles outlined above.

Two cognitive systems are central to the Efficiency-Driven Processor (EDP): a lexicon that draws primarily on declarative memory, and a computational system, sometimes called procedural memory (Ullman, 2001a and b, see Chapter 5), supported by working memory. This computational processor

functions innately in all normal human brains (but O'Grady does not define its nature in detail). WM is conceptualized as a pool of resources that holds representations and supports computations on those representations. The precise model of WM (see Chapter 5) is not relevant to the claims, as whatever the nature and capacity of the computational processor, holding information within WM is costly and therefore avoided.

O'Grady's model has been used to explain the structure and acquisition of a wide range of phenomena, for example voiced stops in phonology and reflexive pronouns (O'Grady, 2005); relative clauses (O'Grady, 2011; O'Grady *et al.*, 2003); quantifier scope (O'Grady *et al.*, 2009; O'Grady, 2008a); constraints on 'want + to' contractions in SLA (O'Grady *et al.*, 2008).

4.3.2.1 EDP and first language acquisition

Underlying the framework is the relatively uncontroversial statement that language acquisition is about the creation of 'mappings between form and meaning' (O'Grady, 2012, p. 117). In addition, O'Grady strives to account for the 'logical problem of language acquisition' by discussing the acquisition of language features where the input does not provide sufficient or any exemplars, and where feedback or negative evidence is rare or non-existent (see, for example, O'Grady, 2007).

For O'Grady, acquisition results from automatizing computational routines based on the information held in the lexicon about words' co-dependencies. The computational system competes for processing space with other cognitive functions; development takes place as the computational system succeeds in this competition, known as 'processing amelioration' (O'Grady, 2012, p. 116). Computational routines become strengthened and automatized at different rates, depending on their cost, and this is what results in apparent routes of development. Some well-known characteristics of L1 and L2 acquisition are accounted for by the Efficiency Requirement; for example, L1 learners omit subject-verb agreement because dependency between subject and verb can be resolved by less costly processes, such as animacy-based assumptions. Learners do not insert incorrect agreement (for example, **I likes her*) as this would overburden the processor with no evidence in the input for its necessity. Over-generalization, whereby learners produce forms like **eated*, is explained because both regular and irregular markings have the same dependencies, and therefore **eated* is no harder to process than *ate*. **Eated* is preferred because the computational routine of producing *-ed* becomes automatized, making it less costly to over-generalize than to inhibit the automatic routine (see 'entrenchment' above, and 'inhibition' in Chapter 5).

Central to the acquisition process is learning the properties of lexical items – each lexical item can only combine with other words in particular ways. For example, children learn movement of BE in yes-no questions (structure

dependency, see Chapter 3) because, for example, copula *be* in questions requires two arguments that must both come to the right, and adjectives cannot be co-indexed with *wh*-arguments. Any deviation from this, for example **Are people who rich are happy?*, does not resolve the correct co-dependencies.

A critical question is how these lexical properties are learnt. O'Grady's answer is by having to interpret sentences over and over again, and so creating probabilistic, distributional biases. That is, 'routines are thus "usage-based" to use Tomasello's term ... routines are mastered gradually, over a period of months' (O'Grady, 2005, p. 195). In line with input-based emergentism, entrenched computational routines can block or inhibit other routines developing, and this (a) constrains the likely interpretation of the input (disallowing 'wild' interpretations and productions) and (b) provides an explanation for developmental orders. So, for example, the early routine of computing NVN strings as SVO then makes other sequences that do not comply with SVO, such as passives, more difficult to acquire. Early language development is constrained by infants' WM, and as this increases between ages 4 to 10, children can produce and interpret more complex structures. To explain how computational routines are established in the first place, O'Grady refers to construction learning (above).

Apparent routes of development may emerge, yet with slightly different rates, because although there are differences between the speed of individuals' computational systems, the relative ease of each computational routine is the same for everyone. This idea, of relative ease of computation between different structural phenomena, helps explain the similarities that are observed in acquisition routes between L1 and L2 learners, though with the important exceptions laid out below.

4.3.2.2 Second language acquisition

A basic prediction is that L2 learners transfer the dominant processing routine of their first language, unless a competing routine is less costly. That is:

the preferred interpretation in the L1 will be favoured in the L2 if and only if it does not have a greater processing cost in the L2. (O'Grady *et al.*, 2009, p. 83)

Thus, SLA phenomena (initial states, developmental changes, end states) are argued to be side effects of the transfer of L1 computational routines and the emergence of new routines if they allow more efficient processing (O'Grady, 2012, pp. 127–8).

Patterns of development in L2 arise from the extra burdens imposed on the WM due to, for example, having to process a new phonological system, to segment words and morphology, to assign syntactic roles to these words and morphological forms, and to learn which arguments and co-dependencies can go with which lexical items and morphology in the L2.

4.3.2.3 Empirical research on the EDP and SLA

Researchers working in this framework seek evidence that what lies behind L2 acquisition is the drive to prevent heavy processing cost, as illustrated by the following study (O'Grady *et al.*, 2005).

Some syntactic representations follow natural or chronological order (for example, *put the crayon on the pencil*), while others do not (*tap the crayon with the pencil*). According to EDP, non-chronological structures are more costly in processing terms for the comprehension system. This idea is expressed as 'The Isomorphic Mapping Hypothesis: A non-isomorphic mapping between syntactic representations and the corresponding event increases processing difficulty' (O'Grady *et al.*, 2005, p. 454). To test the predictions of the hypothesis, O'Grady *et al.* (2005) conducted a comprehension experiment which investigated the influence of (non) isomorphism on the one hand, and frequency on the other, on learners' comprehension of simple sets of instructions in L2 English.

Table 4.3 Predicted and actual degree of difficulty based on isomorphism (source: O'Grady *et al.*, 2005, pp. 455–6)

Patterns	Frequency	Isomorphic (follows real world event order)?	Prediction	Results % correct (Korean/Japanese)
Locative (put the crayon on the pencil)	High	Yes	Easy	96.2 / 95.5
Basic instrument (tap the crayon with the pencil)	High	No	Difficult	60.8 / 28.4
Fronted instrument (with the pencil, tap the crayon)	Low	Yes	Easy	92.6 / 96.6

In this study, 47 L2 English participants (27 L1 Korean and 20 L1 Japanese) 'acted out' with props instructions like those in Table 4.3. Both groups of participants comprehended the isomorphic patterns far better than the non-isomorphic pattern, and there was also no difference in the comprehension of the two isomorphic patterns even though one is much more frequent than another.

The authors comment:

(at least) the early stages of second language acquisition are characterized by significant deficits in working memory which undermine attempts to compute indirect mappings between levels of representation, including non-isomorphic mappings between word order and the structure of the corresponding event. (O'Grady *et al.*, 2005, p. 457)

4.3.2.4 How does O'Grady's work fit with other L2 theories?

As O'Grady often notes, several aspects of his thesis are not original, such as left to right processing and the idea that lexical items must be somehow combined. He acknowledges others who have proposed that processing is the engine for acquisition (for example, Carroll, 2001; Truscott and Sharwood Smith, 2004), and he notes that Pienemann (1998) has argued that what is transferred from L1 to L2 is determined by processing constraints, although defined somewhat differently. But no previous account has aimed to cover all of: the nature of language, language typology, L1 acquisition and L2 acquisition.

Unlike strong connectionist accounts, the theory does not clearly reject the notion of symbolic representation of language, which it sees as a possible side-product of processing (O'Grady, 2012). Unlike UG accounts (see Chapter 3), the processor's constraints are physical (O'Grady, 2008a, p. 461, footnote). Although early accounts included binary branching hierarchical structures (see Chapter 3), these were to illustrate the direction of online processing during comprehension and production, rather than innate rules and representations (O'Grady, 2011). Overall, O'Grady clearly aligns his theory with associative, emergentist and constructionist principles.

4.4 Evaluation of implicit, cognitive approaches

Recent years have seen a great deal of research into the role of general, innate learning mechanisms in SLA. The methods used, as well as the questions asked, differ from research stemming directly from linguistics, or from more socially oriented approaches. However, increasing interconnections are being made between cognitive and other approaches. For example, some researchers investigate whether emergentist, constructionist and associative explanations can account for phenomena that have been previously accounted for by a UG model. Other researchers are interested in the importance of the nature of the input (for example, frequency, saliency, meaningfulness), and this underpins a great deal of the interactionist research discussed in Chapter 6.

4.4.1 The scope and achievements of research into implicit, cognitive approaches

The scope of cognitivists' research varies widely, including analyses of the input and of learners' productions, cross-linguistic experiments to identify processing constraints and computer simulations of the acquisition of discrete grammatical phenomena. Some cognitivists see their field of enquiry as being specifically the processing mechanisms and how they develop in L2 learning, but argue that we also need a property theory in order to understand the linguistic system. Others, adopting a strong emergentist view of learning, see the

SECOND LANGUAGE LEARNING THEORIES

patterns observed in language as mere by-products of the learning mechanisms – there are, in fact, no rules represented in the mind, and so these do not need to be accounted for separately. Yet other researchers see that the learning mechanisms themselves actually predetermine how language is structured and used.

There is growing evidence that form-meaning connections can be learned implicitly – vital support for the argument that learning such a complex system is possible without deduced knowledge of rules. However, much more research is needed to determine exactly what can be learned implicitly, by whom and when, and what the knowledge sources are that underpin it (UG, L1 and/or L2). Determining the type and amount of input that is necessary for implicit learning to occur presents considerable challenges for future research.

4.4.2 The view of language

As noted above, strong connectionist views do not see that language is represented symbolically in the mind. Others view language as constrained by humans' processing capacity limitations, but a processing-based view in itself does not entail one single view of the representations of language that are stored. For example, one of the processor-based theorists we reviewed (Piennemann) sees a need for a separate model of language; while another (O'Grady) does not. O'Grady's viewpoint has developed over the years, from proposing abstract symbolic representations (2005) to more strongly emergentist views that see language as an artefact of computational routines (2011), though he has consistently argued that lexical representations include information about the dependencies that are permitted for each constituent. From these processor-based perspectives, we can look forward to further testable hypotheses about other language phenomena.

Generally, emergentists believe that links between mental representations of form and meaning become stronger as these form-meaning associations keep recurring. The links become part of larger networks as connections between elements become more numerous. Language in this view is seen as a set of probabilistic patterns which become strengthened in the brain of the learner through repeated activation.

Perhaps somewhat surprisingly, work on implicit learning is often carried out in the written modality, and tested via acceptability (interpretation-based) tests (though bi-modally by O'Grady *et al.*, 2009). Aural input, oral production and real-time sentence processing research (see Chapter 5) would enhance the empirical base, given that time pressure is thought to increase the chances of eliciting implicit, automatic knowledge.

Much of the research reviewed has been done either with (semi-)artificial languages or small subsystems of real languages. This is partly due to the fact

4.4 Evaluation of implicit, cognitive approaches

that computer simulations and short laboratory experiments are only able to use well-defined samples, and also because these approaches stem from psychology where such a degree of control is common. On the one hand, this control is an advantage as researchers can eliminate 'noise' from their data, and explain cause and effect relations in learning. On the other hand, however, it is questionable how far one can isolate variables that would interact in a natural context, and therefore how far results can mirror what happens in real life with real languages.

4.4.3 The view of language learning

The approaches reviewed in this chapter claim that a central element of learning is the implicit calculation of the statistical properties of elements of language, and how they relate to meaning and function. One concern about emergentist approaches has been whether this learning of statistical distribution is simply the product of learning, rather than the actual learning mechanism itself. In this respect, emergentists are providing mounting evidence that the properties of the input, together with principles of associative learning, can predict what can be learnt easily and what will be more difficult, including morphosyntactic features. Finally, there are resemblances between general statistical learning and language learning which suggest that a general processor is responsible for linking elements of sentences together.

One of the strengths of cognitive approaches is that they are thought to be 'neurally inspired' (Ellis and Schmidt, 1997, p. 154). It is somewhat surprising, therefore, that there is not much discussion in mainstream SLA research about the precise neural make-up of statistical L2 learning. Although computer simulations of connectionist networks are used, the extent to which these actually represent neural networks is not well understood. In fact, much of the research investigating L2 learning using neurolinguistic techniques takes the view that different memory systems are involved in L1 and L2 learning, and that explicit mechanisms have a larger role in L2 learning (see Chapter 5). To some extent, this seems compatible with those arguments above (Section 4.2.2.5) that there are certain aspects of language that cannot be learned using implicit memory systems in an L2. However, most of the theories discussed in the current chapter do not specify particular memory systems involved in learning. One exception is O'Grady's framework, which relies specifically on the declarative-procedural model of memory (see Chapter 5). This model may help researchers to explain why adults are less effective than children at automatizing the kind of computational routines proposed by O'Grady. Similarly, his broadly conceived resource-limited WM may help frame investigations into how language development over time is linked to changes (that is, apparent reductions) in computational cost.

SECOND LANGUAGE LEARNING THEORIES

We further discuss the role of WM in SLA in Chapter 5, reflecting the emerging consensus that WM capacity influences L2 learning when the learner has some awareness of learning and knowledge (Roehr, 2008; Williams, 2012).

A further concern about emergentist approaches has been whether they can account for the absence of 'wild' grammars in L2 development. Recent attempts to address this are producing some promising results, with testable suggestions such as the associative learning principles of statistical pre-emption and attention blocking, and learner-internal processing limitations. L1 acquisition research has demonstrated statistical pre-emption and the effects of children's limited analyses of the input on learners' subsequent productions. These advances will hopefully feed into similar work in SLA research, and facilitate fuller accounts of L2 developmental routes, or the acquisition of highly complex linguistic phenomena.

4.4.4 The view of the language learner

'Innate cognitivists', like the linguists reviewed in Chapter 3, are concerned primarily with the individual. Although comprehension of the input, and, therefore, interaction with other speakers, is seen as critical for learning, these researchers do not view the learner first and foremost as a social being. Also, they are generally interested in the learner's mind as an implicit processor of regularities, rather than focusing on the detail of the linguistic information it contains. However, recent work has paid more attention to the language representations in the mind, using methods to elicit intuitions and implicit knowledge, such as reaction times, 'act out' tasks, acceptability judgements and semi-spontaneous oral production tasks.

The role of individual differences in the innate cognitive mechanisms discussed here requires significant research. The focus in this chapter has been on mechanisms that are thought to be innate and to drive L1 learning (as well as L2). So, such mechanisms cannot rely primarily on resources that differ between individuals, as all individuals learn a critical core of a language system. O'Grady makes it clear that his proposed computational processor in WM is constant across humans: 'The right [computational] choices will be made by any brain with a computational system sensitive to the burden on working memory, regardless of how "smart" it is' (2005, p. 206).

Nevertheless, there is some evidence that statistical learning ability is variable. So, it is tempting to ask whether an L2 learner with a more efficient processor would be less likely to transfer an L1 computational routine even when the L2 computational routine is more costly. Similarly, it is clear that adults' WM capacity is much greater than that of child L1 learners. In principle, this could undermine the claim that L2 learners will always adopt the least costly routine (be it the L1 or the L2 routine), and challenge the relevance of the Efficiency-Driven Processor for adult L2 learning. A related issue is how far

4.4 Evaluation of implicit, cognitive approaches

these theorists see their proposed learning mechanisms interfacing with the more explicit learning mechanisms available to adult learners, discussed in Chapter 5.

The cognitivists' view of language learning has significant relevance to classroom research. Classroom activities can be manipulated to increase input frequency and to make certain features and co-dependencies salient. Studies investigating the input characteristics that make learning more likely can already inform the design of classroom interventions; and in the longer term, findings about the relative difficulty of particular features and computational routines could inform curriculum and assessment decisions.

We can look forward to a great deal more research testing cognitive theories of implicit and associative learning. In particular, collaboration with researchers from linguistic perspectives is needed to challenge cognitive researchers to identify and explain L2 learning phenomena that cannot be explained purely by L1 transfer, or by input characteristics such as frequency, salience or redundancy.

5 Cognitive approaches (2): the role of memory systems and conscious learning

In contrast to the main thrust of most of the constructionist, statistical and implicit learning research reviewed in the previous chapter, we now turn to perspectives which set out to demonstrate that different learning mechanisms are central to L2 learning from those central to L1 learning. Once again, a variety of perspectives is covered. Some theorists use models of memory and sentence processing in order to describe and explain L2 phenomena; others argue that certain mechanisms, such as information processing and attention, are essential for at least some aspects of L2 learning; and yet others argue that particular functions are beneficial in some way, such as awareness and larger working memory capacities.

Several theories propose that L1 and L2 learning tap into different mechanisms and knowledge bases, and they are not all cognitively inspired. For example, the recent reformulation of the Fundamental Difference Hypothesis (Bley-Vroman, 2009) proposes that UG-constraints and full 'grammar-driven processing' no longer work in the same way in L2 learning, though they remain available to some extent. He argues that general 'data-driven learning' and 'rough-and-ready shallow processing' (p. 193) take on a much greater role in L2 learning, though they also operate in a minor way in L1. In Chapter 3 we met proposals that some aspects of L2 learning are constrained by UG, but certain parts of UG are not operational in L2 learning and so general cognitive architecture, such as associative learning, must also be relied on, in common with the emergentist theorists we have reviewed in Chapter 4. However, we have not yet discussed some key mechanisms that are thought to be central to L2 learning, but little used, if at all, by infants acquiring the complex grammatical systems of their L1: particular memory systems; explicit knowledge about language; skill acquisition; and conscious attention to language form. These are the foci of the current chapter.

As a starting point, however, we must first of all outline a dichotomy used in much of this research. This is the belief that two different types of knowledge underpin human learning: **declarative knowledge** (that is, knowledge that something is the case, also often referred to as explicit or conscious knowledge, or, in the case of language, as metalinguistic knowledge or awareness) and **procedural knowledge** (that is, knowledge how to do something, also sometimes called implicit knowledge, a concept dealt with in Chapter 4, though within a different framework). Let us illustrate: if you are learning to drive a car, for example, you will be told that if the engine is revving too much, you need to change to a higher gear; you will also be told how to change gear. In the

5.1 Memory systems and their role in L2 learning

early stages of learning to drive, however, knowing that (declarative knowledge) you have to do this does not necessarily mean that you know how (procedural knowledge) to do it quickly, successfully or reliably. An example from language learning is a learner who has declarative (or metalinguistic) knowledge of a word or a rule, for example the different uses of *por* and *para* in Spanish, or that you need to add an *-s* to third person singular verbs in the present tense in English. But the same learner might not be able to use *por* or *para* consistently, or produce *-s* in conversation in real time. This is said to be because this learner possesses declarative knowledge, but has not proceduralized that knowledge. Conversely, it is possible for someone to have procedural knowledge and so use the forms reliably, and without awareness, but have no declarative knowledge of them. This situation is easy to imagine for a native speaker who has never been taught about their language system.

In this chapter we see how these labels are used in L2 theorizing, and how they relate to awareness, memory and learning. We begin by describing the work of neurolinguists and psycholinguists who investigate the memory systems that are thought to underlie learning, the differences in online processing of morphosyntax in L1 and L2 learning, and whether this can explain some of the differences and similarities between them.

5.1 Memory systems and their role in L2 learning

The idea that different memory systems are involved in learning, and that they work with different types of knowledge which may or may not interact, is at the root of various L2 models or hypotheses (such as: the Declarative/Procedural model of memory; the Shallow Structure Hypothesis; Implicit/Explicit learning; Information Processing and Skill Acquisition, and, indeed, O'Grady's model that we met in Chapter 4). We now review how this idea is presented in research.

5.1.1 The role of biologically driven changes in memory and learning systems

Memory is central to learning, for establishing, storing, representing and accessing representations during online processing. The existence and nature of different memory systems are supported by a considerable research tradition in cognitive psychology, and over the last 20 years these ideas have been applied to SLA theories to explain differences in learning speed and success at different ages. Some researchers investigate how 'procedural' vs. 'declarative' memory systems are involved in SLA. For example, Paradis (1994, 2004, 2009) makes the following assumptions:

- (a) The declarative memory system is used to learn declarative knowledge, and procedural knowledge is learned within the procedural memory system.

SECOND LANGUAGE LEARNING THEORIES

- (b) All declarative knowledge is explicit (with awareness), and it is subserved by declarative memory. Procedural knowledge is implicit (without awareness) and is subserved by procedural memory.
- (c) There is no communication between these two memory systems. One system cannot process data from the other.
- (d) Children learn language implicitly as a proceduralized, automated skill, whereas adults learn language through the declarative memory system.
- (e) Explicit knowledge cannot 'become' implicit knowledge. The two develop independently of each other. An initial, heavy reliance on metalinguistic knowledge stored in the declarative system will gradually be replaced by a heavier reliance on the procedural system, following extensive practice. However, this re-balancing does not, necessarily, entail the loss of the declarative knowledge, which may remain available once the procedural knowledge has developed.

A related model is put forward by Ullman, who draws evidence from L1 learning and language disordered populations (Ullman, 2001b, 2004) and L2 learning (Ullman, 2001a, 2005, 2006). He also distinguishes between the declarative and procedural (DP) memory systems, providing a detailed account of their neuroanatomy. Key underlying assumptions are:

- (a) The rule-governed aspects of language, including both syntax and morphology, are supported by the procedural system, as well as skill learning such as driving a car. Item-based aspects, such as the lexicon and lexicalized stretches of language learnt as a whole, for example 'how are you?', are supported by the declarative system.
- (b) The declarative memory underpins declarative knowledge, defined more broadly (than by Paradis, for example) to include both explicit and implicit knowledge and learning (that is, we might learn new words implicitly, but they would still belong to our declarative memory store). The procedural memory system in his view is one of several systems that underlie different types of implicit knowledge.
- (c) The declarative system is quick to learn; the procedural system is slower.
- (d) These two systems work both collaboratively and in competition with one another. That is, deficits in one system will increase reliance on the other system, and vice versa.
- (e) The two memory systems interact; for example, procedural memory can use information stored in declarative memory. For L2 learning this predicts that some types of declarative knowledge can influence the representations stored in procedural memory. It also means that procedural memory can influence declarative knowledge, and will sometimes be accessible to

5.1 Memory systems and their role in L2 learning

consciousness. For example, learners might bring procedural knowledge into consciousness, and then analyse it: so, a learner who produces *how are you* as a lexicalized chunk might extract its components when establishing the rules for question formation in English.

- (f) L2 processing can become automatized and stored in the procedural memory system, and therefore potentially become L1-like, though this requires either sufficient practice or sufficiently early acquisition, and is dependent on an 'individual's intrinsic procedural learning abilities' (Ullman, 2006, p. 100).
- (g) Children rely more on their procedural memories than adults. This reliance tails off during adolescence due to hormonal changes, and the declarative system is gradually used more (Ullman, 2006, p. 99). Children and adults use both systems when learning language, but as the age of acquisition increases there is an increasing reliance on the declarative system for processing vocabulary, morphology and syntax. Evidence for this comes from neuroimaging and Event Related Potential studies showing few differences between L1 and L2 speakers in lexical processing (recall that L1 vocabulary learning is thought to depend largely on the declarative system), but more significant differences in grammar processing. However, individual differences in declarative memory abilities mean that not all L2 learners can make effective use of explicit rules, and sole reliance on the declarative system cannot lead to entirely L1-like proficiency.

This reliance on the declarative system is thought to predict a greater reliance on stored lexicalized chunks in L2 learning and a heightened sensitivity to frequency in the input. For example, some researchers have used priming and neurolinguistic techniques to investigate how far adult L2 learners rely on declarative vs. procedural knowledge when acquiring regular past-tense marking in German and English. L2 learners have been shown to store these forms holistically (that is, as a single word; for example, *polished*), more than L1 speakers, who tend to store low-frequency regular verbs compositionally, that is, as a verb stem + ending: *polish+ed* (Gor, 2010). This evidence has been used to suggest that L2 learners rely more on the declarative system. However, findings are not clear cut, with some studies suggesting that high proficiency learners are no more likely to store 'verb+ending' holistically than L1 speakers.

Ullman's DP model is drawn upon by a range of L2 researchers (whereas rather less reference is made in empirical studies to Paradis' model). Here we describe one research agenda that is strongly influenced by Ullman's model, focusing on morphology and syntax in online L2 sentence processing.

5.1.2 Online L2 processing of morphosyntax

The observation that L2 learners often do not process grammatical form when trying to comprehend sentences is not new and various explanations have

SECOND LANGUAGE LEARNING THEORIES

been put forward. Swain (1995) has argued that this is due to tensions between semantic and syntactic processing; other researchers (for example, Gass, 1997; VanPatten, 2004) say that L2 learners process language for communication, for which many grammatical forms are redundant (see Chapter 4). Recent studies using methodologies such as self-paced reading (Jiang, 2004, 2007), ERPs (Chen *et al.*, 2007) and eye-tracking (Grüter *et al.*, 2012; Lew-Williams and Fernald, 2010) suggest that L2 learners are less sensitive to inflectional morphology than L1 speakers, and that the L1 and L2 processing of inflectional morphology are based on different mechanisms (see Clahsen *et al.*, 2010, for a review). The Shallow Structure Hypothesis (SSH), developed by Clahsen and Felser (2006a, 2006b), formalizes some of these differences between L1 and L2 morphosyntactic processing, and makes the following claims:

1. Children rely on syntax when processing grammar, as do adult L1 speakers (known as the 'Continuity Hypothesis'), whereas late (adult) language learners rely to a greater extent on lexical-semantic and pragmatic information and do not compute syntactic structures in the same way as L1 learners or adults.
2. The procedural memory system is partially available to late L2 learners, though primarily for 'local' morphology and not (or much less) for morphosyntactic processes which link more distant elements. For example, verb-subject agreement may be proceduralized if they are close together as in *the woman runs fast*, but not if they are far apart as in *the woman who won first prize in last year's race runs fast*. (Note: this is a more conservative view of eventual L1-like attainment than Ullman's DP model.)
3. The L1 does not significantly impact on the L2 of the learners, so that shallow syntactic processing occurs regardless of the relationship between L1 and L2.

Felser *et al.* (2003) tested the SSH by investigating how learners work out who the referent is in relative clauses in sentences such as:

The dean liked the secretary of the professor who was reading a letter.

This sentence is ambiguous as either the professor or the secretary can be the subject of *was reading a letter*. Speakers of different languages have different preferences for choosing either *the professor* or *the secretary* as subject. Felser *et al.* found that highly proficient L2 English speakers (German and Greek L1) exhibited no preference for either subject, that is, they did not transfer their L1 preference for *secretary* nor did they adopt the English preference for *professor*. Felser *et al.* concluded that this is because L2 speakers, in contrast to native speakers, tend to opt for semantic and pragmatic cues rather than computing the syntactic structure of a sentence.

However, there are numerous challenges for research into the SSH, online processing and memory systems. We mention five of these here.

5.1 Memory systems and their role in L2 learning

First, some researchers suggest that factors such as learners' L1, their working memory capacity or the verb semantics can overcome shallow processing and so allow some advanced learners to behave like adult L1 speakers (Jiang *et al.*, 2011; Havik *et al.*, 2009; Jackson, 2008). (In contrast to the SSH, Ullman's model does account for some learners being able to attain native-like procedural knowledge.)

Second, the SSH has been criticized for claiming a qualitative difference between L1 and L2 processing, whereas the difference is merely one of frequency; that is, L1 and L2 speakers all use shallow processing but L2 speakers use it more often (Sekerina and Brooks, 2006; Indefrey, 2006). A similar idea is found in Bley-Vroman's (2009) reformulated Fundamental Difference Hypothesis mentioned above.

Third, neurolinguistic evidence for L1 and L2 storage and morphosyntactic processing provides a mixed picture in terms of informing learning theory (DeKeyser, 2012a, pp. 448 and 453). Some evidence suggests that L1 and L2 morphosyntactic processing rely on the same neurolinguistic architecture, and that dissimilarities only occur when the features being processed are dissimilar in the L1 and L2 (Tokowicz and MacWhinney, 2005; Tolentino and Tokowicz, 2011).

Fourth, researchers need to address the extent to which millisecond differences in online processing or differences in brain activation reflect real differences in how the L2 is used in comprehension and production, combining online measures of processing and language use (Chen *et al.*, 2007; Roberts *et al.*, 2008; Grüter *et al.*, 2012).

Finally, it is not yet clear how improved understanding of online processing and L1/L2 memory systems actually improves our understanding of learning mechanisms themselves. For example, it remains somewhat unclear exactly 'how certain learners gain [L1-like] proficiency and begin to use their procedural networks more than other learners' (Herschensohn, 2007, p. 220). It is also unclear when, exactly, knowledge stored in the procedural memory can become accessible to conscious control: this is crucial if explicit awareness is needed for learning, as argued by some researchers (see below).

The focus of our review in this area has been morphosyntax, neglecting memory-based accounts of L1/L2 differences in other areas. In terms of vocabulary storage, the interplay between L1 and L2 is an active research area (Linck *et al.*, 2008; Sunderman and Kroll, 2006). Ullman's model of memory suggests that lexical items are learned and stored primarily using declarative memory in both L1 and L2, consistent with the observation that vocabulary learning in L2 is not prone to age effects (DeKeyser, 2012a). As the declarative memory system works with both implicit and explicit information, Ullman's model can account for incidental and, possibly, implicit vocabulary learning (Chen and Truscott, 2010).

Overall, the notion that there is a change in the way humans learn as they move from childhood to adulthood receives considerable support as an explanation for L1/L2 differences in grammatical processing. As noted in Chapter 3, for some theorists this is due to reduced access to certain features or interfaces within UG. Others suggest that it is due to a change in more general cognitive capabilities. For example, DeKeyser *et al.* (2010) argue that age influences morphosyntactic ability, and that different aptitudes have a role in this: 'younger learners learn more while relying less on aptitude; older learners learn less, and to the extent they do learn, must rely more heavily on their verbal aptitude' (p. 433). Similarly, DeKeyser *et al.* (forthcoming, cited in DeKeyser, 2012a) found that salience interacts with age, that is, older learners are more affected by salience of morphological form than younger learners. Both findings are compatible with the argument that child learners rely more heavily on implicit learning mechanisms, whereas adults rely more on explicit learning initially (see DeKeyser, 2000, 2003, 2012a and b; and Skill Acquisition Theory in Section 5.2.2). We now turn to research into defining and identifying explicit knowledge more closely, and then we explore the extent and nature of explicit learning in SLA.

5.2 Explicit knowledge, information processing and skill acquisition

5.2.1 Defining and measuring explicit knowledge

Definitions of explicit knowledge are many and varied. We provide two here:

a person can be said to have explicit knowledge when they are in a higher order state of knowing that they know something. They should be able to intentionally use this higher order knowledge to control actions, including verbal report. (Williams, 2009, p. 321)

Explicit knowledge can be accessed only with controlled effort and, thus, is typically used in tasks that allow for careful planning and monitoring ... explicit knowledge is analyzed and model-based, and thus represents consciously held insights about language. (Han and Ellis, 1998, p. 6)

The consensus is that explicit knowledge is accessible to conscious awareness, is capable of being put into words, and tends to be used when the participants do not feel under time pressure. It is also thought to be learned faster than implicit knowledge. There is some degree of agreement, though not complete, about other characteristics such as: explicit knowledge is learnable at any age, given sufficient cognitive maturity; anxiety reduces the use of explicit knowledge; it is stored as declarative knowledge; it is more inaccurate than implicit knowledge; its quality and use are more prone to individual differences such as working memory capacity; and it is more prone to decay over time than

5.2 Explicit knowledge, information processing and skill acquisition

implicit knowledge. R. Ellis (2005b) lays out some criteria for defining implicit and explicit knowledge, summarized in Table 5.1.

Table 5.1 Operationalizing the constructs of L2 implicit and explicit knowledge (source: R. Ellis, 2005b, p. 152)

Criterion	Implicit knowledge	Explicit knowledge
Degree of awareness	Response according to feel	Response using rules
Time available	Time pressure	No time pressure
Focus of attention	Primary focus on meaning	Primary focus on form
Systematicity	Consistent responses	Variable responses
Certainty	High degree of certainty in responses	Low degree of certainty in responses
Metalinguistic knowledge	Metalinguistic knowledge not required	Metalinguistic knowledge encouraged
Learnability	Early learning favoured	Late, form-focused instruction favoured

'Metalinguistic knowledge' refers to descriptions of language which can be put into words, and is a subset of 'explicit knowledge about language'. It includes any information held about language with awareness, such as word meanings, explicit grammar rules or specific memories of language use. It is a subset of 'awareness' (any fleeting conscious attention to or detection of language). Here we use the terms explicit and metalinguistic knowledge interchangeably.

As noted in Chapter 4, knowledge and learning are not necessarily the same: explicit knowledge is not always the result or cause of explicit learning, and it may also arise from implicit learning, implicit knowledge or increasing proficiency (see Roehr, 2007 for discussion). Explicit learning can be defined as 'when the learner has online awareness, formulating and testing conscious hypotheses in the course of learning' (Roehr, 2008, p. 69; see also R. Ellis, 2004, 2005b; Ellis and Loewen, 2007; R. Ellis *et al.*, 2009; Hulstijn, 2005). Section 5.2.2 examines related learning theories.

R. Ellis (2004, 2005b, 2007) has outlined the kinds of language tests that seem to tap into different types of knowledge. He hypothesized that an untimed grammaticality judgement test (where the subjects had to identify ungrammatical sentences, in their own time) and a metalanguage test (where subjects had to select the rule that best explained an error, spot examples of named grammatical features – for example, finite verb – and name grammatical parts in sentences) were likely to tap into explicit knowledge as they required awareness of a rule, were unpressured by time, focused attention on form and encouraged use of metalinguistic knowledge. Ellis found that the learners' scores on these two tests were highly positively correlated, and statistically

SECOND LANGUAGE LEARNING THEORIES

distinguishable from scores on an oral narrative and an elicited imitation test (where subjects had to repeat sentences), which are thought to tap more into implicit knowledge.

Interestingly, using the same data, R. Ellis (2006) found that particular structures had different accuracy scores, depending on whether the task elicited explicit or implicit knowledge. There was no correlation between the rank orders of scores for 17 grammatical structures on the two types of measures, further suggesting that these two types of knowledge are independent of one another.

As described above, metalinguistic knowledge has often been measured by learners' ability to correct, describe and explain errors. In a study with advanced L1 English university students of L2 German, Roehr (2007) combined measures of those abilities with a specially devised additional test, requiring learners to spot grammar patterns in L2 sentences (as in classic language aptitude tests). She argued that this test combination including 'language-analytic ability' was more highly correlated with a measure of L2 proficiency than tests of error correction or rule provision alone. On the basis of a statistical procedure called **Principal Components Analysis**, she suggests that all these abilities are components of the same construct of 'metalinguistic ability'.

So far, we have described work that uses different kinds of tests and claims that these elicit different kinds of knowledge. The relationship is, of course, not straightforward. It is likely that learners access some explicit and some implicit knowledge in all test types (R. Ellis 2002, 2005b). Williams (2009) cautions us against taking evidence of different performance on different tasks as evidence of different knowledge. It is possible that different tests require different ways of accessing the same representations of knowledge. In addition, many researchers now posit some interface between the two types of knowledge (see Roehr, 2008, for discussion). Nevertheless, the characteristics that researchers are coming to associate with the labels 'implicit knowledge' and 'explicit knowledge' are relevant to teaching and assessment.

Several roles have been suggested for metalinguistic knowledge in learning, for example that it helps the learner to:

- first notice or register a new language element, particularly for those that are not salient or essential for understanding meaning, or those whose function is also expressed by another means in the L1 or L2 (Schmidt, 1990; Terrell, 1991) (see Attention Blocking in Chapter 4)
- parse input into parts of speech, particularly for complex rules
- narrow the number of potential rules or patterns that could potentially be in operation (that is, narrow the learner's hypothesis space)
- formulate correct output which can then be analysed for its component parts

5.2 Explicit knowledge, information processing and skill acquisition

- when comprehension fails, explicitly register the problematic string in memory, or call on existing knowledge to reanalyse the input (see N.C. Ellis, 2002; MacWhinney, 1997).

Of course, just having explicit knowledge or providing learners with illustrative exemplars of pedagogical rules is insufficient to promote fluent use (R. Ellis, 2002). We now must ask how learners use explicit information to develop a language system for real-time use, and what the learning mechanisms may be. For this, we turn to models of Information Processing. Strictly speaking, Information Processing models are one example of a theory of Skill Acquisition, and here we use the terms interchangeably.

5.2.2 Theories underlying the use of explicit knowledge in learning: Skill Acquisition Theory

5.2.2.1 Description of the theory

Under this broad umbrella of information processing, three stages of learning have generally been proposed (Anderson, 1983, 1993; Altarriba and Basnight-Brown, 2009; Byrne, 1986; McLaughlin and Heredia, 1996; Shiffrin and Schneider, 1977). The terms used for each stage vary in different models, but the subtler differences need not concern us here. We outline only the key aspects of each stage.

Stage 1: Cognitive, declarative, or presentation

First, learners establish some new explicit knowledge. This includes information from a teacher, a book or an observation made by the learner themselves. For example, a description of how to play a certain tennis shot; explicit information about a language feature, such as 'an -s is required on a verb after a third person subject'; or a conscious observation about how to pronounce a word. The knowledge must include some kind of abstract description and concrete exemplars. Representations of this knowledge are temporarily activated in working memory (see Section 5.4). Maintaining and using these representations require a lot of attentional control (conscious manipulation of information, see Sections 5.3 and 5.4), and is constrained by the limited capacity of working memory.

Stage 2: Associative, procedural, or practice

In the next stage this knowledge becomes procedural knowledge, that is, the information about how to do something is put into action and the skill is performed. For example, a person first tries the new tennis shot, or a learner produces a third person singular subject plus a verb and ends the verb with -s. The proceduralization task must be constrained so that the declarative knowledge can be put into practice exactly as it was formulated. Repetition

SECOND LANGUAGE LEARNING THEORIES

activates the same processes, but 'proceduralisation can become complete after just a few trials/instances' (DeKeyser, 2007a, p. 98; 2007b, 1997). Thus, proceduralization quickly reduces demands on working memory, as the information becomes reassembled as a 'chunk', and access to it is quicker. However, knowledge at this stage is also prone to restructuring, as learners encounter difficulties with their knowledge and/or reassemble it into more efficient chunks. This can result in the apparent temporary loss of a skill, as it is reorganized and reincorporated (Altarriba and Basnight-Brown, 2009).

Stage 3: Autonomous, automatic, or production

Before proceduralized knowledge can be used reliably and quickly, a great deal of automatization has to take place. Extensive practice is needed to decrease the time required to perform the skill, the error rate, the amount of attention required, and the extent to which other tasks interfere with the skill (DeKeyser, 2007a, p. 99). Automatized knowledge is still prone to errors. However, it is difficult to change or delete such knowledge because it is now outside attentional control. An advantage of this is that it is less prone to corruption over time, and it does not require attentional resources. This means automatic processes can work in parallel, enabling clusters of complex skills to be performed simultaneously. Controlled processes are freed to deal with the integration of other skills. Simple skills must become automatic before more complex ones can be tackled, thus explaining the step-by-step nature of learning. Underlying this view of learning is the observation, made across many different kinds of cognitive skills, that performance improves rapidly after relatively little practice, in the proceduralization stage. After this, in the automatization stage, improvement slows down rather abruptly and gradually stabilizes without ever reaching a clear end point. This pattern, of fast then slow change, is frequently referred to as the power law of practice (a mathematical formula); in everyday language we might refer to this as 'a steep learning curve'. Critically, in the proceduralization stage there is a change in the nature of the knowledge as it is restructured. The automatization process is much slower, and some researchers think this is simply a quantitative 'speeding up' of access, rather than a change in nature of the knowledge.

This 'power law' underpins the proposed role for frequency in L2 learning, in several ways: the raw frequency of stimuli in the input; the frequency of learners actually attending to them; the frequency of learners accurately associating them with meaning and context; the frequency of learners using them in production (N.C. Ellis, 2002, 2006b).

An important assumption of these theories is that declarative knowledge is transferable to other contexts, skills, or tasks. In contrast, automatized knowledge is highly context- and skill-specific, and cannot easily be transferred to other tasks. DeKeyser (2007a, 2007b) suggests that automatized knowledge

5.2 Explicit knowledge, information processing and skill acquisition

does not get transferred from comprehension to production of language, for example, and some evidence for this is found by de Jong (2005). Nor would automatized knowledge transfer between speaking and writing. In its extreme form, a complete lack of transfer of proceduralized knowledge across modalities (oral/written) or modes (production/comprehension) is difficult to conceptualize, as one cannot produce meaningful language without having comprehended it at some level. But, if we refer back to Ullman's model, we see that procedural knowledge may be used by the declarative system and brought into consciousness. This would explain apparent transfer between, say, comprehension and production, though, critically, this would be via a declarative stage.

At this point it is important to note that previous applications of information processing models to L1 and L2 learning have been criticized for insisting that all knowledge starts out in declarative form. However, few, if any, current language acquisition theorists consider skill acquisition theory to be applicable to infant L1 learning. Current L2 theorists, such as DeKeyser, do not claim that skill acquisition explains all L2 phenomena or that all learning must start out as declarative knowledge; nor do they suggest that implicit learning never happens. Current descriptions acknowledge that skill acquisition theory explains only some L2 learning, for some learners, in some contexts. The assumption is that L1 and L2 learning tend to draw on different mechanisms, with L2 learning tending to rely more on general learning mechanisms that are often explicit, and L1 learning drawing more on either innate linguistic infrastructure (Chapter 3) or innate cognitive mechanisms (Chapter 4).

Skill Acquisition Theory provides accounts for at least six key SLA phenomena, as follows:

- (a) *Why some structures never seem to enter the interlanguage at all.* Given that stage 1 requires accurate and reliable declarative knowledge, structures may not become declarative knowledge if they are complex, abstract, communicatively redundant, infrequent or non-salient (DeKeyser, 2005; and see Chapter 4). Alternatively, declarative knowledge *may* have been established but had insufficient opportunity to be proceduralized, and so is never observed in production.
- (b) *Why native-like forms are used in some contexts but not others.* This variability is in line with the claims that proceduralized and automatized knowledge can be restructured and still be error prone, as well as the claim that these knowledge types are context- and skill-specific. Recall that proceduralization requires some attentional resources. Given that learners have limited attentional resources at any given time, with conflicting demands placed upon them, learners might not always have sufficient resources to access their declarative and/or procedural knowledge.

SECOND LANGUAGE LEARNING THEORIES

- (c) *Why learning is incremental (step by step)*. Recall that during the shift from declarative through to automatic processing, controlled processes are freed up gradually, to establish new declarative knowledge or deal with more complex processing.
- (d) *Why there are differences between individual learners*. The establishment of declarative knowledge is likely to be affected by individual cognitive differences, such as working memory capacity, analytical ability, general intelligence, or learning style (DeKeyser, 2003, 2005; Roehr, 2008; Ullman, 2001a).
- (e) *Why there is fossilization*. Fossilization, that is, non-native-like structures in the L2 in spite of abundant linguistic input and years of practice, is a result of declarative knowledge that is non-native-like becoming automatized. As automatized knowledge is difficult to modify, it is likely to remain in the learner's interlanguage, giving rise to a stable, though non-native-like, construction.
- (f) *Why some structures are more likely to fossilize than others*. Non-native-like declarative knowledge is more likely for some structures than others due to many factors, including: the nature of the feature (for example, complexity, frequency, saliency, relation to the L1); the number of communicative events which would actually push the learner to restructure their initial declarative knowledge (for example, failed parsing or corrective feedback, see Chapter 6). In addition, communicative contexts for particular forms are very frequent (for example, contexts that require third person *-s*). If a learner had non-native-like declarative knowledge about a highly frequent structure (for example, 'subject-verb agreement is never necessary in English'), then there is ample opportunity for the learner to proceduralize and automatize this frequently 'required', but incorrect, knowledge.

5.2.3 Empirical research linked to information processing models

L2 researchers who are interested in the role of explicit knowledge in L2 learning are, essentially, appealing to some form of skill acquisition theory. These researchers investigate the role of declarative knowledge, normally called metalinguistic or explicit knowledge in L2 research, in learning. We mention below several bodies of research that investigate this issue.

5.2.3.1 Associations between declarative knowledge and learning

Correlational studies have found significant, positive associations between learners' metalinguistic knowledge and their proficiency (see Roehr, 2006,

5.2 Explicit knowledge, information processing and skill acquisition

2008 for reviews), and Roehr (2007) found that such correlations were stronger among more proficient learners. However, as Roehr notes, correlation research cannot determine whether increasing proficiency causes improvement in metalinguistic ability, or vice versa. For that, we need studies that compare learners with high and low metalinguistic ability and examine the effects on increasing proficiency.

Researchers using think-aloud protocols, and others analysing learner–learner or learner–expert interactions, have demonstrated that learners with greater metalinguistic awareness show superior learning gains over those with less (see Section 5.3, and Chapter 8). Recall, however, that in Chapter 4 we reviewed research that set out to determine whether explicit awareness is essential. Results indicated that learning was observed even when participants did not seem to have any initial declarative knowledge of any sort. Such studies have enabled researchers to identify the situations in which skill acquisition does not seem to be applicable.

5.2.3.2 Experimental laboratory and classroom research into the role of explicit knowledge

For skill acquisition theory to be given a fair chance to be observed in action, the initial declarative knowledge must be accurate and reliable, and the subsequent practice must be tightly related to that declarative knowledge. This is difficult to operationalize with language learning in the classroom or laboratory. However, a few studies do directly relate to skill acquisition theory (de Jong, 2005; DeKeyser, 1997; Robinson, 1997a). DeKeyser's (1997) laboratory study exposed 61 adult participants to an artificial language over 11 weeks. Participants experienced three different learning conditions: comprehension practice, production practice and both types of practice. In line with skill acquisition theory, their learning of four morphological rules followed the pattern of fast proceduralization, indicated by a rapid reduction in both errors and reaction times, followed by a slow automatization stage. Also in line with skill acquisition theory was the finding that their knowledge was not transferred between the comprehension practice condition and a production test, nor vice versa. The study by de Jong and Perfetti (2011) illustrates the application of skill acquisition theory to L2 classroom research. They found that talking about the same topic three times, at increasing speeds each time, led to improved speech fluency compared to a control group that talked about three different topics. The benefits were maintained four weeks later and were transferable to another topic. The researchers argue that repeated use of particular words and sentence structures led to the proceduralization of knowledge.

A much larger body of research looks more generally at the usefulness of teaching declarative knowledge (explicit information about language form). For full accounts of this research, sometimes referred to as the focus-on-form/s

SECOND LANGUAGE LEARNING THEORIES

agenda, see Doughty and Williams (1998), Loewen (2011), Norris and Ortega (2000), Spada and Tomita (2010). Meta-analyses are increasingly frequent, although the diversity of research designs makes comparisons difficult. Overall, the consensus seems to be that explicit learning conditions result in higher scores on post tests than less explicit conditions, at least on tests that give instructed learners time to access explicit knowledge. The evidence is more mixed as to whether gains can be made, within the timeframes investigated, on tests that require free, unplanned communicative production (see R. Ellis, 2002; Marsden and Chen, 2011).

One area that remains to be fully addressed is the relative merits of whether the initial, declarative knowledge is picked out by the learner (induced) or provided by some external source such as a teacher or textbook (deduced). The advantages of deduced knowledge are its accuracy and generalizability. On the other hand, induced explicit knowledge may have greater relevance to the moment and so perhaps be more easily established in memory. For studies in which learners seemed to induce declarative knowledge, see Marsden and Chen (2011), Robinson (1997a), Sanz and Morgan-Short (2004).

Some researchers are interested in whether declarative knowledge is more likely to be proceduralized when target language forms are simple, or complex. Spada and Tomita (2010) carried out a meta-analysis of 30 ESL studies that compared metalinguistic teaching activities to implicit teaching approaches such as input floods and implicit error correction. They found that for both simple and complex structures explicit teaching was more effective, regardless of the type of test used to elicit language knowledge. However, they acknowledge difficulties with their definition of complexity. It is also difficult to know whether the explicit knowledge provided by the teachers in these classroom studies had become proceduralized or automatized by the time it was tested. So, we have to be careful in interpreting these results in terms of skill acquisition theory.

Other researchers are interested in whether explicit information about constructions is useful for classroom learners (Chapter 4, and Robinson and Ellis, 2008). For example, it may be useful to tell learners about particular prototypes, that is, best exemplars of a particular category, structure, or feature, and tell them how to break these prototypes into their constituent parts. However, research must first establish which prototypes are valid and useful (Wu, 2011) and whether constructions are accessible to conscious reflection so that learners can 'break them down'.

5.2.3.3 Learning strategies

Learning strategies are procedures undertaken by the learner to make their language learning as effective as possible. Many theories have been used to underpin work on learning strategies (Oxford, 2011a), including information processing models (such as Anderson, 1983).

5.2 Explicit knowledge, information processing and skill acquisition

The basic idea is that, first, conscious knowledge of a strategy is established, such as 'use known linguistic information to facilitate a new learning task'; 'use information in the text to guess meanings'; or 'elicit additional explanation from a teacher or peer' (O'Malley and Chamot, 1990, p. 43). Then, this strategy is put into action, practised and eventually becomes automatized. That is to say:

learning strategies are complex procedures that individuals apply to tasks; consequently, they may be represented as procedural knowledge which may be acquired through cognitive, associative, and autonomous stages of learning. As with other procedural skills at the different stages of learning, the strategies may be conscious in early stages of learning and later be performed without the person's awareness. (O'Malley and Chamot, 1990, p. 52)

Systematic instruction in learning strategies seems to be related to improved proficiency in certain language skill areas (O'Malley and Chamot, 1990).

The links between information processing theory and strategy instruction are discussed by Chamot (2005) and Oxford (2011b). However, overall, there has been relatively little engagement with learning theory from researchers interested in learning strategies. In his review of 61 learning strategy studies, Plonsky (2011) notes critically: 'Unfortunately, the lack of theory in this area has left researchers and practitioners to design studies of Strategy Instruction based largely on convenience, intuition, and/or some level of idiosyncrasy' (p. 998). Nevertheless, some of the review's findings lend broad support to certain aspects of skill acquisition theory. For example, the effect of strategy instruction among adults was much larger than among high school learners, in line with the prediction that skill acquisition is more likely to explain learning among older and more academically oriented students.

The difficulties of establishing declarative knowledge and providing sufficient proceduralization within the classroom are illustrated by Plonsky's finding that strategy instruction was much more effective in laboratory studies than classroom studies. Recall also that automatized knowledge is context-specific, and so unlikely to be observed on outcome measures that are different to the context in which the skill was learnt. Given that the objective of instruction in learning strategies is for learners to transfer strategies to other contexts, this could challenge the idea that information processing underpins strategy instruction. Another problem for applying this theory to strategies for, specifically, speaking and listening is the difficulty of establishing declarative knowledge of relevant strategies in the first place, that is, alongside ongoing speech production or comprehension; recall that this phase requires a great deal of attentional control and performance is slow (Chamot, 2005). Indeed, Plonsky (2011) found that strategy instruction for listening was not effective in the ten studies he reviewed.

SECOND LANGUAGE LEARNING THEORIES

In this section we have looked at the nature of declarative (or explicit) knowledge and the subsequent learning processes. We now move on to the role of awareness and attention in establishing a new representation of language, or a representation of explicit knowledge about language.

5.3 Awareness and attention in second language acquisition

Partly in reaction to Krashen's claims that unconscious acquisition was superior to explicit, intentional learning of rules (see Chapter 1), and partly because of potential relevance for language pedagogy, much research has investigated the role of attention and awareness in L2 learning.

5.3.1 The role of noticing (conscious awareness)

Schmidt (1990, 1994, 2001) was very influential in promoting the view that conscious registration of a form in the input is necessary for language learning to happen. The term **noticing** refers to the process of bringing some stimulus into focal attention, that is, registering its simple occurrence, whether voluntarily or involuntarily ('for example when one notices the odd spelling of a new vocabulary word', 1994, p. 17). Schmidt distinguished between different types of attention which learners might pay to language form. He reserved the terms understanding and awareness for explicit knowledge, that is, 'awareness of a rule or generalisation' (1994, p. 18). He suggested that although beneficial, understanding and awareness are not necessary. This has subsequently received some support in a study by Rosa and Leow (2004) who found that some learners had learnt to operate a rule even though they only reported noticing (conscious registration), and not understanding of a generalizable rule.

Key evidence in support of the necessity of noticing came from Schmidt's own personal diary, kept while learning Portuguese, with accompanying tapes of his own conversational development:

Journal entry, Week 21 ... I'm suddenly hearing things I never heard before, including things mentioned in class. Way back in the beginning, when we learned question words, we were told that there are alternative long and short forms like *o que* and *o que é que*, *quem* or *quem é que*. I have never heard the long forms, ever, and concluded that they were just another classroom fiction. But today, just before we left Cabo Frio, M said something to me that I didn't catch right away. It sounded like French *qu'est-ce que c'est*, only much abbreviated, approximately [kekse], which must be (*o*) *que* (*é*) *que* (*vo*)*cê* ...

Journal entry, Week 22. I just said to N *o que é que você quer*, but quickly [kekseker]. Previously, I would have said just *o que*. N didn't blink, so I guess I got it right. (Schmidt, 1990, p. 140)

5.3 Awareness and attention in second language acquisition

Schmidt commented on this data extract as follows:

In this particular case, it is very clear that these forms had been present in comprehensible input all along. *E que* variants of question words were used by my interlocutor on all the conversational tapes; 43 per cent of all question words on the first tape are of this type. I heard them and processed them for meaning from the beginning, but did not notice the form for five months. When I finally did notice the form, I began to use it. (Schmidt, 1990, p. 141)

On the basis of this kind of evidence, Schmidt argued that 'noticing is the necessary and sufficient condition for the conversion of input to intake for learning' (1994, p. 17), an idea widely referred to as the Noticing Hypothesis. The idea was applied to all aspects of language, from phonology to pragmatics (Schmidt, 1993).

Later, Schmidt modified this view to the weaker claim that 'more noticing leads to more learning' (1994, p. 18), which implies that learning without noticing is in fact possible, but that noticing is beneficial. Schmidt (2001) clarified the proposal somewhat: only the initial registration of a feature needs to be with conscious awareness. Once established in memory then implicit perception can 'activate' this pre-existing representation. This idea has been referred to elsewhere as the 'Implicit Tallying Hypothesis', whereby each subsequent occurrence of a form in the input will strengthen a representation and 'its associations will be tallied and implicitly catalogued' (N.C. Ellis, 2002, p. 174). So, although noticing may be necessary for encoding instances of language use in memory, the extraction of form/meaning relationships and subsequent (re)organization of the linguistic system can be unconscious (Robinson, 1995; Schmidt, 2001).

A debate is ongoing, however, as to whether attention with awareness is necessary, even for that initial establishment of a representation (as we saw in Chapter 4). Tomlin and Villa (1994) used the term 'detection' to describe attention that occurs without awareness, and argued that this was what was required for SLA. Robinson (1995) then suggested that a subset of detected input *is* noticed (that is, under focal attention). Additionally, he proposed that rehearsal must take place, as rehearsal allows communication between temporarily held representations and current representations in long-term memory, following Cowan (1995). A small number of studies have investigated these subtleties (Leow, 1998; Simard and Wong, 2001), but L2 research in this area has tended to centre around the key question: is noticing (that is, + awareness) essential, or just beneficial?

There is general agreement that noticing is beneficial. Many classroom studies suggest that teaching approaches that promote awareness lead to greater learning gains than approaches that do not (see Norris and Ortega, 2000; Leow, 2000). Even studies that demonstrate that implicit learning *can* happen also

SECOND LANGUAGE LEARNING THEORIES

provide indirect support for the benefits of conscious awareness. For example, Williams' (2005) study discussed in Chapter 4 found that all aware participants performed significantly better than the 'unaware' participants, as did Marsden and Chen (2011).

The debate as to whether awareness is necessary was described in Chapter 4, in the accounts of the work on implicit learning by Williams and colleagues. The evidence we reviewed suggested that it is possible to learn a generalizable form-meaning connection without awareness of it. Though recall that Hama and Leow (2010), along with other work by Leow, argued that none of their unaware participants learned and that noticing is essential.

As we saw in Chapter 4, in their study of learning of a semi-artificial language with novel articles, Leung and Williams (2011) find evidence for learning without awareness. They explain exactly what their 'unaware' learners must have noticed, and what they did not:

the participants were fully aware of (that is, they noticed) the critical phrase (for example, *ul Mary*) and its association to the entity (for example, a girl) within the event ... of a girl kissing a boy. In this sense, the participants were aware of a form-meaning relationship ... What they were not aware of was the specific relationship between [the article *ul*] and [its function] that ... was implicit within their understanding of the event. (p. 51)

5.3.2 Evidence of awareness and attention and links to learning

Evidence for the noticing hypothesis has been collected in various ways (see Mackey, 2006; Robinson *et al.*, 2012). The main approach has been to elicit first-person reports from the learners themselves about their awareness, either via diaries, tally-marking, questionnaires, or oral reports such as think-aloud protocols. These can be 'online', that is, concurrent to the actual comprehension or production process; or 'offline', at some time after the event, ranging from a fraction of a second to several weeks. The methodology clearly impacts on the nature of the data elicited, and shorter time delays and the provision of stimuli to help recall are thought to increase validity.

Of course, our interest is in whether noticing (that is + awareness) leads to learning. Using self-reports to demonstrate the link between noticing and actual learning is difficult to establish, particularly during classroom instruction. Using a battery of self-report techniques, Mackey (2006) counted the number of times a learner self-reported their awareness and tracked the link with learning. 'Noticing' was defined as when learners indicated awareness that their use of form was problematic, that the form was new to them, or that they had received corrective feedback about their non-target-like production. L2 development was defined as increases in target-like usage of the forms in oral production tasks.

5.3 Awareness and attention in second language acquisition

As Mackey points out, learners that were identified as 'aware' did not necessarily demonstrate development. And, conversely, in the control group, learning was not necessarily accompanied by noticing (Table 5.2). Noticing was associated with learning for question development but not for the other two forms tracked in this study.

Table 5.2 Learners' reports about noticing and learning (source: Mackey, 2006, p. 421)

	Group with feedback about forms ^o			Control group		
	Questions	Plurals	Past tense	Questions	Plurals	Past tense
Aware learners/total learners	12/15	10/15	5/15	1/13	2/13	1/13
Development/aware learners	9/12	5/10	1/5	3/1	0/2	3/1

Self-report procedures have been criticized because they can ongoing performance, either positively or negatively. An additional, perhaps more serious, problem is that first-person reports can only access the kind of attention that participants can actually express in words. Attention to a language feature may be so fleeting that it is immediately forgotten, or it may be such that the participant cannot or does not want to describe it. Thus, self-report studies may have a certain circularity: they document what learners are already capable of articulating, rather than those critical moments where initial awareness to some completely new feature of language is registered.

A similar issue plagues eliciting awareness after a particular learning event: how can we be sure whether the learner was aware of the L2 knowledge they demonstrated? As noted in Chapter 4, researchers are now asking participants to rate their confidence in their own responses to language test items, and to indicate whether they based their responses on 'a rule', 'memory', 'a guess' or 'intuition', with 'rule' and 'memory'-based responses indicating conscious awareness (Dienes, 2008).

5.3.3 What do learners attend to? Incidental attention to form and attention to form-meaning connections

Working on the basis that noticing is, at least, beneficial for learning, some researchers seek to determine what learners are aware of when left to their own devices, as opposed to when they are directed to a form by a teacher or textbook. This is often called 'incidental attention to form'. Researchers have often sought evidence for this in learner-learner interactions, and such studies represent an intersection between the cognitive perspectives on attention (this chapter), dialectic learning (N.C. Ellis, 2007, see Chapter 4), and socioculturally inspired approaches (see Chapter 8). Learners' self-initiated comments about

language, that is, instances of noticing, are used to document the frequency and focus of incidental, or spontaneous, attention (Park and Han, 2008; Bell, 2012). Evidence suggests that morphosyntax is attended to, though the lexicon is much more frequently attended (Williams 1999).

A long line of studies has documented the effects of 'forcing' learners to attend to a form-meaning (or form-function) connection while listening to or reading sentences (known as Processing Instruction, VanPatten, 2004). VanPatten's claim is that attending to form-meaning connections is essential for L2 learning. To test this, comparison must be made to a condition in which form-meaning connections are not essential. Evidence from classroom studies investigating this issue found that when learners' attention was not drawn to the form-meaning connection, no significant learning was observed, broadly compatible with VanPatten's claims (Marsden, 2006; Marsden and Chen, 2011). However, other, more implicit measures of learning may have obtained different results. The proposal that attending to morphosyntax and other cues in the input is in tension with attending to other things is based on the notion that attentional resources are limited or constrained in some way. We briefly examine this idea next.

5.3.4 Models of attentional resources and allocation of attention during L2 performance in production

The amount of attention that a human can allocate to different stimuli and tasks at any one time is generally thought to be constrained in some way. Two hypotheses about how attention is allocated during L2 performance have generated several empirical studies: Robinson's Cognition Hypothesis (Robinson, 2007) and Skehan's Trade-off Hypothesis (Skehan, 2009). In general, this line of research into attention aims to inform pedagogical task design to push learners to focus on, practise, and thereby improve, different dimensions of their language: accuracy, fluency, complexity, vocabulary. The Cognition Hypothesis assumes that humans have different 'pools' of attentional resources, dedicated to perceiving vs. responding, verbal coding vs. spatial coding, and modality of perception and response (following Neumann, 1987 and Wickens, 2007). Robinson suggests that poorer performance is due to competition within and interference between these pools. The Trade-off Hypothesis, on the other hand, proposes a single limited capacity and deteriorations in performance are due to limitations in capacity (Skehan and Foster, 2001). These proposals are investigated by manipulating the demands of language tasks, and measuring the effect on L2 learners' accuracy, fluency, etc. Under the Cognition Hypothesis, increasing particular task demands can focus attention in specific ways and so lead to greater control of production and improved performance on these measures; under the Trade-off Hypothesis, increasing particular task demands leads to competition between fluency, accuracy and complexity.

5.4 Working Memory and second language acquisition

Whether attention is constrained by a balance between and within several pools of resources or by a single capacity limitation, some learners appear to be better than others at actually allocating and focusing attention while using language. The system in the brain which selects what to focus attention on is known as **Working Memory**, discussed in the next section.

5.4 Working Memory and second language acquisition

Working Memory (WM) is the term used to refer to mechanisms or processes involved in the temporary storage, manipulation, and maintenance of task-relevant information during online cognitive operations, including language comprehension and production, and general learning (Miyake and Shah, 1999, p. 450). As there is general consensus that WM is used for language comprehension, and comprehension is necessary for language learning, it follows that WM is likely to have a key role in both L1 and L2 language learning. In Chapter 4, we briefly mentioned a role for WM in O'Grady's efficiency-driven processor. We are exploring its contribution to learning more fully in this chapter because researchers in this area increasingly focus on the varying capacity of WM between individuals and its contribution to language aptitude. WM is also likely to be involved in explicit learning and the use of explicit knowledge (Roehr, 2008; Williams, 2012), and recent research has explored whether WM capacity may be explicitly trainable.

5.4.1 Defining and measuring Working Memory

5.4.1.1 Models of WM used in L2 research

Baddeley and Hitch's (1974) seminal model of WM, which has evolved over nearly four decades of research, is summarized as follows by Williams (2012):

There are two essential components to the WM system. The first is concerned with the temporary storage of information; that is, short-term memory. The second is concerned with the control of that information, as required to carry out complex tasks, and the component responsible for this is variously referred to as the *Central Executive* (Baddeley, 2007) or *executive attention* (Kane *et al.*, 2007). (p. 427)

The storage component is thought to encode, store, and rehearse phonological and visual-spatial information, in two separate subcomponents known as the **phonological memory** (or phonological loop) and the visuo-spatial sketchpad. Information from different sources can be bound and held in the so-called 'episodic buffer'.

The central executive must control the distribution of attentional resources between the storage subcomponents. WM is generally thought to have a limited

SECOND LANGUAGE LEARNING THEORIES

capacity, so the central executive **must control** the focus of attention. It is responsible for attentional capacity, and is thought to be accessible, in part, to conscious awareness.

WM processes and sifts representations of information in real time, and then feeds some of this information into **long-term memory**, which stores it. Juffs and Harrington (2011), citing Baddeley (2000), describe WM as 'a bottleneck through which information has to pass in order to be stored in long-term memory' (p. 139).

The characteristics of WM that have attracted most attention in SLA research are its limited capacity (Just and Carpenter, 1992), and the way it controls attention needed to maintain focus and inhibit irrelevant information. L2 researchers have also investigated the role of the phonological loop, though not those of the visuo-spatial sketchpad or the episodic buffer.

Three comprehensive overviews of research into the role of WM in SLA are available: Juffs and Harrington (2011), Wen (2012) and Williams (2012). Interestingly, there was an equivalent surge of interest three to five years earlier in cognitive psychology (Baddeley, 2007; Baddeley *et al.*, 2009; Conway, 2005; Conway *et al.*, 2007; Gathercole, 2007). For a readable introduction from a cognitive psychologist, see Chapter 4 in Eysenck (2012).

5.4.1.2 Measuring WM capacity

Measures of WM capacity need to tap into both its storage function and its processing, computational function. Conway *et al.* (2005) provide a methodological discussion of WM measures. Here we briefly describe two approaches frequently used in SLA research.

One is a reading span task in which participants read sequences of unrelated sentences, which become increasingly longer, and then recall the final word of each sentence in order. A person's 'span' is the maximum number of sentence-final words they can recall. Walter (2004) built on this method by also asking learners to indicate the logicity of each sentence, thus focusing their attention on meaning and making it difficult for the learners to rehearse words silently to themselves. Their responses, and their reaction times, were incorporated into the final measure of reading span. This is known as 'partial span scoring' and is considered good practice for investigating the role of WM in complex cognitive tasks like reading (Juffs and Harrington, 2011). However, a serious consideration is whether the test is delivered in the L1 or the L2 (Gass and Lee, 2011). Other span tests, such as digit span tests (remembering sequences of numbers), do not require comprehension and so are probably less relevant for language-related research.

The other commonly used task is a non-word repetition task, which is used as a measure of phonological memory (Gathercole *et al.*, 1992). Participants have to

5.4 Working Memory and second language acquisition

repeat individual nonsense words of varying lengths immediately after hearing them (for example, *ballop*, *emphiforvent*). Participants with larger phonological short-term memory successfully repeat longer words. This test seems to be particularly suitable for use with young children. It is generally thought to tap into a mechanism used in word learning, and so is widely used in vocabulary learning research (Baddeley *et al.*, 1998; Gathercole, 2006). Note however that repeating non-words does not measure the rehearsal or computational functions of WM, and so is less widely used in investigations of learning syntactic or discourse level relations.

5.4.2 The role of WM in SLA

Strong correlations between general L2 proficiency and measures of WM are not very prominent in the literature (though see VanDen Noort *et al.*, 2006). This might indicate that WM only has an impact on subcomponents of proficiency, and research has indeed focused on discrete subcomponents.

One such area is L2 reading comprehension. For example, Walter (2004) found that learners with a higher L2 WM capacity were better at transferring their L1 ability to link between pronouns (termed 'structure building') when reading L2 French, and this corresponded with better reading comprehension. This advantage was more pronounced for the lower proficiency learners, leading Walter to argue that WM differentiates between learners when 'the going gets tough' (p. 332). Rai *et al.* (2011) found a subtle interplay of WM capacity, anxiety levels and the complexity of inferences to be computed while reading in L2: learners with higher WM capacity slowed down in order to maintain accurate comprehension, whereas those with lower WM capacity only slowed down under stress but this did not necessarily result in accurate comprehension.

A few studies have investigated the role of WM in online processing of syntactic relations within sentences, with mixed results. Unlike in L1, involvement of WM during L2 online processing of syntax is not observed consistently (for example, Felser and Roberts, 2007; Sagarra and Herschensohn, 2010). Juffs and Harrington (2011) conclude that the L1 plays a much more important role when processing sentences in L2, with WM playing a minor role (p. 151). Roberts' (2012) review clarifies that when participants have to make an explicit response to the sentence, a high WM capacity can lead to native-like sentence processing (for example, Dussias and Piñar, 2010). However, WM seems to have little relation to sentence processing when participants simply have to read or listen to the sentence. This is compatible with the idea that high WM capacity may be most useful when some level of awareness about the language is involved (Roehr, 2008; Williams, 2012).

In terms of noticing morphology during online processing, there is some evidence that learners with higher WM capacity are more likely to attend to communicatively redundant morphology (Sagarra, 2008). Such studies support

SECOND LANGUAGE LEARNING THEORIES

the idea that when comprehension remains effortful, WM will not be available to allocate attention to redundant morphosyntactic cues (see VanPatten, 2007, pp. 116–19).

There is considerable evidence of strong associations between WM (specifically, **phonological memory**) and L2 vocabulary learning (Speciale *et al.*, 2004). Williams and Lovatt (2003) demonstrated the role of phonological short-term memory in learning both new vocabulary and morphosyntax. However, recent cross-linguistic evidence suggests that non-alphabetic scripts in learners' L1 may reduce the reliance on the phonological loop in word learning (Hamada and Koda, 2011).

Other studies explore how WM may influence whether novel forms are learned by investigating the role of WM in interaction (see Chapter 6). In a series of studies Mackey and colleagues explore whether learners with higher WM capacity are likely to benefit more from corrective feedback during interaction. Mackey *et al.* (2002) found that higher WM capacity learners took longer than low WM participants to reflect on their output, during which they compared it with existing knowledge. They observed significant relationships between their outcome measures and WM capacity, though interestingly only in delayed test results. Mackey *et al.* (2010) found that WM capacity (measured by listening span score) was associated with just under a fifth of the amount of modified output produced by learners, showing some role for WM capacity in the uptake of feedback.

Some researchers have raised methodological issues related to WM. For example, Goo (2010) found that the think-aloud technique used to elicit data about awareness actually causes increased awareness and more rule learning among participants with high WM capacity. Révész (2012) shows that different subcomponents of WM were associated with different language sub-skills: learners with high phonological short-term memory made more gains in oral performance, whereas learners with a high reading span score were more likely to improve on a written test. She speculates, based on Skill Acquisition Theory, that different WM tests can tap into learners' ability to learn declarative or procedural knowledge (see also Wen, 2012 who calls for skill-specific WM tests). Gass and Lee (2011) present a serious methodological challenge for L2 research as they found that scores on L2 tests of WM increased with proficiency; this makes it difficult to unpick causal relations between proficiency and WM.

What is clear from this short review is that L2 researchers typically use WM in correlational designs, which limits the claims that can be made about underlying causal relationships. Although the research on attention (reviewed in the previous section) goes some way to explaining a link between WM and L2 learning, the exact mechanisms that link WM to long-term memory (that is, why and how some representations move from WM to long-term memory,

5.4 Working Memory and second language acquisition

and not others) remain to be explored (see Jones *et al.*, 2007 for one model in L1 learning).

5.4.3 Working Memory and inhibition

An emerging strand of research focuses on the role of WM in preventing a learner from being distracted, known as ‘inhibition’. The distraction may come from a range of sources, but research has tended to focus on the L1, which sometimes ‘gets in the way’ of processing the L2 (Abutalebi and Green, 2008; Sunderman and Kroll, 2009). Inhibitory control develops during childhood, stabilizes in young adulthood, and declines with aging. Bilinguals become very good at inhibiting one language when using the other, and this is thought to enhance their overall inhibitory control. For example, Bialystok, Martin and Viswanathan (2005) found that bilinguals had greater inhibitory control than monolinguals during childhood, middle age and old age (see also Bialystok, 2009).

The role of WM in inhibiting competing information for non-bilinguals, that is, adult L2 learners, is now a focus of research, but findings so far are by no means clear (Trude and Tokowickz, 2011; Gass and Lee, 2011).

Our review of the research on WM memory so far has focused on the role it plays in SLA, and on the impact of individual differences in WM capacity on performance and proficiency. The next section asks whether WM capacity is a stable feature within individuals, or whether it can be changed through training or experience.

5.4.4 Working Memory: fixed aptitude, or trainable?

Working Memory has traditionally been thought of as a ‘trait’ – a relatively fixed capacity that increases in a predictable, maturationally constrained way as children grow, stabilizing somewhere between 11 and 13 years old, and only increasing gradually thereafter until young adulthood. This view considers WM to be an individual difference, in the same way as other individual characteristics such as motivation, intelligence, aptitude etc. (Chapter 1) (Dörnyei and Skehan, 2003; Miyake and Friedman, 1998; Robinson, 2005a; Skehan, 2002; Wen, 2012). Indeed, WM viewed as a stable trait underlies a great deal of the work that has been reviewed above.

In contrast with this view are studies investigating whether WM capacity can in fact be modified with training (Eysenck, 2012; Holmes *et al.*, 2009; Klingberg, 2010; Turley-Ames and Whitfield, 2003). They have suggested that the executive component, controlling the allocation of attention, can be trained, though not the storage components. Although this work has been carried out largely with children with attention deficit disorders, its potential generalizability to SLA is an interesting new avenue for research. It is compatible with a range

of other observations that WM capacity is not fixed, such as evidence that being bilingual alters WM functioning (Bialystok); WM capacity changes with proficiency (Gass and Lee); and correlations between WM capacity, practice and experience (MacDonald and Christiansen, 2002). Indeed, several studies have failed to find clear and reliable links between L2 aptitude tests and WM tests. We must remain cautious in our interpretation of this research, however. It could be that there are aspects of WM that are fixed and others that are alterable (Juffs and Harrington, 2011, p. 157).

We can expect to see a great deal of work in this area as SLA researchers seek application of the WM construct to language teaching. A key challenge is going to be avoiding two potential circularities: one is that WM capacity predicts L2 learning and yet L2 WM capacity increases with proficiency; another is that particular measures of WM capacity may predict outcomes on only particular L2 tests. Teasing out causal relations will provide us with insights about mechanisms thought to drive, rather than reflect, L2 learning.

5.5 Evaluation of cognitive approaches (2): memory systems and conscious learning

5.5.1 The scope and achievements of research into memory systems and conscious learning

Models of memory systems are adding neurological evidence to the range of other kinds of evidence used in SLA research, and this development is shedding new light on some issues. L1/L2 differences in storage and online processing may be biologically determined in that they lead to reliance on different memory systems and learning mechanisms at different times during the life span. This could account for some of the L1/L2 differences in the rate, end state and, to some extent, what is learnt.

Skill acquisition theory and the proposed reliance on explicit knowledge and intentional learning has given us a better understanding of how learning develops over time, and why fossilized structures can be so difficult to eradicate. Researchers also make some suggestions about why characteristics of the target language affect what learners can represent as declarative knowledge. However, following our review of skill acquisition theory, one might be left wondering exactly how much practice is required for any given learner to automatize any given language feature. Indeed, one challenge for L2 skill acquisition theorists is the prediction that if accurate and reliable declarative knowledge is not established, or if opportunities for proceduralization and automatization are not sufficient, then skill acquisition is unlikely to occur. As such, few L2 studies to date have set up the ideal conditions to test skill acquisition theory. However, we anticipate this will be addressed in the future, in both laboratory and classroom contexts.

5.5 Evaluation of cognitive approaches (2)

Research into the role of WM has enhanced our understanding of SLA in a range of ways. In particular, how WM provides learners with inhibitory control has brought a new dimension to our understanding of the role of L1 transfer. This line of investigation also has potential pedagogical implications, as better inhibitory control would be predicted to lead to better learning.

Another achievement of the work on WM is its contribution to methodological challenges facing L2 researchers. So far, it has shed light on the potentially circular links between WM and specific measures of language use; the influence of WM capacity on the validity of think-aloud protocols; and the impact of response types in online sentence processing research. This work will continue to sharpen the L2 researcher's toolset.

5.5.2 The view of language

Researchers who assume that more explicit cognitive mechanisms operate in L2 than in L1 are not strongly identified with one specific model of language. For example, there is little interaction with linguists from a UG perspective, with the exception of some research into online sentence processing.

However, these researchers do refer to particular characteristics of language, such as complexity, salience, redundancy, frequency and L1-L2 similarity, and use these concepts to predict which parts of the language learners will find difficult. Generally, their assumptions are similar to those of emergentists (Chapter 4): low-frequency, complex syntax, L1-L2 differences, low perceived salience and redundancy all conspire to make certain features less likely to be incorporated in the developing system. These characteristics make it more difficult for learners to notice or understand the L2 system, critical for establishing accurate declarative knowledge. It is, therefore, important for researchers in this area to define these characteristics carefully, and we can look forward to ongoing discussion about measures of, for example, complexity and salience. Until these ideas are more clearly articulated, the approaches reviewed in this chapter are perhaps less successful at explaining specific developmental stages and routes of L2 learning than the approaches we have met so far in Chapters 3 and 4.

One of the strengths of skill acquisition theory is that it gives a good account of the development of fluency: fast proceduralization means that processes are reassembled into easily accessible routines. In turn, the step-by-step nature of learning is explained by the idea that easier skills are acquired before more complex processes. As noted above, for this we need robust definitions of 'easier' and 'more complex'. There may be some scope for adopting O'Grady's framework here (Chapter 4), as it provides a principled approach to deciding which computational routines are more likely to place a burden on WM and be less easy to integrate. Even though O'Grady's assumption is that the computational device works without consciousness, the same principles of

SECOND LANGUAGE LEARNING THEORIES

calculating computational cost may perhaps provide testable hypotheses about processing with consciousness.

Research into how attentional resources are allocated has enhanced our understanding of L2 performance. To test the different models, even more agreement is required about the measures of complexity, accuracy and fluency that are used as evidence. Recent inclusion of measures of lexical use enriches this active area of research, and longitudinal studies will further inform *learning* theory.

5.5.3 The view of language learning

We have learnt how different memory systems are available to learners: the declarative system holding and processing information that is available to conscious reflection and also information that is implicit; and the procedural system being responsible for implicit, syntactic computations. Most theorists seem to assume some interaction between these systems (in contrast to Krashen's early thinking on this, Chapter 1, and see Paradis' model). However, exactly how and when these systems interact is of interest to L2 theorists, and merits further research. This has important consequences for whether we can expect L2 learners to make use of explicit information in fluent, automatic ways (see N.C. Ellis, 2005; R. Ellis, 2002).

The facilitative role of metalinguistic knowledge and attention to language form seems to be influenced by many factors. Current applications of skill acquisition theory to L2 learning suggest that establishing accurate declarative knowledge can be heavily constrained by the learners' developmental stage and age; the extent of L1/L2 similarity; type of instruction; individual differences such as use of learning strategies or WM capacity; and requirements of different tests. This situation is all too familiar to L2 learners and teachers. Because of these constraints, current skill acquisition theory seems to predict that, generally, SLA will be successful for learners in instructed contexts because accurate and generalizable declarative knowledge is available (DeKeyser, 2007a and b). It predicts that language features that can be described easily are most likely to be represented as declarative knowledge. Finally, it predicts success among those well equipped to pick up declarative knowledge and to use controlled attention to proceduralize it, often adults and those with high 'central executive' functioning in WM.

5.5.4 The view of the language learner

Perspectives in this chapter place great importance on individual cognitive differences between language learners. They explain L1/L2 differences in rates of learning and the nature of L2 fossilization by the fact that people have different declarative, procedural, and WM memory capacities. As L2 learning is thought to rely heavily on explicit mechanisms, it is subject to limitations such as an

5.5 Evaluation of cognitive approaches (2)

individual's aptitude and analytical ability. We have a growing body of evidence that learners with higher WM capacities are more likely to attend to and learn vocabulary and morphology. The influence of WM capacity on online processing of syntax is less clear and warrants further investigation.

Although, previously, skill acquisition approaches have tended to view learners as individual 'problem solvers' and 'processors of information', rather than as 'social beings', the current work investigating the role of WM during interaction is opening up new avenues between cognitivists and interaction researchers (Chapter 6). This is an interesting development that shows much promise.

Finally, the notion of limited online cognitive processing is absolutely central to most, if not all, the theories discussed in this chapter. Even where models of attentional resources and memory differ, theorists seem to agree that some kinds of constraint operate on what can be attended to, held in memory and processed for meaning at any one time. Further investigations into the nature of these constraints are likely to prove fruitful.

6 | Interaction in second language learning

6.1 Introduction

We do not need research to tell us that using a language is beneficial for learning it. On the other hand, we have seen that one of the fundamental challenges in second language learning research is to explain why learners commonly show continuing difficulty in learning features of the second language to which they are regularly exposed during L2 interaction. For example in Chapter 1 we encountered Patty, the learner of L2 English studied longitudinally by Lardiere (2007), and saw how despite many years' residence in the USA, she was not a consistent user of some common morphosyntactic features of English, such as simple past *-ed*. As we saw in Chapter 2, this problem has attracted research attention from the earliest period of systematic second language learning research. In that chapter, we introduced and explained some early thinking on this issue, in the shape of the **Input Hypothesis** (Krashen, 1982, 1985), and early versions of the Interaction Hypothesis (Long, 1981, 1983a, 1983b).

As we noted in Chapter 2, Krashen's key idea was that 'comprehensible input' is not only necessary, but sufficient, for second language learning to take place. According to the Input Hypothesis, if input is understood, and there is enough of it, the necessary grammar is automatically provided and acquired via a Language Acquisition Device (Krashen, 1985, p. 2).

The first version of Long's Interaction Hypothesis shared the underlying assumptions of Krashen regarding the existence of some form of distinctive language acquisition mechanism, but shifted attention from comprehensible input, as a means of stimulating acquisition, towards more interactive aspects of second language discourse. Long argued that for learners to obtain L2 input at an appropriate level of difficulty for their particular individual needs (that is, to maximize the comprehensibility of L2 input), it was likely that ongoing conversational adjustments would be needed. Long's early research showed that native speaker–non-native speaker interactions when performing tasks such as informal conversation or game-playing were rich in meaning negotiations, including repetitions, confirmation checks or clarification requests. Long argued that these adjustments made L2 speech more comprehensible, and thus increased its usefulness for L2 acquisition (1985, p. 378); a number of laboratory-based studies in which learners undertook oral problem-solving tasks, with and without various forms of meaning negotiation, provided evidence showing that negotiation of meaning did indeed lead to greater problem-solving success (for example Pica *et al.*, 1987; Gass and Varonis, 1994).

In this chapter, we concentrate on more recent research which has continued to tease out the relationship between L2 interaction and L2 acquisition, while drawing increasingly on concepts from cognitive learning theory and language processing theory rather than Krashen's 'black box' LAD, to explain learners' successes and failures. As is evident from many recent collected volumes, reviews and research syntheses (for example Mackey, 2007a; Mackey and Polio, 2009; Sheen and Lyster, 2010; Mackey *et al.*, 2012), the 'interactive approach' remains a very active strand of research, with mounting evidence concerning particular ways in which interaction can promote second language learning. In following sections we first of all investigate the theoretical 'relaunch' of the Interaction Hypothesis during the 1990s. We will see that the Interaction Hypothesis has been tested with respect to a range of L2 target structures (for example English questions, English past tense and aspects of the English article system); and that different researchers have highlighted different aspects of the interaction process. Thus some researchers have followed up Long's interest in the negotiation of meaning, and explored its impact on acquisition. A large group of researchers has pursued the influence of different kinds of interlocutor feedback on learning; here, we will investigate in particular studies of the role of **recasts**, and of **prompts** in L2 interaction, and their influence on acquisition.

Complementing the Interaction Hypothesis, Swain proposed the so-called **Output Hypothesis**, arguing that learners' own productions during L2 interaction played an important role in promoting noticing and intake of new language (Swain, 1985, 1995). While Swain herself has changed her own research direction somewhat (see Chapter 8 for an account of her later engagement with sociocultural theory), other researchers have continued to pursue this idea and explore the impact on acquisition of elicited self-corrections, for example (see Shehadeh, 2002; Izumi, 2002, 2003; and the work of Lyster and collaborators, reviewed in Lyster and Saito, 2010).

Regarding the puzzle as to why interaction is not uniformly effective in promoting L2 acquisition, researchers have pursued a number of ideas, which will also be reviewed below. First, researchers have debated whether L2 learners are in most need of positive evidence regarding linguistic features of the L2 (that is, examples made naturally available through interaction), or whether they also need negative evidence (that is, some form of implicit or explicit correction), which alerts them to problems within their own interlanguage grammar, when compared with the L2 target. Second, researchers have investigated the 'learnability' of different language structures through concentrated oral interaction activities (for example R. Ellis, 2007; Jeon, 2007; McDonough, 2007), and shown that some L2 structures can be acquired more quickly than others, over relatively short periods. Similarly, others have compared the learnability through interaction of vocabulary vs. grammar (for example Egi, 2007a). Third, researchers have tried to explore the extent to which learners actually pay

attention to linguistic features during meaning-focused interaction, and in particular how far they notice mismatches between their own productions and the models and corrective feedback which interaction makes available to them (for example, Mackey, 2006). And finally, in line with the overall cognitive orientation of more recent interactionist research, researchers have looked at a number of cognitive traits and how these may influence individual learners' ability to benefit from L2 interaction; the traits examined include working memory capacity, analytic ability and powers of attention (for example, Trofimovich *et al.*, 2007), as well as learners' age (Oliver, 2000). (There is little concern in this particular research tradition with learner identity, social characteristics or particular sociocultural contexts, including instructional ones, with very few exceptions: Ross-Feldman, 2007). These gaps are increasingly noticed in commentaries on the interactionist approach: for example, see Ellis and Sheen, 2006.

6.2 The revised Interaction Hypothesis (Long, 1996): an appeal to cognitive theory

The original version of Long's Interaction Hypothesis sparked a body of controlled and semi-controlled studies which explored whether engagement in meaning negotiations could be shown to make L2 input more comprehensible to the learner. For example, Pica *et al.* (1987) reported a study in which groups of L2 learners listened to different versions of a script instructing them to place coloured cut-out figures on a landscape picture, and tried to complete the task. In one condition the learners had to follow the instructions without any additional help. In another version, they were encouraged to ask for clarifications etc. from the person reading the script. The researchers coded the resulting meaning negotiations using the **speech act** categories of confirmation checks, clarification requests and comprehension checks; examples of these interactional modifications as defined by Pica *et al.* (1987) are shown in Table 6.1. The researchers found that most of the negotiations took place around content words, and did not have the effect of simplifying the grammar used by the speakers. Nonetheless, the learners who were permitted to take part in meaning negotiation were more successful than the others in completing the task accurately; from this, Pica *et al.* concluded that interactional modifications were indeed helpful in promoting L2 comprehension.

Long (1985) had also argued for a research agenda investigating whether interactional modifications could be shown to promote L2 acquisition in addition to L2 comprehension. In his later reformulation of the Interaction Hypothesis (1996), which has strongly influenced interactionist research since the late 1990s, Long placed much more emphasis on how these processes might work, proposing links between features of input and the linguistic environment with 'learner-internal factors' (that is, a set of cognitive factors: 1996, p. 454).

6.3 Interaction and the learning of target L2 structures and vocabulary

Table 6.1 Examples of interactional modifications in NS conversations (source: Pica *et al.*, 1987, p. 740)

NS	NNS
And right on the roof of the truck place the duck. The duck.	I to take it? <i>Dog?*</i>
Duck.	Duck.
It's yellow and it's a small animal. It has two feet.	<i>I put where it?***</i>
You take the duck and put it on top of the truck. <i>Do you see the duck***</i>	<i>Duck?*</i>
Year. Quack, quack, quack. That one. The one that makes that sound.	Ah yes, I see in the – in the head of him.
OK. <i>See?***</i>	<i>Put what?***</i>
OK. Put him on top of the truck.	<i>Truck?*</i>
The bus. Where the boy is.	Ah yes.

* confirmation checks; ** clarification requests; *** comprehension checks

Long's 1996 version of the Interaction Hypothesis reads as follows:

It is proposed that environmental contributions to acquisition are mediated by selective attention and the learner's developing L2 processing capacity, and that these resources are brought together most usefully, although not exclusively, during *negotiation for meaning*. Negative feedback obtained during negotiation work or elsewhere may be facilitative of L2 development, at least for vocabulary, morphology and language-specific syntax, and essential for learning certain specifiable L1-L2 contrasts. (1996, p. 414)

This revised version of the Hypothesis highlights the possible contribution to L2 learning of negative evidence as to the structure of the target language, derivable from the input received by the learner (here referred to as 'environmental' language). It also highlights the attempt to clarify the processes by which input becomes intake, through introducing the notion of selective attention and L2 processing capacity. These and other cognitive concepts are repeatedly referred to in current discussions of interaction and its contribution to language development (see for example Izumi, 2003; Trofimovich *et al.*, 2007; N.C. Ellis, 2009).

6.3 Interaction and the learning of target L2 structures and vocabulary

In this section, we examine how far the interactionist approach has succeeded in showing that engagement in interaction does promote L2 acquisition.

SECOND LANGUAGE LEARNING THEORIES

Empirical research on this issue has included descriptive studies, which have tried to trace whether learners either reuse L2 vocabulary or structures which have been the object of some kind of negotiation, or recall these at a later time. For example, Oliver (2000) investigated naturally occurring teacher–student interaction, and documented (a) the overall frequency of negotiations and corrective feedback with learners of different ages, and (b) the extent to which learners showed **uptake** of the language points at issue. The following example shows a child L2 learner who corrects herself following a teacher recast and produces **modified output** (the essence of uptake), in the shape of a plural marker on the noun:

Teacher	What did you do in the garden?
NNS student (child)	Mm, cut the tree
Teacher	You cut the trees. Were they big trees or were they little bushes?
NNS student (child)	Big trees

(Oliver, 2000, p. 140)

However, from a cognitive/linguistic perspective, there are some difficulties in interpreting this type of immediate, spontaneous self-correction. It could have a number of causes (for example in this case is the child learning and applying a rule for plural *-s*? or imitating a global phrase *big trees*?), and evidence of longer term retention is lacking. (For example, see Gass, 2003, for fuller discussion.) Interactionists have therefore frequently turned to experimental research designs to investigate the issue in a more controlled manner, targeting particular L2 structures thought to be relevant to the learner group in the study, running **pre-tests** to document how well the structure(s) were known, providing some form of structured interactive experience as the experimental '**treatment**', and then running one or more **post-tests** in addition to the interactive experience, to document any additional learning.

In one of the first substantial studies of this type, Mackey (1999) set out to test whether opportunities to interact and negotiate for meaning would boost the knowledge of question forms among learners of English as a second language. Question forms were selected as the syntactic focus of the study, for a number of reasons. They are readily elicited, and are present in some form at all stages of learning; in addition, their acquisition has been well studied, and the normal six-stage acquisition sequence for English question forms is known (for example, see Pienemann and Johnston, 1987). The participants in the study were lower-intermediate adult learners, who undertook a range of information-gap tasks which required them to ask and answer questions (for example story completion, spot the difference, picture sequencing). Some participants (the 'interactors') were allowed to negotiate meanings with their NS interlocutor,

6.3 Interaction and the learning of target L2 structures and vocabulary

while others were not (the 'non-interactors'); all participants carried out other tasks as pre-tests, and as post-tests.

Mackey's (1999) experimental study produced statistically significant results showing that the learners who had engaged in interaction progressed one (or more) stages in L2 question formation, while the non-interactors failed to do so. The following extract illustrates this development, in the case of one 'interactor' participant:

Pretest	55	NNS:	<i>The meal is not there?</i>	
	56	NS:	<i>No it's gone, what do you think happened?</i>	
	57	NNS:	<i>Happened? The cat?</i>	
	58	NS:	<i>Do you think the cat ate it?</i>	
	59	NNS:	<i>The meal is the is the cat's meal?</i>	
	60	NS:	<i>It's not supposed to be the cat's dinner. I don't think so.</i>	
Treatment	61	NNS:	<i>But although this, this cat have eaten it.</i>	
	4	NNS:	<i>What the animal do?</i>	
	5	NS:	<i>They aren't there, there are no bears.</i>	
	6	NNS:	<i>Your picture have this sad girl?</i>	
	7	NS:	<i>Yes, what do you have in your picture?</i>	
	8	NNS:	<i>What my picture have to make her crying? I don't know your picture.</i>	
	9	NS:	<i>Yeah ok, I mean what does your picture show? What's the sign?</i>	
	10	NNS:	<i>No sign? ... No, ok, what the mother say to the girl for her crying?</i>	
	11	NS:	<i>It's the sign 'no bears' that's making her cry. What does your sign say?</i>	
	12	NNS:	<i>The sign? Why the girl cry?</i>	
	Posttest 1		NNS:	<i>What do your picture have?</i>
	Posttest 2		NNS:	<i>What has the robber done?</i>
		NNS:	<i>Where has she gone in your picture?</i>	

(Mackey, 1999, p. 577)

In this example we see that the NNS speaker was using declarative word order with question intonation in order to ask questions during the pre-test (this is Stage 2 of the developmental sequence proposed by Pienemann and Johnston, 1987). During the treatment the learner produced WH fronting, but still with declarative word order (Stage 3). However, by the time of the second post-test (without any further ESL instruction), the learner was correctly placing an auxiliary verb in second position to WH words (Stage 5). This kind of progress was not documented for the non-interactor group.

Mackey's study thus provided some of the first experimental evidence that 'taking part in interaction can facilitate second language development' (1999,

SECOND LANGUAGE LEARNING THEORIES

p. 565). Mackey and Goo (2007) located 28 experimental studies of this type. The review of Mackey and Goo, as well as that of Keck *et al.* (2006, reviewing 14 experimental studies), reached the broad conclusion that engagement in L2 interaction impacts positively on L2 learning, as shown in statistical analysis of **effect sizes** (Cohen, 1988). However, both these surveys make it clear that once more precise questions are asked, the research conducted to date does not yet offer many definitive answers.

Most of the studies reviewed by Mackey and Goo concern the acquisition of selected aspects of L2 English (question forms, the article system, verb tense, lexis etc.). However a study by Jeon (2007) deals with the learning of L2 Korean, and will be discussed here to illustrate some of the challenges involved in interpreting the impact of interaction on acquisition of particular linguistic subsystems. Jeon worked with a group of 41 English L1 learners of Korean, and she ran an experiment in which 31 learners undertook a range of picture-description tasks. (The other 10 received no treatment and served as a control group.) This research is of special interest because the tasks were designed to 'push' the use of several different areas of Korean vocabulary and grammar:

Unfamiliar noun vocabulary	for example <i>wucheykwuk</i> , 'post office' <i>kwangtay</i> , 'clown' <i>cemcangi</i> , 'fortuneteller'
Unfamiliar action verb vocabulary	for example <i>ssiss-ta</i> , 'to wash' <i>ppwuli-ta</i> , 'to sprinkle' <i>soksaki-ta</i> , 'to whisper'
Object relative clauses (relative clauses in Korean precede the modified noun and are indicated by a verbal suffix)	<i>[namca-ka mek-nun] sakwa</i> Man-TOP eat-REL.PRE apple 'the apple which a man is eating' (TOP = topic marker, REL = relative marker, PRE = present tense)
Honorific subject-verb agreement (honorific morphology encodes relative social status of participants in a communicative event; the study focused on the honorific nominative case marker <i>-kkeyse</i> and the verbal suffix <i>-si</i>)	<i>Halapeci-kkeyse yenghwa-lul po-si-eyo</i> Grandfather-SUB.HON movie-ACC see-HON-DEC 'Grandfather watches a movie' (SUB.HON= subject honorific marker , ACC = accusative marker, HON = honorific verbal suffix, DEC = declarative sentence ender)

(after Jeon, 2007, pp. 388–90)

The tasks lasted around 45 minutes for each of the target language areas. The learners worked to solve the picture-description tasks with an NS investigator, who interacted with them, providing a mix of meaning negotiations and recasts.

6.3 Interaction and the learning of target L2 structures and vocabulary

The following example shows negotiation around an unfamiliar lexical item (in this case a clarification request, initiated by the learner):

- NS *Cemcang-nun eti isseyo?*
 'Where is a fortuneteller?'
- NNS *Cemcang?*
- NS *Cemcangi*
 'fortuneteller'
- NNS *Cemcangi mwe-eyyo?*
 'What is a fortuneteller?'
- NS *Cemcangi nun milay-lul malhyecwu-nun salam i-eyyo*
 'A fortuneteller is the person who tells you the future'

(Jeon, 2007, pp. 390–401)

All participants took part in a pre-test and two post-tests (oral production tasks in all cases); some learners who achieved high scores in the pre-test were excluded from later analysis. As expected, the learners who engaged in intensive interaction requiring use of the different linguistic areas made significant learning gains overall, while the control group did not. However, in line with some past studies, the researcher had predicted that the 'interaction' group would find the two areas of vocabulary easier to learn, and would find the two morphosyntactic areas harder to learn. This turned out not to be the case, precisely. While the 'interaction' group made most progress in the learning of action verbs (that is, in one of the vocabulary areas), they learned one of the two grammatical structures (object relative clauses) almost as well as they learned the new vocabulary, and much better than the other grammatical structure (honorific morphology).

To explain these results, Jeon suggests that high frequencies of verb use in Korean discourse may have contributed to the particularly successful learning of this vocabulary domain; and that the learners may have been 'developmentally ready' to learn object relative clauses. (A re-examination of the data showed that the learners were already able to produce subject relative clauses.)

However, with respect to the learners' poor performance on honorific morphology, Jeon remains more tentative. Perhaps honorifics are not sufficiently salient in discourse (so that learners do not pay attention to them – a processing explanation)? Perhaps they lack communicative value (a semantic explanation)? Or perhaps their socio-pragmatic value was not understood by the learners, and LI English politeness norms were blocking their use (a sociolinguistic explanation)? Jeon discusses these different possibilities, but on the available evidence, she was not able to choose among them.

It is interesting to compare the results of this particular study with the more general discussion on the effectiveness of interaction in the reviews of Keck

SECOND LANGUAGE LEARNING THEORIES

et al. (2006) and Mackey and Goo (2007). As far as Keck *et al.* could conclude, interaction is just as likely to be effective for the acquisition of lexis as for the acquisition of morphosyntax; Mackey and Goo suggest an advantage for lexis, at least in the short term, on the basis of their analysis of a larger group of studies. On the other hand, Mackey and Goo also detect some evidence that interaction may have a delayed effect on the acquisition of morphosyntax (that is, in some studies, delayed post-tests provide stronger evidence for the long-term learning of morphosyntax). However, both review teams agree that the evidence base is still small and call for longer series of experimental studies before such questions can be resolved. (In addition, the study of Jeon, 2007, clearly suggests that some areas of morphosyntax are more 'learnable' than others.)

6.4 The role of feedback

The question of whether, and how, feedback on learners' errors is useful in driving forward L2 learning is a long-standing focus of research in foreign language education, where the practical implications are very obvious (for example, see the review of an already extensive body of research, in Chaudron, 1988). The interactionist approach to second language learning research has pursued this issue, and feedback has received detailed attention within both observational and experimental studies. Useful **systematic reviews** of empirical work on feedback have been published by Russell and Spada (2006: analysis of 31 controlled studies and classroom observational studies) and by Lyster and Saito (2010: 15 classroom studies).

Research on feedback began with attempts to develop fairly descriptive taxonomies of feedback types (for example, Allwright, 1975; Chaudron, 1977). However, discussions on the value and influence of feedback have increasingly been informed by different theoretical perspectives on second language learning. As we have seen in Chapter 3, the strong generativist perspective on language acquisition takes the view that positive evidence about the language to be learned is sufficient to 'trigger' parameter setting, within a pre-existing Universal Grammar; from this point of view, corrective feedback is of limited theoretical interest and usefulness to learners (Schwartz, 1993; Truscott, 1999). However, in the later 'cognitivist' version of the Interaction Hypothesis presented above in Section 6.2, Long (1996) claims that the incorporation of forms of feedback within meaningful L2 interaction provides negative evidence which is usable by the learner, in his/her second language development. Usable in what way? Long's essential claim is that feedback involving **reformulation** of the learner's own intended utterance can assist with the 'noticing' of gaps between the learner's own L2 productions and L2 target forms, and may even be essential in overcoming aspects of L1 influence. Researchers who see second language learning as a matter of skill acquisition (discussed in Chapter 5) view feedback as making a contribution to the establishment and proceduralization of declarative

6.4 The role of feedback

knowledge (Ranta and Lyster, 2007). Those who see a role for explicit knowledge in L2 learning see **metalinguistic feedback** as one means of making explicit knowledge available in a usable form (R. Ellis, 2007, p. 358). This process is modelled by N.C. Ellis (2005, quoted in R. Ellis, 2007):

external scaffolded attention → internally motivated attention → explicit knowledge → explicit memory → implicit learning → implicit memory, automatization and abstraction.

There is little research on corrective feedback in informal social interaction, but it seems probable that the amount of corrective feedback in such contexts will be quite variable for socio-pragmatic reasons. (In a recent study, Philp *et al.*, 2010 report a relatively low rate of peer corrective feedback, in the context of informal learner–learner group work. However, a study of American students residing with host families abroad reports relatively high levels of corrective feedback, for example during mealtime interactions: Wilkinson, 2002.)

Most research on corrective feedback has been conducted with instructed learners interacting with their teachers in classroom settings, or else in controlled studies. An observational study conducted by Lyster and Ranta (1997) in four French immersion classrooms in Canadian schools documented relatively high rates of corrective feedback, and identified six typical feedback moves that the teachers made. This taxonomy has been very influential in feedback studies, and is presented below. (Examples come from Lyster and Ranta, 1997, and from Yang and Lyster, 2010.)

Explicit correction	Learner is clearly told they have made an error, and a correct reformulation is provided	S: We cut the straws into six different widths ... T: No David, I want you to use the word 'lengths'
Recast	Teacher reformulates all or part of a student utterance, minus the error	S: Well Cinderella was such an, such a simple girl that she never knew what is waiting for her T: What was waiting for her
Clarification request	Learner is asked to clarify their meaning (without any indication of the presence of an error)	S: Why does he fly to Korea last year? T: Pardon? S: Why did he fly to Korea last year?
Metalinguistic feedback	Comments, information or questions relating to the well-formedness of the learner utterance	S: I went to the train station and pick up my aunt T: Use past tense consistently S: I went to the train station and picked up my aunt

SECOND LANGUAGE LEARNING THEORIES

Elicitation	The learner is prompted to reformulate their utterance	S: Once upon a time, there lives a poor girl named Cinderella T: Once upon a time, there ... S: There lived a girl
Repetition	The teacher repeats the learner utterance, including any error(s)	S: Mrs Jones travel a lot last year T: Mrs Jones travel a lot last year? S: Mrs Jones travelled a lot last year

In this study, Lyster and Ranta examined 18 hours of naturally occurring immersion classroom talk, some of it from second language lessons and some from 'content' lessons, and coded all of the errors made by the students, the teachers' feedback moves and subsequent learner **repairs** (if any). (In this study, the only way in which the effectiveness of feedback was assessed was through its role in prompting learner repair.) The researchers found that the teachers responded in some way to over 50 per cent of the students' errors, and that recasts were much the most popular type of feedback move they used (see Table 6.2). However, the types of feedback move which were least successful in eliciting immediate student repairs were recasts and explicit corrections.

Table 6.2 Immersion teachers' feedback moves (source: Lyster and Ranta, 1997)

	T3 (n = 243)	T4 (n = 146)	T5 (n = 194)	T6 (n = 103)	Total (n = 686)
Recast	93 (39%)	96 (66%)	116 (60%)	70 (68%)	375 (55%)
Elicitation	45 (18%)	18 (12%)	26 (13%)	5 (5%)	94 (14%)
Clarification request	37 (15%)	9 (6%)	14 (7%)	13 (13%)	73 (11%)
Metalinguistic feedback	32 (13%)	3 (2%)	20 (10%)	3 (3%)	58 (8%)
Explicit correction	16 (7%)	15 (10%)	9 (5%)	10 (10%)	50 (7%)
Repetition	20 (8%)	5 (3%)	9 (5%)	2 (2%)	36 (5%)

Since the Lyster and Ranta study, there have been many further feedback studies with instructed learners. Some have focused on particular feedback types (such as recasts), and assessed their effectiveness for different types of learner, in varied settings (for example in computer-mediated communication: Sagarra, 2007), and/or for different linguistic structures (R. Ellis, 2007). Indeed, recasts have attracted most researcher attention (featuring in over half the

studies surveyed by Russell and Spada, 2006), and some, though not all, studies of recasts have shown benefits for learners from their use (for example Doughty and Varela, 1998). Other studies have compared the effectiveness of different feedback types for learning a variety of target structures (for example, Ammar and Spada, 2006; R. Ellis, 2007; Loewen and Nabei, 2007; Ammar, 2008).

The systematic reviews of Russell and Spada (2006)⁶ and of Lyster and Saito (2010) come to somewhat mixed conclusions however. Both review teams carried out statistical meta-analysis with the results of individual studies, including the calculation of mean effect sizes, and concluded that active oral feedback is generally helpful for learning compared to no oral feedback, contrary to the argument of Truscott (1999), for example. However, on the basis of ten oral studies, Russell and Spada found insufficient evidence to argue that any one particular type of oral feedback has advantages over others. Lyster and Saito analysed a different selection of 15 classroom-based experimental studies, and they conclude that recasts are demonstrably less effective for classroom learners than are prompts (a general term covering elicitations, clarification requests, and other types of feedback which encourage modified student output).

To understand these issues more clearly, we will examine a **quasi-experimental** classroom study of the learning of the English possessive determiners *his* and *her*, different aspects of which are reported by Ammar and Spada (2006) and Ammar (2008). The study was conducted in three primary school (Grade 6) classrooms in Quebec, Canada, with French L1 children learning English as L2. Possessive determiners present some learning difficulty for L1 French speakers, as they behave differently in French (where they show morphological agreement with the formal gender of the possessee noun), and in English (where they show agreement with the semantic gender of the possessor). This contrast is illustrated in the following pairs of sentences, which are identical in meaning:

- Pair 1 Le garçon joue avec sa voiture
 (possessive determiner *sa* agrees with feminine noun *voiture*)
 The boy is playing with his car
 (possessive determiner *his* agrees with male human possessor *boy*)
- Pair 2 La fille joue avec sa voiture
 (possessive determiner *sa* agrees with feminine noun *voiture*)
 The girl is playing with her car
 (possessive determiner *her* agrees with female human possessor *girl*)

The research team worked with three intact classes and their regular teachers. The teachers had been selected after a period of classroom observation, on the grounds of their observed personal preferences regarding corrective feedback. (One teacher regularly used recasts, a second used prompts, and the third

SECOND LANGUAGE LEARNING THEORIES

teacher rarely corrected students' errors in spoken English.) All of the teachers were asked to deliver a short episode of formal instruction on English possessive determiners (presentation plus controlled practice), using materials provided by the research team. Each teacher was then asked to run the same sequence of 'communicative' activities, over a four-week period (for example, information-gap activities and games, all presenting opportunities to use possessive determiners). At the same time, they were each asked to react to any student errors produced in the course of these activities by implementing a particular type of feedback. (The teacher with the existing preference for recasts was asked to use only recasts in response to student errors, the second teacher was asked to provide prompts only, and the third teacher was asked to ignore student errors.)

A range of tests including grammaticality judgement tests, oral production tests (based on pictures showing interaction among family members) and a computer-based multiple choice test were administered as pre-test, post-test and delayed post-test.

A statistical analysis of test scores was carried out, exploring relationships among the children's starting knowledge of possessive determiners, the different feedback conditions, and their learning and retention of determiners during and after the study (Ammar and Spada, 2006). The main differences in learning outcomes across the three groups are shown visually in Figure 6.1. The figure shows that both of the **experimental groups** who were receiving corrective feedback outperformed the control group, who received none, on the immediate and delayed post-tests. However, the 'prompts' group also outperformed the 'recasts' group; both sets of findings were statistically significant.

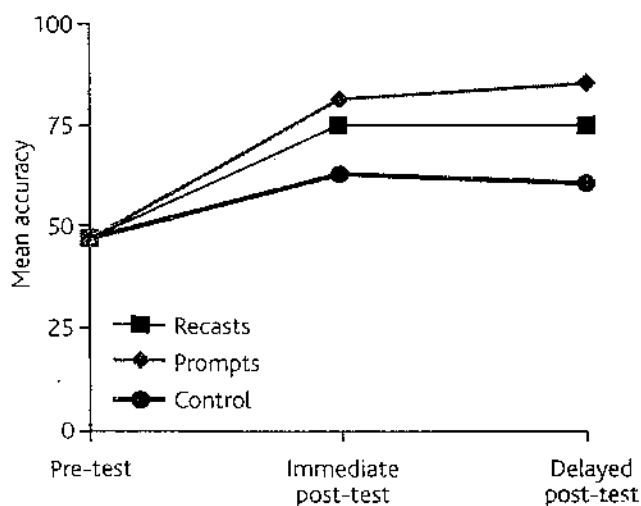


Figure 6.1 Mean accuracy of three groups on test of possessive determiners (oral picture description task) (source: Ammar and Spada, 2006, p. 558)

The three intact classes in this study achieved similar group scores on the pre-tests, and it was therefore reasonable to compare them in the different ways described above. However, within each class, there was a mix of low achieving and high achieving students (at least, in terms of their starting knowledge of possessive determiners, as shown in the pre-tests). The research team compared the learning of the 'low' and 'high' students, and the responses of these subgroups, to the different feedback treatments. Interestingly, they found that the 'high' students found feedback helpful overall, but were equally able to benefit from prompts or from recasts. (That is, there was no significant difference in achievement between the 'prompt-high' and 'recast-high' subgroups.) However, the 'low' students benefited significantly more from experiencing prompts than they did from recasts; in fact, as seen in Figure 6.2,

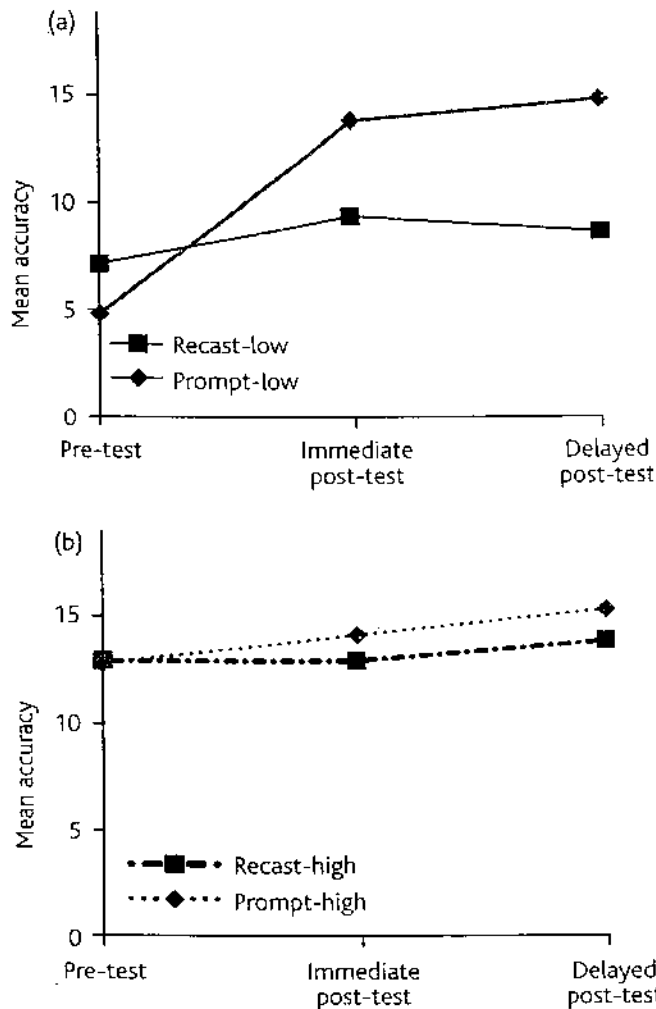


Figure 6.2 Performance of (a) 'low' and (b) 'high' students on grammaticality judgement task (written error correction task) (source: Ammar and Spada, 2006, p. 559)

SECOND LANGUAGE LEARNING THEORIES

the 'prompt-low' students succeeded in catching up with the performance of the 'high' students, on the grammaticality judgement task by the time of the delayed post-test, despite a significantly lower starting point, while the 'recast-low' students did not.

This study is an interesting example of a classroom-based quasi-experiment, which enlisted real teachers to act as research partners, and ran for four weeks, thus overcoming some of the doubts which can be raised concerning the validity of short controlled experiments (see discussion in Loewen and Nabei, 2007). Unfortunately, however, the teachers concerned were unwilling to be audio-recorded while actually teaching, and allowed only limited lesson observations, so the fine details of the treatment experienced by the students could not be documented or analysed.

Overall, the Ammar and Spada study provides confirming evidence that corrective feedback contributes helpfully to classroom communicative interaction, from the perspective of L2 acquisition (in line with the general conclusions reached by Russell and Spada, 2006 and Lyster and Saito, 2010, as we have seen). But why is it the case that recasts in particular seem to be less effective than other forms of feedback? Ellis and Sheen (2006) provide an extended critical review of research on recasts, pointing out that the concept is not clearly defined, and that the contextual factors which may impact on the usefulness of recasts are not well understood. Ammar and Spada (2006), as well as Lyster and Saito (2010), also explore in some detail the possible theoretical reasons why prompts of various kinds may be more effective than recasts.

First, the original suggestion made by Long (1996), that feedback is useful because it is a provider of negative evidence, needs more critical examination. Ellis and Sheen (2006) and also Lyster and Saito (2010) argue that recasts, in particular, are usually better interpreted as providing learners with positive evidence about target language forms. (After all, a recast consists precisely in a corrected reformulation of a poorly formed learner utterance.) Whether or not recasts also provide an element of negative evidence is dependent on learner attention and noticing, that is, whether the learner is paying attention to the detailed linguistic differences between the recast and their own production. As we shall see in Section 6.6 (and we saw in Section 5.3), this kind of attention to form cannot be taken for granted. For Lyster and Saito (2010) and others (Ammar and Spada, 2006; Ammar, 2008; R. Ellis, 2007), several other forms of feedback, such as metalinguistic feedback or different types of prompts, provide negative evidence in a purer form. This is because they draw the attention of the learner to the inadequacy of his/her utterance in conveying meaning, and/or in terms of linguistic form, without at the same time providing a correct reformulation. Thus one clear explanation offered for the apparent greater effectiveness of prompts over recasts has to do with the extent to which negative evidence is provided in a noticeable and unambiguous form.

6.5 The Output Hypothesis and the role of prompts in corrective feedback

Further theoretical explanations for the variable influence of feedback are discussed next. In Section 6.5, we explore the relationship between different feedback types, and an aspect of interaction which we have dealt with only incidentally so far: that is, learners' own target language output.

6.5 The Output Hypothesis and the role of prompts in corrective feedback

We have seen in Chapter 2 how the Output Hypothesis was put forward from the 1980s onward by the researcher Merrill Swain, arising from her work with immersion students experiencing content-based L2 French instruction in Canadian schools (Swain, 1985, 1995, 2005; Izumi, 2003).

The immersion students studied by Swain and her colleagues were exposed to French-medium instruction for extended periods of time, and achieved comprehension abilities in French L2 which were close to native speaker level. However, their productive ability lagged behind, something which Swain attributed to the fact that their classroom involvement with French mostly involved reading and listening to L2 input, without needing to speak/write in French at a high level. Swain argued that students could often succeed in comprehending L2 texts, while only partly processing them; that is, concentrating on semantic processing. She took the view that only production (that is, output) really forces L2 learners to undertake complete grammatical processing, and thus drives forward most effectively the development of L2 syntax and morphology.

The Output Hypothesis makes a number of claims about the functions of learner output in second language learning:

1. A 'noticing/triggering' function, or what might be referred to as a consciousness-raising role
2. A hypothesis-testing function
3. A metalinguistic function, or what might be referred to as its 'reflective' role.

(Swain, 1995, p. 128)

That is to say, Swain argued that the activity of producing the target language may push learners to become aware of gaps and problems in their current L2 system (no. 1); it provides them with opportunities to reflect on, discuss and analyse these problems explicitly (no. 3); and of course, it provides them with opportunities to experiment with new structures and forms (no. 2).

In her own research, Swain concentrated largely on the 'reflective' role of output and especially on the possible contribution of metalinguistic talk between peers to L2 development (for example, see Swain and Lapkin, 1995, 1998). Swain subsequently adopted a neo-Vygotskian, collaborative view of

SECOND LANGUAGE LEARNING THEORIES

second language learning, in place of the cognitive interactionist perspective focusing on the individual learner which is the focus of this chapter. Her later work on collaborative metalinguistic talk (which she now calls **linguaging**) is accordingly discussed below in Chapter 8. However, other researchers have further discussed the psycholinguistic underpinning of the Output Hypothesis (Izumi, 2003), and continue to conduct research which seeks to connect individual learners' opportunities for output more directly to their L2 development.

For example, Ellis and He (1999) and de la Fuente (2002) researched the contribution of learner output to L2 vocabulary acquisition. In the first of these experimental studies, Ellis and He worked with low-proficiency ESL learners, using a pool of unfamiliar furniture vocabulary (*lamp, cushion* etc.). All the learners carried out a design task, placing small pictures of the furniture items around the plan of an apartment, but one group received premodified instructions which they could not negotiate. A second group received the same instructions but could negotiate if meanings were not clear, while the third group were required to give instructions to an interlocutor. In this study, pre-tests and post-tests of the selected vocabulary showed that the third, 'output' group outperformed the others both receptively and productively. The de la Fuente study (2002) had a similar design, though with learners of L2 Spanish rather than English. In this case, the 'output' group of learners also outperformed the rest of the students in post-tests, as far as productive vocabulary was concerned.

The studies just quoted generally seem to show benefits arising from 'pushing' students to produce L2 output, at least as far as vocabulary is concerned. But what about the role of output in contributing to L2 morphosyntactic development? This issue has been pursued most clearly within the 'corrective feedback' strand of interactionist research, and by those researching various kinds of prompts in particular.

For example, McDonough and associates have conducted a number of larger scale experimental studies which have investigated the effectiveness of various kinds of corrective feedback (that is, prompts) in eliciting modified output, and the subsequent impact on L2 learning. In two studies reported by McDonough (2005) and McDonough and Mackey (2006), the target L2 structure investigated was once again the acquisition of question forms by Thai L1 learners of English (see Pienemann and Johnston, 1987, in Section 6.3 above). In a further study (McDonough, 2007), the target L2 structure was the simple past tense of English activity verbs (*dance, walk* etc.). To illustrate this approach, we will discuss the first of these three studies in some more detail.

In her 2005 study, McDonough worked with 60 young adult learners, all of them considered by pre-testing to have reached Stage 4 in the acquisition of English L2 question forms. (That is, they were already producing questions including

6.5 The Output Hypothesis and the role of prompts in corrective feedback

wh-words followed by verb–subject inversion, such as *What is the thing that he carry?*). To demonstrate progression to Stage 5, the learners needed to produce questions involving auxiliary inversion after *wh*-words, such as *When are they going to do the business?*. The study ran for eight weeks, and included a pre-test (oral production of questions), three interactive sessions with native speaker interlocutors involving question-rich communicative activities, and a series of post-tests. This was a true experiment, in which the learners were randomly assigned to four groups (three **treatment groups** and one control group). The interlocutors were trained to provide different feedback in response to naturally occurring learner errors; two of the ‘treatment’ groups received prompts of various kinds, designed to promote modified output, while two did not. That is, the first group (called the ‘opportunity to modify’ group) received open clarification requests (such as *What?* or *Huh?*), and the second group (the ‘enhanced opportunity’ group) heard their own error repeated, along with an accompanying clarification request. The third group got feedback but no opportunity to reformulate their utterance, and the fourth (control) group got no feedback. These four treatments are exemplified below (McDonough, 2005, pp. 85–6):

Opportunity to modify	Enhanced opportunity to modify	Feedback with no opportunity to modify	No feedback
Learner: <i>what happen for the boat?</i>	Learner: <i>what angel doing in this situation?</i>	Learner: <i>what we do with it?</i>	Learner: <i>where you going the last holiday?</i>
NS: <i>what?</i>	NS: <i>what angel doing? Huh?</i>	NS: <i>what we do?</i>	NS: <i>to Laos</i>
Learner: <i>what's wrong with the boat?</i>	Learner: <i>what is angel doing?</i>	Uh <i>let's see well we could talk about the purpose if you want</i>	

In order to document the amount and nature of the feedback received by the learners in the different conditions, and to document any modified output they produced, the treatment sessions were transcribed and analysed. Table 6.3 shows the results of this analysis, and Table 6.4 shows the results of the post-tests, in terms of the number of students within each group who progressed from Stage 4 to Stage 5 in their production of English questions.

Table 6.3 shows that the first three groups received similar amounts of feedback, and that the first two groups produced modest amounts of modified output (that is, Stage 5 questions) in response. The test results presented in Table 6.4 show that most of the students who progressed from Stage 4, and showed consistent ability to produce Stage 5 questions during post-tests, belonged to the first two groups. These results were further analysed using the statistical

SECOND LANGUAGE LEARNING THEORIES

Table 6.3 Negative feedback and modified output, by group (source: McDonough, 2005, p. 89)

Treatment group (N = 15 per group)	Negative feedback*			Modified output**		
	Sum	Median	Interquartile range	Sum	Median	Interquartile range
Enhanced opportunity to modify	99	5.0	4.0	20	2.0	2.0
Opportunity to modify	93	5.0	5.0	12	0.0	1.0
Feedback, no opportunity to modify	72	4.0	2.0	0	0	0
No feedback	0	0	0	0	0	0

*Number of feedback occasions, per group

**Production of Stage 5 questions only

Table 6.4 Question development by group (source: McDonough, 2005, p. 90)

Stages	Enhanced opportunity to modify	Opportunity to modify	Feedback without opportunity to modify	No feedback
4→5	9	5	2	2
No change	6	10	13	13

Note: In each treatment group, $n = 15$

procedure of **logistic regression**, in order to explore the influence of (a) experience of feedback, and (b) production of modified output, on learners' progression from Stage 4 to Stage 5. The only statistically significant predictor of ESL question development turned out to be production of modified output. This study thus offers strong support for the Output Hypothesis, and suggests that clarification requests (and other prompt types such as repetition of learner utterances) perform an indirect role in L2 development, insofar as they promote learner reformulations, **self-repair**, and the production of modified output.

The study of McDonough and Mackey (2006) with another group of Thai L1 learners provides further supporting evidence for the impact of modified output on the learning of English question forms. This study returns to recasts, and examines learners' responses to these. Where the participants heard and immediately repeated a native speaker recast, no influence on progression from Stage 4 to Stage 5 questions could be shown. However, where learners heard a recast, and later produced other utterances following the model of the recast, but with fresh vocabulary (called 'primed production' in this study), there was a significant relationship with progression to Stage 5.

Some of the most interesting current evidence regarding the Output Hypothesis, therefore, is coming from feedback studies conducted within the interactionist

approach. There are still many limitations to this work, however, and results can be inconsistent. McDonough's own (2007) study of the learning of English simple past for activity verbs, for example, did not show any advantage for prompts accompanied by modified output, over simple recasts, while a somewhat similar study by R. Ellis (2007) showed a weak effect for metalinguistic prompts with the learning of English simple past, and a stronger effect with a different grammar area (comparative adjectives).

6.6 The problem of 'noticing'

A major claim of the 1996 Interaction Hypothesis, and also of the Output Hypothesis, derives from psycholinguistic studies of the nature of attention and its role in learning (see Chapter 5 for our own discussion of these issues). The interactionist belief is that learners will be encouraged to 'notice' (and perhaps therefore to modify) mismatches between features of their own interlanguage productions and target language forms, in the course of communicative interaction including meaning negotiation and repair. That is, learners are expected to interpret prompts and (perhaps) recasts as negative evidence, attend to the form and realize the need to reformulate their intended utterance in order to convey their intended message effectively. In turn, the amount of attention which the learner is paying to matters of form is expected to influence the extent to which L2 input and interaction actually lead to L2 intake. This argument is attractive, in view of the rather mixed results we have seen in foregoing sections from studies of output, negative feedback etc.

The possible significance of attention for L2 uptake has therefore been commented on consistently by a range of interactionist researchers, such as Pica (1994), Nicholas *et al.* (2001), Ellis and Sheen (2006). In particular, Nicholas *et al.* tried to explain the mixed results of research into the effectiveness of negative feedback, by stressing the linked issues of saliency and attention. Overall, they conclude that:

recasts in L2 classrooms are effective if they are accompanied by some additional cue, telling learners that it is the *form* and not only the meaning of their utterance that is in focus. (Nicholas *et al.*, 2001, p. 748)

Despite this continuing interest, Mackey (2007b) is critical of the underdeveloped nature of theories of attention as applied in interactionist research. She comments that 'interaction research to date has typically made little reference to particular models of attention, awareness and noticing. Rather, these terms have been used in a general ... way in claims about the utility of interaction' (p. 25).

A partial exception is Izumi (2003), who relates the Output Hypothesis to Levelt's well-known model of speech production (Levelt, 1989). Izumi comments

SECOND LANGUAGE LEARNING THEORIES

in particular on the role of self-monitoring and the feedback system in regular speech production, where 'internal speech is matched against internal standards that are formed by the speaker's receptive knowledge about the use of specific rules' (Izumi, 2003, p. 185). He goes on to suggest that where internal representations are not yet fully formed or uncertain, learners will be disposed to search for guidance in the immediate linguistic environment (for example, in recasts or other forms of feedback):

If relevant input is immediately available ..., the heightened sense of problematicity during production may cause the learners to process the subsequent input with more focused attention; they may try to examine closely how the TL expresses the intention which they just had difficulty expressing on their own. (Izumi, 2003, p. 186)

Izumi also appeals to VanPatten's Input Processing Theory (2007) to account for learners' inconsistent use of corrective feedback. He reminds us of the semantic biases which influence the processing of incoming speech, and of the limited nature of human processing capacity; even in L1, we process incoming language selectively, influenced partly by the salience of particular elements in speech, and partly by broad expectations deriving from context and from our knowledge of the world (2003, p. 175).

To test some of these ideas empirically, a small number of empirical studies have also been undertaken by interactionist researchers to explore learner perceptions of feedback, and in turn, how learners' varying perceptions might affect their uptake of new L2 forms.

Such research is challenging as it sets out to access mental processes, some of them below learners' conscious awareness, while distorting their functioning as little as possible. A range of research techniques have been trialled, including learner journals and written questionnaires. In several studies, the technique of **stimulated recall** has been used, in order to get closer to learners' real-time perceptions of feedback. In stimulated recall studies of oral feedback, learners are typically filmed while taking part in some form of L2 interaction. The film is subsequently replayed, and the learner is asked to recall and report what they were thinking about, at particular moments during the film. There is some debate about the validity of this technique as a means of accessing people's focus of attention at a particular moment in the past, but for the purposes we are interested in, stimulated recall research yields interesting and interpretable patterns concerning at least some aspects of L2 noticing. (For a full account of the technique, see Gass and Mackey, 2000.)

In a pioneering study, Mackey *et al.* (2000) used stimulated recall with a group of 17 learners of English and of Italian, in a descriptive study which explored how learners viewed the recasts etc. they had received in a problem-solving, picture-matching task, undertaken with an NS interlocutor. When reviewing the film of their own interactions, the learners seemed most aware of feedback relating

to lexical and phonological problems. They made most comments on these episodes, and focused on matters of form when they did so. However, they were less aware of feedback containing L2 morphosyntactic information, and tended to interpret feedback of this type as relating to content rather than linguistic form. Common types of response to morphosyntactic recasts are illustrated in the following examples (from Mackey *et al.*, 2000, pp. 485–6):

NNS: *It have mixed colors.*

NS: *It has mixed colors.*

NNS: *Mixed colors aha.*

Recall: *Uh, I was thinking . . . nothing, she just repeat what I said.*

NNS: *So one man feed for the birds.*

NS: *So one man's feeding the birds?*

NNS: *The birds.*

Recall: *When I saw the picture I thought this is a park and I tried to describe.*

Egi (2007a and b) also used stimulated recall in order to examine the extent to which adult learners of L2 Japanese interpreted corrective feedback as relevant to content, and/or to language form. She found that around 17 per cent of recasts were interpreted as relating to content (and also showed tentatively that where this was the case, learning as measured on individualized oral post-tests was less likely than where recasts were interpreted as having a focus on L2 form). In a laboratory study, Philp (2003) adopted a different approach to investigating learner noticing of morphosyntactic recasts, by collecting the research evidence during rather than following the communicative event. She gave ESL learners a story completion and a picture-description task, similar to those used in previous studies of question formation by Mackey and colleagues. The learners had to ask questions to complete the tasks, and their errors received active recasts from their NS interlocutors. To investigate whether the learners were noticing the recasts, they were prompted at intervals by a signal to repeat what their interlocutor had just said. Their ability to do this was taken as evidence that they had been 'noticing' the recasts, at least enough to be holding them in working memory.

It turned out that the participants in Philp's study could reproduce a high proportion of the recasts which they heard. However, the accuracy of these repetitions depended (a) on the learner's language level, (b) the length of the recast and (c) the number of corrections it contained. In particular, learners had great difficulty in repeating question forms which were not currently part of their interlanguage grammar, unless the utterances containing them were very short. Where recasts were complex and highlighted more than one 'problem', learners also had greater difficulty in responding.

Reflecting on a further study of this type, which we have discussed in Chapter 5 (Section 5.3.2), Mackey concludes that noticing has been shown to be 'a potential mediator in the feedback-learning relationship' (2006, p. 426). She comes to similar conclusions to Philp (2003) regarding the complexity of the issues involved in studying the phenomenon of noticing, and the ambitious nature of the research agenda which is needed to understand it fully.

6.7 Learner characteristics and engagement

In this final review section, we will briefly note the fact that interactionist researchers have also developed an interest in individual learner differences. Here, they have clearly identified themselves with cognitive theorists of language learning. As explained in Chapter 5, the main topic investigated has to do with working memory capacity, and how far this may affect a learner's ability to benefit from recasts etc. Studies by Mackey *et al.* (2010) and by Révész (2012), discussed in Section 5.4.2, both found that higher working memory capacity promoted learning in particular ways.

As our last example in this chapter, we will examine the study of Trofimovich *et al.* (2007), conducted once again in Canada with Francophone learners of English L2. The study investigated the relationship between the noticing of feedback, the learning of English L2 morphosyntax (possessive determiners) and vocabulary (transitive and intransitive verbs), and four cognitive characteristics of the target learner group: phonological memory, working memory, attention control, and analytic ability. (Attention control is the ability to efficiently allocate attention among different tasks; it has been suggested that this attribute enhances processing, and helps the management of different sets of linguistic relationships: Trofimovich *et al.*, 2007, p 175.)

In this study, the learners were first of all tested for their general proficiency, and for knowledge of the target grammar and lexis (through an oral production test). As the experimental treatment, they then completed a computerized picture-description task. For every picture they were asked to answer a question by producing a one-sentence description; they then heard a correct version of the statement, and were asked to report whether or not the repetition matched their own utterance. (See Figure 6.3 for an illustration of the procedure.)

The participants then completed a series of formal psychological tests (of phonological memory etc.; the test used to measure 'attention control' estimates an individual's ability to shift attention between two sets of 'stimuli' by getting them to construct two different symbol sequences at the same time). Finally, a post-test and a delayed post-test eliciting knowledge of the target grammar and vocabulary were also administered.

The results of this experiment showed that the overall amount of noticing reported by participants was not significantly related to their L2 learning.

6.7 Learner characteristics and engagement

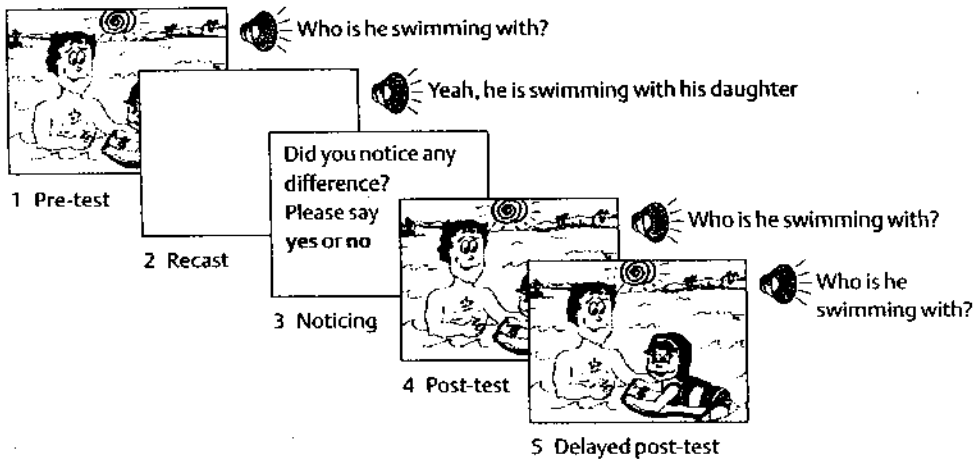


Figure 6.3 Procedure for assessing 'noticing' (source: Trofimovich *et al.*, 2007, p. 180)

However, as seen in Table 6.5, there were significant statistical correlations between levels of attention control and analytical ability (as measured in the separate psychological tests) and aspects of language development as seen in the pre- and post-tests.

Table 6.5 Correlations between grammatical accuracy in picture description and four cognitive variables (source: Trofimovich *et al.*, 2007, p. 188)

Target	Phonological memory	Working memory	Attention control	Analytical ability
<i>Pre-test</i>				
Grammar	.30	.27	-.55**	.44
Lexical	.25	.12	-.17	.07
Mixed	.41	.26	-.44	.35
<i>Post-test</i>				
Grammar	.36	.34	-.51	.47
Lexical	.23	.38	-.37	.21
Mixed	.26	.48	-.66***	.45
<i>Delayed post-test</i>				
Grammar	.41	.28	-.60***	.55**
Lexical	.11	.22	-.55**	.20
Mixed	.24	.27	-.56**	.52

Asterisks identify significant correlation coefficients: ** $p < .001$; *** $p < .0001$, two tailed

This line of research is clearly producing interesting preliminary results, and bringing interactionist research more into line with the concerns of cognitive theory. However, as with stimulated recall research, in this new strand of working memory research we are still some distance from fully understanding the relationships between learner production, recasting, prompting, noticing and learner reformulation, as these phenomena unroll (and influence each other) in real time.

6.8 Evaluation

6.8.1 The scope of interactionist research

Interaction researchers like to cite Evelyn Hatch as an early inspiration for the interactionist research tradition. Thus, for example, Mackey *et al.* (2012) quote Hatch as saying: 'one learns how to do conversation, one learns how to interact verbally, and out of the interaction syntactic structures are developed' (Hatch, 1978, p. 404).

However, compared with this broad formulation, the interactionist tradition as it has evolved since the 1980s has limited its focus in a number of ways. First, Krashen's Input Hypothesis paid attention to only one side of any given interaction, and Long's early formulation of the Interaction Hypothesis viewed negotiation of meaning as a means to a similar basic end: for the learner to increase their share of comprehensible input. Swain's Output Hypothesis expanded the focus once again, so that more balanced attention is now paid in interactionist research to the input being received, to negotiations of both form and meaning, and to the productions of the learner.

Second, whether studying input or output, the interactionist tradition is quite selective in the aspects of conversation to which it pays attention. In many of the studies reviewed above, the research focus is limited to the learner's use of particular words or 'target' morphosyntactic forms, and to certain discourse moves being performed by their interlocutor (for example, recasts, prompts, and metalinguistic). There is a much more comprehensive treatment of interaction in sociocultural and sociolinguistic research, for example (see Chapters 8 and 9).

Third, researchers in the interactionist tradition are wary of claiming the status of a 'theory' for what they prefer to call the Interaction Hypothesis, or more recently the interaction 'approach' (on this, see Gass and Mackey, 2007; Mackey *et al.*, 2012).

The main strengths of this very active tradition are indeed related to these limitations of scope. A large number of empirical studies have been conducted since the 1990s (approximately 100 according to Mackey *et al.*, 2012, p. 10), exploring the relationship between a range of interactional behaviours and the learning of various L2 morphosyntactic features as well as vocabulary.

The interactional behaviours explored include the modification of input by negotiation, 'noticing' of new language features, the provision of feedback and of prompts, and opportunities for learners themselves to produce modified output. The morphosyntactic features for which learning has been claimed include articles, questions, past-tense formation, and plurals. Studies have mostly been conducted with instructed learners, but they have included children and adults, and have been concerned with a wide range of target languages. They have commonly taken the form of controlled experiments, and have regularly shown experimental groups receiving interactional 'treatments' performing better on post-tests than other groups. All this has demonstrated that 'interaction plays a strong facilitative role in the learning of lexical and grammatical target items' (Mackey and Goo, 2007, p. 438).

The 'interaction approach' [sic] self-evidently meets the first two evaluation criteria proposed in Chapter 1: the claims of the interaction hypothesis are clear, and a range of systematic procedures have been adopted and developed to test these claims. The extent to which it sets out to meet the third criterion (explanatory power) is more debatable, however, and we will return to this issue at the end of the chapter.

6.8.2 The interaction approach and the nature of language

It could be inferred that the Input Hypothesis, and the early version of the Interaction Hypothesis, assumed a broadly Chomskyan view of the nature of language, and in particular the existence of an innate language faculty. Some later debates within the interactionist tradition also reflected Chomskyan thinking, notably the discussion as to whether recasts etc. are sources of positive evidence or of negative evidence regarding the target language system (and whether negative evidence is required by L2 learners).

However, from the 1990s onward, as interest in L2 processing issues increased, interactionists tacitly moved away from a Chomskyan position. Some commentators have made alternative proposals, notably N.C. Ellis (2009), who argued that a functionalist view of language was most appropriate and relevant for interactionist research. However, this kind of thinking has not been widely adopted, and interactionists undertaking empirical research typically say little about any broader theory of language which underlies their work. Instead, they identify particular morphosyntactic features and subsystems, and study how these are learned, somewhat in isolation from any larger picture. Where developmental sequences have been identified for particular subsystems, such as English questions, these may be used as a scale to measure learner progression, but even in these cases there is little discussion of implications for interlanguage development beyond these particular subsystems.

Finally, as noted above, oral interaction itself is typically viewed here as a sequence of functionally discrete and quantifiable discourse moves or strategies (for example, clarification requests and recasts). The idea that interaction is jointly constructed, which characterizes the alternative traditions of sociocultural theory and conversation analysis, for example, is not found.

6.8.3 The interaction approach and the nature of learning

Again, following early Chomskyan thinking, Krashen's Input Hypothesis assumed the existence of a distinctive Language Acquisition Device which received and processed L2 input, but paid little attention to the internal workings of the device.

Long's revised Interaction Hypothesis (1996) reoriented the interactionist tradition decisively in a cognitive direction, as far as learning theory was concerned, directing concerns towards learner attention and L2 processing capacity as mediating factors which would affect the availability of L2 input for intake and for acquisition. Progress was made in devising ways of monitoring learner attention, and some empirical research has supported the idea that learners are more likely to acquire words and morphosyntactic features where feedback etc. has been noticed. Relatively little progress has been made, however, in tracking the online processing of L2 interaction (and indeed, Gass and Mackey, 2007, state that this is beyond the scope of the interactionist approach). Thus, for example, where feedback is complex, and deals with more than one morphosyntactic feature, we remain very unclear about how it is interpreted and processed (though we know that eventual learning is less likely). This is a central issue, and without a better understanding of online processing (for example through a link-up with theorists of parsing and input processing such as Carroll, 2001 or VanPatten, 2007), we remain unable to explain satisfactorily why some L2 features are learned more easily through interaction than others.

6.8.4 The interaction approach and the language learner

The language learner studied in interactionist research is typically an individual classroom learner, who takes part in a sequence of controlled activities in a classroom or laboratory setting. Some basic assumptions are made, for example that the learner is uniformly motivated to attend to L2 input, and to engage actively in the prescribed activities and tests. In most studies, learners are chosen so as to be fairly closely positioned on a common learning route, for example at similar 'stages', for the learning of English questions. The individual learner characteristics which are felt to be important are psycholinguistic ones: age, language proficiency level and – increasingly – working memory capacity. This tradition pays no attention to learner identity, nor to the learning group as a community; sociolinguistic and cultural dimensions of learners' language

practices are not usually seen as relevant; indeed, Gass and Mackey (2007) say that the sociocultural context is beyond the scope of the interaction approach. Yet as Ellis and Sheen (2006) point out, learners' orientation to the learning context may affect their engagement with interaction in significant ways, and hence mediate the influence of feedback, elicitations, and the rest.

6.8.5 Overall conclusion

The interactionist approach is successfully demonstrating many interconnections between aspects of L2 interaction and L2 learning. It partly derives from an applied pedagogic tradition (early work on classroom feedback), and has clear implications for classroom practice, reviewed in Mackey *et al.* (2012). A solid strand of experimental research has been developed, and innovative research techniques such as stimulated recall have been applied. However, some major puzzles remain, for example regarding the selective nature of learner attention and noticing, and continuing difficulties in predicting which L2 features will prove most amenable to interactionist treatments. Recent writings by interactionist researchers acknowledge the need for closer integration with other research and theoretical strands, for example on L2 processing (for example, Mackey, 2007b; Ellis and Sheen, 2006); this would be an important step in advancing this tradition from the status of an 'approach', to a theory with greater ambitions to explain underlying cause-effect relationships.

7 | Meaning-based perspectives on second language learning

You won't understand adult language acquisition if you don't understand discourse activity. (Perdue and Klein, 1993, p. 263)

7.1 Introduction

Where do grammars come from? In Chapter 3, we encountered theorists whose main concern was with this particular question, and who have argued that because of its complexity as a formal system, the natural grammar of human language cannot be learned in its entirety, from scratch, by each individual human being, but must at least to some extent be innate. In Chapters 4 and 5, we examined emergentist perspectives which argue that formal grammars can be built by general learning mechanisms from experience of language use.

The **functionalist perspective** on the nature of language developed by theoretical linguistics such as Givón, Halliday and Langacker was briefly introduced in Section 1.3.3. In this chapter we are concerned with SLL research which is grounded in this viewpoint. That is to say, rather than making the acquisition of a formal linguistic system their starting point, these researchers are centrally concerned with the ways in which L2 learners set about making meaning, and achieving their personal communicative goals; they argue that the great variety of interlanguage forms produced by second language learners cannot be sensibly interpreted unless we pay attention also to the speech acts which learners are seeking to perform, and to the ways they exploit the immediate social, physical and discourse context to help them make meaning. Further, it is argued that these meaning-making efforts on the part of the learner are a driving force in ongoing second language development which interact with the development of formal grammatical systems.

We begin the chapter by examining some small-scale functionalist case studies of second language learning, selected to illustrate key issues and principles of this approach. We then review a major research programme of the European Science Foundation (ESF), which examined informal language learning by adult immigrants in a range of European countries, and makes proposals for a communication-driven learner grammar (the 'basic variety'). Next we examine more focused lines of inquiry into how learners develop the linguistic means to encode a range of conceptual meanings, including the notions of 'past time' and of 'motion'. We then consider current research into how learners develop the linguistic means, and the contextual knowledge, to perform a range of speech acts in L2. Finally, we evaluate the overall contribution so far of this tradition to our understanding of L2 development.

7.2 Early functionalist studies of second language learning

In Chapter 2, we reviewed the emergence during the 1970s of the concept of interlanguage in second language research (Corder, 1967; Selinker, 1972). This involved a major shift away from viewing learner language essentially as a defective version of the target language, towards viewing it as an organic system with its own internal structure.

7.2.1 Pragmatic vs. syntactic modes of expression

Within interlanguage research, functionalist approaches to the study of second language communication and development soon appeared. Dittmar (1984) presented a reanalysis of data collected for an earlier, grammar-oriented study of adult Spanish migrants' L2 German. This was a cross-sectional study of learners at a very elementary level, who made little use of the morphology of standard German, and typically expressed semantic concepts such as time and mood, and also speech acts such as requesting, warning and promising, either lexically or through contextual inference, rather than through grammatical encoding.

For example, the following learner utterance involving **code switching** between German and Spanish (in parentheses) was interpreted in context as expressing a promise:

Ich morgen /a/ España /y/ sage bei dir: zurück España, eine /botella de coñac/ bei dir
I tomorrow to Spain and say with you: back Spain, one bottle of cognac with you
'I am going to Spain tomorrow and promise to bring back a bottle of cognac for you'
(after Dittmar, 1984, p. 243)

Here the only explicit reference to future time is expressed in the lexical item *morgen* (tomorrow); modality and the notion of 'promising' have to be inferred from context; the inflected second person pronoun *dir* seems to be produced as part of an unanalysed chunk, *bei dir*; etc. Dittmar argued that the interpretation of data like this is helped by the theoretical distinction drawn by Givón (1979) between pragmatic and syntactic 'modes of expression'. Givón has argued that both informal speech and learner speech (whether L1 or L2) convey meaning through a relatively heavy reliance on context, whereas more formal styles of language rely on more elaborate language coding, with reduced dependence on contextual meaning. For Givón, these pragmatic and syntactic 'modes' are the ends of a continuum, rather than discrete categories; he interprets language acquisition, language change and language variation in terms of movement along this continuum.

SECOND LANGUAGE LEARNING THEORIES

Table 7.1 Pragmatic and syntactic modes of expression (source: Givón, 1979, p. 98)

Pragmatic mode	Syntactic mode
a. Topic-comment structure	Subject-predicate structure
b. Loose conjunction	Tight subordination
c. Slow rate of delivery (under several intonation contours)	Fast rate of delivery (under a single intonation contour)
d. Word order is governed mostly by one PRAGMATIC principle: old information goes first, new information follows	Word order is used to signal SEMANTIC case functions (though it may also be used to indicate pragmatic-topicality relations)
e. Roughly one-to-one ratio of verbs to nouns in discourse, with the verbs being semantically simple	A larger ratio of nouns over verbs in discourse, with the verbs being semantically complex
f. No use of grammatical morphology	Elaborate use of grammatical morphology
g. Prominent intonation-stress marks the focus of new information; topic intonation is less prominent	Very much the same, but perhaps not exhibiting as high a functional load, and, at least in some languages, totally absent

Table 7.1 shows the main features of the two modes proposed by Givón. Dittmar (1984) argued that the talk of his elementary adult learners showed many characteristics of the pragmatic mode. In particular, he argued that their utterances were typified by a **theme-rheme** (or topic-comment) structure, delineated by a single intonation curve, rather than by a grammar-based subject-predicate structure. (In everyday terms, the theme or topic is what is being talked about, and the rheme or comment is what is being said about it.) Typical examples from his German interlanguage data are:

ich alleine – nicht gut

I alone not good

immer arbeite – nicht krank

always work(ing) not ill

ich vier Jahre – Papa tot

I four years father dead.

However, Dittmar's analysis in this early study was somewhat impressionistic, and the issue of how learners' utterances might move on from topic-comment structure to conventional target language sentence syntax was not addressed in detail. Altogether, while this study appealed to the theoretical framework of Givón, by showing that learners start at the pragmatic end of the continuum, it did not yet offer any very rigorous test of it. (In later work Dittmar adopted a longitudinal case study approach, and performed a variety of more detailed form-to-function and function-to-form analyses: see various papers in Dittmar and Reich, 1993.)

7.2.2 Form-to-function analysis

Some other early functionalist studies did take a longitudinal approach, for example the year-long case study conducted by Huebner (1983) of a Hmong L1 speaker, Ge, learning English as L2. Ge arrived as an adult in Hawaii with no English (but bilingual in two topic-prominent languages, Hmong and Lao) and was contacted within a few weeks by Huebner, who audio-recorded informal conversations with him at three-week intervals. Ge was working full time in a garden centre, and attended no language classes. Huebner studied a number of forms in Ge's interlanguage where development was apparent, all of them important for the management of information in discourse.

For example, Huebner studied the changing functions of the form *is(a)* in Ge's interlanguage, over time. This form served initially as a general marker for topic-comment boundaries, and developed over time into a copular verb *be* (as in Standard English). In the following example, *isa* is functioning as a boundary marker:

ai werk everdei, + isa woter da trii

'As for the work I do everyday, it involves watering the plants'. (p. 74)

The course of development for Ge's use of the *is(a)* form was not straightforward. From using it frequently as a topic boundary marker, he moved to much less frequent use of the form, in both grammatical and ungrammatical environments, according to the norms of Standard English (SE). Finally, Ge 'gradually and systematically re-inserted the form in SE grammatical environments' (p. 205), that is, in those where it performed the copula function.

Huebner describes similar patterns of development for the evolution of the functional distribution of the article form *da*. Thus, he identified all possible contexts for production of *da*, and examined its actual frequency distribution over time. This analysis showed that:

Ge's use of the article *da* shifts from an almost SE one but one which is dominated by the notion of topic, to one in which the form marks virtually all noun phrases. From that point, Ge's use of *da* is first phased out of environments which share no common feature values with SE definite noun phrases, followed by those environments that share one of the two feature values with SE definite noun phrases. (p. 130)

Huebner's study thus provides further evidence that 'the rules governing various aspects of the interlanguage grammar were influenced by the structure of discourse' (p. 203). He also documents the complexity of development in Ge's interlanguage, arguing that apparent variability is due to gradual, systematic shifts in function for particular forms. Finally, his study illustrates the need to pay attention to more than one level of language to make sense of interlanguage development; in order to pinpoint the functions of the forms *isa*

SECOND LANGUAGE LEARNING THEORIES

and *da*, his analyses begin at the level of discourse/pragmatics, and move to an examination of syntax and morphology.

An important limitation of his study, however, lies in the fact that the languages in which Ge was already fluent (Lao and Hmong) are both topic-prominent languages. Therefore, Huebner recognizes it is impossible to tell whether the topic-comment structure found in Ge's early English interlanguage is the product of L1 transfer, or a more universal characteristic of learner language. Other limitations have to do with the small number of subsystems actually studied, and the project focus on a single learner.

7.2.3 Function-to-form analysis: a fuller test of Givón

Another longitudinal case study conducted by Sato (1990), working with two Vietnamese L1 boys, Thanh and Tai, also drew on the theoretical contrast proposed by Givón between pragmatic and syntactic modes of expression. However, Sato was critical of earlier work in this tradition, on the grounds of difficulties with identifying topic-comment structures in learner language (pp. 29–39).

Sato's own study did not pursue the topic-comment problem further. Instead, it explored the extent to which her subjects' interlanguage moved from **parataxis** (adapted from Givón's 'pragmatic mode of expression') to syntacticization (from Givón's 'syntactic mode'). These concepts were redefined by Sato as follows:

Parataxis: Extensive reliance on discourse-pragmatic factors in face-to-face communication and minimal use of target language (TL) morphosyntactic devices in expressing propositions. Discourse-pragmatic factors include shared knowledge between interlocutors, collaboration between interlocutors in the expression of propositions, and the distribution of propositional content over a sequence of utterances rather than within a single utterance.

Syntacticization: The process through which the use of morphosyntactic devices in IL increases over time, while the reliance on discourse-pragmatic context declines. (Sato, 1990, pp. 51–2)

Sato's two subjects were brothers in their early teens, and were immigrants to the USA who had been fostered in a white American family. They attended school, but received no specialist ESL instruction there. Over a period of ten months, Sato collected informal conversational data from the boys at weekly intervals. An example of talk between Sato (Ch) and Thanh (Th), in Sato's phonemic transcription, is given below (Sato, 1990, p. 125).

Th1: tudej ai ga muvɨ in də in dəsku /
'Today [I got] a movie in school'

7.2 Early functionalist studies of second language learning

- C: You saw a movie?
Th2: tu au yæ
'[For] two hours, yeah'
C: Of what?
Th3: muvi ts əh (hæv) yu si muvi (1 sec. pause)
'[A] movie (unclear) you [seen this] movie?'
Th4: ɔnli bɔn pipɔl æn deɪ fɑɪt /
'People only [made of bone] were fighting'
Th5: pipɔl ɔnli bɔn
'People [who were] only [made of] bone'
C: Skeletons?

The recorded speech of Thanh and Tai was divided into 'utterances' on the basis of phonological criteria ('an utterance being defined as a sequence of speech under a single intonation contour bounded by pauses', p. 58). To explore the nature and degree of parataxis/syntacticization, Sato concentrated on a function-to-form analysis of their IL talk. She firstly explored all means used by the boys to express past time reference, and secondly examined the linguistic encoding of semantic propositions, both simple and complex. (A propositional utterance was defined as one which 'expressed at least one argument and a predication about that argument', p. 94.)

7.2.3.1 Thanh and Tai: the expression of past time reference

As far as past time reference was concerned, Sato found that over the ten months there was little development from a paratactic mode of expression in the direction of syntax. Throughout, the boys typically expressed past time either adverbially, or through inference from the discourse context (as can be seen in the quoted extract). A few irregular past-tense forms appeared (*bought*, *came*), but the regular *-ed* inflection never occurred.

Sato's findings are in line with many other studies, which show that inflected past-tense verb forms are slow to develop for naturalistic learners; ten months was just too short a time for syntacticization to take place in this domain. (It seems that this is an area where formal instruction can make a great difference to the rate of acquisition: Bardovi-Harlig, 2000, Chapter 4.) Sato points out how seldom the absence of formal past-tense markers caused any communication difficulties for Thanh and Tai (that is, there was little communicative pressure to include these). She also points out the necessity of a multilevel perspective on this issue; regular past-tense inflections were not phonologically very salient in the TL input which the boys were receiving. Another complication was the fact that in the boys' own speech, because of

SECOND LANGUAGE LEARNING THEORIES

L1 phonological influence, realizations of syllable-final consonant clusters remained distant from the English target.

7.2.3.2 Thanh and Tai: the encoding of propositions

As far as propositional encoding was concerned, Sato hypothesized that parataxis would involve:

1. A predominance of non-propositional speech (that is, a large proportion of non-propositional utterances);
2. A low proportion of multi-propositional utterances;
3. Extensive reliance on interlocutor collaboration in the production of propositions;
4. Little use of connective morphology in expressing inter-propositional relations (p. 93).

Accordingly, syntacticization would appear through:

1. An increase in propositional speech;
2. An increase in multi-propositional utterances;
3. A decrease in reliance on interlocutor collaboration;
4. An increase in the use of connective morphology (p. 93).

The actual results did not fit the expected pattern, however. From the beginning of the study, Thanh and Tai were found to be producing a high proportion of (single-)propositional utterances, with little need of scaffolding by their interlocutors; Sato attributes these findings to their relative 'cognitive maturity', compared with the younger subjects studied in some previous child SLA research (such as Hatch, 1978). Multi-propositional utterances were rare, however, and simple juxtaposition was the most important means of linking them; both learners were only beginning to use a variety of logical connectors other than *and*. (Table 7.2 shows some examples of what Sato calls 'paratactic precursors' for various target language constructions, from the speech of Tai.)

Where multi-propositional utterances (MPUs) were produced, many of them involved a small set of memorized phrases or 'chunks' as the starting point. The expressions *ai dono, hi dono, ai tin, hi sei, yu sei* (I don't know, he don't know, I think, he say, you say) were found in around 25 per cent of all such utterances. Sato argues here that particular lexical-semantic items may form important 'entry points' to aspects of TL syntax, another example of the general need for multilevel analysis. (For a parallel, see cognitive theorists' interest in 'prototypes', discussed in Chapter 4.)

Sato's study has been treated at some length because it raises a number of important theoretical issues for functionalist research in SLL:

7.3 Functionalism beyond the case study: the ESF project

Table 7.2 Paratactic precursors of different TL constructions (examples from Tai) (source: Sato, 1990, p. 111)

Precursors	Examples
Infinitival complement	hi wan me go fɔlbæk He-want-me-go-fullback 'He wanted me to [play] fullback'
WH-complement	no" aɨ pɨkɨdaɨ? wət stɔri aɨ wa æn ʃi rɨd me No-I-pick-it-out-what-story-I-want-and-she-read-me 'No I pick out which story I want and she reads it to me'
Relative clause	tan hi seɨ ə də pɨʃt deɨ sɨktɨn deɨ kæn go tu mvi a:r Thanh-he-say-the-people-they-sixteen-they-can-(?)-go-to-movie-R 'Thanh says that people who are sixteen can go to R-rated movies'
Adverbial clause	wi wɔkin aɨ sɔ də di dɛd We-walking-I-saw-the-deer-dead 'When we were walking, I saw the dead deer'

1. She seeks to clarify the Givón distinction between pragmatic and syntactic modes of expression.
2. In her work on past time reference and propositional encoding, she offers a clear example of function-led analysis (in contrast with, for example, Huebner, who started with particular forms identified in the English interlanguage of his subject Ge, and tried to track the changing functions they expressed).
3. She demonstrates important interrelationships between different levels of language (phonology, lexis and grammar), in particular highlighting the potential importance of particular chunks/lexical items as entry points into new syntactic patterns (on this see also Bardovi-Harlig, 2008, 2009; Myles, 2004).
4. She highlights the need to take account of L2 learners' level of cognitive maturity, and offers a reminder of the limitations of conversational interaction as a 'driver' for syntactic development, because communication problems in this context can so routinely be solved through discourse-pragmatic means.

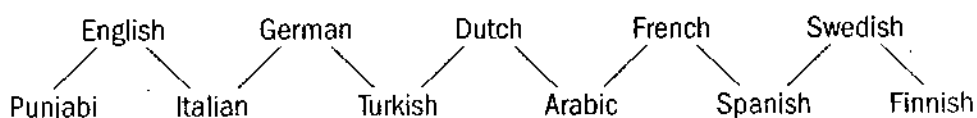
7.3 Functionalism beyond the case study: the European Science Foundation project

The functionalist research studies which we have reviewed up to this point have been small-scale case studies of one or two learners, typically involving just one source language and one target language (Spanish–German, for Dittmar, 1984; Hmong–English, for Huebner, 1983; Vietnamese–English, for Sato, 1990). In small-scale work of this kind, the personal characteristics of the learner, the

SECOND LANGUAGE LEARNING THEORIES

influence of their particular L1, and their individual social practices, make it difficult to generalize about L2 development.

Next we turn to a much larger functionalist project on the informal second language acquisition of adult migrants. Full accounts can be found in volumes authored/edited by the project directors (Klein and Perdue, 1992; Perdue, 1993a, 1993b, 2000), and shorter overviews are also available (for example, Perdue, 2002; Klein and Dimroth, 2009). The project was funded by the European Science Foundation, and involved research teams in five European countries. These teams worked with groups of adult migrants who were acquiring one of five target languages (English, German, Dutch, French and Swedish). The migrants spoke a range of first languages, so that ten language pairs in all were explored, in the following pattern:



In the end, a total of 40 learners contributed substantially to the research. In selecting the participants, care was taken to avoid people currently attending language classes, as the aim was to study naturalistic development. The research teams kept in contact with the participants over a period of 2.5 years, by means of regular tape-recorded or video-recorded encounters. The participants undertook a varied range of tasks which were regularly repeated, including informal conversation, picture description, role plays (for example, of service encounters such as interviews with housing officials) and retelling the story of a silent Charlie Chaplin film.

7.3.1 Aims and findings of the ESF project

The ESF project aimed to describe naturalistic interlanguage development among adult learners. They also aimed to document the characteristics of NS–NNS communication, and to identify internal and external factors influencing the rate of the acquisition process and its overall success. Perdue and Klein argue very explicitly for a functional approach to SLA (1993, pp. 266–9). They believe that only a broad pragmatic approach can capture the changing means used by the learner to express notions such as **temporality**. They therefore aim to provide a complete, contextualized account of the origins of more narrowly linguistic means for encoding such notions (for example, how past, present and future time are formally encoded through verb morphology to do with tense and **aspect**). Similarly, they argue that the basic structure of learners' utterances derives from the wish:

to refer to persons or objects. Speakers do not learn for example N-bar structure. They learn to refer with varying means under varying conditions, and *the result*

7.3 Functionalism beyond the case study: the ESF project

of this acquisitional process is what theoretical linguists like to call N-bar structure.
(p. 269, emphasis in original)

Drawing especially on the Charlie Chaplin narratives, Klein and Perdue (1992) argue that three developmental levels in the basic organization of learners' utterances could be identified in functional terms, across all the linguistic groups which were studied. These were

- nominal utterance organization (NUO)
- infinite utterance organization (IUO)
- finite utterance organization (FUO).

The three types of utterance organization are distinguished as follows:

In NUO, utterances are extremely simple and mainly consist of seemingly unconnected nouns, adverbs and particles (sometimes also adjectives and participles). What is largely missing in NUO is the structuring power of verbs such as argument structure, case role assignment, etc (hence, 'preverbal utterance organisation' might be a better term). This is different in IUO: The presence of verbs allows the learner to make use of the different types of valency which come with the (non-finite) verb; it allows, for example, a ranking of the actants of the verb along dimensions such as agentivity, and the assigning of positions according to this ranking. At this level, no distinction is made between the finite and non-finite component of the verb; such a distinction, which is of fundamental importance in all languages involved in this study, is only made at the level of FUO, which is not attained by all our learners. Transition from NUO to IUO and from there to FUO is slow and gradual, and the coexistence of several types of utterance organisation as well as backsliding is not uncommon. (Klein and Perdue, 1992, p. 302)

For example, the IUO level (also termed the Basic Variety: Klein and Perdue, 1997) is illustrated in the following extract from a Charlie Chaplin film retelling by one of the Punjabi L1 learners of English, when Charlie Chaplin escapes from a police van. Here we can see that verbs are linked to a range of 'actants' though verb inflections are mostly absent:

- (1) *back door stand the policeman? right?*
- (2) *she pushin policeman ...*
- (3) *charlie and girl and policeman put on the floor*
- (4) *car gone ...*
- (5) *charlie get up first*
- (6) *he say daughter/ sorry +
he pickup girl + charlie +*
- (7) *say 'go on*

7.3 Functionalism beyond the case study: the ESF project

who may have won on that occasion – and the answer specifies one of them ... Let us call 'focus' that part of a statement which specifies the appropriate candidate of an alternative raised by the question, and 'topic' the remainder of the answer.

(1992, pp. 51–2)

The main pragmatic constraint states that the focus should be mentioned last, as in *back door stand the policeman* [Focus].

The next example illustrates the qualities of the Basic Variety (here the target language is German and source language is Italian). It must be emphasized that, lexis apart, the researchers see the Basic Variety as 'remarkably impermeable to the specifics of source language and target language' (Perdue and Klein, 1993, p. 257).

- (1) *jetzt charlie komme in eine restaurant*
'now Charlie come in a restaurant'
- (2) *und essen*
'and eat'
- (3) *und wann is fertig + *chiamà**
'and when is ready + (calls)'
- (4) *eine polizei komme*
'a police come'
- (5) *und charlie sage*
'and Charlie say'
- (6) *"bezahle"*
'"pay"'
- (7) *charlie sage de polizei*
'Charlie say the police'
- (8) *"bezahle was alles ich esse"* [this is repeated, with slight variants]
'"pay what all I eat"'
- (9) *und die polizei jetzt bezahle*
'and the police now pay'
- (10) *nicht charlie + die polizei*
'not Charlie + the police'
- (11) *und fort brauchen die charlie*
'and away bring the Charlie'
- (12) *und jetzt komme eine auto*
'and now come a car'
- (13) *und charlie *sale**
'and Charlie (leaves)'

(Klein and Perdue, 1992, pp. 152–3)

7.3.3 Development beyond the Basic Variety

All learners in the ESF study appeared to achieve the Basic Variety, and some then reached a steady state, that is, did not grammaticize their productions any further.

Others, however, did progress beyond the Basic Variety towards FUO; the most important indicator of this development was the acquisition of 'finiteness', that is, the gradual appearance of verb inflections (tense marking preceding aspect marking, irregular forms preceding regular ones). Parallel developments were identified in the pronoun system, in the acquisition of focalization devices such as cleft structures (*is not the man steal the bread, is the girl*; Klein and Perdue, 1992, p. 321), of means for **subordination** (*they think about one house for live together*, p. 322) and the development of more complex topics (Dimroth, 2002). Some learners made considerable progress towards TL syntactic norms, and the researchers conclude that they can see no reason in principle why L2 learners cannot achieve these in full. However, L1 background was now seen as influencing at least the rate of progress beyond the Basic Variety, and possibly as affecting the degree of ultimate success.

But what drives development? If the Basic Variety is effective for everyday communication, why move beyond it? At varying times, the ESF researchers propose somewhat different answers to this question. When discussing the acquisition of temporality they review two possible factors promoting the gradual development of verb inflection:

- 1 The subjective need to sound and to be like the social environment
- 2 Concrete communicative needs.

At this point, they argue that

Our observations about development beyond the basic variety clearly indicate that the first factor, the subjective need to sound and be like the social environment, outweighs the other factor, the concrete communicative needs: Learners try to imitate the input, irrespective of what the forms they use really mean, and it is only a slow and gradual adaptation process which eventually leads them to express by these words and constructions what they mean to express in the TL. (Klein *et al.*, 1993, p. 112)

However, Perdue and Klein elsewhere give priority to 'communicative needs in discourse' (1993, p. 261); 'acquisition is pushed by the communicative tasks of the discourse activities that the learner takes part in' (p. 262). This is argued not only with reference to the acquisition of the Basic Variety, but also with reference to some post-Basic features.

(It is worth comparing the ESF team's views on this point with those of Dittmar, who argues that the shift from pragmatic and lexical modes of expression towards grammaticalization is motivated primarily by the learner's long-term

7.4 'Time talk': developing the means to talk about past time

need 'to look for economy and efficiency in language use and to stabilize the expressibility in the basic communicative functions': 1993, p. 216).

7.4 'Time talk': developing the means to talk about past time

Some very active strands of functionalist research concentrate in more detail on particular areas of meaning, and the ways language learners at different stages of development attempt to express them. We have already noted the interest of functionalist researchers in the means used by learners to talk about time (or 'temporality', for example Dietrich *et al.*, 1995). Others have also studied the means used by learners to talk about place (spatial location, for example Becker and Carroll, 1997), to maintain coherent reference in discourse (for example, Broeder, 1995) and to express modality (for example, Salsbury and Bardovi-Harlig, 2000). As a first example of this type of research, this section looks more closely at the development of 'time talk', as described by Bardovi-Harlig (2000).

Drawing on the ESF and other studies, Bardovi-Harlig concluded that interlanguage users of any language will pass through three successive stages when talking about time:

Pragmatic stage	To express time, learners rely on <ul style="list-style-type: none">● scaffolding by interlocutors;● inference from the context;● contrasting events;● chronological order.
Lexical stage	To express time, learners rely on <ul style="list-style-type: none">● temporal and locative adverbials (for example, <i>now</i>, <i>then</i>, <i>here</i>, <i>there</i>);● connectives (for example, <i>and</i>, <i>and then</i>);● calendric references (for example, <i>May</i>, <i>Saturday</i>);● verb lexis (for example, <i>start</i>, <i>finish</i>).
Morphological stage	Learners start to use verb morphology (tense and aspect) as indicators of temporality.

Examples of the use of pragmatic and/or lexical means to express temporality are plentiful in the ESF data quoted earlier in this chapter, as well as in the conversations of Sato with Thanh and Tai (see Section 7.2.2). The following example, a diary entry written by Hamad, an Arabic L1 learner of English as L2, is particularly rich in adverbials which locate the events reported in time (highlighted with italics):

SECOND LANGUAGE LEARNING THEORIES

Deat [Date]: Jan 27

It was Saturday is the wecknd I welk up at 10:00 o'clock morning I tulk my shoer and *after that* I go to my frind *when I pe there* they sead they well go to the mool [shopping mall] and I go with they we go around in the mool around 2 hours *than* we go to the movei in the Selima [cinema] in the mool to waching a good movei *after* the movei we go Back to our Dorms we seat to gather in our Friend room we talking to gather *and after that* every Budy go to he's room me too I go back to my room that all. (Bardovi-Harlig, 2000, p. 58)

Learners are considered by Bardovi-Harlig and others to have entered the morphological stage once examples of tense-aspect morphology are noted in their interlanguage utterances. This is called the 'emergence' of morphology, and does not necessarily mean that these forms are used accurately and consistently. Bardovi-Harlig lists four 'general principles' which have been found in functionalist verb morphology studies:

1. The acquisition of morphology is slow and gradual, and uninflected verb forms 'linger' in interlanguage.
2. Form often precedes function; that is, verb inflections may appear which to begin with do not seem to contrast in meaning or in function with other verb forms used at the same time.
3. Irregular morphology precedes regular morphology (for example, irregular past forms such as English *went, came* appear ahead of forms such as *jumped, ended*).
4. Learners notice and use verbal suffixes to denote 'past' meanings, ahead of other means such as auxiliary verbs (for example, use of a *V-é* form in place of the auxiliary plus past participle which make up the French *passé composé*).

(after Bardovi-Harlig, 2000, pp. 111–13)

Bardovi-Harlig also claims that tense and aspect morphology 'emerges' in interlanguage in regular sequences, which remain the same for particular target L2s, regardless of learners' L1 background. Thus, for example, the order of emergence

Past → past progressive → present perfect → pluperfect

was observed for L2 English by Bardovi-Harlig in a study including learners with Spanish, Korean and Japanese as L1s (2000, pp. 169–75), and was also reported by Klein for Italian L1 learners of English (1995). Finally, Bardovi-Harlig concludes that both observational and experimental studies show beneficial effects for instruction on the learning of L2 tense and aspect morphology. However, her survey agrees with many others in concluding that instructed learners still go through the same pragmatic and lexical stages as uninstructed learners, and acquire tense and aspect morphology in similar order, though they

7.5 The Aspect Hypothesis and the acquisition of past tense

may make faster progress and eventually reach a more advanced stage, with more extensive and accurate use of verb morphology.

7.5 The Aspect Hypothesis and the acquisition of past tense

One well-known developmental suggestion which links the learning of L2 meaning and form is the so-called 'Aspect Hypothesis' (Andersen and Shirai, 1994). Aspect has to do with the speaker perspective on an action or event being talked about: the event may be viewed as ongoing/unbounded (**imperfective aspect**), or as bounded (**perfective aspect**). While verb morphology commonly expresses what is called grammatical aspect (for example, the English *-ing* form which marks imperfective/progressive aspect, or the Spanish preterite which marks perfective aspect), verbs also possess what is called inherent lexical aspect, as part of their core meaning. In a well-known classification, Vendler (1967) has proposed that verbs can be grouped into four types, according to their inherent lexical aspect (examples after Salaberry and Shirai, 2002, p. 2):

- statives for example, *to be, to have, to love*
- activities for example, *to run, to walk, to laugh*
- accomplishments for example, *to run a mile, to build a house*
- achievements for example, *to notice someone, to break a stick, to reach the summit*

These verb types can also be regrouped along three basic semantic dimensions: **dynamicity**, **durativity** and **telicity** (Salaberry and Shirai, 2002). Dynamicity includes all verb types except for statives; durativity includes all types except for achievements (which are punctual, that is, happen in a moment); and both achievements and accomplishments are telic (the actions referred to have an end point), while statives and activities are atelic (there is no end point).

The Aspect Hypothesis claims that 'first and second language learners will initially be influenced by the inherent semantic aspect of verbs or predicates in the acquisition of tense and aspect markers associated with or affixed to these verbs' (Andersen and Shirai, 1994, p. 133). Thus, for example, Andersen (1991) suggested that L2 learners of Spanish will start to use the imperfect tense with verbs from the stative group, and will first of all use the preterit tense with achievement verbs. Specifically, the Aspect Hypothesis predicts that use of imperfect and of preterit in L2 Spanish will spread in opposite directions across the four lexical aspect classes, as shown in Figure 7.1.

The Aspect Hypothesis has been widely researched with somewhat mixed results (see reviews by Bardovi-Harlig, 2000; Salaberry and Shirai, 2002; Salaberry, 2008, and methodological discussion in Salaberry and Comajoan, 2011). Dietrich *et al.* (1995) say that the data from the naturalistic learners of

SECOND LANGUAGE LEARNING THEORIES

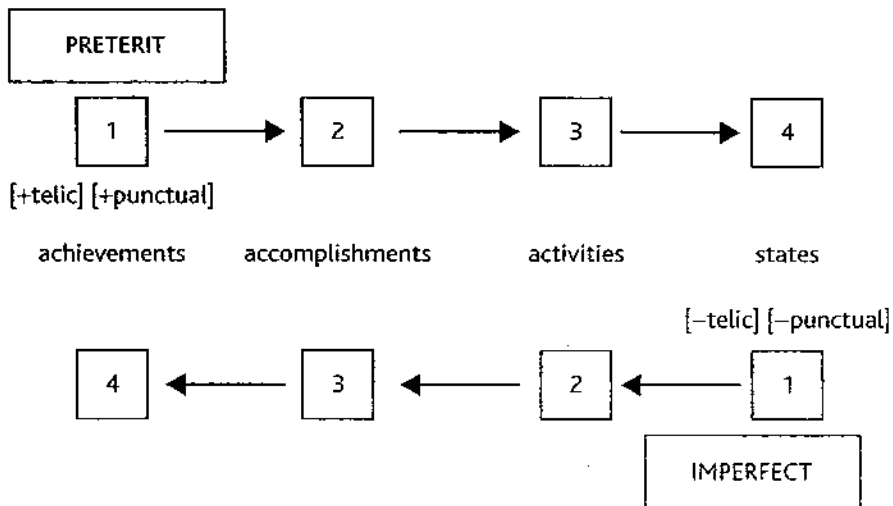


Figure 7.1 Expected direction of spread of preterit and imperfect forms in L2 Spanish across lexical classes (source: Domínguez *et al.*, 2013)

the ESF project do not support it. However, numerous studies of classroom L2 learners have produced results in line with parts of the hypothesis. Thus, for example, Bayley (1994) found that Chinese L1 learners of English L2 were more likely to mark verbs for past tense if they were telic, that is, if their meaning included an end point (for example, *sing a song*) than if they were atelic (for example, *sing*). Salaberry (1999) found that post-beginner English L1 learners of Spanish L2 doing a narrative task were more likely to mark stative verbs as imperfect and accomplishment/achievement verbs as preterit, in line with Andersen's suggestions. Only the most advanced learners in Salaberry's study began to use verb tense more flexibly, for example to mark the speaker's viewpoint on the events making up the narrative. Salaberry has also shown clearly however that early learners of Spanish L2 (presumably the learners for whom the 'spreading' pattern should be most obvious) seem to use the preterit initially as a default 'past-tense' marker (2002, 2003, 2011), for all types of verb, against the predictions of the Aspect Hypothesis.

Many studies exploring the Aspect Hypothesis have relied on learners' (semi) naturalistic productions, and in particular on oral narratives, for their evidence. A recent study by Domínguez *et al.* (2013) collected a wide array of data from the same group of Spanish L2 learners, and also from native speakers of Spanish (including open-ended narratives, controlled narratives and a comprehension/judgement task). These researchers have shown that in open-ended, naturalistic narratives, the tense/aspect choices of both native speakers and advanced learners show a statistical pattern in line with the Aspect Hypothesis. For example, they strongly prefer preterit with achievement verbs,

7.5 The Aspect Hypothesis and the acquisition of past tense

and they strongly prefer imperfect with states. However, the researchers argue that these advanced users are reflecting high-frequency and/or prototypical associations (for example, of the copular verb 'to be' with habitual meaning) in their language usage, and such speakers are quite able to produce less usual combinations when the need arises. (This phenomenon has been discussed by others as the 'Distributional Bias Hypothesis': Andersen and Shirai, 1994.) Wulff *et al.* (2009) provide further evidence on frequencies of different verb types in association with English present, past and progressive forms, in large English native speaker corpora, and confirm that distinctive pairings such as 'look' + Progressive, 'become' + Past, are common in native speaker data.

In a controlled storytelling task which forced the production of non-prototypical pairings, the advanced learners studied by Domínguez *et al.* (2013) could respond successfully. This is illustrated in the following example which shows one learner's ability to produce the non-prototypical combination imperfect/accomplishment:

Gwen de niña cada fin de semana [leía un libro(accomp-imp)], [pintaba un cuadro(accomp-imp)] [escribía un cuento(accomp-imp)] y durante la semana [se despertaba temprano(achiev-imp)] [UG-75]

'Gwen when she was a child each weekend would read a book, paint a picture, write a story, and during the week she would wake up early.' (Domínguez, *et al.*, 2013)

In this same study, the early learners of Spanish L2 behaved very differently, however, and their behaviour did not follow the predictions of the AH. During the open-ended oral tasks, their preferred past-tense form was preterit, which they used across all four lexical classes equally. (This evidence is consistent with Salaberry's 'Default Past Tense' hypothesis, mentioned earlier: 1999.) They used imperfect very little (though when they did use it, there was a strong association with state verbs, or rather, with the 'be' verbs *ser/estar*, which provided 85 per cent of the examples of imperfect for this group). On the controlled story task, these beginners also showed a strong imperfect/state association, but there was no evidence for the 'spreading' of preterit or imperfect across lexical classes, as suggested by the AH (and modelled in Figure 7.1 above). Complementary evidence from a judgement task also showed strong preterit/event and imperfect/state associations. It seems from this study overall that dynamicity (and not, for example, telicity) is the semantic feature to which these early learners were most sensitive.

But even if the complex predictions of AH are not correct in detail, the importance of underlying semantic constructs and the possibility that these influence the acquisition of new morphosyntactic forms are underlined by this research programme. A functionalist discussion by Giacalone Ramat of the learning of L2 Italian by speakers from a variety of language backgrounds (2002) adds a further dimension: she points out that where languages differ in

their underlying 'conceptualisation patterns' (p. 242), learners may encounter additional difficulty. (Thus, for example, German does not formally encode grammatical aspect in verb morphology, which she argues causes particular difficulties for German L1 speakers acquiring Italian as L2.)

7.6 Cognitive linguistics and 'thinking for speaking'

The relationship between cognitive concepts and linguistic forms is made central to theories of language by proponents of so-called 'cognitive linguistics' (for example, Evans and Green, 2006; Talmy, 2000; Langacker, 2008; Verspoor and Tyler, 2009). From this perspective, meaning is reflected in the symbolic systems of both grammar and vocabulary, though necessarily in complex ways; thus, lexical items typically have more than one meaning, and grammatical meanings may be highly abstract. There is no separate, formal semantics, so that linguistic meaning corresponds with conceptual meaning (our understanding of the world); however, we perceive and portray the world from different perspectives, so that the meaning of any expression is partly a matter of subjective point of view, and may be imagined rather than real. Langacker (2008) gives the example sentence *This road winds through the mountains* (p. 69); of course, the road itself does not move, but we endow it with imagined motion.

Metaphor is consequently an important strand of research and theorizing in cognitive semantics (Lakoff, 1987; Cameron, 2011), and conceptual metaphors are seen as linking idioms and broader areas of vocabulary and grammar. For example, the conceptual metaphor ANGER IS A HOT LIQUID IN A CONTAINER is reflected in expressions such as *boiling with rage*, *simmer down*; many English phrasal verbs reflect underlying conceptual metaphors, such as VISIBLE IS UP (*turn up*, *look up*; examples from Boers and Lindstromberg, 2008). There is a general tendency to 'use vocabulary from the external [physical] domain in speaking of the internal [mental] domain' (Sweetser, 1990, in Tyler, 2008, p. 469). This tendency is illustrated in metaphors such as:

My thoughts raced ahead

The theory has run into an obstacle

I see your point

(examples after Tyler, 2008)

Ideas from cognitive linguistics have been attracting increasing interest from different branches of second language learning and teaching research; an overview is provided in the recent survey volume edited by Robinson and Ellis (2008). For example, Tyler (2008) builds on a cognitive linguistic analysis of English modal verbs, originally developed by Sweetser (1990), which argues that their root meanings have to do with 'physical forces, barriers and paths'. So, for

7.6 Cognitive linguistics and 'thinking for speaking'

example, the verb *must* involves the action of an irresistible external force on the speaker or doer; the verb *may* involves the removal of a barrier to action, by some figure of authority. The **polysemy** (multiple meanings) of modals can be related to these key underlying ideas, as in the following examples:

John may go = John is not barred by authority from going

John may be at the party = I am not barred by my premises from the conclusion that he is there. (examples from Sweetser, 1990, in Tyler, 2008, p. 470)

Tyler has developed concept-based teaching materials for the English modals which incorporate this analysis; an example of her diagrammatic representation of the modal verb *will* is shown as Figure 7.2. She also describes some small-scale classroom experiments in which the approach was tested successfully with advanced-level ESL learners (2008, pp. 472–85).

A considerable amount of work has also been done from this perspective on the learning and teaching of different domains of L2 vocabulary (see the survey of Boers and Lindstromberg, 2008). This work has brought greater underlying conceptual coherence to the teaching of English prepositions, phrasal verbs and polysemous nouns, and classroom experiments have demonstrated that 'at least at the lexical level, meaningful connections help the learner remember' (Verspoor and Tyler, 2009, p. 171).

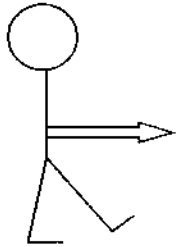
ROOT Physical/social reasoning	METAPHORIC EXTENSION	EPISTEMIC Predictive/logical-causal
<p>WILL</p>  <p>Force emanates from doer</p>		
<p>If I let go of this apple, it will fall I will finish the paper today You will be happy you took this course Absolute surety of commitment → future implied</p>	<p><i>Just as I am sure about the state of the world and my commitments, the data and premises support the certainty of my conclusion</i></p>	<p>The Court will find in favour of our client = 'I am certain of the court's ruling; no other ruling is possible.' Very strong certainty</p>

Figure 7.2 Diagrammatic representation of modal verb *will* (after Tyler, 2008, p. 473)

SECOND LANGUAGE LEARNING THEORIES

One further topic in cognitive semantics has attracted the special attention of second language learning researchers, because of its potential to shed light on the extent to which learners restructure their underlying meaning systems, to accommodate the conceptual structure of the L2. This topic has to do with the learning of verbs of motion. The cognitive linguist Leonard Talmy (1985, 2000) has proposed a basic conceptual framework for verbs of motion, including the following elements:

- figure: an object moving or located with respect to another object (ground)
- ground: a reference object in relation to which the figure moves
- path: trajectory or site occupied by the figure
- motion: the presence of motion/locatedness within the event
- manner: the manner in which the motion takes place
- cause: the cause of its occurrence. (definitions after Talmy, 2000, p. 26)

Talmy has noted that languages tend to encode different aspects of a movement event within lexical motion verbs. He proposed (2000) the existence of a number of broad language groups, including: Satellite-Framed languages, which tend to encode motion and manner within the verb, and encode path by means of an external phrase or 'satellite' such as a prepositional phrase; and Verb-Framed languages, which tend to encode motion and path within the verb. English, Danish and Dutch are examples of Satellite-Framed languages, while Romance languages such as French or Spanish are Verb-Framed. The following sentences illustrate these differences:

English: *Oscar limps out of the kitchen*

French: *Oscar quitte la cuisine en boitant*

'Oscar leaves the kitchen limping' (examples after Gullberg, 2011)

That is, the English verb *limp* includes the concept of motion, and also the manner of motion, but does not include the direction of motion or path; this is expressed through the prepositional phrase *out of the kitchen*. The French verb *quitte* includes the concept of motion, plus the concept of departure (that is, the path), but the manner of motion is expressed in a second (non-finite) verb phrase *en boitant*.

A large cross-linguistic research programme initiated by the child language researcher Daniel Slobin has investigated the use of motion verbs in oral narratives by speakers of a range of Satellite-Framed and Verb-Framed languages (using the famous 'frog story': Berman and Slobin, 1994). Relating to this research, Slobin has elaborated the so-called 'thinking for speaking' hypothesis (1996), which claims that speakers are more disposed to notice and encode linguistically those features of an event which are most easily encoded in the language(s) they know. Analysis of 'frog stories' told in S-languages and

7.6 Cognitive linguistics and 'thinking for speaking'

V-languages showed that even by the age of 3, children differed considerably in the way they talked about motion; for example, manner of motion was described more elaborately by speakers of S-languages (Slobin, 2000, 2004).

Moreover, it has been shown that the accompanying gestures made by native speakers of S-framed and V-framed languages when describing motion events are not the same, mirroring differences in the encoding of manner and path (Gullberg *et al.*, 2010). For example, Kita and Özyürek (2003) had native speakers of English, Japanese and Turkish describe the same *Sylvester and Tweety Bird* cartoon story (Freleng, 1950). When describing the cat Sylvester rolling down a drainpipe, a motion event in which manner was particularly salient, the English L1 speakers used a verb + satellite construction, accompanied by a combined gesture, which indicated both manner of motion and path. However, the Turkish and Japanese L1 speakers typically encoded the scene in two clauses, using both a manner verb and a separate path verb. If gestures appeared, they used separate gestures for manner and/or for path.

Second language researchers have followed up these ideas through empirical studies of L2 learners describing motion events in various languages, and in some cases have also paid attention to the accompanying gestures (overviews are provided by Cadierno, 2008; Gullberg *et al.*, 2010; Gullberg, 2011). The theoretical interest of these studies has to do with how far the underlying conceptual representations of L2 are adopted and reflected both in L2 speech and in accompanying gesture. For example, Choi and Lantolf (2008) carried out a study with Korean L1 speakers who were learning English as L2, and with English L1 speakers who were learning Korean as L2. The participants in the study all told the same *Tweety Bird* cartoon story in both languages, and their speech and gestures were analysed in detail.

The results of this study are complex, but overall they suggest that learners do not fully adopt the 'thinking for speaking' patterns of the new language. As far as the marking of path was concerned, the L2 speakers showed some flexibility, with the Korean learners of L2 English using satellite expressions to indicate path, for example, and the English learners of L2 Korean using path verbs. For manner, however, all of the speakers seemed to continue their L1 behaviour when narrating in their L2.

It is interesting to compare the results of the Choi and Lantolf study (2008), with a longitudinal case study reported by Stam (2010). This researcher recorded a Spanish L1 user of English as a second language, residing in an English-speaking environment, on two well-separated occasions, in 1997 and again in 2006. Once again the speaker told the *Sylvester and Tweety Bird* cartoon story, in both L1 and L2, concentrating on the drainpipe episode. The two Spanish versions showed the characteristics of S-language narrations, and did not change in any material way between 1997 and 2006. The first English version showed considerable influence from Spanish thinking for speaking

(for example, path was often expressed with a verb rather than with a satellite expression, and manner was not marked in speech – for example, the verb ‘roll’ was not used). By 2006, the English narrative was considerably more native-like for the expression of path, but not for manner, leading the researcher to conclude that a Spanish thinking-for-speaking pattern still dominated in this domain.

7.7 Second language pragmatics

In this section we will provide a short introduction to one more area of current research which seeks to connect meaning-making and L2 development: L2 pragmatics.

Pragmatics is a broad field within linguistics, which examines context-dependent aspects of meaning, and in particular the communicative intent of speakers, the social relationships between them and the speech acts they wish to perform (Cruse, 2010). There is long-standing interest in the speech acts which learners try to perform, their understanding of the politeness conventions governing interaction in different settings (**socio-pragmatics**) and the linguistic means they use to achieve conversational goals (**pragmalinguistics**). In recent decades there have been many studies of learners’ developing command of speech acts, such as requests, apologies, compliments, greetings and forms of address. A comprehensive survey was provided by Kasper and Rose (2002), with useful recent overviews by Kasper (2009) and by Bardovi-Harlig (2012). Taguchi (2011) additionally reviews an extensive body of research on L2 pragmatic development in the context of study abroad.

One of the challenges of L2 pragmatics research is determining how far learners can transfer their existing L1 pragmatic competence (for example, their knowledge of how to be polite) to the new language. For example, in many languages (and perhaps universally, though this is debated), polite requests are expressed with some degree of indirectness, to reduce the social imposition of the request. L2 learners presumably know this, but how far can they use the limited pragmalinguistic means at their disposal to express requests in a ‘polite’ manner, for example? The interim conclusion drawn by Taguchi is that studies have repeatedly found that ‘high general proficiency supports quality pragmatic performance, but it does not guarantee a nativelike performance’ (2011, p. 906). It seems that even advanced learners continue to transfer L1-based strategies into L2 use to some degree, and have continuing difficulty in making sense of aspects of target language pragmatics.

A second issue which has been extensively discussed in L2 pragmatics research has to do with the most appropriate research methodologies (for fuller discussion see Kasper and Rose, 2002, Chapter 3). As we have seen in earlier sections of this chapter, case studies have relied on naturalistic observation

of learners in different social situations, but are very labour intensive. Consequently much L2 pragmatics research has relied on (semi) controlled elicitation tasks. In early L2 pragmatics research, the so-called Discourse Completion Task was commonly used. Here, L2 learners are given a written scenario, which is incomplete in some way, and are asked to write down what they imagine they would say. An example is shown below:

At the College Teacher's office

A student has borrowed a book from her teacher, which she promised to return today. When meeting her teacher, however, she realizes that she forgot to bring it along.

Teacher: Miriam, I hope you brought the book I lent you.

Miriam:

Teacher: OK, but please remember it next week.

(Blum-Kulka *et al.*, 1989, p. 14, in Kasper and Rose, 2002, p. 91)

The validity of the DCT has been criticized, however, and other researchers have preferred to use structured speaking activities such as role plays as data-collection tools. These mean that learners must manage the interaction in real time, though social relations of power and distance are, of course, simulated rather than real. For example, a recent study of requesting by adult learners of English L2 (Al-Gahtani and Roever, 2012) used role plays incorporating varied social relationships, such as the following:

Situation 1 (Bread): The participant asks his housemate to go to the supermarket and buy some bread but the complication is that the housemate is watching TV and would prefer not to go immediately.

Situation 2 (Lecture Notes): The participant is a student who asks his professor to give him the lecture notes from the last lecture, which he did not attend due to illness. Instead of acceding to the request right away, the professor first asks him why he did not attend and whether he is feeling better.

When investigating learners' L2 oral productions such as apologies and requests, there has also been debate about the most appropriate analysis methods to use (see Kasper and Rose, 2002; Kasper, 2009 for fuller discussion). Two important approaches have been (a) the development and application of some kind of coding scheme, to categorize the detail of the speech act(s) being performed (Blum-Kulka *et al.*, 1989); and (b) the use of conversation analysis, a more holistic approach which documents the relationships among the speech turns produced by both the learner and their interlocutor. (For a fuller discussion of the application of CA to the study of L2 pragmatics, L2 use and L2 learning, for example, see Seedhouse, 2004; Kasper, 2006; Kasper and Wagner, 2011.)

SECOND LANGUAGE LEARNING THEORIES

To conclude the section we will briefly review two studies of L2 pragmatic development, both of them concentrating on the development of requests. First, Félix-Brasdefer (2007) studied the development of requests among instructed English L1 learners of L2 Spanish (in a university setting). This was a cross-sectional study involving three groups of learners (15 at each of three levels: beginner, intermediate and advanced). The data was collected using a set of open role plays, designed to reflect different social relationships (degree of intimacy/social distance and power relations). Sample role plays were:

- A student asks a professor for a letter of recommendation (*Letter*: + Power, + Distance)
- A student who frequently misses class asks to borrow the notes of a classmate with whom he/she rarely interacts (*Notes*: – Power, + Distance)
- A student asks his/her roommate to clean the bathroom over the weekend (*Bathroom*: – Power, – Distance)

The students' attempts at performing these requests were transcribed and coded, using a modified version of the scheme proposed by Blum-Kulka *et al.* (1989). For example, this scheme distinguishes between Direct Requests, Conventionally Indirect Requests and Non-conventionally Indirect Requests. Figure 7.3 shows the extent to which the different learner groups made use of these request strategies, and some examples of the requests for a letter of recommendation from a professor produced by learners at different levels are shown below.

Learner level	Request type	Example
Beginner	Direct	ah por favor escribe un 'letter' ↓ para clase ↑ (Female #1, Letter) 'Ah please write a letter ↓ for class ↑'
Intermediate	Non-conventionally Indirect	hola, puedes escribir un carta de recomendación para mí? (Female #7, Letter) 'hi, can you (INFORMAL) write a letter of recommendation for me?'
Advanced	Conventionally Indirect	es posible si puede escribir un recomendación para mí para un trabajo en el mundo español? (#15, Female, Letter) (turn 4) 'is it possible if you (FORMAL) can write a recommendation for me for a job in the Spanish world?'

7.7 Second language pragmatics

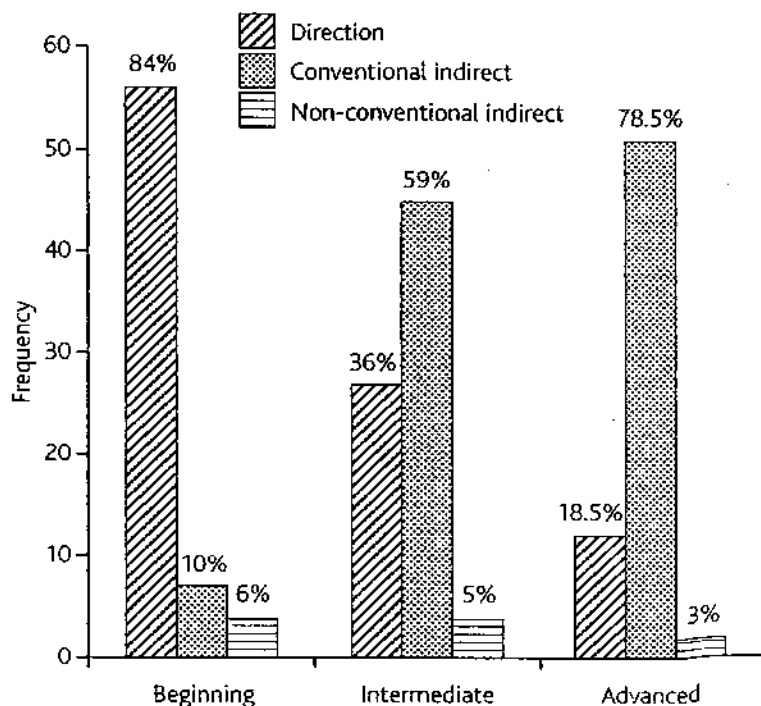


Figure 7.3 Distribution of request types by learner group (source: Félix-Brasdefer, 2007, p. 266)

This study leads the writer to propose a four-stage developmental sequence for learner requests (echoing to some extent the terminology of the ESF researchers' Basic Variety). First, in a pre-Basic stage, learners produce verbless utterances and rely heavily on contextual information to convey their meaning. They indicate their socio-pragmatic competence by using expressions such as *per favor* (= please), and by rising intonation. In the Basic stage, learners produce infinitive verb forms and/or imperative forms, plus a few formulas such as *necesito* (= I need). They still lack the pragmalinguistic means (such as, for example, modal verbs) to make their requests indirect. In the third stage, formulas are unpacked to some extent, and Conventionally Indirect requests are preferred, with a strong preference for the modal expression *puedes (tú)* (= can you) as a preface to the actual request. The fourth stage is titled Pragmatic Expansion; by this stage, most requests are modified quite extensively, and the head act of requesting is frequently delayed and follows a variety of mitigating expressions. Overall, it seems that learners are aware of the politeness issues relating to requests from their earliest efforts, and that the pragmalinguistic means for indirectness (for example, mastery of modals, of conditionals, of imperfect tense) are brought into play as soon as they are available. However, Félix-Brasdefer also notes some lack of sensitivity to situation among his learners; for example, even advanced students tend to use Indirect request

SECOND LANGUAGE LEARNING THEORIES

strategies in the peer–peer situations, where Direct strategies could be appropriate.

The study of Al-Gahtani and Roever (2012) is in some respects similar to that of Félix-Brasdefer (2007). In this case, Arabic L1 learners of English L2 were also recorded undertaking a series of open role plays involving requests, for example to buy bread on the requester's behalf; there were 26 learners, and as in the first study, they were assigned to beginner, intermediate and advanced groups. Each individual participant completed the role plays with an English native speaker as their interlocutor. However, while Félix-Brasdefer focused mainly on the pragmalinguistic realization of the particular speech act of requesting, these researchers were more interested in the evolution of students' ability to manage the requesting interaction as a whole. Consequently, they adopted a conversation analysis approach to their data, and studied the following issues among others:

1. The nature of interactional sequences preceding the actual request (here termed pre-expansions)
2. The nature of sequences inserted by the interlocutors between the request itself, and its acceptance (insert expansions)
3. Distribution of first pair parts between the interlocutors (that is, who was taking the conversational initiative).

The extract below illustrates the performance of the 'Bread-buying' role play, by a beginner learner:

1. P: ↑Excuse me::
2. I: yes
3. P: I (.) want bread
4. I: Ok
5. P: Yea::h
6. I: So:: you want bread?
7. P: Yes:: (.) it is enough in the (.)
8. I: .hhh (.) >you mean< there is nothing: in the fridge?
9. P: Yes
10. I: So:: (.) you wa::nt me to go:: to the superma::rket and get some bread for you
11. P: Yes
12. I: Ok (.) I'll go ↑now and get it for you

(Al-Gahtani and Roever, 2012, p. 50)

This example shows the very early introduction of the learner's request (line 3), and lack of any pre-expansions. The learner does attempt some sort of account

7.7 Second language pragmatics

or justification (line 7), but the interlocutor takes over the conversational leadership at this point, and uses successive first pair parts to clarify the situation (lines 6, 8 and 10) and reduce the learner's role to agreement (lines 9 and 11), before finally offering an acceptance (line 12).

A performance of the same role play by an upper intermediate learner is shown below for comparison:

1. P: hi ((name))
2. I: hi ((name))
3. P: .hhh >actually< I wanna ask you something?
4. I: Su::re.
5. P: →.hhh today I have too many (.) assignments to do=
6. I: =Yeah
7. P: →↑so I have no:: more time (.) to do my shopp[ing
8. I: [hh
9. P: →for today (.) a::nd I'm running out (.) the bread so could you (.3) buy
10. some bread for me?
11. I: su::re yeah (.) but >you know< (.) right n::ow I'm wa::tching this mach (.) so::
12. do you want it at the moment or I can buy it la::ter on?
13. P: yeah (.) that's all right (.3) you can do [this
14. I: [later
15. P: later on.
16. I: .hh
17. P: yep.

(Al-Gahtani and Roever, 2012, pp. 56–7)

In this example, we can see the learner using a number of pre-expansions to mitigate their request (lines 3, 5, 7 and 9), while the interlocutor only produces one first pair part, introducing an insert expansion (lines 11–15). Overall, the CA approach allows these researchers to show how requesting behaviour changes with proficiency at a more strategic level. They also draw an interesting conclusion, regarding the impact of the learners' requesting behaviour on their interlocutor: 'early provision of the request and lack of pre-expansions signals to the interlocutor a lower degree of interactional ability and the need to take greater charge of the conversation and keep complications to a minimum' (p. 59). Such responses may not only enable completion of the interaction, but may also model for the learner the types of sequences which are culturally appropriate and thus provide pragmalinguistically relevant input.

7.8 Evaluation

What are the most important contributions of the functionalist tradition to our understanding of second language learning?

7.8.1 The scope and achievements of the functionalist perspective

The functionalist tradition is well established in second language learning research. Its fundamental claim is that language development is driven by pragmatic communicative needs, and that the formal resources of language are elaborated in order to express more complex patterns of meaning. Functionalist research typically takes the form of naturalistic case studies of individuals or groups of learners; most often these have been adults in the early stages of L2 learning, who are acquiring the language in informal environments rather than in the classroom. These studies have offered us rich descriptive accounts of both the rate and route of naturalistic L2 learning, at least in the early stages. They complement the focus on instructed learners typical of some other traditions (for example, the interactionist tradition). Their interest in the learning of areas such as L2 pragmatics and vocabulary complements the concern with morphosyntax seen elsewhere (for example, the UG tradition). They also shed light on the relationship between thought and language (and now between thought, gesture and language), through research on 'thinking for speaking', for example. In terms of methodology, a number of techniques have been elaborated for the analysis of (semi) naturalistic L2 talk, ranging from speech act coding to conversation analysis.

Functionalist researchers vary, however, in the scope of their enquiries. Some have adopted a 'patch' approach, studying the use and evolution of selected L2 forms, or the development of L2 within a semantic or pragmatic domain such as 'time', 'space' or 'requests'. The intersections of such domains with specific areas of morphosyntax have also been explored in some depth, for example in research on L2 aspect. On the other hand, the ESF team has made quite strong universalist claims for their proposed L2 'Basic Variety', which represents a proto-grammar stage which all learners should pass through.

Below, we comment more specifically on their contributions to understandings of the nature of interlanguage, the learning process and the language learner.

7.8.2 Functionalism and the nature of (inter)language

Functionalist researchers have adopted a broad characterization of 'language', encompassing metaphor, discourse and pragmatics, in addition to lexis and formal morphosyntax. Descriptively, this tradition has added considerably to our understanding of interlanguage communication while the formal system is still in an underdeveloped state, and has made interesting suggestions about

the interactions between form, meaning and function. Functionalist researchers have demonstrated the wide range of devices (lexical and pragmatic as well as formal) which IL users deploy in order to convey meaning. For example, the expanded treatment by functionalist researchers of the semantic notion of temporality has taken the study of how IL users locate their utterances in time well beyond a search for formal sequences in verb morphology development. Research inspired by the Aspect Hypothesis has suggested how learners may use links between meaning and morphological form as an entry point into various formal subsystems of their target language.

Functionalist researchers have also drawn our attention to the issue of textual/discourse organization in learner language, and offered considerable evidence in support of the view that early learner varieties rely heavily on parataxis rather than on syntax in order to structure and express both individual propositions and inter-propositional relationships.

A continuing limitation on functionalists' characterization of interlanguage is that in studies of informal (uninstructed) learners, most attention has been paid to the earlier stages of development (the proposals for the 'Basic Variety'). The interlanguage of more advanced learners has been explored thoroughly in some specific areas, but usually with instructed learners (for example, work on past time, on aspect, or on motion verbs). However, the range of languages investigated is broadening beyond Germanic and Romance to include, for example, Asian languages, and the influence of learners' L1s on post-Basic varieties is now firmly on the agenda through the 'thinking for speaking' research approach.

7.8.3 Functionalism on language learning and development

Functionalist researchers insist generally on the gradual nature of IL development and syntacticization. The approach has led to some far-reaching proposals regarding developmental routes (for example, the 'Basic Variety'). However, much functionalist work has focused on development within various semantic and formal subsystems.

Linkages across these different subsystems are not always clear, though functionalist researchers argue consistently for a multilevel approach to the analysis of IL data. Some valuable work has been done, for example, demonstrating the role of intonation and prosody in demarcating utterances, or demonstrating how paratactic constructions mirror and prefigure their syntactic equivalents. The lexical level has also been studied, from the point of view of its relationship with the development of both morphology and syntax (for example, Sato's comments about the potential significance of items such as *think* and *know* for the development of subordination, or the use of motion verbs).

While their contribution at a descriptive level has been very strong and varied, however, the contribution of functionalist studies to the explanation of IL development has so far been more limited. The 'thinking for speaking' research tradition addresses the role of L1 influence in an interesting new way, with its claims that L1 thinking patterns exercise an enduring influence on L2 speech and gesture. It has also been shown how effective a Basic Variety can be in meeting immediate communicative needs. But it is less clearly established that communicative need is the prime driver for L2 syntacticization and development beyond the Basic Variety. Indeed, researchers such as Bardovi-Harlig conclude that instructed learners make more progress with the acquisition of tense and aspect morphology. But no distinctively functionalist explanation has been advanced as to why instruction should be particularly beneficial for morphological development.

Some functionalist research has concentrated largely on the analysis of learners' interlanguage output, and paid relatively less attention to input and even to interaction. Thus, the ESF research team paid little attention to the details of input and interaction in which their subjects were engaged (apart from ethnographic work by Bremer *et al.*, 1993, 1996, discussed here in Chapter 9).

Attention has been paid to input in other areas, however, for example functionalist research on the acquisition of tense and aspect. Sato noted the rarity and lack of phonological saliency in interlocutor speech of regular past-tense forms. Bardovi-Harlig notes the frequency in input of adverbial forms, and appeals to Input Processing Theory (VanPatten, 2002) in suggesting that learners may therefore not need to notice or process verb tense morphology in the language that they hear. Discussions of the Aspect Hypothesis have taken account increasingly of the significance of input frequency in explaining learners' progress and their preference for certain prototypical verb-aspect pairings (for example, the verb 'be' with states). And L2 pragmatics research has added considerably to the power of its analyses of, for example, learner requests, through the adoption of conversation analysis methodology with its fine-grained interpretation of interaction sequences.

7.8.4 Functionalism on the language learner

Much functionalist research has concerned itself with naturalistic adult learners, acquiring a socially dominant target language in the workplace and other non-domestic settings. As we have seen, the driving forces promoting L2 acquisition for such learners have been explained by the ESF team as (a) immediate communicative need and (b) a longer term and more variable desire for social integration with the target language community. These ideas point the reader in the direction of motivation theory, identity theory and theories to do with the nature of communities and the place of the individual within them. However, with the exception of some work on L2 pragmatics, functionalist

researchers do not typically locate their work in larger frameworks of this type. For a full consideration of these, it is necessary to turn to more explicitly sociolinguistic work, discussed in Chapter 9.

Functionalist researchers have commented on the greater general success of classroom learners in acquiring L2 morphology. It is not, however, very obvious from a functionalist perspective why classroom learners should be more successful than uninstructed learners, as classroom communicative needs are often very reduced and/or indirect. We saw in Chapter 6 that classroom discourse pushes L2 learners to attend to the communicative value of formal items such as tense and aspect morphology, through recasts and other kinds of feedback which elicit modified learner productions. In this direction also, it seems that possibly fruitful connections are waiting to be made.

8

Sociocultural perspectives on second language learning

The co-construction of linguistic knowledge in dialogue is language learning in progress. (Swain and Lapkin, 1998, p. 321)

8.1 Introduction

In this chapter and the next (Chapter 9), we turn our attention to theorists who view language learning in essentially social terms. In both these chapters, we examine the work of those who claim that target language interaction cannot be viewed simply as a source of 'input' to be parsed by internal learning mechanisms, but that it has a much more central role to play in learning. Indeed, for some researchers, interaction itself constitutes the learning process, which is quintessentially social rather than individual in nature. This is not a new view (for example, see Hatch, 1978, cited in Chapter 6), but it has been given extra impetus from the 1990s onward by an increasing interest in applying learning theory associated with the Soviet developmental psychologist Lev S. Vygotsky to the domain of second language learning. In this chapter, we review and evaluate this strand of neo-Vygotskian thinking and research, here called 'sociocultural' theory (SCT), following most current writers in this field.

Since the 1980s, the foremost group advocating the relevance of sociocultural theory to second language learning have been James Lantolf and his associates. From the mid-1990s Lantolf edited several collections of papers which illustrated the application of different facets of Vygotskian thinking to second language learning (Lantolf and Appel, 1994; Lantolf, 2000). A later volume by Lantolf and Thorne (2006) provided the most substantial theoretical overview of applications of SCT concepts to SLA to date, but numerous other shorter accounts by Lantolf and others have provided updates regarding theoretical developments as well as summarizing a wider range of empirical sociocultural research (for example, Swain *et al.*, 2002; Thorne and Lantolf, 2006; Lantolf and Thorne, 2007; Lantolf and Poehner, 2008, 2009; Lantolf, 2011; Swain *et al.*, 2011; Lantolf, 2012).

8.2 Sociocultural theory

Lev Semeonovich Vygotsky was born in 1896, the same year as the Swiss developmental psychologist Jean Piaget whose views on language development were briefly mentioned in Chapter 1. Born in the Russian provinces, Vygotsky was active in Moscow scientific circles between 1925 and his early death in 1934. Like Piaget, he was a researcher and theorist of child development; however, his work fell into disfavour within Soviet psychology, and the first of

his many writings to be translated into English, *Thought and language*, appeared only in 1962. (This book was later republished as *Thinking and speech*: Vygotsky, 1987.) Since that time his views on child development have become increasingly influential, having been taken up and promoted by psychologists and child development theorists such as Jerome Bruner (1985), James Wertsch (1985, 1998) and Barbara Rogoff (1990, 2003), and applied in classroom studies by many educational researchers (for example, Mercer, 1995, 2000; Daniels, 2007; Mercer and Littleton, 2007; Wells, 1999, 2009). Contemporary interpretations and modifications to Vygotsky's original ideas mean that current sociocultural theory is best described as 'neo-Vygotskian'. (For an authoritative review of Vygotsky's original ideas and their modern interpretation, see Daniels *et al.*, 2007). In the rest of this section, we will outline a number of key ideas current in contemporary interpretations/discussions of Vygotsky which, as we shall see, have been taken up and developed by SLL theorists.

8.2.1 Mediation and mediated learning

Mediation is a central concept in Vygotsky's writings (see reviews in Lantolf and Thorne, 2006, pp. 59–83; Wertsch, 2007). Lantolf (2000) provides an introductory account:

The central and distinguishing concept of sociocultural theory is that higher forms of human mental activity are *mediated*. Vygotsky (1987) argued that just as humans do not act directly on the physical world but rely, instead, on tools and labour activity, we also use symbolic tools, or signs, to mediate and regulate our relationships with others and with ourselves. Physical and symbolic tools are artifacts created by human culture(s) over time and are made available to succeeding generations, which often modify these artifacts before passing them on to future generations. Included among symbolic tools are numbers and arithmetic systems, music, art, and above all, language. As with physical tools, humans use symbolic artifacts to establish an indirect, or mediated, relationship between ourselves and the world. The task for psychology, in Vygotsky's view, is to understand how human social and mental activity is organised through culturally constructed artifacts and social relationships. (Lantolf, 2000, p. 80)

This quotation shows clearly the sociocultural belief in the centrality of language as a 'tool for thought', or a means of mediation, in mental activity. Through language, for example, we can direct our own attention (or that of others) to significant features in the environment, rehearse information to be learned, formulate a plan or articulate the steps to be taken in solving a problem. In turn, it is claimed that the nature of our available mental tools can itself shape our thinking to some extent. For example, Olson has argued that once writing systems were invented, these 'mental tools' changed our understanding of the nature of language itself, because they provided humanity with concepts

and categories for thinking about language, such as the 'word', the 'sentence' or the 'phoneme', which did not exist prior to the development of literacy (1995). Similarly, Thorne (2009) claims that texts produced through internet means such as blogging, instant messaging and online fan fiction ('new media literacy') not only have new and distinctive characteristics shaped by the technology itself, but also contribute to forging new cultural practices and new understandings of the term 'community'.

From the sociocultural point of view, learning itself is also a mediated process. It is mediated partly through learners' developing use and control of mental tools (and once again, language is the central tool for learning, though other semiotic modes of representation play a role: Wells, 1999, pp. 319–20). Importantly, learning is also seen as socially mediated, that is to say, it is dependent on face-to-face interaction and shared processes such as joint problem-solving and discussion, with experts and also with peers. There is some controversy among sociocultural theorists about how these learning processes are claimed to work (see extended discussion in Lantolf and Thorne, 2006, Chapter 6). Some key ideas are explored further in the next subsection.

8.2.2 Regulation, scaffolding and the Zone of Proximal Development

The mature, skilled individual is capable of autonomous functioning and self-management, that is, of **self-regulation**. However, the child or the unskilled individual learns by carrying out tasks and activities under the guidance of other more skilled individuals (such as caregivers or teachers), initially through a process of **other-regulation**, typically mediated through language. That is, the child or the learner is inducted into a shared understanding of how to do things through collaborative talk, until eventually they internalize (Lantolf and Thorne, 2006) or **appropriate** (for example, Rogoff, 1995) new knowledge or skills into their own individual consciousness. So, successful learning involves a shift from collaborative inter-mental activity to autonomous intra-mental activity. The process of supportive dialogue which directs the attention of the learner to key features of the environment, and which prompts them through successive steps of a problem, came to be known as **scaffolding** in some interpretations of sociocultural theory. Some of the earliest scholars to promote this metaphor were Wood *et al.* (1976); for more recent discussion and review, see, for example, Daniels (2007). According to Stone (1998, slightly paraphrased from Daniels, 2007, p. 323), scaffolding has four key features:

1. The recruitment by an adult of a child's involvement in a meaningful and culturally desirable activity beyond the child's current understanding or control;
2. Assistance ... using a process of 'online diagnosis' of the learner's understanding and skill level, and the estimation of the amount of support required;

3. Support which is not a uniform prescription, but may vary in mode (e.g. physical gesture, verbal prompt, extensive dialogue), as well as in amount;
4. The support provided is gradually withdrawn as control of the task is transferred to the learner.

As Donato puts it, 'scaffolded performance is a dialogically constituted interpsychological mechanism that promotes the novice's internalisation of knowledge co-constructed in shared activity' (1994, p. 41). However, in some recent sociocultural work on second language learning, the term 'languaging' has been preferred for talk focusing on the construction of linguistic knowledge (see Swain *et al.*, 2011, and further discussion below in Sections 8.3.1–8.3.3).

The domain where learning can most productively take place was christened by Vygotsky the **Zone of Proximal Development** (ZPD), that is, the domain of knowledge or skill where the learner is not yet capable of independent functioning, but can achieve a desired outcome given relevant assistance. The ZPD was defined by Vygotsky as:

the difference between the child's developmental level as determined by independent problem solving and the higher level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (1978, p. 85)

These ideas are illustrated in the sequence below, which presents an example taken from the general educational literature (Mercer and Littleton, 2007, p. 80):

The computer screen shows:

Q3

Rough surfaces cause

- a) As much friction as a smooth surface?*
- b) More friction than a smooth surface?*
- c) Less friction than a smooth surface?*

Rachel: Which one do you think it is?

Cindy: 'c'

Rachel: I think 'b' (*laughs*)

Cindy: I don't. Look, 'changes more surfaces than a smooth surface' (*misreading the screen*)

Rachel: Yeah I know, but if you rub

Cindy: (*inaudible*)

Rachel: Yeah I know but – wait, wait – listen, if you rub two smooth surfaces together will they be slippery or not? (*rubs hands together*)

Cindy: Stable – depends how tight you've got it

SECOND LANGUAGE LEARNING THEORIES

- Rachel: Cindy listen! if you've got oil on your hands and you rub them together will they be slippery or not? (*rubs hands together*)
- Cindy: Well you see (*rubs hands in a parody of Rachel, but without hands touching*) cos they don't rub together, they go
- Rachel: Cindy! (*mock exasperation*) If you've got
- Cindy: Yeah, they will be slippery (*laughs*)
- Rachel: Yeah, exactly. So if you've got two rough surfaces and you rub them together it will not be as slippery will it?
- Cindy: No
- Rachel: So that proves my point doesn't it?
- Cindy: mmm
- Rachel: Yes, do you agree? Good (*she clicks on answer 'b'*)

(*On-screen indication that 'b' was selected*)

Here, the student Cindy starts by approaching the computer-based problem rather carelessly (misreading the instructions). She is scaffolded by fellow student Rachel with a mimed example, which is made successively more explicit (the idea of a lubricant is introduced). Eventually, Rachel's miming and questioning lead Cindy to think through the problem, and once an agreed answer has emerged/been internalized, the computer solution is cross-checked.

The ZPD has proved a very attractive concept for educators, but its interpretation has been controversial. For example, it seems clear that from a classic Vygotskian perspective, instruction 'leads' development within the ZPD – that is to say, the learner is challenged by the presentation of some new, advanced stimulus or idea, and the learner's developmental level is apparent from the nature of their response. However, many neo-Vygotskian interpreters of the ZPD idea seem influenced by constructionist or co-constructionist thinking, where the learner(s) themselves build new knowledge, as they grapple with a problem-solving activity. (A fuller account of current debates around the ZPD and its application in general education can be found, for example, in Del Río and Álvarez, 2007; Daniels, 2007.)

8.2.3 Microgenesis

The example just quoted illustrates in miniature some general principles of sociocultural learning theory. According to Vygotsky's 'genetic law' of cultural development, these principles apply on a range of different timescales. These include the learning which the human race has passed through over successive generations (**phylogenesis**), as well as the learning which the individual human infant experiences (**ontogenesis**). For the entire human race, as well as for the

individual infant, learning is seen as first social, then individual. As Vygotsky put it:

Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first between people (interpsychological), and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relations between human individuals. (Vygotsky, 1978, p. 57)

Throughout their life, of course, human beings remain capable of learning; and the ongoing learning process for more mature individuals acquiring new knowledge or skills is seen in the same way. That is, new concepts continue to be acquired through social/interactional means, a process which can sometimes be traced visibly in the course of talk between expert and novice. This most local, contextualized learning process is labelled **microgenesis** (Lantolf and Thorne, 2006, p. 52); it is important for sociocultural accounts of second language learning, as will be made clear below.

This broad cultural-historical perspective on human development, from phylogenesis to microgenesis, forms an overall backdrop to empirical sociocultural research. As far as research methods were concerned, Vygotsky himself reacted against the experimental methods of the psychology of his day. He made proposals for so-called **double stimulation**, that is, a methodology where one or more pre-planned stimuli were introduced into a problem-solving situation, and the uses made of these stimuli, plus the creation and use of other tools by the research participants, were studied and documented (see the account in Engeström, 2007). This general idea of making one or more interventions in a situation, and tracking the outcomes in a holistic way (but in the absence of formal experimental features such as a control group, for example), is compatible with several current qualitative research methodologies, and highly characteristic of contemporary sociocultural research in second language learning (see Lantolf and Thorne, 2006, Chapter 6).

8.2.4 Private and inner speech

For sociocultural theorists, language is the prime symbolic mediating tool for the development of consciousness, for the human race overall and also for the individual, whether child or adult. The relationship of language and thought has therefore been a consistent focus of attention.

Young children can often be observed to engage in **private speech**, talk apparently to and for themselves, rather than for any external conversational partner. From the point of view of classic Piagetian theory of child development, this talk has been interpreted as evidence of children's egocentrism, or inability to view the world from another's point of view. However, private speech is

interpreted differently in sociocultural theory. Here, it is seen as evidence of the child's growing ability to regulate their own behaviour – when, for example, the child talks to itself while painting a picture, or solving a puzzle. For Vygotsky, private speech eventually becomes **inner speech**, a use of language to regulate internal thought, without any external articulation. From this point of view, private speech reflects an advance on the earliest uses of language, which are social and interpersonal. The fully autonomous individual has developed inner speech as a tool of thought, and normally feels no further need to articulate external private speech. However, when tackling a new task, even skilled adults may accompany and regulate their efforts with a private monologue. (For a fuller account see John-Steiner, 2007.)

8.2.5 Activity theory

The last important sociocultural idea which we need to consider is that of activity theory, originally developed by one of Vygotsky's successors, A.N. Leontiev (Leontiev, 1981; Zinchenko, 1995; Lantolf and Thorne, 2006, Chapter 8) and further popularized today by Yrjö Engeström and associates (Engeström, 1999; Daniels *et al.*, 2010). Where Vygotsky focused mainly on the relation between individuals and their goals, mediated by physical and cultural tools, activity theorists set out to make sense of individual actions within a broader, collaborative setting. Leontiev himself illustrated the idea of 'activity' with the example of hunting among hunter-gatherer peoples, where individual actions (such as the driving of game animals) make sense only within the broader collective activity, stimulated by the need for food or clothing (Leontiev, 1981, p. 210).

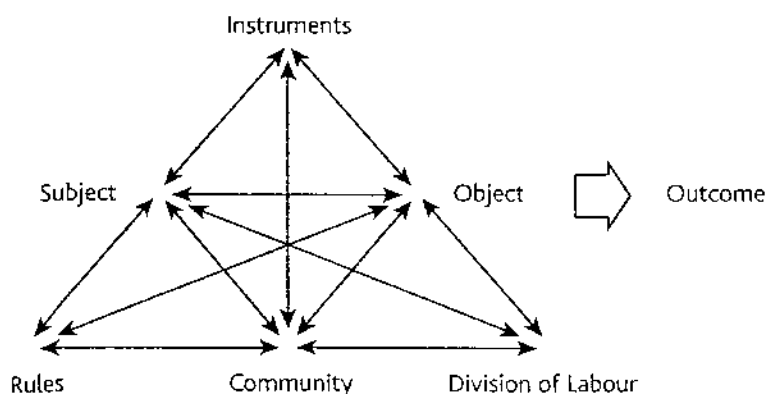


Figure 8.1 Model of an activity system (after Engeström, 1999)

Contemporary activity theorists have modelled so-called 'activity systems' as shown in Figure 8.1 (after Engeström, 1999). The top part of this model reflects Vygotskian concerns with the individual (the 'subject' in the diagram, in Leontiev's example perhaps the individual hunter), their goals (the 'object', perhaps the game animal) and mediation by physical or cultural tools (the

'instruments', in this case perhaps a spear). The lower part of the model adds a collective dimension, that is, the 'community' (in Leontiev's example, the hunting band), the 'rules' (for example, to be silent, to conceal oneself) and the 'division of labour' (for example, to drive the game, to lie in ambush, to throw spears, etc.). The model thus shows how individual actions and goals are interconnected with those of the sociocultural context. Contemporary activity theory has been applied to the study of many types of work and educational settings (see the collections edited by Wertsch *et al.*, 1995, Engeström *et al.*, 1999, and by Daniels *et al.*, 2010).

8.3 Applications of sociocultural theory to SLL

From a sociocultural perspective, children's early language learning arises from processes of meaning-making in collaborative activity with other members of a given culture. From this collaborative activity, language itself develops as a 'tool' for making meaning (Newman and Holzman, 1993, in Dunn and Lantolf, 1998, p. 420). Lantolf and Thorne (2006) note that the view of first language acquisition which 'best complements' sociocultural theory is that of an emergent system, in which people 'develop a repertoire of linguistic devices, to produce and interpret communicative intentions' (p. 173). They view SCT as compatible with the usage-based theory of Tomasello (2003) and others, which we have reviewed in Chapter 4. (For a fuller discussion, see Thorne and Lantolf, 2006, pp. 172–5.)

From a sociocultural point of view, therefore, having internalized the symbolic tools of the first language system, the second language learner has further opportunities to create yet more tools and new ways of meaning, through collaborative L2 activity. Applications of the ZPD to second language learning assumes that new language knowledge is jointly constructed through collaborative activity, which may or may not involve formal instruction and metatalk (depending on whether the learning is naturalistic, or classroom-bound: see discussion in Section 8.3.3 below in the context of **concept-based instruction**). The new language is then appropriated and internalized by the learners, seen as active agents in their own development.

In the following sections, we will consider a selection of L2 research studies which have appealed to key Vygotskian ideas: private speech, activity theory, the role of self-regulation and the ZPD in language learning and assessment, and finally the new field of concept-based mediation and instruction.

8.3.1 Self-regulation, private speech and 'languaging' in second language discourse

Instances of private speech have been regularly noted in naturalistic studies of child L2 acquisition. However, their significance has been variously interpreted.

SECOND LANGUAGE LEARNING THEORIES

The following example is quoted by Hatch (1978), from a study by Itoh (1973) of a Japanese L1 child, Takahiro, learning English as L2:

H: House.

Takahiro: This house?

H: House.

T: House.

To make the house.

To make the house.

To make the house.

This?

House.

Garage.

Garage house

house

big house

Oh-no!

broken.

H: Too bad.

T: Too bad.

H: Try again.

T: I get try.

I get try.

H: Good.

For Hatch, Takahiro's extended speech turn, accompanying a construction activity of some kind, is viewed as 'not social speech at all but [only] language play' (p. 411). From a Vygotskian perspective, however, this extended spoken accompaniment to action provides evidence about the role of language in problem-solving and self-regulation. (It also provides evidence for the appropriation by the child of the new lexical item *house*, initially supplied by the supportive adult, but then quickly reused by Takahiro in a range of syntactic frames.)

The first phase of studies which explicitly brought Vygotskian conceptions of private speech to bear on second language learner data mostly worked with data elicited from older learners, in semi-controlled settings (see reviews by McCafferty, 1994; de Guerrero, 2005; and Lantolf and Thorne, 2006, Chapter 4). In one of the first attempts to apply any aspect of Vygotskian theory to second language learning, Frawley and Lantolf (1985) reported an empirical study of

8.3 Applications of sociocultural theory to SLL

English L2 learners undertaking a picture-based narrative task. The sequence of pictures comprised the following frames:

Frame 1: A boy walks along a road.

Frame 2: He sees an ice cream seller.

Frame 3: He buys a 50-cent ice cream cone.

Frame 4: He gives the cone to a small boy.

Frame 5: A man approaches the small boy.

Frame 6: The man takes the cone from the small boy. The small boy cries.

In retelling this story, the English L2 learners produced accounts which were, as narratives, disjointed and incoherent. However, they incorporated into their accounts many utterances which involved direct reactions/descriptions of individual pictures (*I see a boy on the road*), or externalizations of the task itself (*You want me to say what they are doing? This is the problem now*, etc). These metacomments were absent from the fluent performances of a group of native speakers (*A little boy is walking down the street ...*).

Frawley and Lantolf interpreted the data as demonstrating the learners' need to 'impose order on the task by speaking and identifying the task' (p. 26). In Vygotskian terms, they argued that the learners were struggling to move beyond object-regulation (in this case, evidenced in direct reactions to the individual pictures, or descriptions of them) towards self-regulation and control over the narrative task. Because they could not take self-regulation for granted, their efforts to gain control were explicitly articulated throughout their performances, which were therefore a mixture of self-directed (that is, private) speech and social speech.

McCafferty conducted further studies of learner narratives (1992, 1994), and argued similarly that many utterances incorporated within the narrative of the L2 subject were examples of private speech. In these studies, McCafferty compared the extent of private speech to be found in the narratives produced by learners at different levels of proficiency as well as by native speakers, demonstrating a systematic relationship between the use of private speech to regulate task performance, and the degree of task difficulty being experienced.

Other studies have documented the naturalistic use of private speech among L2 learners. For example, Lee (2008) video-recorded seven adult Korean-English bilingual biology students at an English-medium American university, while they studied privately in their rooms for an upcoming examination. The students were filmed for three hours each; all of them used some form of private speech, some of them very actively (up to 60 minutes of the total time). The students read aloud to themselves, asked themselves questions and answered them, annotated texts and drew pictures; they also regulated their attention through self-directed gesture. Much of this private activity was carried out bilingually, in both English

SECOND LANGUAGE LEARNING THEORIES

and Korean, and Lee argues that the students were dialoguing with themselves, both ensuring they understood the scientific material, and building up their specialist English-language knowledge in the field.

In the language classroom, researchers have recorded learners' private L2 speech during ongoing classroom interaction, and have investigated possible links between this type of private speech and the internalization of new language forms. A striking example is the work of Amy Snyder Ohta, who conducted longitudinal case studies of seven adult learners of Japanese as L2, in classroom settings (2001). The learners regularly wore personal microphones, so that their private speech was recorded alongside other types of language use. In Ohta's study, the learners were judged to be using L2 private speech when they whispered or spoke with reduced volume, and/or when they spoke but were not attended to by others (for example, by the teacher). Most of the learners in this study used L2 private speech regularly during whole class interaction.

Ohta identifies three main types of L2 private speech. The commonest form was repetition, where the learners privately repeated the utterances of the teacher or of other students. This was common practice with new L2 material which was the focus of class attention. The example below shows learner Rob repeating a new Japanese word privately (the symbols ° and °° are indicators of lowered speech volume):

- 1 T: Ja shinshifuku uriba ni nani ga arimasu ka?
So, what is there in the men's department?
- 2 S9: Kutsushita ga arimasu.
There are socks.
- 3 T: Kutsushita ga arimasu.
There are socks.
- 4 S10: Jaketto.
Jackets.
- 5 S11: Nekutai.
Ties.
- 6 T: Jaketto ga arima:su. Un S12-san? Nekutai ga arimasu. S12-san?
There are jackets. Uh S12? There are ties. S12?
- 7 S12: Uh [kutsushita ga arimasu.
Uh there are socks.
- 8 R: [°°Nekutai nekutai°° (.) °nekutai nekutai°
°°Tie tie°° (.) °tie tie°.

(Ohta, 2001, pp. 57–8)

Learners also produced vicarious responses, when they responded privately to a question from the teacher, or secretly repaired/completed someone else's

8.3 Applications of sociocultural theory to SLL

utterance. In the following example, learner Kuo-ming produces an incorrect vicarious response first of all, and then self-corrects privately after hearing the teacher's utterance:

- 1 T: Eto jaa kanji no kuizu arimashita ne:: (.) arimashita. (.) ne arimashita ne, muzukashikatta desu ka?
Um well there was a kanji quiz wasn't there. (.) there was (.) right? There was, was it difficult?
- 2 Km: °Um°
- 3 Ss: lie
No
- 4 Km: °E::h yasashi desu°
°E::h it is easy° ((error: should be in the past tense))
- 5 T: Yasa[shikatta desu um
It was easy um
- 6 Km: [°°Yasashikatta desu°°
°°It was easy°°
- 7 T: li desu ne:: Jaa kanji ii desu ka?
That's good. Is everyone okay with the kanji?

(Ohta, 2001, p. 51)

Finally, learners engaged in manipulation, when they privately constructed their own L2 utterances, manipulating sentence structure, building up and breaking down words and playing with sounds.

Ohta claims that her case study learners typically engaged in L2 private speech when confronted with 'new or problematic' language. This private speech allowed them to develop phonological and articulatory control of new material (through repetition). It provided opportunities for hypothesis testing about sentence construction, for example through comparison of privately produced candidate forms with the utterances of others, or through working on segmentation problems. Private speech during whole class talk also allowed for rehearsal of social interaction and conversational exchanges, ahead of, for example, involvement in pair or group work. Altogether, Ohta argues that:

covert learner activity is a centerpiece of learning processes, deepening our understanding of how learners appropriate language through interactive processes ... results suggest the power of engagement as a factor in L2 acquisition, as the data reveal instances in which linguistic affordances acted on by the learner in private speech are incorporated into the learner's developing linguistic system. (2001, pp. 30–1)

The two studies just quoted (Lee, 2008 and Ohta, 2001) concentrate on the use of L1 and L2 private speech to manage ongoing learning activity, in natural

situations (the student's residence, a regular Japanese L2 classroom). Such studies have not documented systematically the learning outcomes resulting from the use of private speech. However, some studies have also set out to capture this. For example, Swain *et al.* (2009) ran an interventionist study, where they set out to teach university learners of L2 French the concept of grammatical 'voice', and its realization in the French verb system, using a pre-test + post-test design.

Nine students took part in this short study. At the beginning of the 90-minute intervention, they were each asked to explain their understanding of **active/passive/middle 'voice'**. They then worked individually through a set of study materials, written in English, which explained both the grammar and semantics of voice in French. They were encouraged to verbalize their understandings as they worked through the materials (this use of L1-medium private speech is called 'languaging' by Swain and her colleagues). Finally, they were asked to redefine the nature of 'voice', and to comment on active, middle and passive verb forms in a given text. (This was the immediate post-test.) One week later, as a delayed post-test, they took a short cloze test in which they had to generate active, passive and middle verb forms in writing. All aspects of the study were conducted individually, audio-recorded and transcribed for later analysis.

This study showed general improvement in the students' understanding of the concept of 'voice', and particularly of semantic concepts such as 'agent', 'patient', etc. Moreover, there was a significant correlation between the amount of 'languaging'/private speech produced by the learners, and their success on the immediate post-test (though not on the delayed post-test). The researchers conclude that individual 'languaging' is an effective means to develop conceptual understanding of L2 grammar; overall the study presents an example of 'double stimulation' method in action, with the instructional materials plus the activity of languaging promoting at least short-term development in these French learners.

8.3.2 Activity theory, small group interaction and L2 internet communication

Early interest in activity theory on the part of second language researchers broadly followed the argument of Leontiev (1981) that human development results from engagement in activity mediated not only by directly relevant physical or cultural/symbolic tools, but also by the wider sociocultural context. This in turn may mean that what appears to be the 'same' task or activity turns out to be enacted differently by different people, depending on their interpretation of the goals of the task, or the cultural understandings they bring to the undertaking.

In second language research, this insight has mostly inspired research into a variety of L2 tasks, used for both second language research and classroom

second language instruction. Early second language learning research drawing on activity theory typically studied the execution of face-to-face tasks; more recently, activity theorists have also turned their attention to computer-mediated communication (see reviews by Lantolf and Thorne, 2006, Chapter 9; Thorne, 2008, and Swain *et al.*, 2011, Chapter 6).

In an early study, Platt and Brooks (1994) investigated pedagogic tasks in the L2 classroom. They recorded pairs and groups of students undertaking a variety of communicative problem-solving tasks in classroom settings, and used activity theory to interpret the resulting discourse. The tasks included map-reading and jigsaw-puzzle completion, that is, the sorts of tasks which interaction theorists view as useful in promoting the negotiation of meaning, and hence providing rich opportunities for L2 acquisition. However, Platt and Brooks argue that the tasks they studied did not provide a uniform learning environment for participating learners, because they were experienced differently by different people. Their examples included:

1. Students 'going through the motions' of English L2 task performance, rehearsing a problem which they appeared already to understand (role playing the demonstration of an oscilloscope).
2. A student who engaged in long stretches of private speech to regulate his own performance, as he addressed the 'same' oscilloscope demonstration task, apparently incapable of attending to his peers who tried to redirect him.
3. Students learning Swahili at beginner level who successfully carried out a map-based information exchange task in L2, using a combination of paralinguistic means and single word paratactic constructions.
4. High school students making extensive use of L1 to define and redefine the groundrules for an L2 Spanish jigsaw-puzzle completion task, and to comment on task performance.

Interpreting these observations from an activity theory perspective, Platt and Brooks claim that students' own immediate task-related goals and task engagement were critical in influencing both the nature of the activities as they were actually experienced, and the language learning opportunities made available (Platt and Brooks, 2002).

McCafferty *et al.* (2001) applied activity theory more directly to a language learning issue – the acquisition of L2 vocabulary. These researchers ran a small-scale comparative study with two groups of learners of L2 Spanish. One group were given a list of previously unknown words about animals, and asked to include them in an essay about zoos. The second group were asked to plan an interview with fellow students about their early language learning experiences, and were told they could ask for any vocabulary items they needed to fill gaps. It was found that the vocabulary items requested by individual members of the second group, and then actively used by them during the interview process,

SECOND LANGUAGE LEARNING THEORIES

were retained much better than the animal words provided for the first group. McCafferty *et al.* interpreted these results as showing that words are learned better when linked to 'goal-directed action'.

Another group of L2 sociocultural researchers have applied activity theory to the study of internet communication. Thorne (2003, 2008, 2009) has conducted a range of studies of L2 learners engaged in telecollaboration, internet gaming and other forms of internet use. He argues that it is necessary to draw on the Engeström notion of an 'activity system' to make sense of students' participation in such activities, where their cultural backgrounds and prior internet experience are diverse.

For example, Kramsch and Thorne (2002) evaluated a less-than-successful language exchange between American and French students, carried out by email. The American students were experienced email users, and expected an informal and spontaneous exchange about youth culture, with many short questions and answers. However, the (less experienced) French students could only communicate via their teacher's internet connection, with disappointing results as far as the Americans were concerned:

Eric: e-mail is kind of like not a written thing ... when you read e-mail, you get conversation but in a written form so you can go back and look at them. That's neat. ... But in the [French] communications, it felt like they were writing essays and sending them to us rather than having an e-mail conversation with us. (Quoted in Thorne, 2003, p. 45)

These researchers attributed the students' mutual disappointment to mismatches in what they call 'cultures of use' in respect of the internet, that is, to contradictions in the wider activity system. To understand these problems, it was necessary to 'frame in-class digital interaction within the larger context of participants' prior and everyday use of internet communication tools' (Thorne, 2008, p. 424).

Thorne (2003) also reports a case study of a more successful virtual language exchange between one American female student (Kirsten) and a French male student (Oliver). They had been paired up through an institutionally arranged email scheme, but, as Kirsten reported in interview, the partnership took a positive turn when the French student initiated 'a switch to instant messaging (IM). The participants preferred an internet tool which they saw as more spontaneous and 'conversational':

Interviewer: Is IM better for=

Kirsten: =oh definitely=

Interviewer: =for you and Oliver to communicate with each other than e-mail? or

Kirsten: Yeah, e-mail is kinda like "ahh, here's my point, here ya go," but it's really hard to have a conversation. (Thorne, 2003, pp. 47-8)

8.3 Applications of sociocultural theory to SLL

In this preferred environment, the partners quickly developed a close online relationship, which encompassed talk about language, as well as talk about common interests. Kirsten reported receiving help with a number of her language problems, including the use of polite and familiar address forms:

Kirsten: If you read my first e-mail, too, I asked him to correct my grammar and he did. He was really nice about it but like, we went [over] I guess my typical errors, and uh, he taught me some things I wasn't quite grasping when the teacher taught it in French. =

....

Interviewer: =Right, right. Is there any of that in here? [pointing to the e-mail and IM transcripts Kirsten had brought with her].

Kirsten: Yeah, actually. If you read where he goes ... We were talking about the election and the fact that Le Pen, he didn't like him at all and it was such a disaster. And then [he said] "let's talk about your French." And he went through and he said this [Kirsten points to a line in Oliver's email which reads "Bon je garde le 'vous' mais, de grace, utilise 'tu' avec moi!!" (*okay I will stick to 'vous', but for goodness sake, use 'tu' with me!*)] And then, at the very end of here [pointing to her e-mail response to Oliver], see, I do learn. I changed it! (Thorne, 2003, p. 49)

Thorne interprets this intervention as a piece of successful other-regulation by Oliver, a highly valued peer; overall, Kirsten's enthusiasm for Oliver, in combination with IM as a physical tool, led to greatly increased confidence and willingness to express herself in French, that is, to emergent self-regulation within a well-functioning activity system, as seen in the later IM transcripts.

8.3.3 Mediation, 'languaging' and second language learning in the Zone of Proximal Development

We have seen that sociocultural theorists view language as a cultural/symbolic tool which arises both phylogenetically (that is, in the history of the human race) and ontogenetically (that is, in the development of the individual child), as an outcome of social communicative activity (Thorne and Lantolf, 2006; Wells, 2009, Chapter 11). They accept the view of other usage-based linguistic theorists that the only genetic endowments needed are (a) the ability to read the intentions of other people in a context of interaction (a so-called 'theory of mind'), and (b) skills of pattern-finding or categorization (Tomasello, 2003, pp. 3-4). Given this endowment, all aspects of the cultural tool of language can gradually be acquired through engagement in communicational activity, and the mediation of others who will regulate attention, use language flexibly to convey communicative intentions, and supplement language use with gesture and objects. Here, grammar as well as vocabulary are treated in the same way: as learnable by the individual, through mediated language experience.

SECOND LANGUAGE LEARNING THEORIES

Many naturalistic studies conducted by researchers working outside the Vygotskian tradition show sharing and transfer of new L2 lexical and grammatical knowledge between speakers. We have already seen the child learner Takahiro appropriating and using the word *house*, offered to him by an adult carer (Hatch, 1978, p. 410). Another of Hatch's examples shows an adult learner eliciting an expression she needs (*last year*) from a cooperative interlocutor:

- NS: O that's a beautiful plant!
 I like that.
 Did you buy that?
- Rafaela: Excuse me...
 This is the...
 October 24.
 The how you say ...
 The ... (writes '1974')
 year, ah?
- NS: 1974. Last year.
- R: Ah! Last years.
- NS: One. (Correction of plural form)
- R: Last year.
 Last year a friend gave me it.

(Hatch, 1978, p. 427)

From an input/interaction perspective (as discussed in Chapter 6), such passages would be viewed as negotiation of meaning, conversational repair etc., which maximizes the relevance of the available input for the learner's acquisitional stage. From a sociocultural perspective, however, we are witnessing microgenesis in the learner's L2 system, through the appropriation of a new lexical item from the talk of the native speaker.

8.3.3.1 Teacher mediation in the L2 classroom

Most sociocultural research into dialogue and its role in second language learning has taken place in classrooms rather than in informal settings. Following the classic Vygotskian view of the ZPD as involving interaction between an 'expert' and a 'novice', one group of sociocultural studies has examined the L2 development which appears to take place as a result of mediation during teacher-student talk.

The well-known study by Aljaafreh and Lantolf (1994) was a pioneering example. The participants were adult ESL learners receiving one-to-one feedback from a language tutor on weekly writing assignments. At each weekly tutorial, the students first of all reread their own writing, and checked it for any errors they

8.3 Applications of sociocultural theory to SLL

could identify without help; the tutor and student then worked through the assignment together, sentence by sentence. When an error was identified, the tutor aimed to scaffold the learner to correct it: 'the idea is to offer just enough assistance to encourage and guide the learner to participate in the activity and to assume increased responsibility for arriving at the appropriate performance' (p. 469).

The learners were tracked and audio-recorded for eight weeks; the study focused on their developing capability (or microgenetic growth) on four grammatical points in written English (articles, tense marking, use of prepositions and modal verbs). First, the researchers looked for an increase in accuracy in the use of these forms over time, as well as for any generalization of learning beyond the specific items which had received attention in tutorial discussion. Second, even where these errors continued to appear in students' writing, they looked for evidence of students' developing capacity to self-correct (that is, increased self-regulation and reduced other-regulation).

Aljaafreh and Lantolf developed a 'Regulatory Scale' for the tutor's interventions, ranging from implicit to explicit correction; this scale is shown as Figure 8.2.

0	Tutor asks the learner to read, find the errors, and correct them independently, prior to the tutorial
1	Construction of a 'collaborative frame' prompted by the presence of the tutor as a potential dialogic partner
2	Prompted or focused reading of the sentence that contains the error by the learner or the tutor
3	Tutor indicates that something may be wrong in a segment (e.g. sentence, clause, line) - 'Is there anything wrong in this sentence?'
4	Tutor rejects unsuccessful attempts at recognising the error
5	Tutor narrows down the location of the error (e.g. repeats or points to the specific segment containing the error)
6	Tutor indicates the nature of the error, but does not identify the error ('There is something wrong with the tense marking here')
7	Tutor identifies the error ('You can't use an auxiliary here')
8	Tutor rejects learner's unsuccessful attempts at correction
9	Tutor provides clues to help the learner arrive at the correct form (e.g. 'It is not really past but something that is still going on')
10	Tutor provides the correct form
11	Tutor provides some explanation for use of the correct form
12	Tutor provides examples of the correct pattern

Figure 8.2 Regulatory scale for error feedback – Implicit (strategic) to Explicit (source: Aljaafreh and Lantolf, 1994, p. 471)

When the feedback needed by individual students moved closer to the Implicit end of this scale, they were considered to be moving towards more independent and self-regulated performance, and this was consequently taken as positive evidence of learning.

SECOND LANGUAGE LEARNING THEORIES

The protocols presented in Figure 8.3 illustrate the type of data collected and discussed by these researchers.

In Protocol L, we see the tutor and student F attempting to work out the correct tense markings for modal + main verb constructions. The tutor provides progressively more explicit feedback on the student's written error

(L)	1	T:	Okay, 'to the ... [yeah] to the US. [Okay] in that moment i can't ...	(M)	1	T:	Okay, 'I called other friends who can't went do the party.' Okay, what is wrong here?
	2		lived in the house because I didn't have any furniture'.		2		
	3		Is that ... what what is wrong with that sentence, too?		3	F:	To
	4		What is wrong with the sentence we just read? ... 'In that moment I can't lived in the house because I didn't have any furniture' ... do you see?		4	T:	'Who can't went do the party because that night they worked at the hospital'. Okay, from here, 'I called other friends who can't went do the party'. What's wrong in this?
	5				5		
	6				6		
	7				7		
	8	F:	No		8	F:	To?
	9	T:	Okay ... ah there is something wrong with the verb with the verb tense in this this sentence and the modal ... do you know modals?		9	T:	Okay, what else? ... what about the verb and the tense? the verb and the tense?
	10				10	F:	Could
	11				11	T:	Okay, here
	12	F:	Ah yes, I know		12	F:	Past tense
	13	T:	Okay, so what's what's wrong what's wrong here?		13	T:	All right, okay, 'who [alright] could not'. Alright? and ?...
	14	F:	The tense of this live		14		
	15	T:	Okay, what about the the ... is it just in this or in this, the whole thing?		15	F:	To
	16				16	T:	Here [points to the verb phrase]. What's the right form?
	17				17	F:	I ... go
	18	F:	The whole this			T:	Go. Okay, 'could not go to [that's right] to the party ...'
	19	T:	Okay, how do you correct it? ... Okay, 'in that moment, ... What? What is the past tense of can? what was happening ... what ... the past, right? What was happening ... what ... the event happened in the past right? So what is the past tense of this verb can? ... Do you know?	(N)	1	T:	Is there anything wrong here in this sentence? 'I took only Ani because I couldn't took both' ... Do you see anything wrong? ... particularly here 'because I couldn't took both'
	20				2		
	21				3		
	22				4		
	23	F:	No		5	F:	Or Maki?
	24	T:	Okay, ah could		6	T:	What the verb verb ... something wrong with the verb ...
	25	F:	Ah yes		7	F:	Ah, yes ...
	26	T:	Okay, 'I could not ...'		8	T:	That you used. Okay, where? Do you see it?
	27	F:	Live		9	T:	(points to the verb)
	28	T:	Ah exactly, okay. So when you use this in the past then the second verb is the simple ...		10	F:	Took? okay
	29	F:	Yes		11	T:	Take
	30	T:	Form, okay ... ahh 'in that moment I could not ...' Live in the house		12	F:	Alright, take (Laughs)

Figure 8.3 Microgenesis in the language system (source: Aljaafreh and Lantolf, 1994, pp. 478–9)

8.3 Applications of sociocultural theory to SLL

(cited in Lines 2/3), actually modelling the correct past-tense form for modal auxiliary *can* in Line 23. Later in the same tutorial, the same problem is encountered again (Protocol M, Lines 1/2). Initially, the learner focuses on a different problem (she has written *do* for *to*, an error which she notices and corrects). However, once the tutor draws her attention to the incorrect verb pattern, she supplies firstly the correct auxiliary past-tense form *could*, and then the untensed form of the main verb *go*. The researchers argue that this reduced need for other-regulation itself constitutes evidence for microgenetic development.

Protocol N provides further performance data, this time from the tutorial which took place around the student's next assignment, one week later. The researchers claim that here again 'we see evidence of microgenesis both in production of the Modal + Verb construction and the extent of responsibility assumed by the learner for its production' (p. 479). The learner has independently produced the correct past-tense form *could* in her written text. She has still marked the main verb incorrectly for tense, but interrupts the tutor to identify the error (Line 6), and offers the correct form *take* with very little hesitation (though her laughter and embarrassment show that self-regulation is still not automatized or complete). In later essays, this student's performance on this particular construction is error-free, and there is some evidence of generalization to other modals.

In a later study, Nassaji and Swain (2000) set out to test more formally the claim of Aljaafreh and Lantolf that effective mediation depends on the state of the learner's ZPD. These researchers worked with two case study learners, both Korean L1 adult learners of English as L2. As in the earlier study, the learners each met a tutor weekly, to review and correct written English assignments; however, this study concentrated on just one feature of English grammar, the use of definite and indefinite articles. When working with one of the learners, the tutor followed the principles of the Aljaafreh and Lantolf regulatory scale. With the other learner, however, the tutor did not 'scale' the feedback, but provided randomly chosen feedback.

The two learners' progress in English article usage was tracked over several weeks' assignments, and at the end of the study specially developed tests based on the learners' own compositions were also administered. By the end of the study, the first learner had substantially improved her use of English articles, while the second learner had not. Most of the time, it seemed, the randomly selected feedback had not been helpful, while the negotiated feedback had led to microgenesis. The researchers interpret these findings as:

consistent with the Vygotskian sociocultural perspective in which knowledge is defined as social in nature and is constructed through a process of collaboration, interaction and communication among learners in social settings and as the result of interaction within the ZPD. (Nassaji and Swain, 2000, p. 49)

8.3.3.2 Dynamic assessment

More recently, research into the ZPD has been taken in a new direction by the introduction to second language learning research of the concept of 'dynamic assessment' (Lantolf and Thorne, 2006, Chapter 12; Poehner, 2008).

Dynamic assessment (DA) is a systematic attempt to apply the ZPD idea to measurement of individual learner capacities, which 'breaks with the traditional dichotomy between assessment and instruction' (Poehner, 2008, p. 34). DA has been developed in general education, in varied forms. Kozulin and Gindis (2007) sum up the underlying principles of DA:

1. Cognitive processes are modifiable and an important task of assessment is to ascertain their degree of modifiability, rather than remain restricted to estimation of the child's manifest level of functioning;
2. Interactive assessment that includes a learning phase provides better insight into the child's learning capacities than unaided performance;
3. The primary goal of assessment is to suggest psychoeducational interventions aimed at the enhancement and realisation of the child's latent ability to learn.

(Kozulin and Gindis, 2007, pp. 355–6)

Together, Lantolf and Poehner (2011) report a project involving a teacher of L2 Spanish at elementary school, who used DA procedures to support her students' learning of noun–adjective concord during her regular Spanish lessons focusing on animals of Latin America. For each lesson, the teacher worked out a 'menu' of teacher prompts, and used these in response to student concord errors. (Sample prompts are shown in Figure 8.4.) As her assessment tool, the teacher recorded on a simple tracking sheet the amount and type of mediation required by individual students. Figure 8.5 shows a protocol extract with a student requiring most types of mediation before he can produce the expected noun–adjective plural concord; the teacher's assessment notes recorded formally this student's need for extensive mediation at this point.

1	Pause
2	Repeat the whole phrase questioningly
3	Repeat just the part of the sentence with the error
4	Teacher points out that there is something wrong with the sentence. Alternatively, she can pose this as a question, "What is wrong with that sentence?"
5	Teacher points out the incorrect word
6	Teacher asks either/or question (<i>negros o negras?</i>)
7	Teacher identifies the correct answer
8	Teacher explains why

Figure 8.4 Teacher's mediating moves (Lantolf and Poehner, 2011, p. 20)

8.3 Applications of sociocultural theory to SLL

- 1 T: *¿Cuántas orejas?* 'how many ears?'
- 2 V: *tiene dos orejas* 'it has two ears'
(long pause, points at the image on the cube, then looks at Tracy)
- 3 **café* 'brown' (looks out to the class, then back to the teacher)
- 4 **café* 'brown' (then looks back at the cube)
- 5 T: *¿Tiene dos orejas *café?* 'it has two *brown ears?'
- 6 V: (looks at the cube again and points at it twice with his finger)
*sí dos orejas *café* 'yes two *brown ears'
- 7 T: *¿*Café?* 'brown?'
- 8 V: *¿Amarillo?* 'yellow?'
- 9 T: *'Café' es correcto pero ¿dos orejas café?* 'brown is correct but two *brown ears?'
- 10 V: (no response, turns his body to face the class, looks at cube then out at class and back to cube)
- 11 T: shhh (directed to another student murmuring something off camera)
- 12 *Hay un problema con la palabra café* 'There is a problem with the word brown'
- 13 V: (Vicente does not respond but another student in the class says 'oh' and raises her hand)
- 14 T: (looks toward the other student and then back to Vicente)
- 15 *¿Es *café or cafés?* 'is it *brown sg. or brown pl.?'
- 16 V: *Cafés* 'brown pl.'
- 17 T: *Sí muy bien tiene dos orejas cafés muy bien excelente Vicente* 'Yes very good it has two brown ears very good excellent Vicente'

Figure 8.5 Dynamic assessment in action (Lantolf and Poehner, 2011, pp. 21–2)

Qualitative analysis of similar lesson protocols and teacher notes showed that students making apparently similar errors needed different levels of prompting. Over time the need for prompts generally was reduced and performances improved. The researchers attribute this improvement to the carefully graded prompting, and also argued that other students benefited from 'overhearing' prompting directed to their peers.

8.3.3.3 Peer-to-peer dialogue and 'languaging' within the ZPD

While Vygotsky's original formulation of the ZPD was primarily concerned with interaction between 'novice' and 'expert', current sociocultural theorists have expanded the concept to include pair and group work among peers:

To learn in the ZPD does not require that there be a designated teacher; whenever people collaborate in an activity, each can assist the others, and each can learn from the contributions of the others. (Wells, 1999, p. 333)

SCT research on peer interaction in the language classroom is reviewed by Swain *et al.* (2002), by Lantolf and Thorne (2006, Chapter 11) and by Swain *et al.* (2011, Chapter 3). Different types of collaborative dialogue have been studied,

SECOND LANGUAGE LEARNING THEORIES

including how learners support each other during oral L2 production, how they work together during 'focus on form' activities and how they collaborate around L2 writing activities. Here we briefly examine examples of each type.

The longitudinal study by Ohta of seven adult learners of Japanese L2 has already been introduced (2000, 2001). Ohta's naturalistic classroom recordings provide abundant examples of peer scaffolding, during oral pairwork. Figure 8.6 lists the array of strategies used by peers in Ohta's study to support their partner, ranked in order of explicitness. The extract below illustrates both repair and co-construction, in an episode where learners Bryce and Matt are describing what people in magazine pictures are wearing:

- 1 B: Un. Hai um kuroi ti-shatsu o kiru, to: um
Yeah. Yes um he wears a black t-shirt, a:nd um
- 2 M: Kiteimasu?
He's wearing?

<i>1. Methods (when interlocutor is struggling)</i>	<i>Degree of explicitness</i>	<i>Description</i>
Waiting	1	One partner gives the other, even when struggling, time to complete an L2 utterance without making any contribution.
Prompting	2	Partner repeats the syllable or word just uttered, helping the interlocutor to continue.
Co-construction	2-3	Partner contributes an item (syllable, word, phrase etc) that works toward completion of the utterance.
Explaining	4	Partner explains in L1 (English)
<i>2. Additional methods (when interlocutor makes an error)</i>	<i>Degree of explicitness</i>	<i>Description</i>
Initiating repair	1-2	Partner indicates that the preceding utterance is somehow problematic, for example saying 'huh?'. This provides an opportunity for the interlocutor to consider the utterance and self-correct.
Providing repair	3	Partner initiates and carries out repair.
Asking the teacher	4	Partner notices the interlocutor's error and asks the teacher about it.

Figure 8.6 Methods of assistance occurring during classroom peer interaction (after Ohta, 2001, p. 89)

8.3 Applications of sociocultural theory to SLL

- 3 B: Kiteimasu? (.) um (.) ahh
He's wearing? (.) um (.) ahh
- 4 M: Han::=
Ha::lf=
- 5 B: =Han- han- han- han-zubon (.) han zubon o um haiteimasu?
=Half- half- half- half-slacks (.) he's um wearing half-slacks?(literally, "half-slacks" means "shorts")
- 6 M: Um hm:
- 7 B: Ah kutsu o:: (.) a:::h haiteimasu, (.) s- (.) um socks he//he
Ah he's a:::h wearing (.) shoes, (.) s- (.) and socks hehe
- 8 M: Kutsushita
Socks (literally, "under-shoes")
- 9 B: Sha uh?
- 10 M: Kutsushita.
Under-shoes.
- 11 B: Kutsushita o:, [o::
Socks ACC:, (.) ACC::
- 12 M: [Haite?
Wear-?
- 13 B: Haiteimasu un haiteimasu, (.) Ah tokai o um hai um hameteimasu?
Wearing yeah wearing, (.) ah he's um wearing a watch ((mispronounced))?

(Ohta, 2001, p. 84)

The data provided by Ohta includes some evidence of learners prompting and scaffolding others with language material which they are not capable of producing reliably themselves, during their own oral production. Ohta explains this by drawing on concepts from cognitive theory: selective attention and the limited capacity of Working Memory (see Chapter 5). She argues that for beginning learners, formulating and producing an L2 utterance means solving a whole variety of phonological, lexical and syntactic problems, and they may lack the Working Memory capacity to solve them all in real time. However, the listening partner, who is not burdened with the demands of actual production, has capacity available both to analyse what is being said, and to project what might come next. They thus have sufficient attentional resources available to collaborate with the speaker, and provide assistance even for language points where their own productive ability is not yet automatized (Ohta, 2001, pp. 77–9).

Other researchers have looked at peer interaction during the performance of classroom activities with a focus on form. For example, in a study of writing in L2 French, Swain and Lapkin (1998) recorded pairs of immersion students

undertaking a jigsaw task. Each student was given half of a set of pictures which together told a story; the task for the pair was to reconstruct the complete story and to produce a written version. In their report, Swain and Lapkin concentrate on what they call 'language related episodes' (LREs) recorded during the activity, that is, episodes where the learners were discussing points of form such as whether or not a verb was reflexive, or sorting out vocabulary problems. They focus on one pair of students (Kim and Rick), who produced the best-quality written story, having also invested most time in the task, and having produced the largest number of LREs. Kim and Rick used a wide range of strategies to co-construct their written story, generating and assessing alternatives, correcting each other's L2 productions, and also using the L1 as a tool to regulate their behaviour. Swain and Lapkin claim that this cognitive activity led to microgenesis taking place for both L2 vocabulary and for grammar. This is argued from the evidence of the oral protocols themselves, and from the written story which resulted, but also from the evidence of specially devised post-tests, which checked the students' recall of some of the words and grammar points discussed during the observed LREs.

The students Kim and Rick, discussed by Swain and Lapkin (1998), were both strong students who worked effectively together. Students undertaking pair work may act competitively rather than collaboratively, and the work of Storch, for example, has provided evidence that, in such cases, supportive scaffolding and the transfer of L2 knowledge is considerably reduced (Storch, 2002). In response to such observations, Mercer (2000) and Klingner and Vaughn (2000) have developed general instructional procedures to promote collaborative rather than competitive dialogue among classroom peers.

8.3.3.4 Languaging and concept-based instruction

In a wide-ranging review of sociocultural theory, Swain *et al.* (2011) have promoted the term 'languaging' to cover both private speech and peer collaborative dialogue, where language is 'being used as a cognitive tool to mediate the process of thinking' (Swain *et al.*, 2011, p. 44). These writers view 'languaging' as a mechanism for the internalization of new knowledge, but they also see it as a means of externalization which transforms the learner's developing thoughts 'into artifacts that allow for further contemplation' (p. 43). Like other sociocultural L2 theorists, they are flexible as to whether 'languaging' is performed in L1 or in L2, and argue that L1 may often be necessary where an activity requires complex analysis or processing. (We previously discussed the study by Swain *et al.*, 2009, which promoted L1 private speech as a means of understanding a challenging grammar concept.)

This leads us to a final key idea attaching to L2 sociocultural research which has emerged clearly in recent studies and discussion: that of 'concept-based mediation' (Lantolf, 2011). In their 2006 book, Lantolf and Thorne point out

8.3 Applications of sociocultural theory to SLL

that for the classic Vygotskian tradition, the distinctive role of formal education was to develop learners' conceptual scientific understanding (pp. 290–1), in line with the overall view that 'instruction leads development'. Thus, for example, Vygotsky argued for the importance of L1 grammar instruction, and of language awareness more generally, for the 'general development of the child's thought' (1987, p. 205).

Lantolf and Thorne apply this line of thinking to current debates about the place of metalinguistic understanding in classroom second language learning, and argue that classrooms cannot replicate the spontaneous learning typical of first language acquisition. Instead they argue in favour of research into the classroom as a site for the 'intentional development of communicatively functional declarative knowledge' (Lantolf, 2011, p. 37). They look to cognitive linguistics (see Chapter 7) as a source of suitable conceptual accounts of grammar phenomena, which are at the core of so-called 'concept-based instruction', along with various kinds of language practice activities, and languaging in which the learners re-explain the new concepts to themselves, and comment on concrete examples of their use.

Earlier, in Section 8.3.1 on private speech, we already encountered an example of concept-based instruction research (Swain *et al.*, 2009). Another study of concept-based instruction for Spanish L2 has been reported by Negueruela (2008). Here, the students were taught a conceptual understanding of a number of key grammatical distinctions in Spanish, following principles articulated by Piotr Galperin (1992 in Negueruela, 2008):

1. concepts form the minimal unit of instruction in the L2 classroom;
2. concepts must be materialised as didactic tools ...;
3. concepts must be verbalised [including] speaking to oneself, and using concepts as tools for understanding, to explain the deployment of meaning in communication;
4. categories of meaning must be connected to other categories of meaning ...

For example, they studied the conceptual (semantic) distinctions between indicative and **subjunctive mood** in Spanish, and between preterit and imperfect aspect. The 'didactic tools' were devised following principled accounts found in cognitive linguistics; Figure 8.7 shows an example from Negueruela, 2008, devised to guide mood selection in Spanish. To meet principle 3, Negueruela experimented with both classroom collaborative dialogue (not so successful) and individual homework verbalization tasks (more successful in this case). To meet principle 4, he addressed a number of different grammar topics, and aimed to develop students' understanding of the underlying relations between them.

As in many SCT studies, Negueruela evaluated the success of his project by tracing the development of some individual participants over time, both in

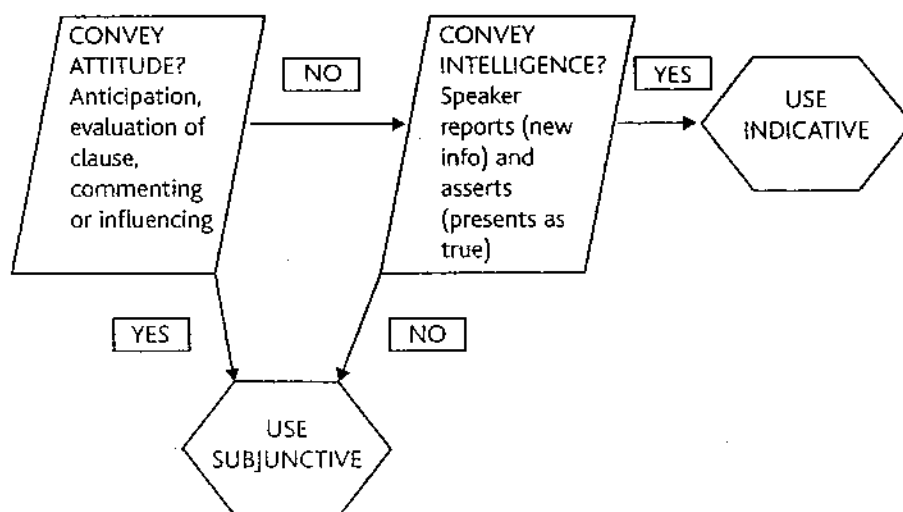


Figure 8.7 Didactic model for mood selection in Spanish (source: Negueruela, 2008, p. 212)

terms of their verbalizations and developing semantic understandings, and in terms of 'discourse performance' (use of the targeted grammar forms, in written compositions). The verbalizations of the single participant discussed in Negueruela (2008) shifted over time from 'rules of thumb' to more meaning-based comments on the use of the subjunctive mood; her use of subjunctive morphology in writing also became more consistent and accurate; and she reflected positively on the whole experience, 'languaging' included.

8.4 Evaluation

Since its emergence in the 1990s, sociocultural theory has rapidly established itself as an active research programme within the field of second language learning. What are its most original features, and how far have its claims been empirically established?

8.4.1 The scope of sociocultural research

L2 researchers working in a sociocultural framework are making an ambitious attempt to apply a general theory of cognition and of development which has been influential in other domains of social and educational research to the language learning problem. First, the conventional separation between social and psychological aspects of cognition and development is rejected. Similarly, the classic Saussurean view of language as a formal abstract system, which has an existence distinct from language use, is also in principle rejected. Learning is seen as a social and inter-mental activity, taking place in the ZPD, which precedes individual development (viewed as the internalization or appropriation of socially constructed knowledge). These have been challenging ideas, for an L2 research

community accustomed to the Chomskyan distinction between language competence and language performance, and to psycholinguistic assumptions about individual development. The sociocultural tradition has found a more sympathetic hearing among other research traditions belonging broadly to the 'social turn' of the 1990s and 2000s (see Duff, 2007, on connections between SCT and language socialization theory). Its applications are also appealing to language educators, who can find that sociocultural theory offers a creative agenda for the renewal of L2 classroom practice.

The empirical research which we have sampled in this chapter has used a varied range of sociocultural constructs (private speech, activity theory, mediation, languaging, the ZPD) to address a variety of aspects of L2 learning (from the acquisition of lexis and grammar, to the development of conceptual understanding, and of discourse skills such as narrative and L2 writing). Studies have typically been small-scale, and have generally focused on teenage and adult classroom learners. In line with the ideas of 'genetic method' and 'dynamic assessment', sociocultural researchers typically record and transcribe learners engaging in some type of organized language learning activity, whether with an individual tutor, a class teacher, or one or more peers. The resulting protocols are then analysed qualitatively, to trace the mediation and co-construction of conceptual and/or linguistic knowledge.

Sociocultural theory clearly meets at least the first and third of the evaluation criteria for a credible theory proposed in Chapter 1. It offers a well-developed conceptual framework, with a long pedigree and roots in an ambitious general explanatory theory of human learning. In recent writings, there is an evident intention among SCT theorists to demarcate more precisely the area of application of the theory, and, in particular, to promote applied research on concept-based instruction and on dynamic assessment (Lantolf, 2012, p. 68).

There is a commitment to empirical research tracing learner development longitudinally, using analyses of ongoing interaction to trace the influence of learning tools such as private speech, the role of mediation and the emergence of new knowledge. This partly satisfies the second criterion, though this approach to empirical research is affected by some of the usual difficulties in developing causal explanations and generalizations through naturalistic research.

Researchers working in this tradition are conscious of these issues, and there are examples of studies which have tried to address them (for example, those studies we have cited which have included some form of distinct post-test in their design: Nassaji and Swain, 2000; Swain *et al.*, 2009 and others). But many of the strongest sociocultural claims about the relationship between interaction and learning have been made on a local scale, with reference to discrete elements of language. SCT research has not yet seen the cumulative focus of successive studies on very similar domains, which characterizes, for example,

the interactionist approach. The new sharper focus – on, for example, concept-based instruction – may change this.

8.4.2 Sociocultural interpretations of language and communication

Sociocultural theory views language as a 'tool for thought'. It is therefore critical of 'transmission' theories of communication, which present language primarily as an instrument for the passage back and forth of predetermined messages and meanings. Dialogic communication is seen as central to the joint construction of knowledge (including knowledge of language forms), which is first mediated inter-mentally, and then appropriated and internalized by the individual. Similarly, private speech, meta-statement etc. are valued positively as instruments for self-regulation, that is, the development of autonomous control over new knowledge.

In addition to these general claims regarding the functions for which language may be used, we have already noted the rejection by sociocultural theorists of the classic Saussurean idea of language as an autonomous abstract system, and of Chomsky's distinction between competence and performance. The early phases of sociocultural work did not offer in its place any very thorough or detailed view of the nature of language as a system – a 'property theory' was lacking, and earlier sociocultural studies of language development within the ZPD focused on individual lexical items or morphosyntactic features as defined in traditional descriptive grammars (for example, Aljaafreh and Lantolf, 1994). More recently, however, sociocultural theorists have aligned themselves much more explicitly with meaning-based, functional perspectives on language, and have proposed what they term a 'linguistics of communicative activity':

Language from this perspective is not about rule governed a priori grammar systems that must be acquired before people can engage in communication, but is instead about communicative resources that are formed and reformed in the very activity in which they are used – concrete linguistically-mediated communicative and cognitive activity. (Thorne and Lantolf, 2006, p. 177)

With respect to language learning, Thorne and Lantolf (2006) also align themselves with the usage-based theory of Tomasello (2003). These theoretical developments have had limited impact so far on empirical research in the SCT tradition, but the developing work on concept-based instruction is grounded in a meaning-centred view of language.

8.4.3 The sociocultural view of (language) learning

Sociocultural theorists assume that the same general learning mechanisms will apply to language as to other forms of knowledge and skill. All learning is seen as

first social, then individual; first inter-mental, then intra-mental. Also, learners are seen as active constructors of their own learning environment, which they shape through their choice of goals and operations. So, this tradition has a good deal to say about aspects of the learning process, and has invested considerable empirical effort in illustrating these. However, the language learning documented in much sociocultural research is local, individual and short-term, and what actually counts as learning is not uncontroversial, as we have seen:

Unlike the claim that comprehensible input leads to learning, we wish to suggest that what occurs in collaborative dialogues *is* learning. That is, learning does not happen outside performance; it occurs in performance. Furthermore, learning is cumulative, emergent and ongoing. (Swain and Lapkin, 1998, p. 321)

Ohta's year-long case study of L2 Japanese learners remains unusual in the field. She developed a very full account of language learning which integrates a range of sociocultural concepts with cognitive ideas about learning processes (2001). The length of her study and detailed nature of her analysis means she can offer rich exemplification in support of her specific detailed claims.

Compared with other traditions which have addressed the issues of **rates** and **routes** of learning very centrally, the Vygotskian tradition may be best described as agnostic. There are some suggestions (Storch, 2002; Nassaji and Swain, 2000) that people who receive timely and effective scaffolding/means of mediation learn faster than those who are denied this help. But varying positions are held regarding the existence/non-existence of common learning routes. Lantolf (2011) notes that the logic of SCT is to challenge 'the existence of a natural syllabus' (p. 42), and calls for empirical studies using concept-based instruction designed to test this. Song and Kellogg (2011) positively reject the concept of orderly L2 developmental routes, but cite evidence relating to vocabulary learning only; overall, as we concluded in an earlier edition of this book, a research 'gap' continues on this issue.

8.4.4 Overall conclusion

SCT has established itself as a vigorous player in the field of second language learning research, making a range of ambitious theoretical claims, and supporting these with diverse if uneven empirical activity. Its central ideas have undoubted appeal for educators, and concepts such as the ZPD, scaffolding and activity theory provide appealing alternative interpretations of the L2 learning and developmental opportunities afforded by classroom basics such as teacher-student interaction, problem-solving and communicative tasks, learner strategy training, focus on form and corrective feedback. The recent concentration on concept-based instruction, and acknowledgement of the 'artificiality' of classroom second language learning (Lantolf and Poehner, 2009), should initiate a more focused agenda and more sustained empirical investigation of key ideas.

9 | Sociolinguistic perspectives

Language and literacy learning involves explicit or implicit socialization through linguistic and social interaction into relevant local communicative practices or ways of using language and into membership in particular cultures or communities. (Duff, 2007, p. 310)

9.1 Introduction

In this chapter we review aspects of the relationship between sociolinguistics and second language learning theory. As we have seen in earlier chapters, theorizing about second language learning originally concentrated mostly on modelling the development of language within the individual learner, in response to an environment defined fairly narrowly as a source of linguistic information. However, in the last 15 years or so, a rich flow of conceptual discussion and empirical research has developed, in which wider aspects of the social context are viewed as central to the overall understanding of second language learning. Sociolinguistics, or the study of language in use, is itself a diverse and changing field, with multiple theoretical perspectives. This is clear from any of the current survey volumes (for example, Holmes, 2008; Mesthrie *et al.*, 2009; Wardhaugh, 2010; Mesthrie and Wolfram, 2011; Meyerhoff, 2011). Here, we will necessarily be selective, identifying strands within contemporary sociolinguistics and **anthropological linguistics** which are having the clearest impact on the field of second language learning. Where appropriate, we will pay attention to sociolinguistic interpretations of the multilingual practices, and virtual communities, which are receiving increasing attention in second language learning theory as in other types of linguistics. Successive main sections of the chapter will deal with:

- sociolinguistically driven variability in second language use
- second language socialization
- communities of practice and situated L2 learning
- L2 learning, agency and the (re)construction of identity
- **affect**, emotion and investment in L2 learning.

One growing sociolinguistic area that we do not deal with in detail is the application to second language discourse of **conversation analysis (CA)**. Deriving ultimately from work of sociologists such as Schegloff (2001), CA is a sophisticated approach to studying the local production of social organization through talk. Advocates for applying a conversation analysis approach to L2 talk ('CA-for-SLA') have drawn attention to the socially skilful nature of L2

9.2 Sociolinguistically driven variability in second language use

conversation, with an orientation towards the accomplishment of orderly talk or turn-taking. Thus, for example, CA practitioners have noted how L2 interlocutors may 'let pass' potentially problematic utterances, in the expectation that the problem will 'either become clear or redundant as talk progresses' (Firth, 1996, p. 243). Interlocutors may also create possible 'moments of learning', without breaching conversational orderliness (Kasper and Wagner, 2011). On the whole these studies have illuminated patterns of L2 use rather than learning, which is why we cannot give further space to CA here. However, numerous qualitative studies reviewed in the book have adopted CA methods to analyse learner talk and this is signalled in appropriate places. See also Seedhouse (2004); Kasper (2006); Pekarek Doehler (2010).

9.2 Sociolinguistically driven variability in second language use

9.2.1 Introduction

Socially patterned variation in language use has been seen by sociolinguistics as one of its major themes: '[Sociolinguists] are interested in explaining why we speak differently in different social contexts' (Holmes, 2008, p. 1). Variability/optionality is also an obvious feature both of child language and learners' L2 interlanguage, which we have discussed elsewhere in this book. In this opening section we explore how far patterns of L2 variability can be explained by sociolinguistic factors. We show how quantitative research methods developed by sociolinguists have been used to study these patterns, and finally we assess how far interlanguage variability can indeed be attributed to socially motivated choices by L2 learners.

By variability, to recapitulate, we refer to the fact that L2 learners commonly produce different versions of particular target language items, within a short timespan (even, perhaps, within succeeding utterances). In Chapter 2 we have already referred briefly to Schumann's case study of Alberto, an adult learner of English as L2 (1978a). Schumann reports an example of variability in Alberto's English interlanguage, where two alternative forms were in use to express negation:

He used both *no V* and *don't V* constructions throughout; however *no V* was clearly the most dominant of the two and consistently achieved a higher frequency of use until the very last sample. (1978a, p. 20)

The point to note here is that although one pattern was more common, two patterns were clearly in use simultaneously, by a single learner, over an extended period of time (this study ran for 40 weeks). The puzzle to be explained is the underlying cause for such persistent L2 variability.

SECOND LANGUAGE LEARNING THEORIES

In reviewing the phenomenon, Romaine (2003) commented that L2 variability is usually 'conditioned by multiple causes'. She listed a series of possible explanations for L2 variability, which she subdivided into 'internal' and 'external' groups. Her 'internal' list is a mixed grouping of linguistic and developmental elements (for example, that a new form may be introduced initially in certain linguistic contexts only), while her 'external' list is influenced by sociolinguistic ideas, for example that L2 learners may use more 'careful' and more target-like styles in formal, monitored settings, and more 'informal', pidgin-like L2 styles in other settings.

R. Ellis (2008) has proposed a typology for interlanguage variability, shown here as Figure 9.1, which sets out to encompass all types of variability, whether psycholinguistic or sociolinguistic. In this typology, 'vertical variation' refers to variation over time, that is, to developmental sequencing of L2 forms. 'Horizontal variation' refers to variability at a single point in time, which is attributed either to psycholinguistic or sociolinguistic causes.

A distinctive feature of this typology is the inclusion of the intermediate category of free variation. R. Ellis has argued consistently that some variation in L2 performance is simply free or random (for overviews see R. Ellis, 1999, 2008, pp. 130–3, 410–13). He has argued (1999) that learners experience an 'expressive need' for greater variety in their interlanguage, which leads them to learn new forms piecemeal and to use them as alternative expressions for existing form-meaning combinations. Once these items are being used in free variation, they are then available for subsequent integration into the interlanguage system, and will also eventually acquire differentiated social and/or pragmatic functions.

Regarding systematic variation, the typology of Ellis distinguishes two types: internal/linguistic variation, and external/social variation. By internal/linguistic variation, he refers to variation dependent on linguistic context. This can be exemplified by the work of Young (1991), who studied the extent to which Chinese L1 learners of English as L2 marked plural *-s* on English nouns. Young's main finding was that linguistic factors such as the position of the noun within

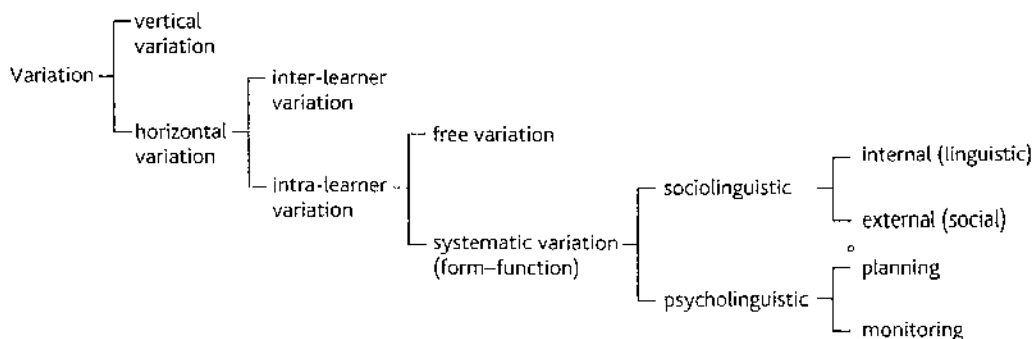


Figure 9.1 A typology of variation in interlanguage (source: R. Ellis, 2008, p. 129)

9.2 Sociolinguistically driven variability in second language use

the Noun-Phrase, its syntactic function and its phonological context, each affected the likelihood that these learners would produce the plural ending. By external/social variation, R. Ellis refers to the choices made by speakers between optional forms, which can be related to social factors such as gender, social class, age or style (formal/informal). As their interlanguage develops, L2 learners might be expected to notice and acquire aspects of sociolinguistic variation, as a dimension of their evolving communicative competence. For example, a study by Tarone (1988) showed that both Japanese L1 and Arabic L1 learners of English L2 supplied the third person singular verb inflection *-s* more reliably in formal contexts. The just-quoted study by Young (1991) found that in addition to internal linguistic factors, the identity of the learner's interlocutor (Chinese or English) also influenced the likelihood that learners would mark/fail to mark English nouns as plural.

9.2.2 Quantifying L2 variability

In trying to make sense of the variability phenomenon, one group of SLA researchers has turned to a quantitative approach, which was originally developed within mainstream sociolinguistics to study L1 variation (see Bayley and Preston, 1996; Preston and Bayley, 2009).

In the 1970s the sociolinguist William Labov pioneered the quantitative study of variability in everyday speech. He concentrated on features in spoken language, often pronunciation features, where choices are possible which are endowed with positive or negative value by a given speech community. An example from contemporary spoken British English would be variation between the alveolar plosive [t] or glottal stop [ʔ] to realize the /t/ phoneme in words such as *better*, *Britain* etc. The glottal stop variant is common in many forms of spoken English; yet it is typically described as 'lazy', 'sloppy' speech etc., that is, it has negative social value or prestige. Labov called such socially preferred/dispreferred items **sociolinguistic markers**.

Labov and his followers systematically recorded L1 speech samples from people representing different social groups, in a variety of situations. They showed in many studies that the relative frequencies of use for more positively/negatively esteemed variants can be correlated with factors such as the immediate linguistic context, the speaker's social class, age and gender, and the formality/informality of the speech setting (for an overview, see Labov, 1972).

Table 9.1 shows an example drawn from 1970s quantitative research in the Labov tradition, discussed by Preston, 1996. This study investigated the simplification of word-final consonant clusters in English among African-American speakers from Detroit city (that is, the deletion of final [t] or [d] in these phonetic environments). The researchers recorded extended speech

SECOND LANGUAGE LEARNING THEORIES

samples from their subjects, and analysed the percentage of final consonant clusters within which [t] or [d] deletion was found.

Table 9.1 [t]/[d] deletion in Detroit African-American speech (source: Wolfram and Fasold, 1974, cited in Preston, 1996, p. 4)

Environments	Social classes			
	Upper middle	Lower middle	Upper working	Lower working
Following vowel:				
[t]/[d] is past morpheme (e.g. 'missed in')	0.07	0.13	0.24	0.34
[t]/[d] is not past morpheme (e.g. 'mist in')	0.28	0.43	0.65	0.72
Following consonant:				
[t]/[d] is past morpheme (e.g. 'missed by')	0.49	0.62	0.73	0.76
[t]/[d] is not past morpheme (e.g. 'mist by')	0.79	0.87	0.94	0.97

As Table 9.1 shows, in this study the percentage of observed occasions of deletion of final [t] and [d] could be linked both to the immediate linguistic context and to speakers' social class.

Researchers in this tradition moved to a greater level of statistical sophistication with the development of a computer program known as **VARBRUL**. (For a guide to using current versions of the program, see Tagliamonte, 2006.) This program is based on the statistical procedure known as logistic regression. VARBRUL draws on data such as that presented in Table 9.1, and calculates the statistical probability that speakers will produce one variant rather than another, taking account of the influence of linguistic factors identified by the researcher (for example, phonological context), as well as social factors (for example, speaker gender). Probabilities are expressed in terms of weightings ranging from 1.00 to 0.00; a weighting of 0.50 or more means that a form is systematically more likely to be produced in a given environment, a weighting of less than 0.50 means that this is less likely. VARBRUL-type programs not only handle these different factors simultaneously, but also handle interactions between them.

Preston (1996) ran the VARBRUL program on hypothetical raw data based on the table presented earlier as Table 9.1. This VARBRUL analysis produced the pattern of probabilities for the different linguistic and social contextual factors shown in Table 9.2.

9.2 Sociolinguistically driven variability in second language use

Table 9.2 VARBRUL results for [t]/[d] deletion by African-American speakers from Detroit: hypothetical data inferred from Table 9.1 (source: Preston, 1996, p. 10)

Result	Probability
Following vowel (V)	0.25
Following consonant (C)	0.75
Morpheme (M)	0.31
Non-morpheme (N)	0.69
Upper middle class (UMC)	0.29
Lower middle class (LMC)	0.42
Upper working class (UWC)	0.60
Lower working class (LWC)	0.69
Input probability	0.60

(The term 'input probability' used in this table refers to the overall likelihood that the deletion rule will operate: note the specialized use of the term 'input' here!) In this hypothetical example we see that two linguistic factors, 'Following consonant' and 'Non-morpheme' have probabilities higher than 0.50, and therefore predict that the consonant will be deleted; the same applies for working-class membership (whether 'Upper' or 'Lower'). Thus we see that the overall likelihood of consonant deletion depends in this case on a combination of both linguistic and social factors.

Preston and others have applied different versions of the VARBRUL tool to the study of variation in L2 use, and its relationship with a range of contextual factors. For example, a study by Bayley (1996) investigated variability in word-final [t]/[d] deletion by Chinese learners of English. This study analysed over 3,000 final consonant clusters produced during lengthy L2-medium sociolinguistic interviews by a group of 20 learners, and compared patterns of [t]/[d] deletion with those reported for native speakers of English. Using the VARBRUL procedure, the extent to which the final consonant was deleted was related to a wide range of factors, including the immediate phonetic environment, the grammatical category of the word to which the consonant cluster belonged, different speech styles (reading aloud, narrative and informal conversation) and the learners' reported social networks (L1 monocultural or mixed American and Chinese).

Table 9.3 shows part of the resulting analysis. It shows VARBRUL values for [t]/[d] deletion for the L1 Chinese learners in the study, for the different grammatical categories studied, and compares them with values found in other studies of North American English. The table shows that [t]/[d] deletion occurred to some extent for all grammatical categories, but was the most usual choice of the L2 speakers only for regular past-tense inflections. This contrasted,

SECOND LANGUAGE LEARNING THEORIES

Table 9.3 [t]/[d] absence by grammatical category in Chinese–English interlanguage and in native English dialects (after Bayley, 1996, p.109)

Variety	Single-morpheme word, e.g. <i>just</i>	Semiweak verb, e.g. <i>he left</i>	Regular past participle, e.g. <i>he had walk#ed</i>	Regular preterit, e.g. <i>he walk#ed</i>
Chinese–English interlanguage	.46	.39	.47	.66
African-American English Vernacular	.68	.46	–	.35
Philadelphia and NYC white English	1.00	.91	.49	.52

for example, with the African-American speakers, who deleted final [t]/[d] most for single-morpheme words, but least where the final [t]/[d] was a grammar morpheme (past-tense inflection).

Bayley explains this finding by arguing that not one, but two variable rules are operating for the L2 speakers. Unlike the native speakers, they are not consistently inflecting verbs for past tense. So, their use of, for example, *he walk* in past-tense contexts results on some occasions from the use of a non-inflected verb form (that is, because of developmental variability) and on other occasions from 'true' sociolinguistic [t]/[d] deletion.

9.2.3 Acquiring sociolinguistic variation in interlanguage

The Bayley (1996) study of [t]/[d] deletion illustrates Romaine's view that variability among L2 learners has mixed origins, and that external sociolinguistic factors play a relatively restricted role. However, there is another group of studies concerned with the learning of L2 French which shows that L2 learners may become sensitive to sociolinguistic variation in the target language; and adapt their usage patterns over time to accommodate increasingly to the variationist norms of the target community. Much of this work has been conducted with English L1 learners in Canada who are learning French as L2 in an immersion setting (see Rehner *et al.*, 2003; Mougeon *et al.*, 2004, 2010 for reviews). Variationist work has also been carried out in Europe with advanced learners studying French in an academic setting (for example, Regan, 1996; Dewaele and Regan, 2002; Dewaele, 2004).

In a large-scale example of this work, Mougeon *et al.* (2004, 2010) ran lengthy interviews with 41 high school English L1 immersion students, to study their acquisition of aspects of the target language where native speakers display sociolinguistic variation. They focused on 13 **linguistic variables**, drawn from Canadian-French grammar, lexis and phonology. The immersion students' choices of different sociolinguistically conditioned variants associated with each

9.2 Sociolinguistically driven variability in second language use

variable were compared with the use of these same variants documented in existing corpora of spoken Canadian French, in the classroom speech of French immersion teachers, and in French instructional materials.

Overall, according to Mougeon *et al.*, contemporary spoken French in Canada has three types of variant:

Vernacular	Nonconforming to the rules of standard French, associated with lower-class speakers and stigmatized
Mildly marked	Nonconforming to the rules of standard French, but not socially stratified or stigmatized
Formal	Typical of careful speech and written standard French, associated with speakers from upper social strata

Their studies show that immersion students rarely or never use 'vernacular' variants (such as the Canadian-French lexical items *ouvrage* = job, *rester* = to reside). However, they do make use of 'mildly marked' variants, though at lower frequency than native speakers, and have some awareness of their sociolinguistic significance. For example, in formal French, the first person plural pronoun *nous* (= we) predominates. In spoken Canadian French, this form is almost entirely replaced by the mildly marked variant *on* (= one). The native speaker informal speech data yielded usage of *on* 95 per cent of the time, and the immersion teachers used it 83 per cent of the time, during supposedly 'formal' classroom talk. Mougeon *et al.* report that their Grade 9/Grade 12 immersion students were only slightly more likely to use *on* than *nous* (55 per cent vs. 45 per cent). However, factor analysis using a version of VARBRUL also showed the influence of both gender and social class on the students' choices. Girls were more likely to use *nous* than *on*, while boys showed the reverse pattern; middle-class students also preferred *nous*, while working-class students preferred *on*. On the other hand, the more the students reported using French outside school, the greater the overall predominance of *on* in their speech. Similar findings were reported for optional deletion of the negative particle *ne*, another highly characteristic feature of non-formal French, and a number of other variables. The researchers believe that the more limited stylistic variation among immersion students, and their apparent overall preference for high-prestige forms, partly reflects the fact that the teachers' classroom speech and even more so the classroom teaching materials showed a general bias towards 'formal' variants, and an almost complete absence of 'vernacular' variants. Even so, the classic factors of gender and social class exerted some influence on students' willingness to use 'mildly marked' variants.

This research programme suggests that while students who encounter the L2 mainly in school are acquiring only a limited repertoire of stylistic variants, they nonetheless gain some awareness of their social meaning. These findings

SECOND LANGUAGE LEARNING THEORIES

are generally confirmed in studies of other French sociolinguistic variables. For example, the advanced learners studied by Regan (1996), who were interviewed before and after an extended stay in metropolitan France, became much more native-like in respect of deletion of the negative particle *ne*, as shown when a VARBRUL-type program was used to compare these students at Time 1 and Time 2.

A recent study by Li (2010) has extended this line of variationist research to study the acquisition of the particle *de* by intermediate and advanced learners of L2 Chinese. This widely used particle has a range of uses in modern Chinese, some optional and some obligatory (Shi and Li, 2002, in Li, 2010). For example, *de* is obligatory in conditional clauses. Three main uses where *de* is optional are as a genitive marker, an attributive marker and a nominalization marker (examples from Li, 2010):

de as genitive marker

我 (的) 朋友
wǒ (de) péngyou
 I (GEN) friend
 my friend

de as attributive marker

中国 (的) 老师
zhōngguó (de) lǎoshī
 China (ATT) teacher
 native Chinese teacher

de as nominalization marker

韩国人 不 喜欢 吃 的
hánguó rén bù xǐhuān chī de
 Korean:people not like eat NOM
 What Korean people don't like to eat

Li conducted informal sociolinguistic interviews with 20 intermediate and advanced students of Chinese L2, who were studying in Harbin, China. The group was balanced for gender, and came from four different L1 backgrounds (Japanese, Korean, Russian, English). She interviewed the students on two occasions, at a few months' interval. She also conducted similar interviews with 12 native speakers of Chinese, to provide baseline data on NS usage of *de*. Finally, she also recorded a number of lessons attended by the students, to document the occurrence of *de* in teacher talk.

Li first of all identified in her data all contexts for the actual and potential occurrence of *de*. Using VARBRUL, she calculated the influence on use/non-use of *de* of a range of linguistic factors (morphosyntactic contexts), plus the social factors of gender and (for the Chinese L2 learners) length of stay in China, plus L1 background. For the native speakers, she also took account of degree of formality (taking the teachers' classroom speech as more formal, the sociolinguistic interviews as less formal).

9.2 Sociolinguistically driven variability in second language use

Figure 9.2 compares the frequency of use of *de* for the native speaker and the learner group, for seven 'optional' grammatical contexts. The figure shows a consistent pattern, whereby the learners used *de* more frequently overall than the native speakers did. (The learners also used *de* 100 per cent of the time in the obligatory 'conditional' context, thus demonstrating that they all knew the form.)

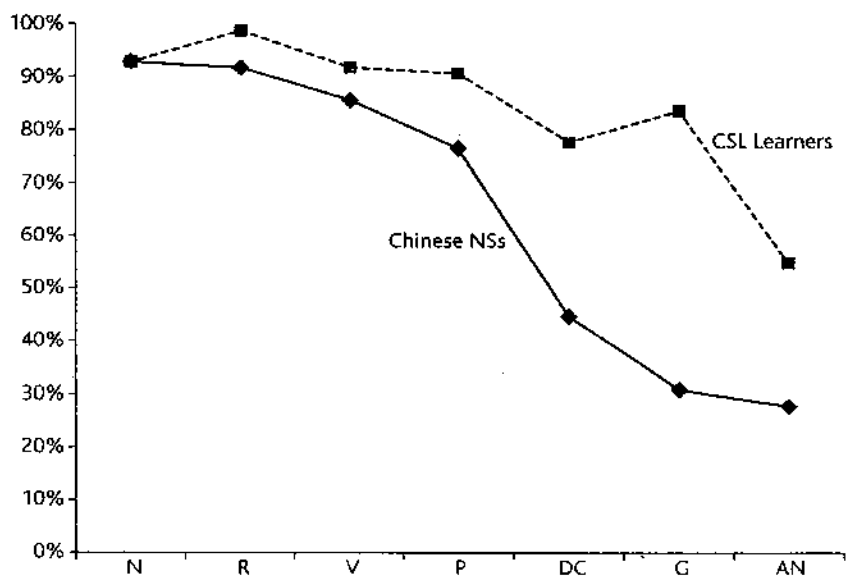


Figure 9.2 Frequency of *de* use (Chinese NSs vs. CSL learners). Key: N = nominalization; R = relative clause; V = verb; P = phrase; DC = DE + DEM/CL; G = genitive; AN = adjective + noun (source: Li, 2010)

However, VARBRUL analysis also showed that the learners distinguished systematically among the optional contexts in terms of how likely they were to omit *de*; other factors which influenced students to omit *de* more often included length of residence in China, proficiency level and gender.

Further analysis of the native speaker data showed the same gender influence on *de* omission (native speaker males were more likely to omit *de* in some grammatical contexts). More dramatically, there were significant differences in rates of *de* omission between the informal NS interview data, and the formal classroom teacher talk. Teachers were significantly more likely to use *de* in most optional contexts, and indeed their rates of *de* usage were very close to the rates of the advanced L2 learners – see Table 9.4.

The study of Li (2010) is of interest because it confirms in a new context (L2 Chinese) the emerging awareness of L2 learners of sociolinguistic variables, and the combination of linguistic and social factors which influence the selection of different variants (in this case, inclusion/omission of optional *de*). It also shows the overall preference of classroom learners for more formal variants, and how this may be influenced at least initially by the speech styles of their teachers.

SECOND LANGUAGE LEARNING THEORIES

Table 9.4 Optional *de* use by all groups (Li, 2010)

	Chinese NSs	CSL learners	Teachers' speech	Textbooks
Nominalization	93	93	98	99
Relative clause	92	99	100	100
Verb	86	92	91	57
Phrase	77	91	83	93
DE + DEM/CL	45	78	63	72
Genitive	31	84	72	73
Adj + Noun	28	55	55	48

This brief survey of research into L2 variability confirms its complex nature. For our present purposes, it is clear that sociolinguistic factors play a role in L2 variation, but these are intertwined with linguistic factors. There is little hard evidence from variationist studies that beginning L2 learners have systematic control of stylistic variation, either within their own interlanguage or reflecting the different speech styles of the target language. On the other hand, it is clear that at least some more advanced learners who engage actively with L1 users can move more or less rapidly towards community norms of stylistic variation. Their motivations for doing so are explored in following sections of this chapter.

9.3 Second language socialization

9.3.1 Introduction

In this section we turn to a strand of sociolinguistic research which takes as its starting point the interdependence of linguistic and sociocultural development: the study of **language socialization**. This work has its roots in anthropological linguistics (Foley, 1997; Ochs and Schieffelin, 2008; Duranti *et al.*, 2011), and also has connections with **systemic functional linguistics** (Williams, 2008) and with sociocultural theory (Duff, 2007). Language socialization theory drew early impetus from longitudinal ethnographic studies of children learning to talk (and to read and write) their first language, in non-Western, non-urban societies. The work of Elinor Ochs in Western Samoa (for example, Ochs, 1988) and of Bambi Schieffelin in Papua New Guinea (Schieffelin, 1990) are influential examples. The work of Shirley Brice Heath on children's first language development among rural working-class communities in the south-east United States of America can also be linked to this tradition (Heath, 1983, 1986). As part of the general 'social turn' in applied linguistics, language socialization theory has been attracting increased interest from second language learning researchers since early studies of EFL classrooms in Hungary carried out by Duff in the 1990s (Duff, 1995, 1996), and this is reflected in recent substantial reviews and collections (for

example, Bayley and Schecter, 2003; Duff and Hornberger, 2008; Watson-Gegeo, 2004; Duff, 2010; Duff and Talmy, 2011). The concept of language socialization is also proving useful to researchers studying second language learning in virtual internet spaces such as chat rooms, online gaming and fan fiction (for example, Lam, 2004, 2008; Thorne *et al.*, 2009).

9.3.2 Developmental links between first language and culture

Researchers in the language socialization tradition believe that language and culture are not separable, but are acquired together:

It is evident that acquisition of linguistic knowledge and acquisition of sociocultural knowledge are interdependent. A basic task of the language acquirer is to acquire tacit knowledge of principles relating linguistic forms not only to each other but also to referential and nonreferential meanings and functions. Given that meanings and functions are to a large extent socioculturally organized, linguistic knowledge is embedded in sociocultural knowledge. On the other hand, understandings of the social organization of everyday life, cultural ideologies, moral values, beliefs, and structures of knowledge and interpretation are to a large extent acquired through the medium of language. Children develop concepts of a socioculturally structured universe through their participation in language activities. (Ochs, 1988, p. 14)

In a 1995 review, Ochs and Schieffelin stress the relevance of language socialization even to aspects of grammatical development:

This approach rests on the assumption that, in every community, grammatical forms are inextricably tied to, and hence index, culturally organised situations of use and that the indexical meanings of grammatical forms influence children's production and understanding of these forms. (Ochs and Schieffelin, 1995, p. 74)

They point out that a language socialization perspective differs from functionalist approaches to grammar development, which concentrate on studying the local, moment-to-moment performance of speech acts, or creation of information structure, and their influence on the selection and learning of isolated elements of the language system. In contrast, a language socialization perspective aims to take systematic account of the wider frameworks and socially recognized situations within which speech acts are performed. In summary, a language socialization perspective predicts that there will be a structured strategic relationship between language development and 'culturally organized situations of use'.

Ochs and Schieffelin (1984, 1995) examined talk to children and by children in a variety of different societies, and show that these practices are themselves culturally organized. In white, middle-class communities of North America, infants are viewed as conversational partners almost from birth, with caretakers

SECOND LANGUAGE LEARNING THEORIES

interacting with them extensively one-to-one, and compensating for their conversational limitations by imputing meaning to their utterances and engaging in clarification routines (for example, by use of comprehension checks and recasts). In Samoa, by contrast, infants are not viewed as conversational partners at all for the first few months (though they are constantly in adult company, as 'overhearers' of all kinds of social interactions). After this time, they are encouraged to get involved in different types of interaction; for example, by being taught explicitly to call out the names of passers-by on the village road. Among the Kaluli people of Papua New Guinea, there is much direct teaching of interactional routines (*elema*). However, in both communities, children's unintelligible utterances are seldom clarified or recast. These features are explained by reference to wider social structures which characterize the Pacific communities. For example, in the Samoan community described by Ochs, individuals are strictly ranked, and higher-ranked persons do not have any particular responsibility to figure out the intended meanings of lower-ranked persons (such as small children).

In all these cultural settings, of course, children learn successfully to talk, leading Ochs and Schieffelin to conclude that: 'grammatical development per se cannot be accounted for in terms of any single set of speech practices involving children' (1995, p. 84). But do children's different cultural experiences influence the course of language acquisition and, if so, in what way? Ochs (1988) examines children's early utterances, and provides examples of links between linguistic development and socialization into particular roles and routines. For example, the first word produced by Samoan infants is generally claimed to be *tae* (= shit), symbolic of the naughtiness and wildness expected of little children, and Ochs documented instances of infants' early vocalizations being interpreted in this way.

Ochs and Schieffelin (1995) provide further instances of young children's language productions which show that their grammar choices are also linked to their social and gender roles. In Samoan, for example, the language offers a choice of first person pronouns, including the neutral form *a'u* (= I, me) and the form *ta ita* (= poor me) which is marked for affect. In the early productions of the children studied by Ochs, the affect-marked form appeared several months before the neutral form (Ochs, 1988, p. 186), linked to a speech act of 'begging' (usually for food); children generally 'are concerned with the rhetorical force of their utterances, and rhetorical strategies may account for certain acquisition patterns' (p. 188). In Kaluli, the imperative verb form *elema* (= say like that) is regularly used by female caregivers when prompting a very young child to copy and produce an utterance. This form is quickly learned and used by girls from age 2 onwards, both in play and to direct even younger children to 'say like that'. However, boys never produce this imperative verb form, though they know and use other forms of the verb (Schieffelin, 1990). It seems in this case that

the children's language choice is influenced by their socialization into gender-appropriate behaviour, rather than by the frequency with which forms are encountered in input, for example.

9.3.3 Language socialization in the L2 classroom

The language socialization perspective has proved appealing to SLA researchers who are concerned to develop a more integrated perspective on language learning, viewed as 'both a cognitive and a social process' (Watson-Gegeo and Nielsen, 2003, p. 156). One of the first L2 researchers to use this perspective was Poole (1992), who conducted an ethnographic study of adult ESL classrooms, claiming that 'a teacher's language behaviour is culturally motivated to an extent not generally acknowledged in most L2 literature' (p. 593). For example, Poole shows that the teachers in her study scaffolded their learners extensively, and led and directed whole class tasks as group activities. However, in the closing stages of these same tasks, the teachers praised the students as if they alone had accomplished them. This was reflected in the teachers' pronoun usage; thus one teacher introduced a task with 'Describe the picture and see if *we* can make a story out of it.' However, when the task was finished, the teacher praised the class: 'Good work, you guys! That's hard! *you - you* did a good job. I'm impressed' (p. 605). Poole argued that the same pattern is found in other novice-expert settings in white, middle-class American culture (such as childrearing), and that this reflects a deep-seated cultural norm which attributes success to individuals rather than groups.

Poole's study has been followed by other classroom-based work which provides rather more evidence about learner development. Much of this has focused on young children in primary school settings. For example, Cekaite (2007) traced how a 7-year-old Kurdish girl, Fusi, developed as a conversational participant over a period of one school year in a Swedish reception class for immigrant children. Cekaite showed how Fusi gradually developed both the linguistic ability, and the turn-taking ability, to contribute appropriately to teacher-led, multi-party conversational activities.

During the year, Fusi passed through three main phases, from a 'silent' child, to a 'noisy' child, to a competent classroom participant. During the early 'silent' phase, she seemed uninterested in multi-party talk, and only attempted to address the teacher one-to-one. The following extract shows her early use of an object (a drawing), physical movement (walking to the teacher), plus limited routine language, to attract the teacher's attention:

- | | | |
|---|------|---|
| 1 | Fusi | Vera titta här! ((holds her drawing half-upraised and walks across to Vera)) <i>Vera look here!</i> |
| 2 | Vera | ((returns to her chair, not noticing Fusi)) |
| 3 | Fusi | Vera ((follows Vera holding out her drawing)) |

SECOND LANGUAGE LEARNING THEORIES

- 4 Fusi Vera (1) titta här ((standing close to Vera))
Vera (1) look here
- 5 Vera ojdå! vilken fin bil du har. ((about Fusi's drawing))
wow! what a nice car you have.

(Cekaite, 2007, p. 49)

By the middle period of the study, Fusi had learned to produce a number of classroom expressions (*jag klar alla* I done all, *kom* come), polyfunctional words, simple adverbials and deictics. However, her Swedish still lacked inflectional morphology, and her verb forms were primarily infinitives and imperatives, such as *nej skriv!* (= no write!) and *här skriv!* (= here write!) These expressions were most probably appropriated from teacher talk, but of course the giving of instructions with imperative forms is not part of 'competent' pupil behaviour. Fusi now tried actively to join in group play, and also in the more routine teacher-led, multi-party classroom discussions (for example, reciting material learned as homework). However, she tended to be teased and excluded from group play, and had not yet mastered interactionally appropriate behaviour in teacher-led discussions, as seen in the example below (with assistant teacher Fare; Cekaite, 2007, p. 51):

- 1 Fare vilken årstid är det?
what is the season?
- 2 Sawan e-
- 3 Fusi et vinter!
it winter!
- 4 Fare vinter! my:cket bra lilla Fusi ((smiley voice)). ser ni!
winter! ve:ry good little Fusi. you see!
- 5 Fusi nej lilla! ((determined))
not little!
- 6 Fare a: du är lilla. du är bara sju år eller hur? ((smiley voice))
yea:h you are little. you are only seven years old aren't you?
- 7 Fusi NEJ lilla! ((angry voice))
NOT little!
- 8 Hiwa he he
- 9 Fare du är stora Fusi.((smiley voice))
you are big Fusi.
- 10 Fusi a
yeah
- 11 Fare bra
good
- 12 Miran en häst Fusi! wi: tukdik tukdik ((pretend 'riding' sounds))
a horse Fusi! wi: tukdik tukdik

SECOND LANGUAGE LEARNING THEORIES

- 15 (1)
 16 Vera: i:ngen frukost?
 no: breakfast?
 17 (1)
 18 Vera: <lilla Nok kan du inte dricka- [äta lite frukost]>
 <*little* Nok can't you drink- have a *little* breakfast>
 19 Abdi: [JAG OCKSÅMÄTT
 [I'M ALSO FULL
 20 Fusi: jag dricker mjölk Vera ef- (.)° efter frukost°
 I drink milk Vera af- (.)° after breakfast°
 21 Vera: a:
 yea:h

In line 1, Vera has asked a general question about who eats breakfast. Fusi self-selects to answer, even though the teacher has specifically addressed Nok in line 5; Fusi can time her first intervention neatly to follow that of Miran. Her utterance in line 9 has several characteristics of a cooperative response (a full sentence including use of diminutives, a 'smiley' voice), and is duly praised by Vera, who endorses her utterance through repetition. Her second intervention (line 20) is topically relevant, and reflects classroom values (milk is healthy!). To construct this response, Fusi has appropriated the verb 'drink' used by the teacher in line 18, but now she can integrate this 'borrowing' into her own sentence. The overall result, for Cekaite, is a display of 'the affective stance of a diligent pupil who complies with approved norms of student identity for the current classroom community' (p. 58).

Routines and appropriation of teacher language have also been noted in studies of language socialization in foreign language classrooms. For example, Kanagy (1999) studied the language socialization of young English L1 children in a Japanese-immersion kindergarten. Over 12 months, Kanagy traced the children's participation in three structured classroom routines: morning greetings or *aisatsu*, checking attendance (*shusseki*) and personal introductions (*jiko-shookai*). The children learned both the verbal and non-verbal behaviour appropriate to Japanese classroom culture by imitating the teacher's 'carefully staged demonstrations of Japanese societal and educational norms' (p. 1489). Especially through the 'personal introductions' routine, they appropriated an increasing variety of formulaic expressions (questions and answers about name, age, eye colour, for example), and could eventually use them in new combinations and with new people. This contrasted with their more creative use of Japanese, which had not progressed beyond the one-word level by the end of the first immersion year.

Ohta (1999) also shows that the adoption of target language routines through L2 socialization can take place during adult classroom learning. Her focus is the

9.3 Second language socialization

achievement of Japanese-style conversational 'alignment' among interlocutors, that is, the culturally appropriate use of a range of expressions to show interlocutor empathy and collaboration. The affective particle *ne/na* is used for one type of alignment, that is, 'assessments' or evaluations of the state of affairs, as in the following example (Strauss, 1995, in Ohta, 1999):

- 1 Mari: *hondana to hon ga kao ni ochite [kichatte*
'the bookshelf and books fell at her face'
- 2 Ken: *[kawai na hidoi na sore.*
'how scary *na* that's awful *na*'

In all of the adult classrooms studied longitudinally by Ohta, teacher-led classroom interactional routines including *ne* occurred regularly; over time, students were socialized into appropriate use of similar expressions, and thus into the achievement of this alignment. Some of the teachers incorporated *ne* assessments into exercises and classroom greeting routines; when students used these routines, the teachers scaffolded them with further instances, as in the following example:

- 1 S1: *Nanji kara nanji made gorufu o suru tsumori desu?*
'What time do you plan to play golf from and how long?'
- 2 S2: *Shichi-ji (.) kara: (.) u: : m (.) u: m (.) juu-ji made gorufu (.) gorufu o suru tsumori desu*
'I plan to golf from seven o'clock to ten o'clock.'
- 3 → S1: *Hayai desu ne.*
'That's early *ne*.'
- 4 → T: *Soo desu ne: : . Hayai desu ne: : .*
'That's so *ne: : .* That's early *ne: : .*'

(Ohta, 1999, p. 1503)

Turning to student-student interaction, Ohta tracked the oral contributions of one particular case study student, Candace. In the early part of the Japanese language course, Candace had the chance to hear numerous *ne* assessments used by her teacher, but she herself did not use any in peer-peer interactions:

- 1 C: *Supo- (.) ag: : (.) tenisu: : (.) tenisu: : s- tenisu o shimasu (.) ka?*
'Spor- (.) ag: : (.) tennis: : (.) tennis: : s- do you play (.) tennis?'
 - 2 S: *lie shimasen*
'No, I don't'
 - 3 C: *Supo: zu o- o shimasu ka?*
'Do you play sports?'
 - 4 S: *lie shimasen*
'No, I don't'
- (Candace, 11/27)

(Ohta, 1999, p. 1506)

SECOND LANGUAGE LEARNING THEORIES

By the last few weeks of the year-long course however, Candice was spontaneously including *ne* assessments and other alignments in similar peer-peer question-and-answer sequences, even though these were not specifically required:

- 3 C: *Atama ga itai toki doo shimasu ka?*
'How do you do when you have a headache'
- 4 S: *Soo desu ne. (.) Nemasu. ((laughs))*
'Let me see. (.) I sleep' ((laughs))
- 5 C: *Hahahaha. li desu ne:::.*
'Hahahaha. That's goo:::d ne::.'
- (Candace, 5/22)

(Ohta, 1999, p. 1508)

These three examples show the socialization of child and adult learners into recognized classroom routines. However, language socialization theorists have also acknowledged the personal 'agency' possessed in principle by learners and novices, which may lead to the renegotiation of the sociocultural context and its norms. Some L2 socialization studies, typically those conducted with older learners and in more heterogeneous contexts (for example, multilingual or transnational settings), have documented the evolution of unintended outcomes of socialization practices. For example, S. Talmy (2008) tracked four ESL classes longitudinally, as part of a 2.5-year ethnographic study of a Hawaiian high school with an ethnically and linguistically mixed intake. The students had been assigned to these classes without regard to their actual English-language level, and resented having to attend them. Consequently, they resisted the 'good student' practices promoted and assumed in the classroom talk of their novice ESL teachers early in the year (for example, that homework would be done, that students would prepare for class), and over time they produced an alternative, 'oppositional' identity and modified their teachers' expectations and official practices to accommodate this. The following extract from a lesson in the final quarter of the year illustrates one teacher's changed assumptions about preparation for class. Mr Day no longer assumes that preparation will have been done, nor even that students will bring the needed books to class, and has modified his expectations to allow catch-up work to fill the lesson:

- 01 Mr. Day: shh. how many of you finished your work
02 for today.
03 loane: not me!
04 Mr. Day: not {loane.
05 Joyleen: [not me either!
06 ?Ss: (3.3) ((inaudible; overlapping talk))
07 Mr. Day: okay that's good, that's good. () is
08 good.

9.4 Communities of practice and situated second language learning

- 09 Jennie: uh [:::.
10 Mr. Day: [shhhhh. today I'm gonna give you guys a
11 little bit of an extra chance to finish
12 your work.
13 (0.8)
14 Mr. Day: how many of you read (.) the (.) pages
15 you were supposed to read in the book?
16 Laidplayer: (don't look at me, brah.)
17 Mr. Day: no?
18 Laidplayer: Mister. I don't know where I put my book.
19 Mr. Day: okay we'll get you one, we'll find it.
20 shh! today we're gonna be doing bookwork
21 and grammar.

(S. Talmy, 2008, p. 636)

In this section we have concentrated on L2 socialization in classroom settings. However, similar renegotiations of the sociocultural context are documented in many studies of informal socialization in multilingual settings, where childrearing practices are changing, formal schooling is replacing socialization in the community and local languages are in competition with more powerful languages such as English. (For example, see Patrick, 2003, for a community study from arctic Quebec, and Howard, 2008, for a broader review.)

9.4 Communities of practice and situated second language learning

9.4.1 Introduction

Sociolinguists have traditionally studied the social roles of language in structuring the identities of individuals and the culture of entire communities and societies. In particular, ethnographers of communication have studied the characteristics of **speech events** which have patterning and significance for members of a particular speech community (Hymes, 1972; Saville-Troike, 1989). Examples of speech events with their own distinctive structures and routines in current urban society might be telephone conversations, service encounters (in shops, banks, etc.), classroom lessons or job interviews. The ability to participate appropriately in relevant speech events is central to communicative competence.

Ethnographers of L2 communication aim similarly to study contexts and events where participants are struggling to achieve communicative goals through the means of a second or other language. However, while the traditional ethnography of communication has typically studied relatively well-established

SECOND LANGUAGE LEARNING THEORIES

and stable speech events and communities, those studied by ethnographers of L2 communication have frequently been more fluid and transitory, and involve participants whose roles and identities as well as linguistic abilities may be much more subject to change.

This has led some sociolinguists and L2 researchers to turn away from the speech event to an alternative concept of greater flexibility, the **community of practice (CofP)**, proposed by Lave and Wenger (1991). The sociolinguists Eckert and McConnell-Ginet suggest the following definition for a CofP:

An aggregate of people who come together around mutual engagement in an endeavour. Ways of doing things, ways of talking, beliefs, values, power relations – in short, practices emerge in the course of this mutual endeavour. As a social construct, a community of practice is different from the traditional community, primarily because it is defined simultaneously by its membership and by the practice in which that membership engages. (1992, p. 464)

Different individuals may be peripheral members or core members of a given CofP. All may be engaged to different degrees in the joint enterprise, but they may have differential access to the 'repertoire of negotiable resources' which have been accumulated by the community (Wenger, 1998, p. 76). For Lave and Wenger, learning itself is socially situated, and involves 'increasing participation in communities of practice' (1991, p. 49), alongside experienced community members who already possess the necessary resources. The social structure of communities and the power relations obtaining within them define the learning possibilities available to members. Of course, membership of a given CofP may be contested, and individuals may be marginalized, either through their own agency, or through exclusionary practices on the part of the group.

9.4.2 Empirical studies of L2 learning as a situated social practice

The ideas of socially situated learning which takes place through participation in the activities of one or more communities of practice have been widely adopted by L2 socialization researchers and other ethnographers of L2 communication (see discussion in Swain and Deters, 2007; Duff, 2007). One obvious application is to view the classroom as a CofP, a perspective adopted by S. Talmy (2008) in the study discussed above. Toohey took the same view of classroom life, in her ethnographic study of a group of six young ESL learners (2000, 2001). Over a three-year period, the study tracked the children's developing identities and patterns of participation as they progressed from kindergarten through to second grade of elementary school. Toohey shows that some children were more successful than others in establishing themselves as legitimate peripheral participants in the classroom community, and that this affected the extent to which they gained conversational and other language learning opportunities,

9.4 Communities of practice and situated second language learning

including access to resources. For example, a Polish L1 child named Julie, who had come to school speaking little English, successfully graduated over time from her ESL status and established herself as an 'average' mainstream student. Another Punjabi L1 child, named Surjeet, was positioned differently as a 'struggling' student who would need continuing ESL support. Disputes were common among the children in the class, and Toohey (2001) analyses these in some detail, showing how Julie's relatively aggressive and skilful responses to threats of subordination allowed her to develop a more powerful place in the classroom community, and consequently to win access to resources and conversational opportunities. Surjeet on the other hand was regularly marginalized by peers and excluded from conversation. The following example, drawn from a dispute about the recognition to be given to work completed, illustrates Surjeet's non-powerful position:

Surjeet: Look! Two more pages. [She shows her notebook to Jean Paul.]

Earl: So what?

Jean Paul: I don't care.

Earl: Yeah, we don't care.

Jean Paul: We've got two pages too. Look!

Surjeet: No, three.

Jean Paul: [aggressive tone] Oh! There's not three.

Earl: I've got one page.

Jean Paul: Let's see.

Surjeet: [to Earl] You're m:::

[She watches as Jean Paul inspects Earl's book]. (Toohey, 2001, pp. 266–7)

A similar incident shows Julie's greater ability to switch topic and achieve acceptance as a conversationally interesting participant:

Julie: I'm almost finished Martin! Look Martin, I'm almost finished.

[Martin does not look, and for a few turns, other children take over the conversation.]

Julie: See, I'm just colouring this part.

[Martin does not look, and he and Julie keep on colouring.]

Julie: Who has the Lion King video? I have the Lion King.

Martin: I have the Lion King.

Earl: I have the Lion King.

Daisy: Clark doesn't.

[Children laugh.] (Toohey, 2001, p. 267)

Another ethnographic study which addresses adult informal language learning as a social practice, located in communities of practice, is that of Norton (2000). This study was conducted with five adult women from diverse language backgrounds, all of them recent immigrants to Canada, who were attending ESL classes but also using English to different degrees at home and

SECOND LANGUAGE LEARNING THEORIES

in a variety of workplaces. The study focused on the participants' informal learning experiences; they completed questionnaires and diaries, and were also interviewed at intervals, over a space of two years.

One participant in the study was a Polish girl called Eva, who was working at a restaurant called Munchies, where at first she could not approach her co-workers or engage them in conversation:

When I see that I have to do everything and nobody cares about me because - then how can I talk to them? I hear they doesn't care about me and I don't feel to go and smile at them. (Norton, 2000, p. 128)

As time passed however she gained enough confidence to find conversational openings, joining in conversations about holidays with her own experiences of holidays in Europe, for example, getting her boyfriend to offer lifts to fellow workers on social outings, or teaching a little Italian to a colleague. In these ways she gained acceptance as a 'legitimate peripheral participant', and correspondingly developed her opportunities for using English. At the beginning, also, Eva was allocated tasks in the restaurant which did not involve interacting with customers. However, she paid close attention to how her fellow workers did this, appropriated their utterances during routines such as meal-ordering, and eventually took the initiative to start serving customers directly. In this way Eva widened her participation in the linguistic practices of the restaurant, and further increased her own language learning opportunities as a result.

In a joint review of their two studies, Toohey and Norton (2001) argue that the qualities that make the adult Eva and the child Julie relatively successful L2 learners are only in part related to their own actions and interventions. Critical to their success was the fact that they both gained more and more access to the social and verbal activities of the target language CofP. In both cases, they experienced attempts to subordinate or isolate them; however, they could and did draw on both social and intellectual resources to overcome these difficulties. Eva's attractive boyfriend, and Julie's big cousin Agatha, were both seen as socially desirable by the very different groups of Munchies workers and elementary schoolchildren, and this seemed to reflect positively on the learners themselves. We have seen how Eva used her knowledge of Italian to build relationships, and Julie similarly used cultural knowledge such as 'secrets' to position herself as a desirable playmate. In both cases, the learners' success in being accepted by the group was central to access to language learning opportunity; and this success derived partly from their own actions, partly from their respective communities' willingness to adapt and to accept them as legitimate participants.

Similar themes are addressed in many recent studies of 'transnational' student communities, where international students achieve differing degrees of

9.4 Communities of practice and situated second language learning

integration with host student groups. For example, Vickers (2007) tracked a team of six student electrical engineers through the accomplishment of their group project at an American university, over several months. Five group members were native speakers of English, while the sixth (Ramelan) was a *lingua franca* user. In the early months, Ramelan's contributions to group discussion within this mini CoP were limited, and failed either to display his actual level of technical knowledge, or to manage successfully face-threatening events such as disagreements. Once the practical work of the project was completed, however, allowing Ramelan to demonstrate his technical skill, Ramelan took on the role of a technically competent group member, confidently explaining and debating technical points with the others. Vickers summarizes both positive and negative aspects of the interactional process which facilitated Ramelan's language socialization, and also his integration within the group:

- (a) access to observations of core members interacting
- (b) scaffolding by some core members both in the lab and in the team meetings
- (c) ridicule by other core members and
- (d) opportunities for successful design experiences and for chances to explain these design processes.

Other studies have shown transnational students finding or creating their own new, hybrid communities of practice, which enable them to survive in culturally alien academic environments. For example, Duff (2007) describes the support community created by Korean students at a Canadian university. Instead of integrating with the wider Canadian student community, as they had expected, her target group found themselves marginalized from this group (and also found them culturally less appealing than they had expected). It was Korean-Canadian heritage students who turned out to offer membership of the most welcoming and enabling hybrid community of practice (including providing bilingual support for English-medium academic practices).

9.4.3 Power, ideology and opportunities for L2 learning

In her study of adult migrants in Canada, Norton was also concerned to investigate how 'relations of power impact on language learning and teaching' (2000, p. 7). For example, another relatively successful participant in Norton's study was a girl named Mai, of Vietnamese origin. On first arrival, Mai lived in her brother's family and was subject to his patriarchal authority. However, Mai resisted a proposed marriage and found a job, so that she could contribute economically to the family. She also made herself useful in looking after her brother's (English-speaking) children. So, in two ways she negotiated greater independence of her brother's authority, while at the same time creating increased opportunities for using and learning English.

SECOND LANGUAGE LEARNING THEORIES

Norton's study relies primarily on interviews and reports by immigrant ESL learners about their L2 encounters, positive and negative. More direct evidence of the nature of such encounters, and the power relationships which prevail within them, is provided by the European Science Foundation (ESF) study of adult migrants, previously discussed in Chapter 7. A subgroup within the ESF team undertook sociolinguistically oriented work, and concentrated in particular on examining adult migrants' encounters (both real and simulated) with a wide variety of gatekeepers (Bremer *et al.*, 1993, 1996). They focused on instrumental speech events such as job interviews, counselling/advice sessions or service encounters (that is, transactions in shops, travel agencies).

In their detailed analysis of specific encounters, Bremer and her colleagues concentrate on how far the participants succeeded in developing and maintaining mutual understanding from moment to moment. An example is taken from a meeting between a Moroccan informant (Abdelmalek) and a French travel agent. This extract shows, first of all, how misunderstanding can arise from a mishearing of a single lexical element. (Abdelmalek mishears French *par quoi* (= how), as *pourquoi* (= why), and proceeds to explain his reasons for needing to travel.) But secondly, it is not normally appropriate for a travel agent to enquire about a client's reasons for a trip; this raises the question why Abdelmalek thought that *pourquoi* 'why' was a reasonable interpretation of what he had heard. Bremer *et al.* suggest that Abdelmalek had already been interrogated many times in France about his motives and his personal life; he assumed that a travel agent, too, had the right to ask such questions.

- (1) A: je partir à casablanca, maroc
i am leaving for casablanca, morocco
N: par quoi vous voulez partir ↑
how do you wish to go ↑
A: [se] beaucoup problèmes là-bas papa malade
je partir tout de suite
a lot of problems there father is ill
i'm leaving right away
(5) N: je comprends pas là, qu'est-ce que vous voulez,
où vous voulez aller ↑
i don't understand that, what do you want,
where do you want to go ↑

(Deulofeu and Taranger, 1984, in Bremer *et al.*, 1996, pp. 12–13)

A final, classroom-based example of the ways in which inter-group tensions and stereotyping can affect learners' participation in an L2 community of practice is offered by another longitudinal ethnographic study, this one concerning Hong Kong Chinese immigrant students at a high-achieving Canadian high school

9.4 Communities of practice and situated second language learning

(Pon *et al.*, 2003). In the Eurocentric academic culture of this multilingual and multi-ethnic school, 'speech is equated with participation in class activities and engagement in the academic curriculum, while silence is equated with an absence of participation and a lack of motivation with regard to school activities' (p. 116). The Hong Kong-born students constituted around one-third of the whole student body, and Cantonese was commonly heard spoken around the school, alongside English. However, the Hong Kong-born students spoke very little during any type of classroom activity, despite their teacher's insistence on forming mixed student groups for regular (English-only) discussions in the classroom.

The Canadian-born students expressed frustration with the silence of the Hong Kong-born students during these class discussions, stereotyping them as a group in a way that Pon *et al.* interpret as 'racialist discourse'. As one student of Indian-Caribbean origin put it:

Everyone in that class just sits there like this. They [= HK born students] are really quiet, they don't do nothing like you know what I mean. In other classes I have other people that are on the same level in the same way as I am, so I have something to conflict with me. Seriously, I don't think half of those people in that class should be in a Grade 12 Advanced class. They shouldn't, they can't speak proper English. (p. 116)

Non-Chinese students also expressed resentment at hearing Cantonese spoken loudly around the school, reflecting the value given not only to speech but to speech in English more specifically, which the authors see as part of a colonialist and racist heritage in Western culture (p. 122).

The Hong Kong students saw things differently. Loyal to their Chinese racial and cultural heritage, they spoke only Cantonese within their Hong Kong group: one boy said that if he spoke English to Hong Kong friends, 'they'd think I'm whitewashed'. In (English-only) class, the teacher attributed their silence to fear of ridicule on the part of Canadian-born students. Some Hong Kong students however kept silent for rather different reasons, again referring to the possible reactions of their Hong Kong peers:

I mean, yeah, I know the questions right? I know it, that's good. I can keep it in my heart. But then, if I put my hand up and then say, 'Sir, I understand' and then answer the questions, right? They [other Hong Kong peers] will, they may think I am showing off. So it's really hard. (p. 121)

Overall in this study, the researchers conclude that not only racial and linguistic difference, but different cultural values and stereotypes (and in particular differing values attached to the dominant language, English), combined at this particular high school to keep student groups apart.

9.5 Second language learning, agency and the (re)construction of identity

9.5.1 Introduction

The concept of social identity was originally borrowed into second language learning studies and applied linguistics from social psychology. A classic theorist of social identity defined it as 'That part of an individual's self-concept which derives from his knowledge of his membership of a social group (or groups) together with the emotional significance attached to that membership' (Tajfel, 1974, p. 69, quoted in Hansen and Liu, 1997, pp. 567–8). Social identity, therefore, is the sense of 'belonging' to a particular social group, whether defined by ethnicity, by gender, by social class, by nationality, by language or any other means.

Such classic definitions of social have come under criticism for being too static and too focused on the individual. Recent treatments of second language identities' (for example, Block, 2007; Norton and McKinney, 2011) prefer 'poststructuralist' conceptions of identity which lay greater stress on the flexibility and negotiability of identity, the 'agency' of the individual in choosing and negotiating their identity, and above all the role of language and discourse practices in the construction of identity.

In her research with adult immigrant language learners, Norton also introduced the idea of prospective, imagined future life and activity:

I use the term identity to reference how a person understands his or her relationship to the world, how that relationship is constructed across time and space, and how the person understands possibilities for the future. (Norton, 2000, p. 5)

For Norton, language, identity and context mutually interact:

I foreground the role of language as constitutive of and constituted by a language learner's social identity ... It is through language that a person negotiates a sense of self within and across different sites at different points in time, and it is through language that a person gains access to or is denied access to powerful social networks that give learners the opportunity to speak. (Norton, 2000, p. 5)

9.5.2 Adult transformations of identity

Norton's longitudinal study explored changes in her women participants' social identity over time and, in particular, their struggles to achieve the right to speak in L2 settings. Another participant in Norton's study was Martina, a Czech-speaking immigrant in her thirties and a mother. Initially, in the fast-food restaurant where she worked, she was bossed around by her teenage fellow workers, but soon she reasserted her status as an adult with authority over children, and claimed the 'right to speak' in this role:

9.5 Second language learning, agency and the (re)construction of identity

In restaurant was working a lot of children, but the children always thought that I am I don't know maybe some broom or something. They always said 'Go and clean the living room', and I was washing the dishes and they didn't do nothing. They talked to each other and they thought that I had to do everything. And I said 'no'. The girl is only 12 years old. She is younger than my son. I said 'No, you are doing nothing. You can go and clean the tables or something'. (Norton, 2000, p. 99)

Norton argues that as Martina's identity changed, so did her opportunities to speak and to learn English.

While Norton relies largely on self-report, the ESF researchers again provide analyses of ongoing L2 interactions which illustrate the local negotiation of aspects of learner identity. In particular they pay attention to learner **face** and self-esteem, and how these may be affected by attempts to negotiate understanding. Thus, threats to L2 speakers' self-esteem can arise when misunderstandings are too frequent in interactional data. For example, a Spanish L1 speaker, Berta, living in a French-speaking environment, attempted to get some shelves made to order in a woodworking shop (Bremer *et al.*, 1996, p. 91). She failed to cope with the shop assistant's more technical enquiries, and eventually lost his attention to another customer. The ESF data shows that L1 speakers in service encounters are often not very cooperative with L2 learners, so that the major burden of achieving understanding rests with the latter. In such face-threatening situations, a range of strategies may be employed by L2 speakers. At one extreme, the ESF team found examples of resistance, that is, more or less complete withdrawal from L2 interaction, and a reassertion of the speaker's L1 identity (for example, by switching to monolingual L1 use). At the other extreme, they found speakers who worked hard during L2 interactions to assert a positive, native-speaker-like identity by indicating explicitly that they had understood, for example, or using excuse formulas when they had to interrupt to clarify meaning (p. 100). Berta was one of this group, who eventually discovered ways of asserting herself and taking more conversational control.

9.5.3 Adolescents and L2 identities

Studies focusing on the identity of adolescent L2 learners produce similarly complex and dynamic portraits. McKay and Wong (1996) studied a group of Chinese L1 immigrant adolescents attending high school in the USA, many of whom were 'caught in the [conflicting] demands made by multiple discourses in their environment' (p. 598). These included colonialist/racialized discourses which positioned immigrants as deficient and backward; 'model minority' discourses which celebrated the economic success of Asian Americans (by contrast with African Americans); Chinese cultural-nationalist discourses which defined 'being Chinese'; social and academic school discourses and gender discourses. The individual students 'managed' their identities differently in this

SECOND LANGUAGE LEARNING THEORIES

complex environment, with differential consequences for their ambitions and success in learning English oral and literacy skills.

Lam (2004) reports the case of two girl students aged 17 and 18 from southern China who were participants in another longitudinal study in an American high school, over a period of eight months. Yu Qing and Tsu Ying were cousins, and were initially shy about speaking English in school, where they felt ethnically typecast, for fear of ridicule. The presence of American-born ethnic Chinese students did not help:

We don't know how to speak and we don't dare to speak. And even though some of them are also Chinese, they are ABC [American Born Chinese] and their educational background is different from ours. We have different feelings, so even when we get together, we feel that they're like white people or other people. So even though they have a Chinese face, we don't feel like they are Chinese. (Yu Qing, February: Lam, 2004)

However, the two girls started to use a Hong Kong-based chat room which was popular with Chinese adolescents living outside China. In this chat room they engaged in informal code-switching interaction, using English together with romanized Cantonese. Lam documented and analysed the nature of the chat-room interaction, showing how the code switching seemed to facilitate the development and sharing of a transnational identity which was neither 'Chinese' nor 'American'. As Tsu Ying said, 'the kinds of friends I meet [in the chat room] are broader'. In the following sample extract Yu Qing (= sure) is making a request of her partner CHoCoLaTe, an English/Cantonese speaker resident in the Netherlands:

- | | | |
|----|-----------|---|
| 1 | sure | choco...>_< can't send mail to u <u>ar</u> (PT: neutral softener or down-toner) ⁶ next time give my (sic: me) your add <u>la</u> (PT: indicates request)... can't send at your web site |
| 2 | CHoCoLaTe | sure> how come <u>ar</u> (PT: indicates question)? |
| 3 | sure | i don't know <u>ar</u> (PT: softener).. when i click on it.. a juno web jump out |
| 4 | CHoCoLaTe | huuh? |
| 5 | CHoCoLaTe | very strange |
| 6 | sure | choco do u know y? |
| 7 | sure | and i can't go your web site everytime... sometimes can't find the site |
| 8 | CHoCoLaTe | very strange (emoticon of a sad face) |
| 9 | sure | too bad |
| 10 | CHoCoLaTe | <u>haiya</u> ('yes' or a sigh in Cantonese) |

While lingua franca English predominated in this chatroom, the Cantonese particles *ar*, *la* and *haiya* add an empathetic quality to the exchange.

9.5 Second language learning, agency and the (re)construction of identity

In turn, the opportunity offered in the chat room to develop a positive transnational identity and use lingua franca English seemed to give the girls more confidence:

I didn't dare to speak English before because my English was poor, like in pronunciation and grammar. I was afraid to say something wrong, and then people would laugh at me, and I would feel embarrassed. After talking more in the chat room, I feel like making mistakes is, well, people joke a lot there, and if I don't know a word, I would just sound it out. I use a lot of wrong words there too, so I feel maybe it's ok to say something wrong. After you've been going to the chat room for a while, you get used to talking, and you spend more time on it and feel more open about it. Even though you may not feel as comfortable speaking in other places, you get into the habit. It's like as you become more open, you feel it's no big deal, and I can talk to you a bit more. (Yu Qing, April)

9.5.4 Life histories of L2 learners

Some of the research we have reviewed in this chapter is grounded in the collection of 'life histories' of L2 learners. Pavlenko (1998) has analysed yet another kind of biographical data in order to explore relationships between L2 learning and identity formation on a more strategic level. She has studied autobiographical narratives produced by literary figures who successfully learned a second language after puberty, and became writers in that language. Using a range of these writings, Pavlenko argues that 'language learning in immigration' involves a first stage of continuous losses (rather than immediate acquisition), and only later a stage of gains and (re)construction. These stages can be subdivided as follows:

The stage of losses

- Careless baptism: loss of one's linguistic identity
- Loss of all subjectivities
- Loss of the frame of reference and the link between the signifier and the signified
- Loss of the inner voice
- First language attrition

The stage of gains and (re)construction

- Appropriation of other's voices
- Emergence of one's own voice, often first in writing
- Translation therapy: reconstruction of one's past
- Continuous growth 'into' new positions and subjectivities

Pavlenko (2001) further explores the evolution of gendered identities among women L2 English learners, as documented in a larger corpus of autobiographical narratives. She lists a range of spaces where gendered identities may be (re)negotiated: educational sites, intimate relationships, friendships, parent-child relationships and workplaces. She claims that many women L2 users in this corpus chose or accepted L2 English as 'the language that gives

them enough freedom to be the kind of women they would like to be' (p. 147), perhaps because of positive associations between American English and feminist discourses. Conversely, other studies have documented the ambivalence with which English L1 learners of Japanese as L2 regard Japanese 'feminine' identity, and showed how they resist features of spoken Japanese such as a raised pitch level, which are associated with being 'polite, cute, gentle, weak, and modest' (Ohara, 2001).

9.6 Affect, emotion and investment in second language learning

Many researchers in SLL have tried to explain differing degrees of learner success by appealing to the concept of motivation. When we introduced this concept earlier in the book, we noted how it has become progressively more dynamic and fluid (see Section 1.5.2). The research reviewed already in this chapter also suggests that learners' attitudes and feelings about L2 learning may be dynamic and negotiable, and may be inspired by imagined communities which learners aspire to join in the future. In this section we consider in more detail the presence of affect/emotion in L2 learning, and introduce the sociolinguistic concept of 'investment' as an alternative to the traditional social psychological concept of motivation.

For adult migrant learners such as Berta, introduced in Section 9.5.2 above, the L2 is the only available communicative option in many difficult encounters with the powerful (Bremer *et al.*, 1996). Her emotional response to the L2 is inextricably entwined with the social context in which she has to use it. For example, the ESF team recorded a conversation with Berta in which she related her experience in hospital, where she had gone to inquire after her child, hurt in an accident, late in the evening. She had located the relevant doctor, but was refused permission to see her child. The following extract comes from the conclusion of her narrative, with its vivid recollection of her strong feelings of anger, and how these feelings frustrated her L2-medium attempts to force the doctor to give her proper attention.

- N: ... qu'est-ce que tu as fait alors ↑
what did you do then ↑
- B: bon je suis fâchée avel/avec lui *y* je le dis beaucoup de choses avec m/ +
 :et + je m'énerve beaucoup
*well i got angry with h/ with him and i told him a lot of things with m/ + and + i
 got very worked up*
- N: ah oui + je comprends ça oui + et tu es partie ↑
yes + i understand it yes + and did you go ↑

9.6 Affect, emotion and investment in second language learning

B: alors oui il est parti pasque je n'avais le/ avais le + que je suis fâchée je ou/
je oubliais les mots en français *por por* dire + je ne/je ne trouvais + rien de
mots *por* dire les choses que/ que je le dis à lui *por* pasque n'est pas bon
la manière qu'il me dit au revoir
*then yes he went because i did not have the/ have the + that i was angry for/
i forget the words in french to say + i did not/ did not find + nothing of words
to say the things which/ which i tell him because it is not good the manner he
said goodbye to me*

(Bremer et al., 1996, p. 94)

Norton and McKinney use the term **investment** to describe 'the socially and historically constructed relationship of learners to the target language' (2011, p. 75). In her 2000 study, Norton showed that the amount of effort that Eva, Mai and the other women in her study were willing to 'invest' in practising English was closely related to the social identities they were aiming to construct over time. This variable investment was also apparent among the Chinese teenagers studied by McKay and Wong (1996), some of whom concentrated on developing the English literacy skills needed for a 'good student' identity, while others concentrated on developing speaking skills, so as to become a 'popular student'.

The English-dominant city of Toronto, Canada, has a highly multi-ethnic and multilingual population, which includes an older French-speaking minority whose 'language rights' are supported by the government's policies of English-French bilingualism, including provision of French-medium schooling. In an extensive ethnographic study of a French-medium Toronto high school, Heller (2006) compared the social motivations for learning French of local white students with those of transnational students of migrant background. The school population included students of Francophone African origin who held ambivalent views towards both French and English, as languages of colonialism, and rejected them as languages of personal cultural significance. Nonetheless they saw excellent mastery of the standard varieties of both languages as tools which could be central to their individual economic success, as skilled multilingual individuals. Having selected the French-medium school as a means to develop advanced proficiency in French, they were disappointed with the prevalence of English as the preferred lingua franca among students outside the classroom, and invested significant effort in developing their French literacy skills.

In contrast, Heller cites a white female student, whose dominant language is English, who is pleased to have studied through French, as part of her family identity, but whose ambitions for French literacy, for example, were self-limiting, as she did not see herself needing or using French in her future education and career:

So I mean like people on my Mom's side and my Dad's side, like they know French sort of thing. So it's kind of like that's kind of not the background, but a lot of ... they always knew French, so I also want my kids to speak French as well. It's like it's my background you know. They spoke French, so I think I should keep it up as well.

(...)

I know I'm going to an English university because, first of all, they offer more programmes, like the programmes that I want, and it will be easier for me to like explain myself in English, you know, especially when I'm going to have to do like a lot of essays and stuff. English is my first language and I can write better and stuff.

(Student Sandra, in Heller, 2006, pp. 119–20)

9.7 Evaluation: the scope and achievements of sociolinguistic enquiry

In this chapter we have introduced several different strands of sociolinguistic theorizing about L2 use and L2 development. One of these strands, the quantitative study of L2 variation, is very different from the others, focusing on interlanguage variability at the lexical and morphological level. Here we have seen that sociolinguistic factors are increasingly important, though sociolinguistic variation is late acquired and coexists with other forms of variation.

The remaining strands deal with L2 learning in a broader way, embedded in its social context. This work is typically qualitative and interpretive in nature, using the techniques of ethnography or of conversational analysis and providing longitudinal accounts of the social processes of L2 interaction and development, in face-to-face and virtual settings. It frequently involves case studies of individuals or groups of learners; great attention is paid to the personal qualities and ambitions of the learner, and their own social contribution to the learning context. Concepts such as 'identity', 'community of practice', 'investment', etc. have been vital for theorizing L2 learning as a social practice in an integrative way. On the other hand, it is still rare to find in sociolinguistic work of this kind any close attention being paid to the linguistic detail of the learning path being followed (that is, to the precise learning *route*), or the cognitive processes involved (see comments of Watson-Gegeo and Nielsen, 2003).

9.7.1 Sociolinguistic perspectives on interlanguage and interlanguage communication

One of the obvious strengths of the sociolinguistic tradition in SLA is the rich accounts offered of cross-cultural L2 communication. The ethnographers of L2 communication whose work we sampled in this chapter explore complete speech events in a holistic way. They take a multilevel view of conversational

9.7 Evaluation: the scope and achievements of sociolinguistic enquiry

interaction; they are concerned with the relationships between linguistic and non-linguistic aspects of communication, and how linguistic expression indexes wider social frames and contexts. They are thus concerned with studying the development of pragmatic and discourse competence in relation to particular identities and communities of practice, rather than focusing on the development of linguistic competence per se.

In contrast, the variationists discussed in Section 9.2 look at a range of relatively 'micro' linguistic features in learner language. They have demonstrated that much variability is patterned, and that it is linked increasingly to social factors, as learners gain more varied experience of L2 use, especially beyond the classroom. The emergence of socially patterned variation among more advanced/more integrated learners can be linked to learners' aspirations to develop appropriate L2 identities, and thus to the themes discussed in later sections of the chapter.

9.7.2 Sociolinguistic perspectives on language learning and development

As far as language learning itself is concerned, sociolinguistically oriented research has provided rich descriptions of the context for language learning, and the speech events and social practices through which it is presumed to take place. Like the Vygotskian sociocultural theorists discussed in Chapter 8, the L2 socialization researchers studied here believe that learning is a collaborative affair, and that language knowledge is socially constructed through interaction. Longitudinal sociolinguistic studies with both children and adults have documented learners' evolving capabilities on pragmatic, functional and stylistic dimensions. Less attention is paid to the evolving linguistic system; there is also no real parallel in L2 'language socialization' studies to the detailed work of Ochs on linguistic development in L1 socialization (1988).

On the other hand, current studies of L2 communication and of L2 socialization offer a great deal of valuable evidence about how the learning context, and the learner's evolving style of engagement with it, may affect the rate and direction of L2 learning and eventual success. The patterning of learning opportunities, through communities of practice with structured and sometimes very unequal power relationships, has been invoked effectively to explain learners' unstable progress even where motivation is high.

9.7.3 Sociolinguistic accounts of the L2 learner

L2 ethnographies take an interest in a wide variety of L2 learners, from the youngest classroom learners to adult migrants. The L2 ethnographers that we have encountered take a more rounded view of the learner as a social being than is true for other perspectives we have surveyed. Thus, for example, dimensions

SECOND LANGUAGE LEARNING THEORIES

such as gender and ethnicity are seen as significant for language learning success.

Most striking, though, is the emphasis placed by contemporary sociolinguistic researchers such as Norton and Pavlenko on the dynamic and alterable nature of learners' identity and engagement with the task of L2 learning. Self-esteem, motivation etc. are believed to be constructed and reconstructed in the course of L2 interaction, with significant consequences for the rate of learning and ultimate level of success. Alongside rich characterizations of the learning context, the importance attributed to agency and investment is one of the most distinctive themes offered by this particular perspective on L2 learning.

10 | Conclusion

10.1 One theory or many?

Having come to the end of our survey of current trends in second language learning research, we are left with a continuing impression of great diversity. (An impression reinforced in other recent handbooks and surveys; for example, see R. Ellis, 2008; Ritchie and Bhatia, 2009; Atkinson, 2011; Gass and Mackey, 2012.) Different research groups are pursuing theoretical agendas which centre on very different parts of the total language learning process; while many place the modelling of learner grammars at the heart of the enterprise, others focus on language processing, or on L2 interaction and socialization. Each research tradition has developed its own cluster of specialized research procedures, ranging from the grammaticality judgement tests associated with early UG-inspired research, to the recordings of naturalistic language now used both by language socialization theorists and those interested in the role of input, or the online methodologies used by cognitive linguists. On the whole, grand synthesizing theories, which try to encompass all aspects of L2 learning in a single model, have not gained support. Rather than a process of theory reduction and consolidation, of the kind proposed by Long and others, we find that newer theoretical perspectives (such as emergentism, skill acquisition theory or sociocultural theory) have flourished, without displacing established ones (such as Universal Grammar).

Some attempts have been made to link specific theories on a more modest scale, to account for different aspects of the L2 learning process; two examples are the proposals made by Towell and Hawkins (1994) to link UG theory with a theory of information processing, and Sharwood Smith and Truscott's MOGUL (Modular Growth and Use of Language), a model of L2 development integrating Jackendoff's modular view of language with a processing component (Sharwood Smith, 2008; Truscott and Sharwood Smith, 2004, 2011). But more noticeable in the field is the increased awareness within particular traditions of other parallel research strands working on similar phenomena, and a willingness to 'borrow' particular constructs without grand theorizing. The increasing interest of interactionist researchers in cognitive phenomena such as Working Memory and the use of conversation analysis tools and constructs in sociocultural research are just two examples.

10.2 Main achievements of recent second language learning research

Drawing on the wealth of studies now available in the SLL literature, what are the most significant developments which can be noted in SLL theorizing in its many forms?

From a linguistic perspective, the continuing application of Universal Grammar to the modelling of L2 competence has led to an increasingly sophisticated and complex range of proposals about the possible contents of that mysterious black box, the 'Language Acquisition Device'. One complication is the growing view among some UG specialists that the innate language module may itself be modular, with different aspects of language knowledge being learned and stored relatively autonomously. Additionally, the interaction between formal linguistic modules (such as syntax or phonology) and other modules involved in language (such as discourse or pragmatics) has received increasing attention. The Universal Grammar approach continues to provide sharp linguistic descriptions of learner language, and has helped to better document the linguistic route followed by L2 learners, to identify language structures that seem difficult to account for by exposure to the input alone, and to explain cross-linguistic influences.

From a cognitive perspective, the main evolutionary developments have been fuller documentation of the relationship between input characteristics and learner language, a clearer picture of how human memory influences L2 acquisition, and the linking of online processing constraints with both the structure of language and with L2 acquisition. We have access to fuller and more principled accounts of the impact of the L1 on L2 perception, attention, processing and representation. In addition, emergentists are now engaging with the acquisition and structure of complex and 'rare' morphosyntactic phenomena (more traditionally investigated through UG perspectives). Under the umbrella term of emergentism, identifiable sub-perspectives are found, including developing research agendas on associative, connectionist, construction and statistical learning. As far as grammar learning itself is concerned, connectionist models offer a radical challenge to traditional linguistic thinking, abandoning the paraphernalia of abstract rules and predefined symbolic representations, and suggesting that a network of much more primitive probabilistic links can underlie language learning and performance. However, before computer models can support these claims, they require further extension to a wider range of language structures including those that are sparse in natural input, and further clarification about the initial knowledge that is 'fed' into the models. Exactly *how* structure and system are extracted from constructions, of any kind, remains contentious.

Descriptively, recent work in the functionalist tradition has added substantially to our understanding of the course of L2 development, and especially the

10.2 Main achievements of recent second language learning research

key role played by pragmatics and lexis in interlanguage communication, particularly in the early stages. The Basic Variety proposals have remained influential, and the ESF database continues to be used as a valuable multilingual learner corpus by a range of researchers, functionalist and otherwise. Research on tense and aspect (some of it grounded in other learner corpora) has explored in depth the relations between meaning and form from a variety of perspectives. Variationist studies also suggest that much L2 variability can be accounted for by evolving links between form, function and speech style.

We have also learned much from recent research about the contexts within which L2 learning takes place, and the kinds of interactions in which learners become engaged, and there is now a substantial research agenda linking interactional engagement and L2 learning itself. In their different ways, the interactionist, sociocultural and sociolinguistic perspectives all address this issue. Together they have shown us how learners' engagement in L2 interaction is systematically influenced by power relations and other cultural factors. On the other hand, we have seen that these factors are not unalterably fixed, but can be renegotiated as learners build new identities. Both interactionist and sociocultural research, in their different ways, show how the ongoing character of L2 interaction can systematically affect the learning opportunities it makes available, and provide demonstrations of how learners actually use these opportunities.

Each of these strands uses a characteristic range of research methods, with the interactionist approach, for example, favouring various types of controlled experiment, while sociocultural researchers prefer teaching interventions and 'microgenetic' qualitative analysis of protocols, and L2 socialization researchers prefer forms of ethnographic inquiry (as in the work of Duff or Heller). Online interaction and online communities have attracted the interest of socially oriented researchers, and this work is producing new understandings of 'community' and its relations with learner investment and identity. There is still a relative scarcity of studies in these traditions which track and document learners' linguistic development in detail over longer periods of time, and link detailed accounts of their evolving control of linguistic structure to a narrative account of their interactional experiences (though the study of Ohta, 2001, for example, continues to offer a valuable example in the sociocultural tradition, and some 'study abroad' research works in this way: Magnan and Lafford, 2012). The growing interest in conversation analysis offers tools which support the close examination of the emergence of new language forms in discourse and may encourage more longitudinal work of this kind.

Finally, the introduction of systematic reviews and meta-analyses has added to the newer research tools in the field, which are enabling generalizations to be drawn with greater confidence from a wealth of smaller scale quantitative studies. For users of research, such as language-teaching professionals, reviews

of this type offer a valuable bridge to the findings of research in a manageable form (Norris and Ortega, 2006).

10.3 Future directions for second language learning research

For the foreseeable future, it seems that L2 learning will mostly be treated as a modular phenomenon, with different research programmes addressing different aspects. The influence of linguistics on the modelling of L2 competence is unlikely to diminish, so that we can expect to see continuing reflexes of evolving linguistic thinking in L2 research. Alongside established linguistic theory (such as UG) are newer models of language, such as the claim that language should be viewed as a complex adaptive system (Larsen-Freeman, 2011a, 2011b). This application of complexity theory to language is very broad in its scope and its implications for language learning. While it is partly grounded in emergentist work of the kind discussed here in Chapter 4, empirical work driven by complexity theory remains otherwise fairly limited, but may be expected to develop. Similarly, accounts of language which view multilingualism as the norm rather than the exception have set a challenge for the SLL field which requires a strong empirical response.

On the other hand, the application of general learning theories derived from cognitive psychology, neural science, sociocultural theory, etc. are also continuing to expand their evidence base, and become both more detailed and broader in scope.

While we believe these different research strands within SLA will retain their autonomy and individual impetus, it is however clear that continuing attempts to cross-refer between them and examine relations between different learning 'modules' in a systematic way will continue to prove a productive way of developing our understanding of the specific modular domains and how they interlink.

From a methodological point of view, the greater use of computer-aided techniques for the analysis of L2 data has continued, and is being taken up by researchers across the field. In the past, corpus-based studies of L2 development or L2 interaction have usually involved manual analysis of a very labour-intensive kind. Led by child language research using software such as the CHILDES package (MacWhinney, 2000), the development of electronic L2 corpora, plus appropriate tools for analysis, is making possible the more systematic linking of L2 grammar development with L2 input and interaction (Granger, 2012; Myles, 2007, 2008). They also facilitate much closer attention to L2 lexis and lexico-grammar, and to the role of **prefabricated chunks** and routines in L2 use and L2 learning. A more recent use of corpora has been to document the actual input that L2 learners are actually exposed to, giving us

10.4 Second language learning research and language education

a more precise picture of how the input may influence learning (Collins *et al.*, 2009). There is great scope for these type of corpora to be extended to other instructional contexts, and, of course, naturalistic language learning settings. Such technical developments do not challenge the fundamental assumptions of second language learning research, which by and large have remained those of rationalist 'modern' science. In recent years, however, the 'social turn' has promoted more socially engaged forms of second language acquisition research on the one hand, and postmodern interpretations of L2 use and learning on the other. **Postmodernism** offers a relativist critique of 'attempts to see human activity as part of a grand scheme, driven by notions of progressive improvement of any kind' (Brumfit, 1997, p. 23). As far as language is concerned, it highlights problems of textuality, and the complex relationship between language and any sort of external reality; 'we are positioned by the requirements of the discourse we think we adopt, and our metaphors of adoption hide the fact that *it* adopts *us*' (Brumfit, 1997, p. 25). The postmodern concept of intertextuality – the idea that all language use is a patchwork of borrowings from previous users – has been argued to be of central importance for L2 learning (Hall, 1995; Song and Kellogg, 2011).

So far, however, the critical and postmodern commentary on SLA has still not dislodged its central modernist assumptions. Nonetheless the 'social turn' has brought together a number of key ideas, summarized by Ortega (2011, p. 172):

- Dichotomies are ill-fitted to help us investigate language learning.
- Second language learning is in important ways intentional, conscious and explicit.
- Language learning and language learners are not defined by deficit.
- Individual variability is a central construct.
- Language learning is supported by embodied experiences within the physical and social world.
- Language learning encompasses social practices, values and indexicality.
- Additional language learning is always about power as much as about language.

10.4 Second language learning research and language education

We noted in Chapter 2 that theorizing about L2 learning has its historic roots in reform movements connected to the practical business of language teaching (Howatt, 2004). Since the 1970s, however, as we have clearly seen, it has become a much more autonomous field of enquiry, with an independent, 'scientific' rationale.

But what kind of connections should this now relatively independent research field maintain with its language-teaching origins? From time to time, it has been argued that the 'scientific' findings of SLA should guide the practices of classroom teachers; the recommendations which flowed from Krashen's Input Hypothesis, in the form of the 'Natural Approach' to language pedagogy, were an early example (Krashen and Terrell, 1983). Other examples which we encountered briefly earlier are the Teachability Hypothesis advanced by Pienemann, who suggests that new L2 items might most effectively be taught in sequences which imitate empirically documented developmental sequences, and VanPatten's Processing Instruction, which suggests that 'forcing' learners to use morphosyntax to interpret meaning is necessary for learning to proceed.

R. Ellis (2008) reviews a number of well-known difficulties with such a top-down, rationalist approach to linking research-derived theory and classroom practice. The findings of SLA research are not sufficiently secure, clear and uncontested, across broad enough domains, to provide straightforward prescriptive guidance for the teacher (nor, perhaps, will they ever be so). They are not generally presented and disseminated in ways accessible and meaningful to teachers; the agenda of SLA research does not necessarily centre on the issues which teachers are most conscious of as problematic. But most importantly, teaching is an art as well as a science, and irreducibly so, because of the constantly varying nature of the classroom as a learning community. There can be no 'one best method', however much research evidence supports it, which applies at all times and in all situations, with every type of learner. Instead, teachers 'read' and interpret the changing dynamics of the learning context from moment to moment, and take what seem to them to be appropriate contingent actions, in the light of largely implicit, proceduralized pedagogic knowledge. This has been built up over time very largely from their own previous experience, and usually derives only to a much more limited extent from study or from organized training.

However, present SLA research offers a rich variety of concepts and descriptive accounts which can help teachers interpret and make better sense of their own classroom experiences, and significantly broaden the range of pedagogic choices open to them. For example, SLL research has produced descriptive accounts of the course of interlanguage development which show that learners follow relatively invariant routes of learning, but that such routes are not linear, including phases of restructuring and apparent regression. Such accounts have helped teachers to understand patterns of learner error and its inevitability, and, more generally, to accept the indirect nature of the relationship between what is taught and what is learned. Similarly, in the recent literature, discussions about the role of explicit knowledge about language (reviewed in Chapter 5), recasts and negative evidence in learning (reviewed in Chapter 6), about scaffolding and microgenesis (Chapter 8), or about language socialization (Chapter 9)

10.4 Second language learning research and language education

have great potential to stimulate teacher reflections on the discourse choices available to them when enacting their own role as L2 guide and interlocutor.

Of course, the subfield of research on 'instructed SLA' (Long and Doughty, 2009), now diversified by research in task-based learning (R. Ellis, 2005a; Samuda and Bygate, 2008), in cognitive linguistics (Chapter 7) and concept-based instruction (Chapter 8), plays a special role in addressing concerns somewhat closer to those of the classroom teacher, and may offer opportunities for more direct involvement of teachers as research partners. But even 'instructed SLA' research is not identical to problem-solving and development in language pedagogy, and does not ensure a shared agenda between teachers and researchers. There is a continuing need for dialogue between the 'practical theories' of classroom educators and the more decontextualized and abstract ideas deriving from programmes of research. Researchers thus have a continuing responsibility to make their findings and their interpretations of them as intelligible as possible to a wider professional audience with other preoccupations. We hope that this book will make a useful contribution to this dialogue.

Glossary

acculturation	Process in which members of one cultural group adopt characteristics of another group
acquisition stage	A documented cluster of interlanguage structures that occur at roughly the same time during development
affect	Term used in psychology and psycholinguistics to refer to emotion or feeling
animacy	A feature attaching to nouns and/or pronouns in many languages to distinguish living/non-living referents
anthropological linguistics	Branch of linguistics that studies the relationship between culture, cognition and language
appropriation	Term used by sociocultural theorists to describe the learning or internalization by an individual of socially constructed knowledge
aspect	A feature attaching to verbs in many languages to indicate the speaker perspective on the event being described, for example whether it is completed ('I ran') or ongoing ('I was running')
automaticity	Fluency in the processing of languages, that reduces the need for conscious attention
behaviourism	General theory of learning current in the mid-twentieth century that stressed processes of habit formation and shaping of behaviour through stimulus and response
bilingualism	Knowledge of two or more languages
Broca's area	Region of the brain just above and in front of the left ear, often associated with the production of grammar
clarification request	Type of conversational move, a request from a hearer to a speaker to reformulate an utterance that has not been understood
clefting	Grammatical construction that brings a particular element into focus, by use of an additional <i>it</i> -clause or <i>wh</i> -clause, e.g. 'what I need is a job'
code switching	Using two languages or language varieties concurrently in conversation

cognitive linguistics	Branch of linguistics that views formal aspects of language as deriving from underlying semantic concepts and shaped by language use
communicative approach	Approach to language teaching that stresses meaning-based activities and learning experiences
communicative competence	Expanded view of language competence that incorporates knowledge of appropriacy and discourse as well as sentence-level grammar and semantics
community of practice	A temporary community formed to carry out a joint activity or work towards a goal, as e.g. in a service encounter
competence	Internal linguistic system which enables the individual to produce and comprehend novel utterances in a language
Competition Model	An emergentist model of language acquisition where learners become sensitive to the contribution of different (competing) language features to the interpretation of meaning
complementizer	Called 'subordinating conjunctions' in traditional grammar, a class of words that introduces complement clauses, e.g. 'whether', 'if'
complex dynamic systems theory	A theory that stresses dynamic and changing relationships among elements of a system, recently influential as a usage-based theory of language
complexification	Process whereby the grammars of pidgin languages acquire the full range of features of natural languages
comprehension check	Type of conversational move, a check by a speaker that they have been understood by their hearer/ interlocutor(s)
concept-based instruction	Teaching approach which centres on the development of students' understanding of key semantic concepts underlying grammatical constructions
confirmation check	Type of conversational move, a check by a hearer that they have understood the speaker's utterance correctly
connectionism	A cognitive theory that views language as a set of nodes with weighted links between them; learning takes place through repeated activation of particular pathways through the network

SECOND LANGUAGE LEARNING THEORIES

connectionist	See 'connectionism'
computer models	
Contrastive Analysis	1950s approach which compared structures in pairs of languages on the assumption that similar structures would be easy to learn and contrasting structures would be difficult to learn
control group	In classic experimental design, the group of participants who serve as a comparison group for those receiving some experimental treatment
conversation analysis	An approach to the study of conversational interaction which focuses on the local production of understanding through analysis of e.g. turn-taking, preference organization and repair
correlation	A statistical technique that analyses the degree of interdependence between two variables
creativity	The ability to use a linguistic system to produce and comprehend novel utterances
creolization	Process whereby contact/pidgin languages become full-blown natural languages
Critical Period Hypothesis	A hypothesis claiming that the innate language faculty guiding L1 acquisition is no longer available after a certain age, making L2 learning fundamentally different
cross-linguistic influence	Ways in which different language systems may interact and influence each other in the mind
cross-sectional research	Research approach where groups of learners at different proficiency levels/ages are compared to shed light on developmental processes
declarative knowledge	Knowledge of information, usually with explicit awareness, e.g. metalinguistic knowledge
definiteness	A property of a noun-phrase that indicates whether a referent can be uniquely identified by speaker and hearer
determiner	A class of words (such as articles or demonstratives) that establishes the type of reference of a noun or noun-phrase, e.g. whether it is definite/indefinite
developmental order	A documented sequence for the learning of a particular structure (e.g. English negation)

discourse	A stretch of talk or written text that includes a coherent sequence of utterances or sentences
ditransitive	A verb that has both a direct object and an indirect object, e.g. 'give someone something'
double stimulation	A research approach used in sociocultural theory where participants are presented with a problem to solve plus a potential tool, and their creative response is studied
durativity	A characteristic of verbs that denote actions or states lasting for a period of time
dynamic assessment	◦ A form of assessment favoured in sociocultural theory, which includes a learning phase and observes learner development in real time
dynamicity	A characteristic of verbs that denote actions but not states
effect size	A statistical measure (e.g. Cohen's d) which estimates the amount (magnitude) of difference between two measurements, commonly found in meta-analyses
elicitation	Collection of data (such as language samples) from research participants through specially designed tasks (e.g. Bilingual Syntax Measure)
elicited imitation	A research technique where participants repeat a set of target sentences
emergentism	A model of language acquisition that rejects the existence of a specific language faculty and claims that language structure emerges and is shaped through language use in meaning-rich environments
end state	The L2 learner's interlanguage system, once learning processes have ceased and the system has stabilized; also described as 'ultimate attainment'
Error Analysis	1970s approach to SLA which analysed learners' L2 errors in order to understand interlanguage development, independent of assumptions about L1 influence
event-related brain potentials (ERPs)	Measurements of brain activity during a specific event, such as comprehension of a particular language structure

SECOND LANGUAGE LEARNING THEORIES

experimental group	In classic experimental design, the participant group that receives the defined new 'treatment', so that their learning/performance can be measured against that of a control group
experimental study	A research design which tests a hypothesis by randomly assigning participants to different experiences so as to compare learning/performance outcomes
face	The public self-image, feelings and wants that speakers project and negotiate in social interaction
feature	See 'functional features'
feature checking	An operation within the Minimalist Program during which the syntax 'checks' that all features in a sentence are compatible with one another, e.g. that number and gender features on a noun and its determiner are the same
feedback	The response of interlocutors to formal features of L2 speech, e.g. recasting or correction
fluency	A measure of speech production that takes account of production features such as speech rate, pausing and false starts/reformulations
focus	A part of an utterance which contributes new information about an established 'topic'; may also be termed 'comment'
formulaic sequence	A phrase or sentence that is acquired and used as an unanalysed whole, not creatively constructed
fossilization	Stabilization of the interlanguage system, in a form divergent from the target language system
frequency	Rate of occurrence of features, words and structures in L2 input, of central importance for acquisition, in cognitive accounts
functional categories	Term used in generative linguistics for 'grammatical' words such as determiners and complementizers, and also for abstract categories such as Tense and Agreement
functional features	Properties of functional categories that vary from language to language, e.g. the category 'determiner' in French has both gender and number features, whereas English only has number features

functionalist perspective	Branch of linguistics that assumes that both language form and language learning are driven by communicative need
generative linguistics	Branch of linguistics that assumes the existence of an innate language faculty, which can generate all, and only, those sentences of a language that are grammatical
Government and Binding Theory	A generativist theory of syntax developed by Chomsky in the 1980s and grounded in the Principles and Parameters approach
grammatical gender	A feature of some languages that attaches to nouns, divides them into 2 or 3 classes ('masculine', 'feminine', etc.) and requires agreement, e.g. French 'la porte' [the FEM door], 'le chat' [the MASC cat]
grammaticality judgement	A research technique where participants are asked to judge whether sentences are grammatical or not
head	The main element of a phrase, e.g. the noun is the head of the noun-phrase
honorific marker	A morphological feature that encodes relative social status of participants in a speech event
hypothesis-testing	Form of research that tests a specific question or proposal
identity	The self-concept of the L2 learner
immersion	Teaching approach that provides L2 learners with all or part of their general education through the medium of L2
imperfective aspect	Verb forms signalling that, from the speaker perspective, the event described is ongoing/incomplete, e.g. 'I was crossing the river'
individual differences	Characteristics of L2 learners that may influence their rate of L2 learning and/or their ultimate success, e.g. language aptitude or personality
information processing	A cognitive theory, applied to L2 acquisition, which considers that learning is driven by the way in which the human mind processes, stores, restructures and accesses new information
Initial State	Term used by generativists to describe the starting point for language learning, comprising L1 knowledge and – perhaps – full or partial access to Universal Grammar

SECOND LANGUAGE LEARNING THEORIES

inner speech	Term used by sociocultural theorists to describe the use of language to regulate inner thought, without any audible speech production
input	All language directed towards the learner in the surrounding environment
Input Hypothesis	Claim that the only requirement for L2 acquisition is access to comprehensible L2 input
Input Processing Theory	Theory which claims that learners must make a form-meaning connection for L2 acquisition to take place and proposes why this does not always happen
Interaction Hypothesis	Claim that L2 interaction, including negotiation of meaning, is the central requirement for L2 acquisition
interfaces	Term used by generativists to describe interactions between different modules of the linguistic system (syntax, phonology, etc.), the sensory-motor system, and the conceptual-intentional system
interlanguage	Term proposed in the 1970s to capture a view of learner language as a developing system in its own right, rather than a debased form of the target language; a continuing central concept in L2 learning research
interlocutor	A partner in linguistic interaction of any kind, e.g. in face-to-face conversation or internet communication
investment	A reworking of the construct of motivation, emphasizing socially constructed and dynamic aspects of the relationship of L2 learners with the target language
language anxiety	Label given by social psychologists to feelings of nervousness and unease when learning/using a new language
language aptitude	The potential talent of an individual for L2 learning, including sub-skills such as the ability to detect grammatical patterns
language modules	See 'modularity'
language socialization	The view that language is learned through social interaction, which inducts the learner simultaneously into the social roles indexed through language form

language transfer	Influence of one language system on another, usually that of L1 on L2
languageing	Term used by some sociocultural theorists for L1 private speech used to monitor and scaffold L2 production
lemma	Abstract conceptual form of a word held in the mental word store (the 'lexicon'), which represents word meaning and potential grammatical connections
lexical categories	Term used in generativist linguistics for content words/open class words such as nouns, verbs and adjectives
lexicon	The mental word store
lexis	See 'lexicon'
lingua franca	A language used for communication by a range of L2 speakers who do not share a common L1; currently English has a pre-eminent global lingua franca role
linguistic variable	Term used in quantitative sociolinguistics for a socially marked linguistic form that indexes, e.g. formality/informality
locative	Grammatical argument or grammatical case that indicates location or position
logistic regression	A statistical technique which explores relationships between one or more predictor variables and a dichotomous outcome variable (e.g. whether or not learning has taken place)
longitudinal	Research approach where participants are tracked over a period of time to study their development
long-term memory	Long-term mental information store, accessed through short-term/working memory
mediation	A central concept for sociocultural theory, capturing the view that human mental activity relies on an array of cultural and symbolic tools (such as language)
meta-analysis	Research approach where related empirical studies are systematically drawn together to extract a smaller set of overall findings
metalinguistic feedback	Type of feedback on learner output that draws attention to matters of form, e.g. to grammatical concepts or rules

SECOND LANGUAGE LEARNING THEORIES

metalinguistic knowledge	A learner's explicit conceptual understanding of target language form, structure or system
microgenesis	Term used by sociocultural theorists to describe short-term learning/development
Minimalist Program	Line of inquiry within generative linguistics developed by Chomsky from the 1990s onward, aiming at maximal economy
modified output	Learner adjustments to their L2 outputs in response to feedback, elicitations, etc., seen as evidence of noticing and development
modularity	Belief that the human mind comprises a number of distinct modules, of which language is one, and that language in turn comprises a number of modules (syntax, phonology, etc.)
morpheme studies	Studies of order of emergence of particular English L2 morphemes, conducted in the 1970s among learners from different L1 backgrounds
morphology	Study of internal word structure and the role of grammatical morphemes (inflections) in representing categories such as Tense and Agreement
morphosyntax	Study of internal word structure (morphology) and how words combine to form phrases and sentences (syntax)
motivation	Social psychological concept to do with the desire to achieve a goal (e.g. to learn a language), the effort actually expended and the satisfaction derived from the task
Move α (move alpha)	Term used by generativists to describe movement of a syntactic unit from its normal place in the sentence in order to perform a certain function, e.g. to ask a question
negative evidence	Form of feedback on learner L2 output which highlights a gap between the interlanguage form and target language form
negotiation of meaning	Two-way exchange in which interlocutors collaborate to repair comprehension problems
noticing	Paying attention to a language stimulus (e.g. a 'new' L2 word or structure), registering that it has occurred in input

ontogenesis	Term used by sociocultural theorists to describe learning/development over the human lifespan
optionality	Phenomenon of instability in interlanguage grammars, where a rule or structure is employed inconsistently
other-regulation	Term used by sociocultural theorists to describe the management of an individual's learning by another person/through interaction
output	All language produced by the learner
Output Hypothesis	Claim that L2 output is necessary for learning, as a driver of full grammar processing and hypothesis-testing
parameters	See 'Principles and Parameters theory'
parataxis	Linkage of ideas and construction of utterances through pragmatic rather than syntactic means
parsing	Decoding of the input to arrive at a meaning, usually including a syntactic analysis (typically at a subconscious level)
pattern drilling	Teaching approach inspired by behaviourist learning theory where learners rehearse sentence patterns in oral exercises
perfective aspect	Verb forms signalling that, from the speaker's perspective, the event described is bounded/complete, e.g. 'I crossed the river'
performance	Production and comprehension of novel utterances in real time ('online'), enabled by drawing on the learners' linguistic system ('competence')
phonological memory	A specialized domain within (working) memory that stores and rehearses phonological material for short periods and facilitates speech processing
phonology	Study of the inventory of meaning-bearing sounds and how they combine in particular languages (consonants and vowels)
phrase	A group of words centring on a headword (e.g. a noun or verb) that acts as a building block within a clause or sentence
phylogenesis	Term used by sociocultural theorists to describe learning over the course of human evolution

SECOND LANGUAGE LEARNING THEORIES

pidgin languages	Contact languages with reduced syntax and vocabulary that do not have native speakers, but arise for limited instrumental purposes in contexts of trade and/or conquest
pidginization	The view that informal (uninstructed) second language learning has parallels to the development of pidgin languages
polysemy	The capacity for a word or phrase to have multiple meanings (though often related to each other), e.g. 'mouse' = (a) small animal with a tail; (b) a small mobile tool used to navigate a computer interface
positive evidence	Naturally occurring language data available to learners as input, which tells learners what constructions are permitted/acceptable in the language, but does not tell them what is not permitted
postmodernism	A philosophical stance which sees 'reality' as constructed in the mind, is suspicious of grand narratives and views 'truth' as relative to individual experience
post-test	A test administered following some innovative treatment, to measure learning outcomes (e.g. gains in L2 proficiency), often used in experimental research designs
poverty of the stimulus	The claim that some language forms are learned even where evidence about them is limited or absent in the input, often used to argue that language is not learnable from positive evidence and a language-specific faculty must exist in the brain
pragmalinguistics	Study of the linguistic resources required to perform communicative acts and convey interpersonal meaning
pragmatics	A domain of linguistics that studies how aspects of the discourse context contribute to utterance meaning
prefabricated chunk	See 'formulaic sequence'
pre-test	A test administered prior to some innovative treatment, to measure starting levels of performance, often used in experimental research designs
Principal Components Analysis	A statistical technique that reduces a set of observed variables to a smaller number of artificial variables, used to determine which variables predict an outcome more strongly than others; related to factor analysis

Principles and Parameters theory	A version of generativist linguistic theory that defines the syntax of all natural languages in terms of a number of universal principles (e.g. structure-dependency), plus parameters that offer a limited amount of choice (e.g. phrase structure may be 'head first' vs 'head last')
private speech	Speech which is audible but addressed to the self and used to regulate behaviours such as problem-solving
procedural knowledge	Knowledge involved in carrying out a task or performing an activity or skill, usually with reduced demands on attention
processing	Parsing and extracting meaning from the L2 input stream, in real time and below the level of conscious awareness
processing constraints	Restrictions on parsing of L2 input, deriving from memory limitations and/or from the current state of interlanguage
prompts	Type of feedback on learner that encourages the learner to produce a revised utterance
property theory	Theory that sets out to model language structure
prototype	A typical, high-frequency example of a particular lexical category or construction that may be learned and used as an exemplar
prototypicality	Quality attaching to typical, high-frequency examples of particular categories
psycholinguistics	Branch of linguistics which is concerned with the psychological processes involved in learning, storing and using language
quasi-experiment	Research design similar to the classic experiment, but where the experimental and control groups are not randomly assigned but are intact groups, e.g. two existing classes
rate of learning	The speed with which learners acquire L2 proficiency
rationalist position	Philosophical standpoint that values reason as a source of knowledge, in addition to/in contrast to sensory experience
reaction time	The speed with which a research participant makes a response, measured in milliseconds, often used in online processing and priming research

SECOND LANGUAGE LEARNING THEORIES

recasts	An interlocutor's reformulation of their partner's non-target-like utterance, in which the meaning is retained but language form is changed
recursion	The embedding of phrases or clauses within others of the same type, allowing the creation of long and novel sentences
reformulation	A revision of an utterance in which the meaning is retained but the form is changed
repair	Solving communication difficulties and achieving shared meaning
research synthesis	The drawing together of previous research to extract common themes, usually from empirical studies, in a systematic and replicable way
rheme	That part of a sentence that comments on the theme or topic, i.e. which adds new information about it
route of learning	Developmental sequence observed across different learners
saliency	The idea that physical characteristics make certain language features more accessible than others
scaffolding	Provision of temporary and graduated support for learners undertaking a new task, through dialogue with 'experts' or peers
self-regulation	Term used by sociocultural theorists to describe self-management of learning, perhaps through use of private speech
self-repair	The repair of communication problems by the author of the problem, e.g. by the learner
semantics	The study of meaning, sometimes conceptualized as a separate 'level' of language
short-term memory	A temporary store of representations within the brain
sociocultural theory	General theory of learning associated with the Russian social psychologist Lev Vygotsky
sociolinguistic marker	A language feature given positive/negative social value by a speech community
sociolinguistics	The study of language in use within its social context

sociopragmatics	Study of social factors affecting the interpretation of communicative acts, such as power relations, degree of intimacy, and extent of social imposition attaching, e.g., to requests
Specific Language Impairment (SLI)	Language impairment in children without associated cognitive delays
specificity	A property of a word or phrase that indicates whether a speaker has a specific known referent in mind
speech act	The communicative function associated with a single utterance, e.g. requesting, advising or warning
speech community	A social group who share a common set of norms and expectations regarding the use of language
speech event	A social activity with distinctive communicative goals, which may involve a particular speech style or register, e.g. a job interview
stimulated recall	A research technique to elicit recollections of a particular event in which the participant is provided with a stimulus (e.g. a video of themselves in a conversation) to prompt their memory
structuralism	View of language as a self-contained and contrasting set of relations among abstract elements, developed by the early twentieth-century linguist Ferdinand de Saussure
subjunctive mood	Verb mood used to express hypothetical, counterfactual or unreal situations and points of view
subordination	Relation between clauses within complex sentences, where a main clause is accompanied by one or more dependent clauses
syntax	The study of how words combine to form phrases, clauses and sentences in a language
systematic review	Survey and collation of previous research in a clearly defined, transparent and replicable way
systematicity	Regularities in a learner's use of language
systemic functional linguistics	Meaning-based approach to language analysis associated with the British linguist Michael Halliday
task-based learning	Language teaching approach that engages learners in problem-solving tasks and activities, and introduces new language relevant to successful task completion

SECOND LANGUAGE LEARNING THEORIES

telicity	A characteristic of verbs where the actions referred to have an end point, e.g. 'enter a room'
temporality	The concept of time, reflected in formal linguistic categories such as verb tense and temporal adverbs
theme	The topic of a sentence, the entity being talked about
token	An actual occurrence in a running text that represents a more abstract lexical entity (lemma), e.g. 'eats' and 'ate' are both tokens of the verb type 'eat'
topic	The entity or actor, about whom a statement or 'comment' is made, in a given sentence
transition theory	A theory that explains how knowledge changes over time and learning develops
treatment	An innovative approach to teaching, often delivered as part of an experiment
treatment group	See 'experimental group'
type	Distinct underlying lexical entity within a language, e.g. 'eat' and 'go' are verb types in English
ultimate attainment	See 'end state'
Universal Grammar	Theory of language that assumes all natural languages share a set of underlying principles and constraints, and derive from an innate language faculty
uptake	When a reformulation provided by an interlocutor is subsequently used by a learner
VARBRUL	Multivariate statistical package used in sociolinguistics to predict the occurrence of sociolinguistic markers on the basis of contextual factors
variability	See 'optionality'
variable	Term for a construct or measure, often used in a statistical analysis
voice, active	Syntactic structure that places the agent of an action as the grammatical subject of the sentence, e.g. 'John opened the door'
voice, middle	Syntactic structure that places the patient of an action as the grammatical subject of an active intransitive sentence, e.g. 'the door opened' (also known as 'unaccusative')

voice, passive	Syntactic structure that places the patient of an action as the grammatical subject of the sentence, e.g. 'the door was opened by John'
Wernicke's area	Region of the brain around and under the left ear, often associated with the production of lexis
wild grammars	Learner varieties that do not follow the constraints of natural languages
Working Memory	The brain system involved in temporarily storing and rehearsing information, as well as integrating it into ongoing cognitive processes
Zone of Proximal Development	Term from sociocultural theory used to describe learner's potential to solve problems just beyond their current level, under guidance

References

- Abrahamsson, N. and Hyltenstam, K. 2009: Age of onset and nativelikeness in a second language: listener perception versus linguistic scrutiny. *Language Learning* 59, 249–306.
- Abutalebi, J. and Green, D. 2008: Control mechanisms in bilingual language production: neural evidence from language switching studies. *Language and Cognitive Processes* 23, 557–82.
- Adams, M. 1978: Methodology for examining second language acquisition. In Hatch, E.M. (ed.) *Second language acquisition*. Rowley, MA: Newbury House, 278–96.
- Aitchison, J. 2008: *The articulate mammal*. 5th edition. Abingdon: Routledge.
- Al-Gahtani, S. and Roever, C. 2012: Proficiency and sequential organization of L2 requests. *Applied Linguistics* 33, 42–65.
- Aljaafreh, A. and Lantolf, J.P. 1994: Negative feedback as regulation and second language learning in the Zone of Proximal Development. *Modern Language Journal* 78, 465–83.
- Allwright, D. 1975: Problems in the study of the language teacher's treatment of learner error. In Burt, M. and Dulay, H. (eds) *New directions in language learning, teaching and bilingual education*. Washington, DC: TESOL, 96–109.
- Altarriba, J. and Basnight-Brown, D.M. 2009: An information-processing approach to second language acquisition. In Ritchie, W. and Bhatia, T. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 115–36.
- Ambridge, B. and Lieven, E. 2011: *Child language acquisition: contrasting theoretical approaches*. Cambridge: Cambridge University Press.
- Ambridge, B., Pine, J.M., Rowland, C.F., Jones, R.L. and Clark, V. 2009: A semantics-based approach to the 'no negative evidence' problem. *Cognitive Science* 33, 1301–16.
- Ammar, A. 2008: Prompts and recasts: differential effects on second language morphosyntax. *Language Teaching Research* 12, 183–210.
- Ammar, A. and Spada, N. 2006: One size fits all?: Recasts, prompts, and L2 learning. *Studies in Second Language Acquisition* 28, 543–74.
- Andersen, R.W. 1991: Developmental sequences: the emergence of aspect marking in second language acquisition. In Huebner, T. and Ferguson, C.A. (eds) *Crosscurrents in second language acquisition and linguistic theories*. Amsterdam: John Benjamins, 305–24.
- Andersen, R.W. and Shirai, Y. 1994: Discourse motivations for some cognitive acquisition principles. *Studies in Second Language Acquisition* 16, 133–56.

- Anderson, J. 1983: *The architecture of cognition*. Cambridge, MA: Harvard University Press.
- Anderson, J. 1993: *Rules of the mind*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Archibald, J. 1998. *Second language phonology*. Amsterdam: John Benjamins.
- Archibald, J. 2005. Second language phonology as redeployment of L1 phonological knowledge. *Canadian Journal of Linguistics* 50, 285–314.
- Atkinson, D. 2011: *Alternative approaches to second language acquisition*. Abingdon: Routledge.
- Auer, P. and Pfänder, S. (eds) 2011: *Constructions: emerging and emergent*. Boston: De Gruyter Mouton
- Ayoun, D. 2003: *Parameter-setting theory in first and second language acquisition*. New York: Continuum.
- Baddeley, A.D. 2007: *Working memory, thought, and action*. Oxford: Oxford University Press.
- Baddeley, A.D. and Hitch, G. 1974: Working memory. In Bower, G. (ed.) *The psychology of learning and motivation: advances in research and theory, Vol. 8*. New York: Academic Press, 47–90.
- Baddeley, A.D., Eysenck, M. and Anderson, M. 2009: *Memory*. New York: Psychology Press.
- Baddeley, A.D., Gathercole, S.E. and Papagno, C. 1998: The phonological loop as a language learning device. *Psychological Review* 105, 158–73.
- Bailey, N., Madden, C. and Krashen, S. 1974: Is there a 'natural sequence' in adult second language learning? *Language Learning* 24, 235–43.
- Bardovi-Harlig, K. 2000: Tense and aspect in second language acquisition: form, meaning and use. *Language Learning* 50 (Supplement 1).
- Bardovi-Harlig, K. 2007: One functional approach to second language acquisition: the concept-oriented approach. In VanPatten, B. and Williams, J. (eds) *Theories in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum, 57–76.
- Bardovi-Harlig, K. 2008: Recognition and production of formulas in L2 pragmatics. In Han, Z. (ed.) *Understanding second language process*. Clevedon: Multilingual Matters, 205–22.
- Bardovi-Harlig, K. 2009: Conventional expressions as a pragmalinguistic resource: recognition and production of conventional expressions in L2 pragmatics. *Language Learning* 59, 755–95.
- Bardovi-Harlig, K. 2012: Pragmatics in second language acquisition. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 147–62.

SECOND LANGUAGE LEARNING THEORIES

- Bartke, S. and Siegmüller, J. (eds) 2004: *Williams syndrome across languages*. Amsterdam: John Benjamins.
- Bates, E. and Goodman, J. 1997: On the inseparability of grammar and the lexicon: evidence from acquisition, aphasia, and realtime processing. *Language and Cognitive Processes* 12, 507–84.
- Bayley, R. 1994: Interlanguage variation and the quantitative paradigm: past tense marking in Chinese–English. In Gass, S., Cohen, A. and Tarone, E. (eds) *Research methodology in second language acquisition*. Hillsdale, NJ: Lawrence Erlbaum, 157–81.
- Bayley, R. 1996: Competing constraints on variation in the speech of adult Chinese learners of English. In Bayley, R. and Preston, D.R. (eds) *Second language acquisition and linguistic variation*. Amsterdam: John Benjamins, 97–120.
- Bayley, R. and Preston, D.R. (eds) 1996: *Second language acquisition and linguistic variation*. Amsterdam: John Benjamins.
- Bayley, R. and Schecter, S.R. (eds) 2003: *Language socialization in bilingual and multilingual societies*. Clevedon: Multilingual Matters.
- Becker, A. and Carroll, M. 1997: *The acquisition of spatial relations in a second language*. Amsterdam: John Benjamins.
- Bell, N. 2012: Comparing playful and nonplayful incidental attention to form. *Language Learning* 62, 236–65.
- Belletti, A., Bennati, E. and Sorace, A. 2007: Theoretical and developmental issues in the syntax of subjects: evidence from near-native Italian. *Natural Language and Linguistic Theory* 25, 657–89.
- Bellugi, U., Van Hoek, K., Lillo-Martin, D. and O'Grady, L. 1993: The acquisition of syntax in young deaf signers. In Bishop, D. and Mogford, K. (eds) *Language development in exceptional circumstances*. Hove: Lawrence Erlbaum, 132–50.
- Beretta, A. (ed.) 1993: Theory construction in SLA. Special issue of *Applied Linguistics* 14.
- Berko, J. 1958: The child's learning of English morphology. *Word* 14, 150–77.
- Berman, R.A. and Slobin, D.I. 1994: *Relating events in narrative: a crosslinguistic developmental study*. Hillsdale, NJ: Lawrence Erlbaum.
- Bhatia, T.K. and Ritchie, W.C. (eds) 2004: *The handbook of bilingualism*. Oxford: Blackwell Publishing.
- Bialystok, E. 2009: Bilingualism: the good, the bad, and the indifferent. *Bilingualism: Language and Cognition* 12, 3–11.
- Bialystok, E., Martin, M. and Viswanathan, M. 2005: Bilingualism across the lifespan: the rise and fall of inhibitory control. *International Journal of Bilingualism* 9, 103–19.

- Biber, D., Johansson, S., Leech, G., Conrad, S. and Finegan, E. 1999: *Longman grammar of spoken and written English*. Harlow: Pearson Education.
- Birdsong, D. (ed.) 1999: *Second language acquisition and the critical period hypothesis*. Mahwah, NJ: Lawrence Erlbaum.
- Birdsong, D. 2009: Age and the end state of second language acquisition. In Ritchie, W. and Bhatia, T. (eds) *New handbook of second language acquisition*. Bingley: Emerald Group, 401–24.
- Bishop, D. (ed.) 2001: *Language and cognitive processes in developmental disorders*. Hove: Psychology Press.
- Bishop, D. and Mogford, K. (eds) 1993: *Language development in exceptional circumstances*. Hove: Lawrence Erlbaum.
- Bley-Vroman, R. 1989: What is the logical problem of foreign language learning? In Gass, S.M. and Schachter, J. (eds) *Linguistic perspectives on second language acquisition*. Cambridge: Cambridge University Press, 41–68.
- Bley-Vroman, R. 2009: The evolving context of the fundamental difference hypothesis. *Studies in Second Language Acquisition* 31, 175–98.
- Block, D. 2003: *The social turn in second language acquisition*. Edinburgh: Edinburgh University Press.
- Block, D. 2007: *Second language identities*. London: Continuum.
- Bloomfield, L. 1933: *Language*. New York: Holt, Rinehart and Winston.
- Blum-Kulka, S., House, J. and Kasper, G. 1989: *Cross-cultural pragmatics: requests and apologies*. Norwood, NJ: Ablex.
- Boers, F. and Lindstromberg, S. 2008: How cognitive linguistics can foster effective vocabulary teaching. In Boers, F. and Lindstromberg, S. (eds) *Applications of cognitive linguistics: cognitive linguistic approaches to teaching vocabulary and phraseology*. Berlin: Mouton de Gruyter, 1–61.
- Boyd, J.K. and Goldberg, A.E. 2009: Input effects within a constructionist framework. *Modern Language Journal* 93, 418–29.
- Boyd, J.K. and Goldberg, A.E. 2011: Learning what not to say: the role of statistical preemption and categorization in “a”-adjective production. *Language* 81, 1–29.
- Bremer, K., Broeder, P., Roberts, C., Simonot, M. and Vasseur, M.-T. 1993: Ways of achieving understanding. In Perdue, C. (ed.) *Adult language acquisition: cross-linguistic perspectives, Volume 2: The results*. Cambridge: Cambridge University Press, 153–95.
- Bremer, K., Roberts, C., Vasseur, M.-T., Simonot, M. and Broeder, P. 1996: *Achieving understanding: discourse in intercultural encounters*. Harlow: Longman.
- Broeder, P. 1995: Adult language acquisition: the establishment, shift and maintenance of reference in narratives. In Geiger, R.A. (ed.) *Reference in multidisciplinary perspective*. Hildesheim: Olms.

SECOND LANGUAGE LEARNING THEORIES

- Brown, R. 1973: *A first language: the early stages*. Cambridge, MA: Harvard University Press.
- Brumfit, C.J. 1997: Theoretical practice: applied linguistics as pure and practical science. *AILA Review* 12, 18–30.
- Bruner, J. 1985: Vygotsky: a historical and conceptual perspective. In Wertsch, J. (ed.) *Culture, communication and cognition: Vygotskian perspectives*. Cambridge: Cambridge University Press, 21–34.
- Butterworth, G. and Hatch, E. 1978: A Spanish-speaking adolescent's acquisition of English syntax. In Hatch, E. (ed.) *Second language acquisition*. Rowley, MA: Newbury House, 231–45.
- Bybee, J. 2008: Usage based grammar and second language acquisition. In Robinson, P. and Ellis, N.C. (eds) *Handbook of cognitive linguistics and second language acquisition*. Abingdon: Routledge, 216–36.
- Bybee, J. and Hopper, P. (eds) 2001: *Frequency and the emergence of linguistic structure*. Amsterdam: Benjamins.
- Byrne, D. 1986: *Teaching oral English*. Harlow: Longman.
- Cadierno, T. 2008: Learning to talk about motion in a foreign language. In Robinson, P. and Ellis, N.C. (eds) *Handbook of cognitive linguistics and second language acquisition*. Abingdon: Routledge, 239–75.
- Cameron, L. 2011: Metaphor in spoken discourse. In Gee, J.P. and Handford, M. (eds) *The Routledge handbook of discourse analysis*. Abingdon: Routledge, 342–55.
- Caplan, D. 2012: Syntactic aspects of language disorders. In Heilman, K. and Valenstein, E. (eds) *Clinical neuropsychology*. New York: Oxford University Press, 86–114.
- Carroll, S. 2001: *Input and evidence: the raw material of second language acquisition*. Amsterdam: John Benjamins.
- Carter, R. 1998: *Mapping the mind*. London: Weidenfeld and Nicolson.
- Carter, R. and McCarthy, M. 2006: *Cambridge grammar of English*. Cambridge: Cambridge University Press.
- Casenhiser, D. and Goldberg, A.E. 2005: Fast mapping of a phrasal form and meaning. *Developmental Science* 8, 500–8.
- Cazden, C. 1972: *Child language and education*. New York: Holt, Rinehart and Winston.
- Cazden, C.B., Cancino, H. Rosansky, E. and Schumann, J. 1975: *Second language acquisition sequences in children, adolescents and adults: final report*. Washington, DC: National Institute of Education.
- Cekaite, A. 2007: A child's development of interactional competence in a Swedish L2 classroom. *Modern Language Journal* 91, 45–62.

- Chamot, A.U. 2005: Language learning strategy instruction: current issues and research. *Annual Review of Applied Linguistics* 25, 112–30.
- Chamot, A.U. 2007: Accelerating academic achievement of English language learners: a synthesis of five evaluations of the CALLA model. In Cummins, J. and Davison, C. (eds) *The international handbook of English language learning Part I*. Norwell, MA: Springer, 317–31.
- Chaudron, C. 1977: A descriptive model of discourse in the corrective treatment of learners' errors. *Language Learning* 27, 29–46.
- Chaudron, C. 1988: *Second language classrooms: research on teaching and learning*. Cambridge: Cambridge University Press.
- Chaudron, C. 2003: Data collection in SLA research. In Doughty, C. and Long, M. (eds) *The handbook of second language acquisition*. Oxford: Blackwell, 762–828.
- Chen, C. and Truscott, J. 2010: The effects of repetition and L1 lexicalization on incidental vocabulary acquisition. *Applied Linguistics* 31, 693–713.
- Chen, L., Shu, H., Liu, Y., Zhao, J. and Li, P. 2007: ERP signatures in subject–verb agreement in L2 learning. *Bilingualism: Language and Cognition* 10, 161–74.
- Choi, S. and Lantolf, J.P. 2008: Representation and embodiment of meaning in L2 communication: motion events in the speech and gesture of advanced L2 Korean and L2 English speakers. *Studies in Second Language Acquisition* 30, 191–224.
- Chomsky, N. 1957: *Syntactic structures*. The Hague: Mouton.
- Chomsky, N. 1959: Review of B.F. Skinner, *Verbal behavior*. *Language* 35, 26–58.
- Chomsky, N. 1965: *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.
- Chomsky, N. 1981: *Lectures on government and binding*. Dordrecht: Foris.
- Chomsky, N. 1986a: *Knowledge of language, its nature, origin and use*. New York: Praeger.
- Chomsky, N. 1986b: *Barriers*. Cambridge, MA: MIT Press.
- Chomsky, N. 1987: Transformational grammar: past, present and future. In *Studies in English language and literature*. Kyoto: Kyoto University, 33–80.
- Chomsky, N. 1995: *The minimalist program*. Cambridge, MA: MIT Press.
- Chomsky, N. 2000: *New horizons in the study of language and mind*. Cambridge: Cambridge University Press.
- Chomsky, N. 2005: Three factors in language design. *Linguistic Inquiry* 36, 1–22.
- Chomsky, N. 2007a: Approaching UG from below. In Sauerland, U. and Gärtner, H. (eds) *Interfaces + recursion = language?* Berlin: Mouton de Gruyter, 1–31.
- Chomsky, N. 2007b: Of minds and language. *Biolinguistics* 1, 9–27.
- Christiansen, M.H. and Chater, N. 2008: Language as shaped by the brain. *Behavioral and Brain Sciences* 31, 489–558.

SECOND LANGUAGE LEARNING THEORIES

- Christiansen, M.H. and MacDonald, M.C. 2009: A usage-based approach to recursion in sentence processing. *Language Learning* 59 (Supplement 1), 126–61.
- Christiansen, M., Conway, C. and Onnis, L. 2012: Similar neural correlates for language and sequential learning: evidence from event-related brain potentials. *Language and Cognitive Processes* 27, 231–56.
- Clahsen, H. 1982: *Spracherwerb in der Kindheit: eine Untersuchung zur Entwicklung der Syntax bei Kleinkindern*. Tübingen: Gunter Narr.
- Clahsen, H. (ed.) 1996: *Generative perspectives on language acquisition: empirical findings, theoretical considerations and crosslinguistic comparisons*. Amsterdam: John Benjamins.
- Clahsen, H. and Felser, C. 2006a: Grammatical processing in language learners. *Applied Psycholinguistics* 27, 3–42.
- Clahsen, H. and Felser, C. 2006b: How native-like is non-native language processing? *Trends in Cognitive Sciences* 10, 564–70.
- Clahsen, H. and Muysken, P. 1986: The availability of Universal Grammar to adult and child learners – a study of the acquisition of German word order. *Second Language Research* 2, 93–119.
- Clahsen, H., Felser, C., Neubauer, K., Sato, M. and Silva, R. 2010: Morphological structure in native and non-native language processing. *Language Learning* 60, 21–43.
- Clark, E. 1985: The acquisition of Romance, with special reference to French. In Slobin, D. (ed.) *The crosslinguistic study of language acquisition*. Hillsdale, NJ: Lawrence Erlbaum, 687–782.
- Cleeremans, A. and Dienes, Z. 2008: Computational models of implicit learning. In Sun, R. (ed.) *Cambridge handbook of computational psychology*. Cambridge: Cambridge University Press, 396–421.
- Clément, R., Baker, S.C. and MacIntyre, P.D. 2003: Willingness to communicate in a second language: the effects of context, norms and vitality. *Journal of Language and Social Psychology* 22, 190–209.
- Cohen, A.D. and Macaro, E. (eds) 2008: *Language learner strategies: thirty years of research and practice*. Oxford: Oxford University Press.
- Cohen, J. 1988: *Statistical power analysis for the behavioural sciences*. 2nd edition. Hillsdale, NJ: Lawrence Erlbaum.
- Collins, L. 2004: The particulars on universals: a comparison of the acquisition of tense-aspect morphology among Japanese- and French-speaking learners of English. *Canadian Modern Language Review* 61, 251–74.
- Collins, L. and Ellis, N.C. (eds) 2009: Input and second language acquisition: the roles of frequency, form, and function: Special Issue. *Studies in Second Language Acquisition* 93.

- Collins, L., Trofimovich, P., White, J., Cardoso, W. and Horst, M. 2009: Some input on the easy/difficult grammar question: an empirical study. *Modern Language Journal* 93, 336–53.
- Conrad, S. 2010: What can a corpus tell us about grammar? In O’Keefe, A. and McCarthy, M. (eds) *The Routledge handbook of corpus linguistics*. Abingdon: Routledge, 227–41.
- Conway, A. 2005: *Working memory capacity*. New York: Psychology Press.
- Conway, A., Jarrold, C., Kane, M., Miyake, A. and Towse, J. (eds) 2007: *Variation in working memory*. New York: Oxford University Press.
- Conway, A., Kane, M.J., Bunting, M.F., Hambrick, D.Z., Wilhelm, O. and Engle, R.W. 2005: Working memory span tasks: a methodological review and user’s guide. *Psychonomic Bulletin and Review* 12, 769–86.
- Conway, C.M., Bauernschmidt, A., Huang, S.S. and Pisoni, D.B. 2010: Implicit statistical learning in language processing: word predictability is the key. *Cognition* 114, 356–71.
- Cook, V. (ed.) 2003: *Effects of the second language on the first*. Clevedon: Multilingual Matters.
- Cook, V. 2008a: Multi-competence: black hole or wormhole for second language acquisition research? In Han, Z. (ed.) *Understanding second language process*. Clevedon: Multilingual Matters, 16–26.
- Cook, V. 2008b: *Second language learning and language teaching*. 4th edition. London: Arnold.
- Cook, V. and Newson, M. 1996: *Chomsky’s Universal Grammar: an introduction*. 2nd edition. Oxford: Blackwell.
- Cook, V. and Newson, M. 2007: *Chomsky’s Universal Grammar: an introduction*. 3rd edition. Oxford: Blackwell.
- Corder, S.P. 1967: The significance of learners’ errors. *International Review of Applied Linguistics* 5, 161–9.
- Corder, S.P. 1978: Language-learner language. In Richards, J. (ed.) *Understanding second and foreign language learning: issues and approaches*. Rowley, MA: Newbury House, 71–93.
- Coughlan, P. and Duff, P.A. 1994: Same task, different activities: analysis of an SLA task from an activity theory perspective. In Lantolf, J.P. and Appel, G. (eds) *Vygotskian approaches to second language research*. Norwood, NJ: Ablex Publishing Corporation, 173–94.
- Cowan, N. 1995: *Attention and memory: an integrated framework*. Oxford: Oxford University Press.
- Cruse, A. 2010: *Meaning in language*. Oxford: Oxford University Press.

SECOND LANGUAGE LEARNING THEORIES

- Csizér, K. and Dörnyei, Z. 2005: The internal structure of language learning motivation and its relationship with language choice and learning effort. *Modern Language Journal* 89, 19–36.
- Curtiss, S. 1977: *Genie: a psycholinguistic study of a modern-day 'wild child'*. New York: Academic Press.
- Curtiss, S. 1988: Abnormal language acquisition and the modularity of language. In Newmeyer, F.J. (ed.) *Linguistics: the Cambridge Survey: Volume 2*. Cambridge: Cambridge University Press, 96–116.
- Dale, P.S., Harlaar, N. and Plomin, R. 2012: Nature and nurture in school-based second language achievement. *Language Learning* 62, 28–48.
- Daller, H., Milton, J. and Treffers-Daller, J. (eds) 2007: *Modelling and assessing vocabulary knowledge*. Cambridge: Cambridge University Press.
- Daneman, M. and Carpenter, P. 1980: Individual differences in working memory and reading. *Journal of Verbal Learning and Verbal Behavior* 19, 450–66.
- Daniels, H. 2007: Pedagogy. In Daniels, H., Cole, M. and Wertsch, J.V. (eds) *The Cambridge companion to Vygotsky*. Cambridge: Cambridge University Press, 307–31.
- Daniels, H., Cole, M. and Wertsch, M. (eds) 2007: *The Cambridge companion to Vygotsky*. Cambridge: Cambridge University Press.
- Daniels, H., Edwards, A., Engeström, Y., Gallagher, T. and Ludvigsen, S.R. (eds) 2010: *Activity theory in practice: promoting learning across boundaries and agencies*. Abingdon: Routledge.
- de Guerrero, M.C.M. 1999: Inner speech as mental rehearsal: the case of advanced L2 learners. *Issues in Applied Linguistics* 10, 27–55.
- de Guerrero, M.C.M. 2005: *Inner speech–L2: thinking words in a second language*. New York: Springer.
- de Jong, N. 2005: Can second language grammar be learnt through listening? *Studies in Second Language Acquisition* 27, 205–34.
- de Jong, N. and Perfetti, C.A. 2011: Fluency training in the ESL classroom: an experimental study of fluency development and proceduralization. *Language Learning* 61, 533–68.
- de la Fuente, M.J. 2002: Negotiation and oral acquisition of L2 vocabulary. *Studies in Second Language Acquisition* 24, 81–112.
- de Villiers, J. and Roeper, T. (eds) 2011: *Handbook of generative approaches to language acquisition*. New York: Springer.
- De Villiers, P.A. and De Villiers, J.G. 1973: A cross-sectional study of the development of grammatical morphemes in child speech. *Journal of Psycholinguistic Research* 1, 299–310.

- DeKeyser, R. 1995: Learning second language grammar rules: an experiment with a miniature linguistic system. *Studies in Second Language Acquisition* 17, 379–410.
- DeKeyser, R. 1997: Beyond explicit rule learning: automatizing second language morphosyntax. *Studies in Second Language Acquisition* 19, 195–221.
- DeKeyser, R. 2000: The robustness of critical period effects in second language acquisition. *Studies in Second Language Acquisition* 22, 499–533.
- DeKeyser, R. 2003: Implicit and explicit learning. In Doughty, C. and Long, M. (eds) *The handbook of second language acquisition*. Oxford: Blackwell, 313–48.
- DeKeyser, R. 2005: What makes learning second-language grammar difficult? A review of issues. *Language Learning* 55 (Supplement 1), 1–25.
- DeKeyser, R. 2007a: Skill acquisition theory. In Williams, J. and VanPatten, B. (eds) *Theories in second language acquisition: an introduction*. Mahwah, NJ: Lawrence Erlbaum, 97–113.
- DeKeyser, R. (ed.) 2007b: *Practice in a second language: perspectives from applied linguistics and cognitive psychology*. Cambridge: Cambridge University Press.
- DeKeyser, R. 2012a: Age effects in second language learning. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 442–60.
- DeKeyser, R. 2012b: Interactions between individual differences, treatments, and structures in SLA. *Language Learning* 62 (Supplement 2), 189–200.
- DeKeyser, R., Alfi-Shabtay, I. and Ravid, D. 2010: Cross-linguistic evidence for the nature of age effects in second language acquisition. *Applied Psycholinguistics* 31, 413–38.
- DeKeyser, R., Alfi-Shabtay, I., Ravid, D. and Shi, M. (forthcoming): The role of salience in the acquisition of Hebrew as a second language.
- Dekydtspotter, L. and Renaud, C. 2009: On the contrastive analysis of features in second language acquisition: uninterpretable gender on past participles in English–French processing. *Second Language Research* 25, 255–67.
- Del Río, P. and Álvarez, A. 2007: Inside and outside the Zone of Proximal Development: an ecofunctional reading of Vygotsky. In Daniels, H., Cole, M. and Wertsch, J.V. (eds) *The Cambridge companion to Vygotsky*. Cambridge: Cambridge University Press, 276–306.
- Dewaele, J.-M. 2004: Retention or omission of the *ne* in advanced French interlanguage: the variable effect of extralinguistic factors. *Journal of Sociolinguistics* 8, 433–50.
- Dewaele, J.-M. 2009: Individual differences in second language acquisition. In Ritchie, W.C. and Bhatia, T.K. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 623–47.

SECOND LANGUAGE LEARNING THEORIES

- Dewaele, J.-M. and Regan, V. 2002: Maîtriser la norme sociolinguistique en interlangue française: le cas de l'omission variable de 'ne'. *Journal of French Language Studies* 12, 123–48.
- Di Sciullo, A.-M., Piattelli-Palmarini, M., Wexler, K., Berwick, R., Boeckx, C., Jenkins, L. and Bever, T. 2010: The biological nature of human language. *Biolinguistics* 4, 4–34.
- Dienes, Z. 2008: Subjective measures of unconscious knowledge. *Progress in Brain Research* 168, 49–64.
- Dienes, Z. and Scott, R. 2005: Measuring unconscious knowledge: distinguishing structural knowledge and judgment knowledge. *Psychological Research* 69, 338–51.
- Diependaele, K., Duñabeitia, J.-A., Morris, J. and Keuleers, E. 2011: Fast morphological effects in first and second language word recognition. *Journal of Memory and Language* 64, 344–58.
- Dietrich, R., Klein, W. and Noyau, C. 1995: *The acquisition of temporality in a second language*. Amsterdam: John Benjamins.
- Dimroth, C. 2002: Topics, assertions and additive words: how L2 learners get from information structure to target language syntax. *Linguistics* 40, 891–923.
- Dittmar, N. 1984: Semantic features of pidginised learners of German. In Andersen, R. (ed.) *Second languages; a cross-linguistic perspective*. Rowley, MA: Newbury House, 243–70.
- Dittmar, N. 1993: Proto-semantics and emergent grammars. In Dittmar, N. and Reich, A. (eds) *Modality in language acquisition*. Berlin: Walter de Gruyter, 213–33.
- Dittmar, N. and Reich, A. 1993: *Modality in language acquisition*. Berlin: Walter de Gruyter.
- Domínguez, L. 2013: *Understanding interfaces: second language acquisition and first language attrition of Spanish subject realization and word order variation*. Amsterdam: John Benjamins.
- Domínguez, L., Tracy-Ventura, N., Arche, M., Mitchell, R. and Myles, F. (2013): The role of dynamic contrasts in the L2 acquisition of Spanish past tense morphology. *Bilingualism: Language and Cognition* 15.
- Donato, R. 1994: Collective scaffolding in second language learning. In Lantolf, J.P. and Appel, G. (eds) *Vygotskian approaches to second language research*. Norwood, NJ: Ablex Publishing Corporation, 33–56.
- Döpke, S. (ed.) 2000: *Cross-linguistic structures in simultaneous bilingualism*. Amsterdam: John Benjamins.
- Dörnyei, Z. 1994: Motivation and motivating in the foreign language classroom. *Modern Language Journal* 78, 273–84.

- Dörnyei, Z. 2001: *Motivational strategies in the language classroom*. Cambridge: Cambridge University Press.
- Dörnyei, Z. 2005: *The psychology of the language learner: individual differences in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum.
- Dörnyei, Z. 2009a: Individual differences: interplay of learner characteristics and learning environment. In Ellis, N.C. and Larsen-Freeman, D. (eds) *Language as a complex adaptive system*. Oxford: Wiley Blackwell, 237–55.
- Dörnyei, Z. 2009b: *The psychology of second language acquisition*. Oxford: Oxford University Press.
- Dörnyei, Z. and Skehan, P. 2003: Individual differences in second language learning. In Doughty, C.J. and Long, M.H. (eds) *The handbook of second language acquisition*. Oxford: Blackwell Publishing, 589–630.
- Dörnyei, Z. and Ushioda, E. (eds) 2009: *Motivation, language identity and the L2 self*. Bristol: Multilingual Matters.
- Dörnyei, Z. and Ushioda, E. 2011: *Teaching and researching motivation*. 2nd edition. Harlow: Pearson Education.
- Doughty, C. 2003: Instructed SLA: constraints, compensation, and enhancement. In Doughty, C.J. and Long, M.H. (eds) *The handbook of second language acquisition*. Oxford: Blackwell Publishing, 256–310.
- Doughty, C. and Varela, E. 1998: Communicative focus on form. In Doughty, C. and Williams, J. (eds) *Focus on form in classroom second language acquisition*. Cambridge: Cambridge University Press, 114–38.
- Doughty, C. and Williams, J. (eds) 1998: *Focus on form in classroom second language acquisition*. Cambridge: Cambridge University Press.
- Duff, P.A. 1995: An ethnography of communication in immersion classrooms in Hungary. *TESOL Quarterly* 29, 505–37.
- Duff, P.A. 1996: Different languages, different practices: socialization of discourse competence in dual-language school classrooms in Hungary. In Bailey, K. and Nunan, D. (eds) *Voices from the language classroom*. Cambridge: Cambridge University Press, 407–33.
- Duff, P.A. 2007: Second language socialization as sociocultural theory: insights and issues. *Language Teaching* 40, 309–19.
- Duff, P.A. 2010: Language socialization. In Hornberger, N.H. (ed.) *Sociolinguistics and language education*. Clevedon: Multilingual Matters, 427–54.
- Duff, P.A. 2012: Identity, agency and second language acquisition. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 410–26.
- Duff, P.A. and Hornberger, N.H. (eds) 2008: *Encyclopedia of language and education*. 2nd edition. Vol. 8, *Language socialization*. New York: Springer.

SECOND LANGUAGE LEARNING THEORIES

- Duff, P.A. and Talmy, S. 2011: Language socialization approaches to second language acquisition: social cultural and linguistic development in additional languages. In Atkinson, D. (ed.) *Alternative approaches to second language acquisition*. Abingdon: Routledge, 95–116.
- Dulay, H. and Burt, M. 1973: Should we teach children syntax? *Language Learning* 24, 245–58.
- Dulay, H. and Burt, M. 1974: Natural sequences in child second language acquisition. *Language Learning* 24, 37–53.
- Dulay, H. and Burt, M. 1975: Creative construction in second language learning and teaching. In Burt, M. and Dulay, H. (eds) *New directions in second language learning, teaching, and bilingual education*. Washington, DC: TESOL, 21–32.
- Dulay, H., Burt, M. and Krashen, S. 1982: *Language two*. New York: Oxford University Press.
- Dunn, W. and Lantolf, J.P. 1998: Vygotsky's zone of proximal development and Krashen's 1 + 1: incommensurable constructs; incommensurable theories. *Language Learning* 48, 411–42.
- Duranti, A., Ochs, E. and Schieffelin, B. (eds) 2011: *Handbook of language socialization*. Chichester: Wiley-Blackwell.
- Dussias, P.E. and Piñar, P. 2010: Effects of reading span and plausibility in the reanalysis of wh-gaps by Chinese-English L2 speakers. *Second Language Research* 26, 443–72.
- Eckert, P. and McConnell-Ginet, S. 1992: Think practically and look locally: language and gender as community-based practice. *Annual Review of Anthropology* 21, 461–90.
- Egi, T. 2007a: Recasts, learner's interpretations, and L2 development. In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 249–68.
- Egi, T. 2007b: Interpreting recasts as linguistic evidence: the roles of linguistic target, length, and degree of change. *Studies in Second Language Acquisition* 29, 511–37.
- Elgort, I. and Nation, P. 2010: Vocabulary learning in a second language: familiar answers to new questions. In Seedhouse, P., Walsh, S. and Jenks, C. (eds) *Conceptualising learning in applied linguistics*. Basingstoke: Palgrave Macmillan, 89–104.
- Ellis, N.C. 2002: Frequency effects in language processing: a review with implications for theories of implicit and explicit language acquisition. *Studies in Second Language Acquisition* 24, 143–88.
- Ellis, N.C. 2003: Constructions, chunking and connectionism. In Doughty, C.J. and Long, M.H. (eds) *The handbook of second language acquisition*. Oxford: Blackwell Publishing, 63–103.

- Ellis, N.C. 2005: At the interface: dynamic interactions of explicit and implicit language knowledge. *Studies in Second Language Acquisition* 27, 305–52.
- Ellis, N.C. 2006a: Cognitive perspectives on SLA: the Associative Cognitive CREED. *AILA Review* 19, 100–21.
- Ellis, N.C. 2006b: Language acquisition as rational contingency learning. *Applied Linguistics* 27, 1–24.
- Ellis, N.C. 2006c: Selective attention and transfer phenomena in L2 acquisition: contingency, cue competition, salience, interference, overshadowing, blocking, and perceptual learning. *Applied Linguistics* 27, 164–94.
- Ellis, N.C. 2007: The Associative-Cognitive CREED. In VanPatten, B. and Williams, J. (eds) *Theories in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum, 77–95.
- Ellis, N.C. 2008a: Temporal cognition and temporal language the first and second times around: commentary on McCormack and Hoerl. *Language Learning* 58, 115–21.
- Ellis, N.C. 2008b: Usage-based and form-focused language acquisition. In Robinson, P. and Ellis, N.C. (eds) *Handbook of cognitive linguistics and second language acquisition*. Abingdon: Routledge, 3–24.
- Ellis, N.C. 2009: The psycholinguistics of the interaction approach. In Mackey, A. and Polio, C. (eds) *Multiple perspectives on interaction*. New York and Abingdon: Routledge, 11–40.
- Ellis, N.C. and Cadierno, T.E. 2009: Constructing a second language. Special section of *Annual Review of Cognitive Linguistics* 7.
- Ellis, N.C. and Ferreira-Junior, F. 2009: Construction learning as a function of frequency, frequency distribution, and function. *Modern Language Journal* 93, 370–85.
- Ellis, N.C. and Larsen-Freeman, D. 2009: Constructing a second language: analyses and computational simulations of the emergence of linguistic constructions from usage. *Language Learning* 59 (Supplement 1), 90–125.
- Ellis, N.C. and Sagarra, N. 2010: The bounds of adult language acquisition: blocking and learned attention. *Studies in Second Language Acquisition* 32, 553–80.
- Ellis, N.C. and Sagarra, N. 2011: Learned attention in adult language acquisition: a replication and generalization study and meta-analysis. *Studies in Second Language Acquisition* 33, 589–624.
- Ellis, N.C. and Schmidt, R., 1997: Morphology and longer distance dependencies: laboratory research illuminating the A in SLA. *Studies in Second Language Acquisition* 19, 145–71.
- Ellis, R. 1985a: Sources of variability in interlanguage. *Applied Linguistics* 6, 118–31.

SECOND LANGUAGE LEARNING THEORIES

- Ellis, R. 1985b: *Understanding second language acquisition*. Oxford: Oxford University Press.
- Ellis, R. 1999: Item versus system learning: explaining free variation. *Applied Linguistics* 20, 460–80.
- Ellis, R. 2002: Does form-focused instruction affect the acquisition of implicit knowledge? *Studies in Second Language Acquisition* 24, 223–36.
- Ellis, R. 2004: The definition and measurement of L2 explicit knowledge. *Language Learning* 54, 227–75.
- Ellis, R. 2005a: Instructed language learning and task-based teaching. In Hinkel, E. (ed.) *Handbook of research in second language teaching and learning*. Mahwah, NJ: Lawrence Erlbaum, 713–28.
- Ellis, R. 2005b: Measuring implicit and explicit knowledge of a second language: a psychometric study. *Studies in Second Language Acquisition* 27, 141–72.
- Ellis, R. 2005c: Planning and task-based performance: theory and research. In Ellis, R. (ed.) *Planning and task performance in a second language*. Amsterdam: John Benjamins, 3–36.
- Ellis, R. 2006: Modelling learning difficulty and second language proficiency: the differential contributions of implicit and explicit knowledge. *Applied Linguistics* 27, 431–63.
- Ellis, R. 2007: The differential effects of corrective feedback on two grammatical structures. In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 339–60.
- Ellis, R. 2008: *The study of second language acquisition*. 2nd edition. Oxford: Oxford University Press.
- Ellis, R. and He, X. 1999: The roles of modified input and output in the incidental acquisition of word meanings. *Studies in Second Language Acquisition* 21, 285–301.
- Ellis, R. and Loewen, S. 2007: Confirming the operational definitions of explicit and implicit knowledge in Ellis (2005): responding to Isemonger. *Studies in Second Language Acquisition* 29, 119–26.
- Ellis, R. and Sheen, Y. 2006: Re-examining the role of recasts in second language acquisition. *Studies in Second Language Acquisition* 28, 575–600.
- Ellis, R., Loewen, S., Elder, C., Erlam, R., Philp, J. and Reinders, H. 2009: *Implicit and explicit knowledge in second language learning testing and teaching*. Bristol: Multilingual Matters.
- Elman, J., Bates, E., Johnson, M., Karmiloff-Smith, A., Parisi, D. and Plunkett, K. 1996: *Rethinking innateness: a connectionist perspective on development*. Cambridge, MA: MIT Press.
- Engeström, Y. 1999: Activity theory and individual and social transformation. In Engeström, Y., Miettinen, R. and Punamäki, R.-L. (eds) *Perspectives on activity theory*. Cambridge: Cambridge University Press, 19–38.

- Engeström, Y. 2007: Putting Vygotsky to work. In Daniels, H., Cole, M. and Wertsch, J.V. (eds) *The Cambridge companion to Vygotsky*. Cambridge: Cambridge University Press, 363–82.
- Engeström, Y., Miettinen, R. and Punamäki, R.-L. (eds) 1999: *Perspectives on activity theory*. Cambridge: Cambridge University Press.
- Erlam, R. 2006: Elicited imitation as a measure of L2 implicit knowledge: an empirical validation study. *Applied Linguistics* 27, 464–91.
- Eubank, L. 1996: Negation in early German–English interlanguage: more Valueless Features in the L2 initial state. *Second Language Research* 12, 73–106.
- Eubank, L. and Gregg, K. 1999: Critical periods and (second) language acquisition: divide et impera. In Birdsong, D. (ed.) *Second language acquisition and the Critical Period Hypothesis*. Mahwah, NJ: Lawrence Erlbaum, 65–99.
- Evans, V. and Green, M. 2006: *Cognitive linguistics: an introduction*. Edinburgh: Edinburgh University Press.
- Eysenck, M. 2012: *Fundamentals of cognition*. Hove: Psychology Press.
- Feldman, L., Kostić, A., Basnight-Brown, D., Filipović Durdević, D. and Pastizzo, M. 2010: Morphological facilitation for regular and irregular verb formations in native and non-native speakers: little evidence for two distinct mechanisms. *Bilingualism: Language and Cognition* 13, 119–35
- Felix, S. 1978: Some differences between first and second language acquisition. In Waterson, N. and Snow, C. (eds) *The development of communication*. New York: Wiley and Sons, 469–79.
- Félix-Brasdefer, J.C. 2007: Pragmatic development in the Spanish as a FL classroom: a cross-sectional study of learner requests. *Intercultural Pragmatics* 4, 253–86.
- Felser, C. and Roberts, L. 2007: Processing wh-dependencies in English as a second language: a cross-modal priming study. *Second Language Research* 23, 9–36.
- Felser, C., Roberts, R., Marinis, T. and Gross, R. 2003: The processing of ambiguous sentences by first and second language learners of English. *Applied Psycholinguistics* 24, 453–89.
- Firth, A. 1996: The discursive accomplishment of normality: on ‘lingua franca’ English and conversation analysis. *Journal of Pragmatics* 26, 237–59.
- Firth, A. and Wagner, J. 2007: Second/foreign language learning as a social accomplishment: elaborations on a reconceptualized SLA. *Modern Language Journal* 91, 800–19.
- Flynn, S. 1983: *A study of the effects of principal branching direction in second language acquisition: the generalization of a parameter of Universal Grammar from first to second language acquisition*. Cornell University, Ithaca, New York: doctoral dissertation.

SECOND LANGUAGE LEARNING THEORIES

- Flynn, S. 1984: A universal in L2 acquisition based on a PBD typology. In Eckman, F., Bell, L. and Nelson, D. (eds) *Universals of second language acquisition*. Rowley, MA: Newbury House, 75–87.
- Flynn, S. 1987: *A parameter-setting model of L2 acquisition: experimental studies in anaphora*. Dordrecht: Reidel.
- Flynn, S. 1996: A parameter-setting approach to second language acquisition. In Ritchie, W. and Bhatia, T. (eds) *Handbook of second language acquisition*. San Diego: Academic Press, 121–58.
- Fodor, J.A. 1983: *The modularity of mind*. Cambridge, MA: MIT Press.
- Foley, W.A. 1997: *Anthropological linguistics: an introduction*. Oxford: Blackwell.
- Foster-Cohen, S. (ed.) 2009: *Language acquisition*. Basingstoke: Palgrave Macmillan.
- Frawley, W. and Lantolf, J. 1985: Second language discourse: a Vygotskian perspective. *Applied Linguistics* 6, 19–44.
- Freleng, F. (dir.) 1950: *Canary row*. New York: Time Warners.
- French, R.M. and Cleeremans, A. (eds) 2002: *Implicit learning and consciousness*. Hove: Psychology Press.
- Freudenthal, D., Pine, J.M., Aguado-Oreana, J. and Gobet, F. 2007: Modeling the developmental patterning of finiteness marking in English, Dutch, German, and Spanish using MOSAIC. *Cognitive Science* 31, 311–41.
- Freudenthal, D., Pine, J.M. and Gobet, F. 2006: Modeling the development of children's use of optional infinitives in Dutch and English. *Cognitive Science* 30, 277–310.
- Fromkin, V., Rodman, R. and Hyams, N. 2010: *An introduction to language: international edition*. Boston, MA: Wadsworth.
- Fukui, N. and Speas, M. 1986: Specifiers and projection. *MIT Working Papers in Linguistics* 8, 128–72.
- Gardner, R.C. 1985: *Social psychology and second language learning: the role of attitudes and motivation*. London: Edward Arnold.
- Gardner, R.C. 2010: *Motivation and second language acquisition: the socio-educational model*. New York: Peter Lang.
- Gardner, R.C. and Lambert, W.E. 1972: *Attitudes and motivation in second language learning*. London: Newbury House Publishers.
- Gardner, R.C. and MacIntyre, P.D. 1993: A student's contributions to second language learning. Part II: affective variables. *Language Teaching* 26, 1–11.
- Gass, S.M. 1988: Integrating research areas: a framework for second language studies. *Applied Linguistics* 9, 198–217.
- Gass, S.M. 1996: Second language acquisition and linguistic theory: the role of language transfer. In Ritchie, W.C. and Bhatia, T.K. (eds) *Handbook of second language acquisition*. San Diego: Academic Press, 317–45.

- Gass, S.M. 1997: *Input, interaction, and the second language learner*. Mahwah, NJ: Erlbaum.
- Gass, S.M. 2003: Input and interaction. In Doughty, C.J. and Long, M.H. (eds) *The handbook of second language acquisition*. Oxford: Blackwell Publishing, 224–55.
- Gass, S.M. 2009: A historical survey of SLA research. In Ritchie, W.C. and Bhatia, T.K. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 3–28.
- Gass, S.M. and Lee, J. 2011: Working memory capacity, inhibitory control, and proficiency in a second language. In Schmid, M. and Lowie, W. (eds) *Modelling bilingualism: from structure to chaos*. Amsterdam: John Benjamins, 59–84.
- Gass, S.M. and Mackey, A. 2000: *Stimulated recall methodology in second language research*. Mahwah, NJ: Lawrence Erlbaum.
- Gass, S.M. and Mackey, A. 2007: Input, interaction and output in second language acquisition. In VanPatten, B. and Williams, J. (eds) *Theories in second language acquisition: an introduction*. Mahwah, NJ: Lawrence Erlbaum, 175–200.
- Gass, S.M. and Mackey, A. 2012: *The Routledge handbook of second language acquisition*. Abingdon: Routledge.
- Gass, S.M. and Selinker, L. 2008: *Second language acquisition: an introductory course*. 3rd edition. Abingdon: Routledge.
- Gass, S.M. and Varonis, E.M. 1994: Input, interaction and second language production. *Studies in Second Language Acquisition* 16, 283–302.
- Gathercole, S.E. 2006: Nonword repetition and word learning: the nature of the relationship. *Applied Psycholinguistics* 27, 513–43.
- Gathercole, S.E. 2007: Working memory and language. In Gaskell, G. (ed.) *Oxford handbook of psycholinguistics*. Oxford: Oxford University Press, 757–70.
- Gathercole, S.E., Willis, C., Emslie, H. and Baddeley, A.D. 1992: Phonological memory and vocabulary development during the early school years: a longitudinal study. *Developmental Psychology* 28, 887–98.
- Gebauer, G.F. and Mackintosh, N.J. 2007: Psychometric intelligence dissociates implicit and explicit learning. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 33, 34–54.
- Gerken, L., Wilson, R. and Lewis, W. 2005: Infants can use distributional cues to form syntactic categories. *Journal of Child Language* 32, 249–68.
- Giacalone Ramat, A. 1997: Progressive periphrases, markedness and second-language data. In Eliasson, S. and Jahr, E.H. (eds) *Language and its ecology*. Berlin: Mouton, 261–85.

- Giacalone Ramat, A. 2002: How do learners acquire the classical three categories of temporality? In Salaberry, M.R. and Shirai, Y. (eds) *The L2 acquisition of tense-aspect morphology*. Amsterdam: John Benjamins, 221–48.
- Givón, T. 1979: From discourse to syntax: grammar as a processing strategy. In Givón, T. (ed.) *Syntax and semantics 12: discourse and syntax*. New York: Academic Press, 81–112.
- Givón, T. 1985: Function, structure and language acquisition. In Slobin, D. (ed.) *The cross-linguistic study of language acquisition*. Hillsdale, NJ: Lawrence Erlbaum, 1005–27.
- Goldberg, A.E. 2006: *Constructions at work: the nature of generalization in language*. Oxford: Oxford University Press.
- Goldberg, A.E. 2009: The nature of generalization in language. *Cognitive Linguistics* 20, 93–127.
- Goldberg, A.E. 2011: Corpus evidence of the viability of statistical preemption. *Cognitive Linguistics* 22, 131–53.
- Goldschneider, J. and DeKeyser, R. 2001: Explaining the ‘natural order of L2 morpheme acquisition’ in English: a meta-analysis of multiple determinants. *Language Learning* 55 (Supplement 1), 26–77.
- Goo, J. 2010: Working memory and reactivity. *Language Learning* 60, 712–52.
- Gopnik, M. and Crago, M.B. 1991: Familial aggregation of a developmental language disorder. *Cognition* 39, 1–50.
- Gor, K. 2010: Introduction. Beyond the obvious: do second language learners process inflectional morphology? *Language Learning* 60, 1–20.
- Graddol, D. 2006: *English next*. London: British Council.
- Granger, S. 2012: How to use foreign and second language learner corpora. In Mackey, A. and Gass, S.M. (eds) *Research methods in second language acquisition: a practical guide*. Chichester: Wiley-Blackwell, 7–29.
- Gregg, K. 1984: Krashen’s monitor and Occam’s razor. *Applied Linguistics* 5, 79–100.
- Gregg, K. 2003a: SLA theory: construction and assessment. In Doughty, C.J. and Long, M.H. (eds) *The handbook of second language acquisition*. Oxford: Blackwell Publishing, 831–65.
- Gregg, K. 2003b: The state of emergentism in second language acquisition. *Second Language Research* 19, 95–128.
- Gregg, K. 2010: Shallow draughts: Larsen-Freeman and Cameron on complexity. *Second Language Research* 26, 549–60.
- Gries, S.T. and Wulff, S. 2005: Do foreign language learners also have constructions? Evidence from priming, sorting, and corpora. *Annual Review of Cognitive Linguistics* 3, 182–200.
- Grondin, N. and White, L. 1996: Functional categories in child L2 acquisition of French. *Language Acquisition* 5, 1–34.

- Grüter, T., Lew-Williams, C. and Fernald, A. 2012: Grammatical gender in L2: a production or a real-time processing problem? *Second Language Research* 28, 191–215.
- Guasti, M. 2004: *Language acquisition: the growth of grammar*. Cambridge, MA: MIT Press.
- Guasti, M. 2009: Universal Grammar approaches to language acquisition. In Foster-Cohen, S. (ed.) *Language acquisition*. Basingstoke: Palgrave Macmillan, 87–108.
- Gullberg, M. 2011: Thinking, speaking and gesturing about motion in more than one language. In Pavlenko, A. (ed.) *Thinking and speaking in two languages*. Bristol: Multilingual Matters, 143–69.
- Gullberg, M. and de Bot, K. (eds) 2010: *Gestures in language development*. Amsterdam: John Benjamins.
- Gullberg, M., de Bot, K. and Volterra, V. 2010: Gestures and some key issues in the study of language development. In Gullberg, M. and de Bot, K. (eds) *Gestures in language development*. Amsterdam: John Benjamins, 3–34.
- Haegeman, L. 1996: Root infinitives, clitics and truncated structures. In Clahsen, H. (ed.) *Generative perspectives on language acquisition*. Amsterdam: John Benjamins, 271–307.
- Hall, J.K. 1995: (Re)creating our worlds with words: a sociohistorical perspective of face-to-face interaction. *Applied Linguistics* 16, 206–32.
- Halliday, M.A.K. and Matthiessen, C. 2004: *An introduction to functional grammar*. 3rd edition. London: Arnold.
- Hama, M. and Leow, R. 2010: Learning without awareness: extending Williams (2005). *Studies in Second Language Acquisition* 32, 465–91.
- Hamada, M. and Koda, K. 2011: The role of the phonological loop in English word learning: a comparison of Chinese ESL learners and native speakers. *Journal of Psycholinguistic Research* 40, 75–92.
- Hamann, C., Rizzi, L. and Frauenfelder, U. 1996: On the acquisition of subject and object clitics in French. In Clahsen, H. (ed.) *Generative perspectives on language acquisition*. Amsterdam: John Benjamins, 309–34.
- Han, Y. and Ellis, R. 1998: Implicit knowledge, explicit knowledge and general language proficiency. *Language Teaching Research* 2, 1–23.
- Han, Z. and Selinker, L. 2005: Fossilization in L2 learners. In Hinkel, E. (ed.) *Handbook of research in second language teaching and learning*. Mahwah, NJ: Lawrence Erlbaum, 455–70.
- Hansen, J.G. 2006. *Acquiring a non-native phonology: linguistic constraints and social barriers*. New York: Continuum.
- Hansen, J.G. and Liu, J. 1997: Social identity and language: theoretical and methodological issues. *TESOL Quarterly* 31, 567–76.

SECOND LANGUAGE LEARNING THEORIES

- Harris, T. and Wexler, K. 1996: The optional-infinitive stage in child English: evidence from negation. In Clahsen, H. (ed.) *Generative perspectives on language acquisition*. Amsterdam: John Benjamins, 1–42.
- Hatch, E.M. 1978: Discourse analysis and second language acquisition. In Hatch, E.M. (ed.) *Second language acquisition: a book of readings*. Rowley, MA: Newbury House, 401–35.
- Havik, E., Roberts, L., Van Hout, R., Schreuder, R. and Haverkort, M. 2009: Processing subject–object ambiguities in L2 Dutch: a self-paced reading study with German L2 learners of Dutch. *Language Learning* 59, 73–112.
- Hawkins, J.A. 2004: *Efficiency and complexity in grammars*. Oxford: Oxford University Press.
- Hawkins, R. 2001: *Second language syntax: a generative introduction*. Oxford: Blackwell.
- Hawkins, R. 2004: The contribution of the theory of Universal Grammar to our understanding of the acquisition of French as a second language. *Journal of French Language Studies* 14, 233–55.
- Hawkins, R. 2008a: Commentary: can innate linguistic knowledge be eliminated from theories of SLA? *Lingua* 118, 613–19.
- Hawkins, R. 2008b: The nativist perspective on second language acquisition. *Lingua* 118, 465–77.
- Hawkins, R. (ed.) 2008c: Current emergentist and nativist perspectives on second language acquisition. Special Issue: *Lingua* 118.
- Hawkins, R. 2009: Second language acquisition of morphosyntax. In Ritchie, W. and Bhatia, T. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 211–36.
- Hawkins, R. and Chan, C. 1997: The partial availability of Universal Grammar in second language acquisition: the 'failed functional features hypothesis'. *Second Language Research* 13, 187–226.
- Hawkins, R. and Franceschina, F. 2004: Explaining the acquisition and non-acquisition of determiner-noun gender concord in French and Spanish. In Prévost, P. and Paradis, J. (eds) *The acquisition of French in different contexts: focus on functional categories*. Amsterdam: John Benjamins, 175–205.
- Hawkins, R. and Hattori, H. 2006: Interpretation of English multiple wh-questions by Japanese speakers: a missing uninterpretable feature account. *Second Language Research* 22, 269–301.
- Hawkins, R. and Liszka, S. 2003: Locating the source of defective past tense marking in advanced L2 English speakers. In van Hout, R., Hulk, A., Kuiken, F. and Towell, R. (eds) *The lexicon–syntax interface in second language acquisition*. Amsterdam: John Benjamins, 21–44.

- Haznedar, B. 2001: The acquisition of the IP system in child L2 English. *Studies in Second Language Acquisition* 23, 1–39.
- Heath, S.B. 1983: *Ways with words*. Cambridge: Cambridge University Press.
- Heath, S.B. 1986: What no bedtime story means: narrative skills at home and school. In Schieffelin, B. and Ochs, E. (eds) *Language socialization across cultures*. Cambridge: Cambridge University Press, 97–124.
- Heller, M. 2006: *Linguistic minorities and modernity*. 2nd edition. Harlow: Longman.
- Hernández-Chávez, E. 1972: Early code separation in the second language speech of Spanish-speaking children. Paper presented at the Stanford Child Language Research Forum, Stanford: Stanford University.
- Herschensohn, J. 2000: *The second time around: minimalism and second language acquisition*. Amsterdam: John Benjamins.
- Herschensohn, J. 2007: *Language development and age*. Cambridge: Cambridge University Press.
- Herschensohn, J. and Young-Scholten, M. (eds) 2013: *The Cambridge handbook of second language acquisition*. Cambridge: Cambridge University Press.
- Holmes, J. 2008: *An introduction to sociolinguistics*. 3rd edition. Harlow: Pearson Education.
- Holmes, J., Gathercole, S.E. and Dunning, D.L. 2009: Adaptive training leads to sustained enhancement of poor working memory in children. *Developmental Science* 12, F9–F15.
- Horwitz, E.K., Horwitz, M.B. and Cope, J. 1986: Foreign language classroom anxiety. *Modern Language Journal* 70, 125–32.
- Houck, N., Robertson, J. and Krashen, S. 1978: On the domain of the conscious grammar: morpheme orders for corrected and uncorrected ESL student transcripts. *TESOL Quarterly* 12, 335–9.
- Howard, K.M. 2008: Language socialization and language shift among school-aged children. In Duff, P.A. and Hornberger, N.H. (eds) *Encyclopedia of language and education*. 2nd edition. Vol. 8, *Language socialization*. New York: Springer, 187–200.
- Howatt, A.P.R. 1988: From structural to communicative. *Annual Review of Applied Linguistics* 8, 14–29.
- Howatt, A.P.R. 2004: *A history of English language teaching*. 2nd edition. Oxford: Oxford University Press.
- Huebner, T. 1983: *The acquisition of English*. Ann Arbor: Karoma.
- Hufeisen, B. and Jessner, U. 2009: Learning and teaching multiple languages. In Knapp, K. and Seidlhofer, B. (eds) *Handbook of foreign language communication and learning*. Berlin: Walter de Gruyter, 109–38.

SECOND LANGUAGE LEARNING THEORIES

- Hulstijn, J. 2005: Theoretical and empirical issues in the study of implicit and explicit second language learning. *Studies in Second Language Acquisition* 27, 129–40.
- Hulstijn, J. and Hulstijn, W. 1984: Grammatical errors as a function of processing constraints and explicit knowledge. *Language Learning* 34, 23–43.
- Hymes, D. 1972: Models of the interaction of language and social life. In Gumperz, J. and Hymes, D. (eds) *Directions in sociolinguistics: the ethnography of communication*. New York: Holt, Rinehart and Winston, 35–71.
- Indefrey, P. 2006: It is time to work toward explicit processing models for native and second language speakers. *Applied Psycholinguistics* 27, 66–9.
- Ionin, T. 2012: Formal theory-based methodologies. In Mackey, A. and Gass, S.M. (eds) *Research methods in second language acquisition: a practical guide*. Oxford: Blackwell Publishing, 30–52.
- Ionin, T., Zúñizarreta, M.L. and Maldonado, S.B. 2008: Sources of linguistic knowledge in the second language acquisition of English articles. *Lingua* 118, 554–76.
- Isabelli, C.A. 2008: First noun principle or L1 transfer principle in SLA? *Hispania* 91, 465–78.
- Izumi, S. 2002: Output, input enhancement, and the noticing hypothesis. *Studies in Second Language Acquisition* 24, 541–77.
- Izumi, S. 2003: Comprehension and production processes in second language learning: in search of the psycholinguistic rationale of the output hypothesis. *Applied Linguistics* 24, 168–96.
- Jackson, C.N. 2007: The use and non-use of semantic information, word order, and case markings during comprehension by L2 learners of German. *Modern Language Journal* 91, 418–32.
- Jackson, C.N. 2008: Proficiency level and the interaction of lexical and morphosyntactic information during L2 sentence processing. *Language Learning* 58, 875–909.
- Jenkins, J. 2006: Points of view and blind spots: ELF and SLA. *International Journal of Applied Linguistics* 16, 137–62.
- Jenkins, J. 2007: *English as a lingua franca: attitudes and identity*. Oxford: Oxford University Press.
- Jenkins, L. 2000: *Biolinguistics*. Cambridge: Cambridge University Press.
- Jeon, K.S. 2007: Interaction-driven L2 learning: characterising linguistic development. In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 379–407.
- Jiang, N. 2004: Morphological insensitivity in second language processing. *Applied Psycholinguistics* 25, 603–34.

- Jiang, N. 2007: Selective integration of linguistic knowledge in adult second language learning. *Language Learning* 57, 1–33.
- Jiang, N., Novokshanova, E., Masuda, K. and Wang, X. 2011: Morphological congruency and the acquisition of L2 morphemes. *Language Learning* 61, 940–67.
- Johnson, J. and Newport, E. 1989: Critical period effects in second language learning: the influence of maturational state on the acquisition of ESL. *Cognitive Psychology* 21, 60–99.
- Johnson, K. 1996: *Language teaching and skill learning*. Oxford: Blackwell.
- John-Steiner, V.P. 2007: Vygotsky on thinking and speaking. In Daniels, H., Cole, M. and Wertsch, J.V. (eds) *The Cambridge companion to Vygotsky*. Cambridge: Cambridge University Press, 136–52.
- Jones, G., Gobet, F., Pine, J.M. 2007: Linking working memory and long-term memory: a computational model of the learning of new words. *Developmental Science* 10, 853–73.
- Jordan, G. 2004: *Theory construction in second language acquisition*. Amsterdam: John Benjamins.
- Juffs, A. 2009: Second language acquisition of the lexicon. In Ritchie, W.C. and Bhatia, T.K. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 181–210.
- Juffs, A. and Harrington, M. 2011: Aspects of working memory in L2 learning. *Language Teaching* 44, 137–66.
- Just, M. and Carpenter, P. 1992: A capacity theory of comprehension: individual differences in working memory. *Psychological Review* 99, 122–49.
- Kanagy, R. 1999: Interactional routines as a mechanism for L2 acquisition and socialisation in an immersion context. *Journal of Pragmatics* 31, 1467–92.
- Kaplan, R. and Bresnan, J. 1982: Lexical-functional grammar: a formal system for grammatical representation. In Bresnan J. (ed.) *The mental representation of grammatical relations*. Cambridge, MA: MIT Press, 173–281.
- Kasper, G. 2006: Beyond repair: conversation analysis as an approach to SLA. *AILA Review* 19: 83–99.
- Kasper, G. 2009: L2 pragmatic development. In Ritchie, W.C. and Bhatia, T.K. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 259–95.
- Kasper, G. and Rose, K.R. 2002: *Pragmatic development in a second language*. Oxford: Blackwell.
- Kasper, G. and Wagner, J. 2011: A conversation-analytic approach to second language acquisition. In Atkinson, D. (ed.) *Alternative approaches to second language acquisition*. Abingdon: Routledge, 117–42.
- Keck, C.M., Iberri-Shea, G., Tracy-Ventura, N. and Wa-Mbaleka, S. 2006: Investigating the empirical link between task-based interaction and acquisition: a meta-

SECOND LANGUAGE LEARNING THEORIES

- analysis. In Norris, J.M. and Ortega, L. (eds) *Synthesizing research on language learning and teaching*. Amsterdam: John Benjamins, 91–132.
- Keenan, E. and Comrie, B. 1977: Noun phrase accessibility and Universal Grammar. *Linguistic Inquiry* 8, 63–99.
- Kita, S. and Özyürek, A. 2003: What does cross-linguistic variation in semantic coordination of speech and gesture reveal? Evidence for an interface representation of spatial thinking and speaking. *Journal of Memory and Language* 48, 16–32.
- Klein, W. 1995: The acquisition of English. In Dietrich, R., Klein, W. and Noyau, C. (eds) *The acquisition of temporality in a second language*. Amsterdam: John Benjamins, 31–70.
- Klein, W. and Dimroth, C. 2009: Untutored second language acquisition. In Ritchie, W.C. and Bhatia, T.K. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 503–22.
- Klein, W., Dietrich, R. and Noyau, C. 1993: The acquisition of temporality. In Perdue, C. (ed.) *Adult language acquisition: cross-linguistic perspectives: Volume 2, The results*. Cambridge: Cambridge University Press, 73–118.
- Klein, W. and Perdue, C. 1992: *Utterance structure: developing grammars again*. Amsterdam: John Benjamins.
- Klien, W. and Perdue, C. 1997: The Basic Variety (or: couldn't natural languages be much simpler?). *Second Language Research* 13, 301–47.
- Klima, E. and Bellugi, U. 1966: Syntactic regularities in the speech of children. In Lyons, J. and Wales, R. (eds) *Psycholinguistic papers*. Edinburgh: Edinburgh University Press, 183–219.
- Klingberg, T. 2010: Training and plasticity of working memory. *Trends in Cognitive Sciences* 14, 317–24.
- Klingner, J.K. and Vaughn, S. 2000: The helping behaviors of fifth graders while using collaborative strategic reading during ESL content classes. *TESOL Quarterly* 34, 69–98.
- Kozulin, A. and Gindis, B. 2007: Sociocultural theory and education of children with special needs: from defectology to remedial pedagogy. In Daniels, H., Cole, M. and Wertsch, J.V. (eds) *The Cambridge companion to Vygotsky*. Cambridge: Cambridge University Press, 332–62.
- Kramsch, C. and Thorne, S.L. 2002: Foreign language learning as global communicative practice. In Cameron, D. and Block, D. (eds) *Globalization and language teaching*. Abingdon: Routledge, 83–100.
- Krashen, S. 1977a: The monitor model of adult second language performance. In Burt, M., Dulay, H. and Finocchiaro, M. (eds) *Viewpoints on English as a second language*. New York: Regents, 152–61.

- Krashen, S. 1977b: Some issues relating to the monitor model. In Brown, H., Yorio, C. and Crymes, R. (eds) *Teaching and learning English as a second language: some trends in research and practice*. Washington, DC: TESOL, 144–8.
- Krashen, S. 1978: Individual variation in the use of the monitor. In Ritchie, W. (ed.) *Second language acquisition research: issues and implications*. New York: Academic Press, 175–83.
- Krashen, S. 1981: *Second language acquisition and second language learning*. Oxford: Pergamon.
- Krashen, S. 1982: *Principles and practice in second language acquisition*. Oxford: Pergamon.
- Krashen, S. 1983: Newmark's ignorance hypothesis and current second language acquisition theory. In Gass, S.M. and Selinker, L. (eds) *Language transfer in language learning*. Rowley, MA: Newbury House, 135–53.
- Krashen, S. 1985: *The input hypothesis: issues and implications*. Harlow: Longman.
- Krashen, S. 2003: *Explorations in language acquisition and use: the Taipei lectures*. Portsmouth, NH: Heinemann.
- Krashen, S. and Scarcella, R. 1978: On routines and patterns in second language acquisition and performance. *Language Learning* 28, 283–300.
- Krashen, S. and Terrell, T. 1983: *The natural approach: language acquisition in the classroom*. Hayward, CA: Alemany Press.
- Labov, W. 1972: *Sociolinguistic patterns*. Philadelphia: University of Pennsylvania Press.
- Lado, R. 1964: *Language teaching: a scientific approach*. New York: McGraw Hill.
- Lai, C., Fisher, S., Hurst, J., Vargha-Khadem, F. and Faraneh, M. 2001: A fork-head-domain gene is mutated in a severe speech and language disorder. *Nature* 413, 519–23.
- Lakoff, G. 1987: *Women, fire and dangerous things: what categories reveal about the mind*. Chicago: University of Chicago Press.
- Lam, W.S.E. 2004: Second language socialization in a bilingual chat room: global and local considerations. *Language Learning and Technology* 8, 44–65.
- Lam, W.S.E. 2008: Language socialization in online communities. In Duff, P.A. and Hornberger, N.H. (eds) *Encyclopedia of language and education*. 2nd edition, Vol. 8, *Language socialization*. New York: Springer, 301–12.
- Lamb, M. 2004: Integrative motivation in a globalizing world. *System* 32, 3–19.
- Langacker, R.W. 1987: *Foundations of cognitive grammar*. Stanford: Stanford University Press.
- Langacker, R.W. 2008: Cognitive grammar as a basis for language instruction. In Ellis, N.C. and Robinson, P. (eds) *Handbook of cognitive linguistics and second language instruction*. Abingdon: Routledge, 66–88.

SECOND LANGUAGE LEARNING THEORIES

- Lange, D. 1979: Negation in natürlichen Englisch–Deutschen Zweitsprachenerwerb: eine Fallstudie. *International Review of Applied Linguistics* 17, 331–48.
- Lantolf, J.P. (ed.) 1994: Sociocultural theory and second language learning: Special issue, *Modern Language Journal* 78, 4.
- Lantolf, J.P. 1996: SLA theory building: 'Letting all the flowers bloom!' *Language Learning* 46, 713–49.
- Lantolf, J.P. (ed.) 2000: *Sociocultural theory and second language learning*. Oxford: Oxford University Press.
- Lantolf, J.P. 2011: The sociocultural approach to second language acquisition. In Atkinson, D. (ed.) *Alternative approaches to second language acquisition*. Abingdon: Routledge, 24–47.
- Lantolf, J.P. 2012: Sociocultural theory: a dialectical approach to L2 research. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 57–72.
- Lantolf, J.P. and Appel, G. 1994 (eds): *Vygotskian approaches to second language research*. Norwood, NJ: Ablex Publishing Corporation.
- Lantolf, J.P. and Poehner, M.E. (eds) 2008: *Sociocultural theory and the teaching of second languages*. London: Equinox.
- Lantolf, J.P. and Poehner, M.E. 2009: The artificial development of second language ability: a sociocultural approach. In Ritchie, W.C. and Bhatia, T.K. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Publishing, 138–59.
- Lantolf, J.P. and Poehner, M.E. 2011: Dynamic assessment in the classroom: Vygotskian praxis for second language development. *Language Teaching Research* 15, 11–33.
- Lantolf, J.P. and Thorne, S.L. 2006: *Sociocultural theory and the genesis of second language development*. Oxford: Oxford University Press.
- Lantolf, J.P. and Thorne, S.L. 2007: Sociocultural theory and second language learning. In VanPatten, B. and Williams, J. (eds) *Theories in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum, 201–24.
- Lardiere, D. 1998a: Case and tense in the 'fossilized' steady state. *Second Language Research* 14, 1–26.
- Lardiere, D. 1998b: Dissociating syntax from morphology in a divergent L2 end-state grammar. *Second Language Research* 14, 359–75.
- Lardiere, D. 2000: Mapping features to forms in second language acquisition. In Archibald, J. (ed.) *Second language acquisition and linguistic theory*. Malden, MA: Blackwell, 102–29.
- Lardiere, D. 2007: *Ultimate attainment in second language acquisition: a case study*. Mahwah, NJ: Lawrence Erlbaum.

- Lardiere, D. 2009: Some thoughts on the contrastive analysis of features in second language acquisition. *Second Language Research* 25, 173–227.
- Lardiere, D. 2012: Linguistic approaches to second language morphosyntax. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 106–26.
- Larsen-Freeman, D. 2011a: A complexity theory approach to second language development/acquisition. In Atkinson, D. (ed.) *Alternative approaches to second language acquisition*. Abingdon: Routledge, 49–72.
- Larsen-Freeman, D. 2011b: Complex, dynamic systems: a new transdisciplinary theme for applied linguistics? *Language Teaching* 45, 202–14.
- Larsen-Freeman, D. and Cameron, L. 2008: *Complex systems and applied linguistics*. Oxford: Oxford University Press.
- Larsen-Freeman, D. and Long, M.H. 1991: *An introduction to second language acquisition research*. Harlow: Longman.
- Laufer, B. and Nation, P. 2012: Vocabulary. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 163–76.
- Lave, J. and Wenger, E. 1991: *Situated learning: legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Lee, J. 2008: Gesture and private speech in second language acquisition. *Studies in Second Language Acquisition* 30(02): 169–90.
- Lenneberg, E. 1967: *Biological foundations of language*. New York: Wiley.
- Leontiev, A.N. 1981: *Problems of the development of mind*. Moscow: Progress Publishers.
- Leow, R.P. 1998: Toward operationalizing the process of attention in second language acquisition: evidence for Tomlin and Villa's (1994) fine-grained analysis of attention. *Applied Psycholinguistics* 19, 133–59.
- Leow, R.P. 2000: A study of the role of awareness in foreign language behavior: aware versus unaware learners. *Studies in Second Language Acquisition* 22, 557–84.
- Leung, J. and Williams, J. 2011: The implicit learning of mappings between forms and contextually derived meanings. *Studies in Second Language Acquisition* 33, 33–55.
- Leung, J. and Williams, J. 2012: Constraints on implicit learning of grammatical form-meaning connections. *Language Learning* 62, 634–62.
- Leung, Y.I. (ed.) 2009: *Third language acquisition and Universal Grammar*. Clevedon: Multilingual Matters.
- Levelt, W. 1989: *Speaking: from intention to articulation*. Cambridge, MA: MIT Press.

SECOND LANGUAGE LEARNING THEORIES

- Lew-Williams, C. and Fernald, A. 2010: Real-time processing of gender-marked articles by native and non-native Spanish speakers. *Journal of Memory and Language* 63, 447–64.
- Li, X. 2010: Sociolinguistic variation in the speech of learners of Chinese as a second language. *Language Learning* 60, 366–408.
- Lieven, E. and Tomasello, M. 2008: Children's first language acquisition from a usage-based perspective. In Robinson, P. and Ellis, N.C. (eds) *Handbook of cognitive linguistics and second language acquisition*. Abingdon: Routledge, 168–96.
- Lightbown, P.M. and Spada, N. 2006: *How languages are learned*. 3rd edition. Oxford: Oxford University Press.
- Linck, J.A., Hoshino, N. and Kroll, J.F. 2008: Cross-language lexical processes and inhibitory control. *The Mental Lexicon* 3, 349–74.
- Loewen, S. 2011: Focus on form. In Hinkel, E. (ed.) *Handbook of research in second language teaching and learning, Vol. 2*. Abingdon: Routledge, 576–93.
- Loewen, S. and Nabei, T. 2007: Measuring the effects of oral corrective feedback on L2 knowledge. In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 361–78.
- Long, M.H. 1981: Input, interaction and second language acquisition. In Winitz, H. (ed.) *Native language and foreign language acquisition*. Annals of the New York Academy of Sciences 379, 259–78.
- Long, M.H. 1983a: Native speaker/non-native speaker conversation and the negotiation of comprehensible input. *Applied Linguistics* 4, 126–41.
- Long, M.H. 1983b: Linguistic and conversational adjustments to non-native speakers. *Studies in Second Language Acquisition* 5, 177–93.
- Long, M.H. 1985: Input and second language acquisition theory. In Gass, S.M. and Madden, C.G. (eds) *Input in second language acquisition*. Rowley, MA: Newbury House, 377–93.
- Long, M.H. 1990: The least a second language acquisition theory needs to explain. *TESOL Quarterly* 24, 649–66.
- Long, M.H. 1993: Assessment strategies for SLA theories. *Applied Linguistics* 14, 225–49.
- Long, M.H. 1996: The role of the linguistic environment in second language acquisition. In Ritchie, W.C. and Bhatia, T.K. (eds) *Handbook of second language acquisition*. San Diego: Academic Press, 413–68.
- Long, M.H. 2007: *Problems in SLA*. Mahwah, NJ: Lawrence Erlbaum.
- Long, M.H. and Doughty, C. (eds) 2009: *The handbook of language teaching*. Chichester: Wiley-Blackwell.
- Lorenzo, G. and Longa, V. 2003: Minimizing the genes for grammar: the minimalist program as a biological framework for the study of language. *Lingua* 113, 643–57.

- Luk, Z.P. and Shirai, Y. 2009: Is the acquisition order of grammatical morphemes impervious to L1 knowledge? Evidence from the acquisition of plural -s, articles, and possessive 's. *Language Learning* 59, 721–54.
- Lyster, R. and Izquierdo, J. 2009: Prompts versus recasts in dyadic interaction. *Language Learning* 59, 453–98.
- Lyster, R. and Ranta, L. 1997: Corrective feedback and learner uptake. *Studies in Second Language Acquisition* 19, 37–66.
- Lyster, R. and Saito, K. 2010: Oral feedback in classroom SLA: a meta-analysis. *Studies in Second Language Acquisition* 32, 265–302.
- MacDonald, M.C. and Christiansen, M.H. 2002: Reassessing working memory: comment on Just and Carpenter (1992) and Waters and Caplan (1996). *Psychological Review* 109, 35–54.
- MacIntyre, P.D. 2002: Motivation, anxiety and emotion in second language acquisition. In Robinson, P. (ed.) *Individual differences and instructed language learning*. Amsterdam: John Benjamins, 45–68.
- MacIntyre, P.D. and Gardner, R.C. 1994: The subtle effects of induced anxiety on cognitive processing in the second language. *Language Learning* 44, 283–305.
- MacIntyre, P.D., Baker, S.C., Clément, R. and Donovan, L.A. 2002: Sex and age effects on willingness to communicate, anxiety, perceived competence, and L2 motivation among junior high school French immersion students. *Language Learning* 52, 537–64.
- Mackey, A. 1999: Input, interaction and second language development: an empirical study of question formation in ESL. *Studies in Second Language Acquisition* 21, 557–88.
- Mackey, A. 2006: Feedback, noticing and instructed second language learning. *Applied Linguistics* 27, 405–30.
- Mackey, A. (ed.) 2007a: *Conversational interaction in second language acquisition*. Oxford: Oxford University Press.
- Mackey, A. 2007b: The role of conversational interaction in second language acquisition. In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 1–28.
- Mackey, A. and Gass, S.M. (eds) 2012: *Research methods in second language acquisition: a practical guide*. Chichester: Wiley-Blackwell.
- Mackey, A. and Goo, J. 2007: Interaction research in SLA: a meta-analysis and research synthesis. In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 407–52.
- Mackey, A. and Polio, C. (eds) 2009: *Multiple perspectives on interaction*. Abingdon: Routledge.

SECOND LANGUAGE LEARNING THEORIES

- Mackey, A., Abbuhl, R. and Gass, S.M. 2012: Interactionist approach. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 7–23.
- Mackey, A., Adams, R., Stafford, C. and Winke, P. 2010: Exploring the relationship between modified output and working memory capacity. *Language Learning* 60, 501–33.
- Mackey, A., Gass, S. and McDonough, K. 2000: How do learners perceive interactional feedback? *Studies in Second Language Acquisition* 22, 471–97.
- Mackey, A., Philp, J., Egi, T., Fujii, A. and Tatsumi, T. 2002: Individual differences in working memory, noticing of interactional feedback and L2 development. In Robinson, P. (ed.) *Individual differences and instructed language learning*. Amsterdam: Benjamins, 181–210.
- MacWhinney, B. 1997: Implicit and explicit processes: commentary. *Studies in Second Language Acquisition* 19, 277–82.
- MacWhinney, B. 2000: *The CHILDES project: tools for analyzing talk*. 3rd edition. Mahwah, NJ: Lawrence Erlbaum.
- MacWhinney, B. 2007: The TalkBank project. In Beal, J.C., Corrigan, K.P. and Moisl, H.L. (eds) *Creating and digitizing language corpora: Volume 1, synchronic databases*. Basingstoke: Palgrave Macmillan.
- MacWhinney, B. 2008: A unified model. In Robinson, P. and Ellis, N.C. (eds) *Handbook of cognitive linguistics and second language acquisition*. Abingdon: Routledge, 341–71.
- MacWhinney, B. 2012: The logic of the unified model. In Gass, S. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 211–27.
- Magnan, S.S. and Lafford, B.A. 2012: Learning through immersion during study abroad. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 525–40.
- Marsden, E. 2006: Exploring Input Processing in the classroom: an experimental comparison of processing instruction and enriched input. *Language Learning* 56, 507–66.
- Marsden, E. and Chen, H.-Y. 2011: The roles of structured input activities in processing instruction and the kinds of knowledge they promote. *Language Learning* 61, 1058–98.
- Marsden, E., Williams, J. and Liu, X. (2013) Learning novel morphology: the role of meaning and orientation of attention at initial exposure. *Studies in Second Language Acquisition* 35 (issue 4).
- Masgoret, A.-M. and Gardner, R.C. 2003: Attitudes, motivation, and second language learning: a meta-analysis of studies conducted by Gardner and associates. *Language Learning* 53, 123–63.

- McCafferty, S. 1992: The use of private speech by adult second language learners: a cross-cultural study. *Modern Language Journal* 76, 179–89.
- McCafferty, S. 1994: Adult second language learners' use of private speech: a review of studies. *Modern Language Journal* 78, 421–36.
- McCafferty, S.G., Roebuck, R.F. and Wayland, R.P. 2001: Activity theory and the incidental learning of second-language vocabulary. *Language Teaching Research* 10, 289–94.
- McDonough, K. 2005: Identifying the impact of negative feedback and learners' responses on ESL question development. *Studies in Second Language Acquisition* 27, 79–103.
- McDonough, K. 2007: Interactional feedback and the emergence of simple past activity verbs in English. In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 323–38.
- McDonough, K. and Mackey, A. 2006: Responses to recasts: repetitions, primed production, and linguistic development. *Language Learning* 56, 693–720.
- McKay, S.L. and Wong, S.-L.C. 1996: Multiple discourses, multiple identities: investment and agency in second-language learning among Chinese adolescent immigrant students. *Harvard Educational Review* 66, 577–608.
- McLaughlin, B. 1987: *Theories of second language learning*. London: Edward Arnold.
- McLaughlin, B. and Heredia, R. 1996: Information-processing approaches to research on second language acquisition and use. In Ritchie, W. and Bhatia, T. (eds) *Handbook of second language acquisition*. San Diego: Academic Press, 213–28.
- Meisel, J. 1997: The acquisition of the syntax of negation in French and German: contrasting first and second language development. *Second Language Research* 13, 227–63.
- Meisel, J. 2011: *First and second language acquisition*. Cambridge: Cambridge University Press.
- Meisel, J., Clahsen, H. and Pienemann, M. 1981: On determining developmental stages in natural second language acquisition. *Studies in Second Language Acquisition* 3, 109–35.
- Mercer, N. 1995: *The guided construction of knowledge*. Clevedon: Multilingual Matters.
- Mercer, N. 2000: *Words and minds*. London: Routledge.
- Mercer, N. and Littleton, K. 2007: *Dialogue and the development of children's thinking: a sociocultural approach*. Abingdon: Routledge.
- Mesthrie, R. and Wolfram, W. (eds) 2011: *The Cambridge handbook of sociolinguistics*. Cambridge: Cambridge University Press.

SECOND LANGUAGE LEARNING THEORIES

- Mesthrie, R., Swann, J., Deumert, A. and Leap, W.L. 2009: *Introducing sociolinguistics*. 2nd edition. Edinburgh: Edinburgh University Press.
- Meyerhoff, M. 2011: *Introducing sociolinguistics*. 2nd edition. Abingdon: Routledge.
- Milon, J.P. 1974: The development of negation in English by a second language learner. *TESOL Quarterly* 8, 137–43.
- Mirman, D., Magnuson, J.S., Graf Estes, K. and Dixon, J.A. 2008: The link between statistical segmentation and word learning in adults. *Cognition* 108, 271–80.
- Misyak, J.B. and Christiansen, M.H. 2012: Statistical learning and language: an individual differences study. *Language Learning* 62, 302–31.
- Miyake, A. and Friedman, N.P. 1998: Individual differences in second language proficiency: working memory as language aptitude. In Healy, A.F. and Bourne, L.E. (eds) *Foreign language learning: psycholinguistic studies on training and retention*. Mahwah, NJ: Lawrence Erlbaum Associates, 339–64.
- Miyake, A. and Shah, P. 1999: *Models of working memory: mechanisms of active maintenance and executive control*. Cambridge: Cambridge University Press.
- Montrul, S. 2011: Multiple interfaces and incomplete acquisition. *Lingua* 121, 591–604.
- Montrul, S. and Yoon, J. 2009: Putting parameters in their proper place. *Second Language Research* 25, 291–311.
- Mougeon, R., Nadasdi, T. and Rehner, K. 2010: *The sociolinguistic competence of immersion students*. Bristol: Multilingual Matters.
- Mougeon, R., Rehner, K. and Nadasdi, T. 2004: The learning of spoken French variation by immersion students from Toronto, Canada. *Journal of Sociolinguistics* 8, 408–32.
- Moyer, A. 2007. Empirical considerations on the age factor in L2 phonology. *Issues in Applied Linguistics* 15, 109–27.
- Müller, N. 2009: Language development in simultaneous bilingual children. In Foster-Cohen, S. (ed.) *Language acquisition*. Basingstoke: Palgrave-Macmillan, 243–72.
- Muñoz, C. and Singleton, D. 2011: A critical review of age-related research on L2 ultimate attainment. *Language Teaching* 44, 1–35
- Myles, F. 2004: From data to theory: the over-representation of linguistic knowledge in SLA. In Towell, R. and Hawkins, R. (eds) *Empirical evidence and theories of representation in current research in Second Language Acquisition*. *Transactions of the Philological Society* 102, 139–68.
- Myles, F. 2005: The emergence of morpho-syntactic structure in French L2. In Dewaele, J.-M. (ed.) *Focus on French as a foreign language: multidisciplinary approaches*. Clevedon: Multilingual Matters, 88–113.

- Myles, F. 2007: Using electronic corpora in SLA research. In Ayoun, D. (ed.) *French applied linguistics*. Amsterdam: John Benjamins, 377–400.
- Myles, F. 2008: Investigating learner language development with electronic longitudinal corpora: theoretical and methodological issues. In Ortega, L. and Byrnes, H. (eds) *The longitudinal study of advanced L2 capacities*. Abingdon: Routledge, 58–73.
- Myles, F. 2010: The development of theories of second language acquisition. *Language Teaching* 43, 320–32.
- Myles, F., Hooper, J. and Mitchell, R. 1998: Rote or rule? Exploring the role of formulaic language in classroom foreign language learning. *Language Learning* 48, 323–63.
- Myles, F., Mitchell, R. and Hooper, J. 1999: Interrogative chunks in French L2: a basis for creative construction? *Studies in Second Language Acquisition* 21, 49–80.
- Naiman, N., Fröhlich, M. and Todesco, A. 1978: *The good language learner. Research in Education Series 7*. Toronto: Ontario Institute for the Study of Education.
- Nakamura, D. 2012: Input skewedness, consistency, and order of frequent verbs in frequency-driven second language construction learning: a replication and extension of Casenhiser and Goldberg (2005) to adult second language acquisition. *International Review of Applied Linguistics* 50, 1–38.
- Nassaji, H. and Swain, M. 2000: A Vygotskian perspective on corrective feedback in L2: the effect of random versus negotiated help in the learning of English articles. *Language Awareness* 8, 34–51.
- Neguera, E. 2008: Revolutionary pedagogies: learning that leads (to) second language development. In Lantolf, J.P. and Poehner, M.E. (eds) *Sociocultural theory and the teaching of second languages*. London: Equinox, 189–227.
- Neumann, O. 1987: Beyond capacity: a functional view of attention. In Heuer, H. and Sanders, A. (eds) *Perspectives on perception and action*. Berlin: Springer, 361–94.
- Newport, E. 1991: Contrasting conceptions of the critical period for language. In Caplan, D. and Gelman, R. (eds) *Epigenesis of mind: Essays on biology and cognition*. Hillsdale, NJ: Lawrence Erlbaum, 111–30.
- Nicholas, H., Lightbown, P.M. and Spada, N. 2001: Recasts as feedback to language learners. *Language Learning* 51, 719–58.
- Noboyoshi, J. and Ellis, R. 1993: Focused communication tasks and second language acquisition. *ELT Journal* 47, 203–10.
- Norris, J.M. and Ortega, L. 2000: Effectiveness of L2 instruction: a research synthesis and quantitative meta-analysis. *Language Learning* 50, 417–528.

SECOND LANGUAGE LEARNING THEORIES

- Norris, J.M. and Ortega, L. (eds) 2006: *Synthesizing research on language learning and teaching*. Amsterdam: John Benjamins.
- Norton, B. 2000: *Identity and language learning: gender, ethnicity and educational change*. Harlow: Pearson Education.
- Norton, B. 2010: Language and identity. In Hornberger, N.H. and Mackay, S.L. (eds) *Sociolinguistics and language education*. Bristol: Multilingual Matters, 349–69.
- Norton, B. and McKinney, C. 2011: An identity approach to second language acquisition. In Atkinson, D. (ed.) *Alternative approaches to second language acquisition*. Abingdon: Routledge, 73–94.
- Ochs, E. 1988: *Culture and language development: language acquisition and language socialisation in a Samoan village*. Cambridge: Cambridge University Press.
- Ochs, E. and Schieffelin, B. 1984: Language acquisition and socialisation: three developmental stories and their implications. In Shweder, R. and LeVine, R. (eds) *Culture theory: essays on mind, self and emotion*. Cambridge: Cambridge University Press, 276–320.
- Ochs, E. and Schieffelin, B. 1995: The impact of language socialisation on grammatical development. In Fletcher, P. and MacWhinney, B. (eds) *The handbook of child language*. Oxford: Blackwell, 73–94.
- Ochs, E. and Schieffelin, B. 2008: Language socialization: an historical overview. In Duff, P.A. and Hornberger, N.H. (eds) *Encyclopedia of language and education*. 2nd edition. Vol. 8, *Language socialization*. New York: Springer, 3–16.
- O'Grady, W. 1987: *Principles of grammar and learning*. Chicago: University of Chicago Press.
- O'Grady, W. 1997: *Syntactic development*. Chicago: University of Chicago Press.
- O'Grady, W. 1999: Toward a new nativism. *Studies in Second Language Acquisition* 21, 621–33.
- O'Grady, W. 2005: *Syntactic carpentry: an emergentist approach to syntax*. Mahwah, NJ: Lawrence Erlbaum.
- O'Grady, W. 2007: The syntax of quantification in SLA: an emergentist approach. In O'Brien, M., Shea, C. and Archibald, J. (eds) *Proceedings of the 8th generative approaches to second language acquisition conference (GASLA 2006): the Banff conference*. Somerville, MA: Cascadilla Press, 98–113.
- O'Grady, W. 2008a: The emergentist program. *Lingua* 118, 447–64.
- O'Grady, W. 2008b: Language without grammar. In Robinson, P. and Ellis, N.C. (eds) *Handbook of cognitive linguistics and second language acquisition*. Abingdon: Routledge, 139–67.
- O'Grady, W. 2010a: An emergentist approach to syntax. In Narrog, H. and Heine, B. (eds) *The Oxford handbook of linguistic analysis*. Oxford: Oxford University Press, 257–83.

- O'Grady, W. 2010b: Fundamental universals of language. *Lingua* 120, 2707–12.
- O'Grady, W. 2011: Relative clauses: processing and acquisition. In Kidd, E. (ed.) *The acquisition of relative clauses: functional and typological perspectives*. Amsterdam: John Benjamins, 13–38.
- O'Grady, W. 2012: Language acquisition without an acquisition device. *Language Teaching* 45, 116–30.
- O'Grady, W., Kwak, H.-Y., Lee, O.-S. and Lee, M. 2011: An emergentist perspective on heritage language acquisition. *Studies in Second Language Acquisition* 33, 223–45.
- O'Grady, W., Lee, M. and Choo, M. 2001: The acquisition of relative clauses by heritage and non-heritage learners of Korean as a second language: a comparative study. *Journal of Korean Language Education* 12, 283–94.
- O'Grady, W., Lee, M. and Choo, M. 2003: A subject–object asymmetry in the acquisition of relative clauses in Korean as a second language. *Studies in Second Language Acquisition* 25, 433–48.
- O'Grady, W., Lee, M. and Kwak, H.-Y. 2009: Emergentism and second language acquisition. In Ritchie, W. and Bhatia, T. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 69–88.
- O'Grady, W., Nakamura, M. and Ito, Y. 2008: Want–to contraction in second language acquisition: an emergentist approach. *Lingua* 118, 478–98.
- O'Grady, W., Yamashita, Y. and Lee, S.-Y. 2005: A note on canonical word order. *Applied Linguistics* 26, 453–8.
- Ohara, Y. 2001: Finding one's voice in Japanese: a study of the pitch levels of L2 users. In Pavlenko, A., Blackledge, A., Piller, I. and Teutsch-Dwyer, M. (eds) *Multilingualism, second language learning and gender*. Berlin: Mouton de Gruyter, 231–54.
- Ohta, A.S. 1999: Interactional routines and the socialization of interactional style in adult learners of Japanese. *Journal of Pragmatics* 31, 1493–512.
- Ohta, A.S. 2000: Rethinking interaction in SLA: developmentally appropriate assistance in the zone of proximal development and the acquisition of L2 grammar. In Lantolf, J.P. (ed.) *Sociocultural theory and second language learning*. Oxford: Oxford University Press, 51–78.
- Ohta, A.S. 2001: *Second language acquisition processes in the classroom: learning Japanese*. Mahwah, NJ: Lawrence Erlbaum.
- Oliver, R. 2000: Age differences in negotiation and feedback in classroom and pairwork. *Language Learning* 50, 119–51.
- Olson, D.R. 1995: Writing and the mind. In Wertsch, J.V., Del Río, P. and Alvarez, A. (eds) *Sociocultural studies of mind*. Cambridge: Cambridge University Press, 95–123.

SECOND LANGUAGE LEARNING THEORIES

- O'Malley, J.M. and Chamot, A.U. 1990: *Learning strategies in second language acquisition*. Cambridge: Cambridge University Press.
- O'Malley, J.M., Chamot, A.U. and Walker, C. 1987: Some applications of cognitive information-processing theory in second language acquisition. *Studies in Second Language Acquisition* 9, 287–306.
- Ortega, L. 2009: *Understanding second language acquisition*. London: Hodder Education.
- Ortega, L. 2011: SLA after the social turn: where cognitivism and its alternatives stand. In Atkinson, D. (ed.) *Alternative approaches to second language acquisition*. Abingdon: Routledge, 167–80.
- Oxford, R.L. 1990: *Language learning strategies: what every teacher should know*. New York: Newbury House/HarperCollins.
- Oxford, R.L. 2011a: *Teaching and researching language learning strategies*. Harlow: Pearson Longman.
- Oxford, R.L. 2011b: Strategies for learning a second or foreign language. *Language Teaching* 44, 167–80.
- Pallotti, G. 2007: An operational definition of the emergence criterion. *Applied Linguistics* 28, 361–82
- Paradis, M. 1994: Neurolinguistic aspects of implicit and explicit memory: implications for bilingualism and SLA. In Ellis, N.C. (ed.) *Implicit and explicit learning of languages*. San Diego: Academic Press, 393–419.
- Paradis, M. 2004: *A neurolinguistic theory of bilingualism*. Amsterdam: John Benjamins.
- Paradis, M. 2009: *Declarative and procedural determinants of second languages*. Amsterdam: Benjamins.
- Paradis, J., Rice, M., Crago, M. and Marquis, J. 2008: The acquisition of tense in English: distinguishing child second language from first language and specific language impairment. *Applied Psycholinguistics* 29, 689–722.
- Park, E.S. and Han, Z.-H. 2008: Learner spontaneous attention in L2 input processing: an exploratory study. In Han, Z.-H. (ed.) *Understanding second language process*. Clevedon: Multilingual Matters, 106–32.
- Patrick, D. 2003: Language socialization and second language acquisition in a multilingual arctic Quebec community. In Bayley, R. and Schecter, S.R. (eds) *Language socialization in bilingual and multilingual societies*. Clevedon: Multilingual Matters, 165–81.
- Pavlenko, A. 1998: Second language learning by adults: testimonies of bilingual writers. *Issues in Applied Linguistics* 9, 3–19.

- Pavlenko, A. 2001: 'How am I to become a woman in an American vein?' Transformations of gender performance in second language learning. In Pavlenko, A., Blackledge, A., Piller, I. and Teutsch-Dwyer, M. (eds) *Multilingualism, second language learning and gender*. Berlin: Mouton de Gruyter, 133–74.
- Pavlenko, A. (ed.) 2011: *Thinking and speaking in two languages*. Bristol: Multilingual Matters.
- Pavlenko, A. and Blackledge, A. (eds) 2004: *Negotiation of identities in multilingual settings*. Clevedon: Multilingual Matters.
- Pekarek Doehler, S. 2010: Conceptual changes and methodological challenges: on language and learning from a conversation analytic perspective on SLA. In Seedhouse, P., Walsh, S. and Jenks, C. (eds) *Conceptualising 'learning' in applied linguistics*. Basingstoke: Palgrave Macmillan, 105–26.
- Penner, Z. and Weissenborn, J. 1996: Strong continuity, parameter setting and the trigger hierarchy: on the acquisition of the DP in Bernese Swiss German and High German. In Clahsen, H. (ed.) *Generative perspectives on language acquisition*. Amsterdam: John Benjamins, 161–200.
- Perdue, C. (ed.) 1993a: *Adult language acquisition: cross-linguistic perspectives: Volume 1, Field methods*. Cambridge: Cambridge University Press.
- Perdue, C. (ed.) 1993b: *Adult language acquisition: cross-linguistic perspectives: Volume 2, The results*. Cambridge: Cambridge University Press.
- Perdue, C. (ed.) 2000: The structure of learner varieties. *Studies in Second Language Acquisition* 22 (4) [Special Issue].
- Perdue, C. 2002: Development of L2 functional use. In Cook, V. (ed.) *Portraits of the L2 user*. Clevedon: Multilingual Matters, 121–44.
- Perdue, C. and Klein, W. 1993: Concluding remarks. In Perdue, C. (ed.) *Adult language acquisition: cross-linguistic perspectives: Volume 2, The results*. Cambridge: Cambridge University Press, 253–72.
- Peters, A.M. 2009: Cracking the language code: processing strategies in first language acquisition. In Foster-Cohen, S. (ed.) *Language acquisition*. Basingstoke: Palgrave Macmillan, 40–61.
- Philp, J. 2003: Constraints on 'noticing the gap': Nonnative speakers' noticing of recasts in NS–NNS interaction. *Studies in Second Language Acquisition* 25, 99–126.
- Philp, J., Walter, S. and Basturkmen, H. 2010: Peer interaction in the foreign language classroom: what factors foster a focus on form? *Language Awareness* 19, 261–79.
- Piaget, J. 1970: *Genetic epistemology*. Columbia, OH: Columbia University Press.
- Piaget, J. and Inhelder, B. 1966: *The psychology of the child*. New York: Basic Books.

SECOND LANGUAGE LEARNING THEORIES

- Piatelli-Palmarini, M. (ed.) 1980: *Language and learning: the debate between Jean Piaget and Noam Chomsky*. London: Routledge and Kegan Paul.
- Pica, T. 1994: Research on negotiation: what does it reveal about second-language learning conditions, processes and outcomes? *Language Learning* 44, 493–527.
- Pica, T., Young, R. and Doughty, C. 1987: The impact of interaction on comprehension. *TESOL Quarterly* 21, 737–58.
- Pienemann, M. 1981: *Der Zweitsprachenerwerb ausländischer Arbeitskinder*. Bonn: Bouvier.
- Pienemann, M. 1984: Psychological constraints on the teachability of languages. *Studies in Second Language Acquisition* 6, 184–214.
- Pienemann, M. 1987: Determining the influence of instruction on L2 speech processing. *Australian Review of Applied Linguistics* 10, 83–113.
- Pienemann, M. 1989: Is language teachable? Psycholinguistic experiments and hypotheses. *Applied Linguistics* 10, 52–79.
- Pienemann, M. 1998: *Language processing and second language acquisition: Processability Theory*. Amsterdam: John Benjamins.
- Pienemann, M. 2003: Language processing capacity. In Doughty, C. and Long, M. (eds) *The handbook of second language acquisition*. Malden, MA: Blackwell, 679–714.
- Pienemann, M. (ed.) 2005: *Cross-linguistic aspects of Processability Theory*. Amsterdam: John Benjamins.
- Pienemann, M. 2007: Processability Theory. In VanPatten, B. and Williams, J. (eds) *Theories in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum, 137–54.
- Pienemann, M. 2010: A cognitive view of language acquisition: Processability Theory and beyond. In Seedhouse, P., Walsh, S. and Jenks, C. (eds) *Conceptualising 'learning' in applied linguistics*. Basingstoke: Palgrave Macmillan, 69–88.
- Pienemann, M. and Johnston, M. 1987: Factors influencing the development of language proficiency. In Nunan, D. (ed.) *Applying second language acquisition research*. Adelaide: National Curriculum Resource Centre, 45–141.
- Pienemann, M. and Kessler, J.L. (eds) 2011: *Studying Processability Theory*. Amsterdam: John Benjamins.
- Pierce, A. 1992: *Language acquisition and syntactic theory: a comparative analysis of French and English child grammars*. London: Kluwer.
- Pine, J.M., Conti-Ramsden, G., Joseph, K.L., Lieven, E.V.M. and Serratrice, L. 2007: Tense over time: testing the Agreement/Tense Omission Model as an account of the pattern of tense-marking provision in early child English. *Journal of Child Language* 34, 1–21

- Pinel, P., Fauchereau, F., Moreno, A., Barbot, A., Lathrop, M., Zelenika, D., Le Bihan, B., Poline, J.D., Bourgeron, T. and Dehaene, S. 2012: Genetic variants of FOXP2 and KIAA0319/TTRAP/THEM2 locus are associated with altered brain activation in distinct language-related regions. *Journal of Neuroscience* 32, 817–25.
- Pinker, S. 1994: *The language instinct*. London: Penguin Books.
- Platt, E. and Brooks, F.B. 1994: The 'acquisition-rich environment' revisited. *Modern Language Journal* 78, 497–511.
- Platt, E. and Brooks, F.B. 2002: Task engagement: a turning point in foreign language development. *Language Learning* 52, 365–400.
- Plonsky, L. 2011: The effectiveness of second language strategy instruction: a meta-analysis. *Language Learning* 61, 993–1038.
- Poehner, M.E. 2008: Both sides of the conversation: the interplay between mediation and learner reciprocity in dynamic assessment. In Lantolf, J.P. and Poehner, M.E. (eds) *Sociocultural theory and the teaching of second languages*. London: Equinox, 33–56.
- Pon, G., Goldstein, T. and Schecter, S.R. 2003: Interrupted by silences: the contemporary education of Hong Kong-born Chinese Canadians. In Bayley, R. and Schecter, S.R. (eds) *Language socialization in bilingual and multilingual societies*. Clevedon: Multilingual Matters, 114–27.
- Poole, D. 1992: Language socialization in the second language classroom. *Language Learning* 42, 593–616.
- Preston, D. 1989: *Sociolinguistics and second language acquisition*. Oxford: Blackwell.
- Preston, D. 1996: Variationist perspectives on second language acquisition. In Bayley, R. and Preston, D. (eds) *Second language acquisition and linguistic variation*. Amsterdam: John Benjamins, 1–45.
- Preston, D. and Bayley, R. 2009: Variationist linguistics and second language acquisition. In Ritchie, W.C. and Bhatia, T.K. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 89–113.
- Prévost, P. and Paradis, J. (eds) 2004: *The acquisition of French in different contexts: focus on functional categories*. Amsterdam: John Benjamins.
- Prévost, P. and White, L. 2000: Missing surface inflection or impairment in second language acquisition? Evidence from tense and agreement. *Second Language Research* 16, 103–33.
- Radford, A. 1990: *Syntactic theory and the acquisition of English syntax*. Oxford: Basil Blackwell.
- Radford, A. 1996: Towards a structure-building model of acquisition. In Clahsen, H. (ed.) *Generative perspectives on language acquisition*. Amsterdam: John Benjamins, 43–90.

SECOND LANGUAGE LEARNING THEORIES

- Radford, A. 1997: *Syntax: a minimalist introduction*. Cambridge: Cambridge University Press.
- Rai, M., Loschky, L., Harris, R., Peck, N. and Cook, L. 2011: Effects of stress and working memory capacity on foreign language readers' inferential processing during comprehension. *Language Learning* 61, 187–218.
- Ramachandra, V., Hewitt, L.E. and Brackenbury, T. 2011: The relationship between phonological memory, phonological sensitivity, and incidental word learning. *Journal of Psycholinguistic Research* 40, 93–109.
- Rampton, B. 1995: Politics and change in research in applied linguistics. *Applied Linguistics* 16, 233–56.
- Ranta, E. and Lyster, R. 2007: A cognitive approach to improving immersion students' oral language abilities: the awareness–practice–feedback sequence. In DeKeyser, R. (ed.) *Practice in a second language*. Cambridge: Cambridge University Press, 141–60.
- Ravem, R. 1968: Language acquisition in a second language environment. *International Review of Applied Linguistics* 6, 175–85.
- Reber, A.S. 1967: Implicit learning of artificial grammars. *Journal of Verbal Learning and Verbal Behavior* 6, 855–63.
- Reber, A.S. 1989: Implicit learning and tacit knowledge. *Journal of Experimental Psychology: General* 118, 219–35.
- Regan, V. 1996: Variation in French interlanguage: a longitudinal study of sociolinguistic competence. In Bayley, R. and Preston, D.R. (eds) *Second language acquisition and linguistic variation*. Amsterdam: John Benjamins, 177–201.
- Rehner, K., Mougeon, R. and Nadasdi, T. 2003: The learning of sociolinguistic variation by advanced FSL learners: the case of *nous* versus *on* in immersion French. *Studies in Second Language Acquisition* 25, 127–56.
- Révész, A. 2012: Working memory and the observed effectiveness of recasts on different L2 outcome measures. *Language Learning* 62, 93–132.
- Richards, J. (ed.) 1974: *Error analysis: perspectives on second language learning*. London: Longman.
- Ringböm, H. 2007: *Cross-linguistic similarity in foreign language learning*. Clevedon: Multilingual Matters.
- Rispoli, M. 1999: Functionalist accounts of first language acquisition. In Ritchie, W.C. and Bhatia, T.K. (eds) *Handbook of child language acquisition*. London: Academic Press, 253–69.
- Ritchie, W.C. and Bhatia, T.K. (eds) 2009: *The new handbook of second language acquisition*. Bingley: Emerald Group.
- Rivers, W.M. 1964: *The psychologist and the foreign-language teacher*. Chicago: University of Chicago Press.

- Rivers, W.M. 1968: *Teaching foreign-language skills*. Chicago: University of Chicago Press.
- Roberts, L. 2012: Individual differences in second language sentence processing. *Language Learning* 62 (Supplement 2), 172–88.
- Roberts, L., Gullberg, M. and Indefrey, P. 2008: Online pronoun resolution in L2 discourse: L1 influence and general learner effects. *Studies in Second Language Acquisition* 30, 333–57.
- Robinson, P. 1995: Attention, memory, and the 'noticing hypothesis'. *Language Learning* 45, 283–331.
- Robinson, P. 1996. Learning simple and complex second language rules under implicit, incidental, rule-search and instructed conditions. *Studies in Second Language Acquisition* 18, 27–67.
- Robinson, P. 1997a: Generalizability and automaticity of second language learning under implicit, incidental, enhanced, and instructed conditions. *Studies in Second Language Acquisition* 19, 223–47.
- Robinson, P. 1997b: Individual differences and the fundamental similarity of implicit and explicit adult second language learning. *Language Learning* 47, 45–99.
- Robinson, P. 2001: *Cognition and second language instruction*. Cambridge: Cambridge University Press.
- Robinson, P. 2002: Learning conditions, aptitude complexes and SLA: a framework for research and pedagogy. In Robinson, P. (ed.) *Individual differences and instructed language learning*. Amsterdam: John Benjamins, 113–33.
- Robinson, P. 2005a: Aptitude and second language acquisition. *Annual Review of Applied Linguistics* 25, 46–73.
- Robinson, P. 2005b: Cognitive abilities, chunk-strength, and frequency effects in implicit artificial grammar and incidental L2 learning: Replications of Reber, Walkenfeld, and Hernstadt (1991) and Knowlton and Squire (1996) and their relevance for SLA. *Studies in Second Language Acquisition* 27, 235–68.
- Robinson, P. 2007: Task complexity, theory of mind, and intentional reasoning: effects on L2 speech production, interaction, uptake and perceptions of task difficulty. *International Review of Applied Linguistics* 45, 193–213.
- Robinson, P. and Ellis, N.C. (eds) 2008: *Handbook of cognitive linguistics and second language acquisition*. Abingdon: Routledge.
- Robinson, P., Mackey, A., Gass, S.M. and Schmidt, R. 2012: Attention and awareness in second language acquisition. In Gass, S.M. and Mackey, A. (eds) *Routledge handbook of second language acquisition*. Abingdon: Routledge, 247–67.

SECOND LANGUAGE LEARNING THEORIES

- Roehr, K. 2006: Metalinguistic knowledge in L2 task performance: a verbal protocol analysis. *Language Awareness* 15, 180–98.
- Roehr, K. 2007: Metalinguistic knowledge and language ability in university-level L2 learners. *Applied Linguistics* 29, 173–99.
- Roehr, K. 2008: Linguistic and metalinguistic categories in second language learning. *Cognitive Linguistics* 19, 67–106.
- Roeper, T. 2007: *The prism of grammar: how child language illuminates humanism*. Cambridge, MA: MIT Press.
- Rogers, V. 2009: *Syntactic development in the second language acquisition of French by instructed English learners*. Unpublished PhD dissertation, Newcastle University.
- Rogoff, B. 1990: *Apprenticeship in thinking*. Cambridge: Cambridge University Press.
- Rogoff, B. 1995: Observing sociocultural activity on three planes: participatory appropriation, guided participation and apprenticeship. In Wertsch, J.V., Del R o, P., and Alvarez, A. (eds) *Sociocultural studies of mind*. Cambridge: Cambridge University Press, 139–64.
- Rogoff, B. 2003. *The cultural nature of human development*. Oxford: Oxford University Press.
- Romaine, S. 2003: Variation. In Doughty, C.J. and Long, M.H. (eds) *The handbook of second language acquisition*. Oxford: Blackwell Publishing, 409–35.
- Romat, A.G. 2009: Typological universals and second language acquisition. In Scalise, S., Magni, E. and Bisetto, A. (eds) *Universals of language today*. Dordrecht: The Netherlands, 253–72.
- Rosa, E. and Leow, R. 2004: Awareness, different learning conditions, and L2 development. *Applied Psycholinguistics* 25, 269–92.
- Ross-Feldman, L. 2007: Interaction in the L2 classroom: does gender influence learning opportunities? In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 53–76.
- Rothman, J. and Slabakova, R. (eds) 2011: Acquisition at the linguistic interfaces. Special Issue of *Lingua*.
- Russell, J. and Spada, N. 2006: The effectiveness of corrective feedback for the acquisition of L2 grammar: a meta-analysis of the research. In Norris, J.M. and Ortega, L. (eds) *Synthesizing research on language learning and teaching*. Amsterdam: John Benjamins, 133–64.
- Sabourin, L. and Stowe, L. 2008: Second language processing: when are L1 and L2 processed similarly. *Second Language Research* 24, 397–430.
- Sagarra, N. 2007: From CALL to face-to-face interaction: the effect of computer-delivered recasts and working memory on L2 development. In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 229–48.

- Sagarra, N. 2008: Working memory and L2 processing of redundant grammatical forms. In Han, Z.-H. (ed.) *Understanding second language process*. Cleveland: Multilingual Matters, 133–47.
- Sagarra, N. and Herschensohn, J. 2010: The role of proficiency and working memory in gender and number processing in L1 and L2 Spanish. *Lingua* 120, 2022–39.
- Salaberry, M.R. 1999: The development of past tense verbal morphology in classroom L2 Spanish. *Applied Linguistics* 20, 151–78.
- Salaberry, M.R. 2000: *The development of past tense morphology in L2 Spanish*. Amsterdam: John Benjamins.
- Salaberry, M.R. 2002: Tense and aspect in the selection of past tense verbal morphology. In Salaberry, M.R. and Shirai, Y. (eds) *Tense-aspect morphology in L2 acquisition*. Amsterdam: John Benjamins, 397–415.
- Salaberry, M.R. 2003: Tense aspects in verbal morphology. *Hispania* 86, 559–73.
- Salaberry, M.R. 2008: *Marking past tense in second language acquisition: a theoretical model*. London: Continuum Books.
- Salaberry, M.R. 2011: Assessing the effect of lexical aspect and grounding on the acquisition of L2 Spanish past tense morphology among L1 English speakers. *Bilingualism: Language and Cognition* 14, 184–202.
- Salaberry, M.R. and Comajoan, L. (eds) 2011: *Research design and methodology in studies on L2 tense and aspect*. New York: Walter de Gruyter.
- Salaberry, M.R. and Shirai, Y. (eds) 2002: *The L2 acquisition of tense-aspect morphology*. Amsterdam: John Benjamins.
- Salsbury, T. and Bardovi-Harlig, K. 2000: Oppositional talk and the acquisition of modality in L2 English. In Swierczbin, B., Morris, F., Anderson, M., Klee, C.A. and Tarone, E. (eds) *Social and cognitive factors in second language acquisition*. Somerville, MA: Cascadilla Press, 57–76.
- Samuda, V. and Bygate, M. 2008: *Tasks in second language learning*. Basingstoke: Palgrave Macmillan.
- Sanz, C. and Morgan-Short, K. 2004: Positive evidence versus explicit rule presentation and explicit negative feedback: a computer-assisted study. *Language Learning* 54, 35–78.
- Sato, C. 1990: *The syntax of conversation in interlanguage development*. Tübingen: Gunter Narr Verlag.
- Saville-Troike, M. 1989: *The ethnography of communication: an introduction*. 2nd edition. Oxford: Basil Blackwell.
- Schachter, J. 1996: Maturation and the issue of Universal Grammar in second language acquisition. In Ritchie, W. and Bhatia, T. (eds) *Handbook of second language acquisition*. San Diego: Academic Press, 159–93.

SECOND LANGUAGE LEARNING THEORIES

- Schechter, S.R. and Bayley, R. 1997: Language socialization practices and cultural identity: case studies of Mexican-descent families in California and Texas. *TESOL Quarterly* 31, 513–41.
- Schegloff, E.A. 2001: Discourse as an interactional achievement III: the omnirelevance of action. In Schiffrin, D., Tannen, D. and Hamilton, H.E. (eds) *The handbook of discourse analysis*. Malden, MA: Blackwell, 229–49.
- Schieffelin, B.B. 1990: *The give and take of everyday life: language socialization of Kaluli children*. Cambridge: Cambridge University Press.
- Schmidt, R. 1990: The role of consciousness in second language learning. *Applied Linguistics* 11, 129–58.
- Schmidt, R. 1993: Awareness and second language acquisition. *Annual Review of Applied Linguistics* 13, 206–26.
- Schmidt, R. 1994: Deconstructing consciousness in search of useful definitions for applied linguistics. *AILA Review* 11, 11–26.
- Schmidt, R. 2001: Attention. In Robinson, P. (ed.) *Cognition and second language instruction*. Cambridge: Cambridge University Press, 3–32.
- Schmidt, R. and Frota, S. 1986: Developing basic conversational ability in a second language: a case study of an adult learner of Portuguese. In Day, R.R. (ed.) *Talking to learn: conversation in second language acquisition*. Rowley, MA: Newbury House, 237–322.
- Schmitz, K. 2010: Frequency and language development: introduction. *Lingua* 120, 2535–7.
- Schneider, S. and Katz, M. 2012. Rethinking the language of thought. *WIREs Cognitive Science* 3, 153–62.
- Schumann, J. 1978a: *The pidginization process: a model for second language acquisition*. Rowley, MA: Newbury House.
- Schumann, J. 1978b: The acculturation model for second language acquisition. In Gingras, R. (ed.) *Second language acquisition and foreign language teaching*. Arlington, VA: Center for Applied Linguistics, 27–50.
- Schumann, J. 1978c: Social and psychological factors in second language acquisition. In Richards, J. (ed.) *Error analysis: perspectives on second language learning*. London: Longman.
- Schwartz, B. 1993: On explicit and negative data effecting and affecting competence and 'linguistic behavior'. *Studies in Second Language Acquisition* 15, 147–63.
- Schwartz, B. 1998: On two hypotheses of 'transfer' in L2A: minimal trees and absolute L1 influence. In Flynn, S., Martohardjono, G. and O'Neil, W. (eds) *The generative study of second language acquisition*. Mahwah, NJ; Lawrence Erlbaum, 35–60.

- Schwartz, B. and Eubank, L. 1996: What is the 'L2 initial state'? *Second Language Research* 12, 1–6.
- Schwartz, B. and Sprouse, R. 1994: Word order and nominative case in non-native language acquisition: a longitudinal study of (L1 Turkish) German inter-language. In Hoekstra, T. and Schwartz, B. (eds) *Language acquisition studies in generative grammar*. Amsterdam: John Benjamins, 317–68.
- Schwartz, B. and Sprouse, R. 1996: L2 cognitive states and the Full Transfer/Full Access model. *Second Language Research* 12, 40–72.
- Sealey, A. and Carter, B. 2004: *Applied linguistics as social science*. London: Continuum.
- Sebba, M. 1997: *Contact languages: pidgins and creoles*. Basingstoke: Macmillan Press.
- Seedhouse, P. 2004: *The interactional architecture of the language classroom: a conversation analysis perspective*. Oxford: Blackwell Publishing.
- Seedhouse, P., Walsh, S. and Jenks, C.J. (eds) 2010: *Conceptualising 'learning' in applied linguistics*. Basingstoke: Palgrave Macmillan, 105–26.
- Sekerina, I. and Brooks, P. 2006: Pervasiveness of shallow processing. *Applied Psycholinguistics* 27, 84–8.
- Selinker, L. 1972: Interlanguage. *International Review of Applied Linguistics* 10, 219–31.
- Selinker, L. 1992: *Rediscovering interlanguage*. London: Longman.
- Serratrice, L., Sorace, A. and Paoli, S. 2004: Crosslinguistic influence at the syntax-pragmatic interface: subjects and objects in English–Italian bilingual and monolingual acquisition. *Bilingualism: Language and Cognition* 7, 183–205.
- Shanks, D.R. 1995: *The psychology of associative learning*. Cambridge: Cambridge University Press.
- Shanks, D.R. 2005: Implicit learning. In Lamberts K. and Goldstone R. (eds) *Handbook of cognition*. London: Sage, 202–20.
- Sharwood Smith, M. 1994: *Second language learning: theoretical foundations*. Harlow: Longman.
- Sharwood Smith, M. 2008: Revisiting the role of consciousness with MOGUL. In Han, Z. (ed.) *Understanding second language process*. Clevedon: Multilingual Matters, 1–15.
- Sheen, Y. 2008: Recasts, language anxiety, modified output, and L2 learning. *Language Learning* 58, 835–74.
- Sheen, Y. and Lyster, R. (eds) 2010: The role of oral and written corrective feedback in SLA. Special Issue of *Studies in Second Language Acquisition* 32 (2).

SECOND LANGUAGE LEARNING THEORIES

- Shehadeh, A. 2002: Comprehensible output, from occurrence to acquisition: an agenda for acquisitional research. *Language Learning* 52, 597–647.
- Shiffrin, R.M. and Schneider, W. 1977: Controlled and automatic human information processing. II: perceptual learning, automatic, attending, and a general theory. *Psychological Review* 84, 127–90.
- Shintani, N. and Ellis, R. 2010: The incidental acquisition of english plural –s by Japanese children in comprehension-based and production-based lessons: a process-product study. *Studies in Second Language Acquisition* 32, 607–37.
- Simard, D. and Wong, W. 2001: Alertness, orientation and detection: the conceptualization of attentional functions in SLA. *Studies in Second Language Acquisition* 23, 103–24.
- Sinclair, J. 1991: *Corpus, concordance, collocation*. Oxford: Oxford University Press.
- Singleton, D. 1995: A critical look at the critical period hypothesis in second language research. In Singleton, D. and Lengyét, Z. (eds) *The age factor in second language acquisition*. Clevedon: Multilingual Matters.
- Skehan, P. 1986: Cluster analysis and the identification of learner types. In Cook, V.J. (ed.) *Experimental approaches to second language learning*. Oxford: Pergamon, 81–94.
- Skehan, P. 1989: *Individual differences in language learning*. London: Edward Arnold.
- Skehan, P. 2002: Theorising and updating aptitude. In Robinson, P. (ed.) *Individual differences and instructed language learning*. Amsterdam: John Benjamins, 69–94.
- Skehan, P. 2009: Modelling second language performance: integrating complexity, accuracy, fluency, and lexis. *Applied Linguistics* 30, 510–32.
- Skehan, P. 2012: Language aptitude. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 381–95.
- Skehan, P. and Foster, P. 2001: Cognition and tasks. In Robinson, P. (ed.) *Cognition and second language instruction*. Cambridge: Cambridge University Press, 183–205.
- Skinner, B.F. 1957: *Verbal behavior*. New York: Appleton-Century-Crofts.
- Slabakova, R. 2000: L1 transfer revisited: the L2 acquisition of telicity marking in English by Spanish and Bulgarian native speakers. *Linguistics* 38, 739–70.
- Slabakova, R. (ed.) 2009: The fundamental difference hypothesis twenty years later. Special issue of *Studies in Second Language Acquisition* 31.
- Slobin, D.I. 1970: Universals of grammatical development in children. In Flores d'Arcais, G. and Levelt, W. (eds) *Advances in psycholinguistics*. Amsterdam: North-Holland Publishing.

- Slobin, D.I. 1979: *Psycholinguistics*. Glenview, IL: Scott Foresman and Company.
- Slobin, D.I. 1996: From 'thought and language' to 'thinking for speaking'. In Gumperz, J. and Levinson, S. (eds) *Rethinking linguistic relativity: studies in the social and cultural foundations of language, Vol. 17*. Cambridge: Cambridge University Press, 70–96.
- Slobin, D.I. 2000: Verbalized events: a dynamic approach to linguistic relativity and determinism. In Niemeier, S. and Dirven, R. (eds) *Evidence for linguistic relativity*. Amsterdam: John Benjamins, 107–38.
- Slobin, D.I. 2004: The many ways to search for a frog: linguistic typology and the expression of motion events. In Strömquist, S. and Verhoeven, L. (eds) *Relating events in narrative: typological and contextual perspectives*. Mahwah, NJ: Lawrence Erlbaum, 219–57.
- Smith, N. 1999: *Chomsky: ideas and ideals*. Cambridge: Cambridge University Press.
- Smith, N. and Tsimpili, I. 1995: *The mind of a savant: language learning and modularity*. Oxford: Blackwell.
- Smith, N., Tsimpili, I., Morgan, G. and Woll, B. 2011: *The signs of a savant: language against the odds*. Cambridge: Cambridge University Press.
- Snyder, W. 2007: *Child language: the parametric approach*. Oxford: Oxford University Press.
- Sokolik, M. and Smith, M. 1992: Assignment of gender to French nouns in primary and secondary language: a connectionist model. *Second Language Research* 8, 39–58.
- Song, S. and Kellogg, D. 2011: Word meaning as a palimpsest: a defense of sociocultural theory. *Modern Language Journal* 95, 589–604.
- Sorace, A. 1996: The use of acceptability judgements in second language acquisition research. In Ritchie, W. and Bhatia, T. (eds) *Handbook of second language acquisition*. San Diego: Academic Press, 375–409.
- Sorace, A. 2005: Selective optionality in language development. In Cornips, L. and Corrigan, K. (eds) *Syntax and variation: reconciling the biological and the social*. Amsterdam: John Benjamins, 55–80.
- Sorace, A. 2011: Pinning down the concept of 'interface' in bilingualism. *Linguistic Approaches to Bilingualism* 1, 1–33.
- Sorace, A. and Filiaci, F. 2006: Anaphora resolution in near-native speakers of Italian. *Second Language Research* 22, 339–68.
- Sorace, A. and Serratrice, L. 2009: Internal and external interfaces in bilingual language development: beyond structural overlap. *International Journal of Bilingualism* 13, 1–16.
- Sorace, A., Heycock, C. and Shillcock, R. (eds) 1999: *Language acquisition: knowledge representation and processing*. Amsterdam: North-Holland.

SECOND LANGUAGE LEARNING THEORIES

- Spada, N. and Tomita, Y. 2010: Interactions between type of instruction and type of language feature: a meta-analysis. *Language Learning* 60, 263–308.
- Sparks, R. 2012: Individual differences in L2 learning and long term L1–L2 relationships. *Language Learning* 62 (Supplement 2), 5–27.
- Sparks, R. and Ganschow, L. 2007: Is the Foreign Language Classroom Anxiety Scale measuring anxiety or language skills? *Foreign Language Annals* 40, 260–87.
- Speciale, G., Ellis, N.C. and Bywater, T. 2004: Phonological sequence learning and short-term store capacity determine second language vocabulary acquisition. *Applied Psycholinguistics* 25, 293–320.
- Spolsky, B. 1989: *Conditions for second language learning*. Oxford: Oxford University Press.
- Stam, G.A. 2010: Can an L2 speaker's patterns of thinking for speaking change? In Han, Z. and Cadierno, T. (eds) *Linguistic relativity in SLA: thinking for speaking*. Bristol: Multilingual Matters, 59–83.
- Stefanowitsch, A. 2008: Negative entrenchment: a usage-based approach to negative evidence. *Cognitive Linguistics* 19, 513–31.
- Storch, N. 2002: Patterns of interaction in ESL pair work. *Language Learning* 52, 119–58.
- Strauss, S. 1995: Assessments as a window to socio-linguistic research: the case of Japanese, Korean and American English. In Tokunaga, M. (ed.) *Gengo-henyoo ni kan-suru taiketeiki kenkyuu oyobi sono nihongo kyoiku e no ooyoo*. Tokyo: Kanda University of Foreign Studies, 177–91.
- Stubbs, M. 1996: *Text and corpus analysis*. Oxford: Blackwell.
- Sunderland, J. 2000: Issues of language and gender in second and foreign language education. *Language Teaching* 33, 203–23.
- Sunderman, G. and Kroll, J.F. 2006: First language activation during second language lexical processing: an investigation of lexical form, meaning, and grammatical class. *Studies in Second Language Acquisition* 28, 387–422.
- Sunderman, G. and Kroll, J. 2009: When study abroad fails to deliver: the internal resources threshold effect. *Applied Psycholinguistics* 30, 79–99.
- Swain, M. 1985: Communicative competence: some roles of comprehensible input and comprehensible output in its development. In Gass, S.M. and Madden, C.G. (eds) *Input in second language acquisition*. Rowley, MA: Newbury House, 235–53.
- Swain, M. 1995: Three functions of output in second language learning. In Cook, G. and Seidlhofer, B. (eds) *Principle and practice in applied linguistics: studies in honour of H.G. Widdowson*. Oxford: Oxford University Press, 125–44.

- Swain, M. 2005: The Output Hypothesis: theory and research. In Hinkel, E. (ed.) *Handbook of research in second language teaching and learning*. Mahwah, NJ: Lawrence Erlbaum, 471–84.
- Swain, M. and Deters, P. 2007: 'New' mainstream SLA theory: expanded and enriched. *Modern Language Journal* 91, 820–36.
- Swain, M. and Lapkin, S. 1995: Problems in output and the cognitive processes they generate: a step towards second language learning. *Applied Linguistics* 16, 371–91.
- Swain, M. and Lapkin, S. 1998: Interaction and second language learning: two adolescent French immersion students working together. *Modern Language Journal* 82, 320–37.
- Swain, M., Brooks, L. and Tocalli-Beller, A. 2002: Peer–peer dialogue as a means of second language learning. *Annual Review of Applied Linguistics* 22, 171–85.
- Swain, M., Kinnear, P. and Steinman, L. 2011: *Sociocultural theory in second language education: an introduction through narratives*. Bristol: Multilingual Matters.
- Swain, M., Lapkin, S., Knouzi, I., Suzuki, W. and Brooks, L. 2009: Linguaging: university students learn the grammatical concept of voice in French. *Modern Language Journal* 93, 5–29.
- Sweetser, E. 1990: *From etymology to pragmatics: metaphorical and cultural aspects of semantic structure*. Cambridge: Cambridge University Press.
- Tagliamonte, S.A. 2006: *Analysing sociolinguistic variation*. Cambridge: Cambridge University Press.
- Taguchi, N. 2011: The effect of L2 proficiency and study-abroad experience on pragmatic comprehension. *Language Learning* 61, 904–39.
- Tajfel, H. 1974: Social identity and intergroup behavior. *Social Science Information* 13, 65–93.
- Talmy, L. 1985: Lexicalization patterns: semantic structure in lexical forms. In Shopen, T. (ed.) *Language typology and syntactic description: Volume 3, Grammatical categories and the lexicon*. Cambridge: Cambridge University Press, 36–149.
- Talmy, L. 2000: *Toward a cognitive semantics*. Cambridge, MA: MIT Press.
- Talmy, L. 2008: Aspects of attention in language. In Ellis, N.C. and Robinson, P. (eds) *Handbook of cognitive linguistics and second language acquisition*. Abingdon: Routledge, 27–38.
- Talmy, S. 2008: The cultural productions of ESL students at Tradewinds High: contingency, multidirectionality, and identity in L2 socialization. *Applied Linguistics* 29, 619–44.

SECOND LANGUAGE LEARNING THEORIES

- Tarone, E. 1988: *Variation in interlanguage*. London: Arnold.
- Terrell, T. 1991: The role of grammar instruction in a communicative approach. *The Modern Language Journal* 75, 52–63.
- Thomas, M. 1991: *Universal grammar and knowledge of reflexives in a second language*. Harvard University, Cambridge, MA: doctoral dissertation.
- Thomas, M. 2004: *Universal Grammar in second language acquisition: a history*. London: Routledge.
- Thordardottir, E., Weismer, S. and Evans, J. 2002: Continuity in lexical and morphological development in Icelandic and English-speaking 2-year-olds. *First Language* 22, 3–28.
- Thorndike, E. 1932: *The fundamentals of learning*. New York: Columbia Teachers College.
- Thorne, S.L. 2003: Artifacts and cultures of use in intercultural communication. *Language Learning and Technology* 7, 38–67.
- Thorne, S.L. 2008: Mediating technologies and second language learning. In Coiro, J., Knobel, M., Leu, D. and Lankshear, C. (eds) *Handbook of research on new literacies*. Mahwah, NJ: Lawrence Erlbaum, 415–48.
- Thorne, S.L. 2009: 'Community', semiotic flows, and mediated contribution to activity. *Language Teaching* 42, 82–94.
- Thorne, S.L. and Lantolf, J.P. 2006: A linguistics of communicative activity. In Makoni, S. and Pennycook, A. (eds) *Disinventing and reconstituting languages*. Clevedon: Multilingual Matters, 170–95.
- Thorne, S.L., Black, R.W. and Sykes, J.M. 2009: Second language use, socialization, and learning in internet interest communities and online gaming. *Modern Language Journal* 93, 802–21.
- Tokowicz, N. and MacWhinney, B. 2005: Implicit and explicit measures of sensitivity to violations in second language grammar: an event-related potential investigation. *Studies in Second Language Acquisition* 27, 173–204.
- Tolentino, L. and Tokowicz, N. 2011: Across languages, space, and time: a review of the role of cross-language similarity in L2 morphosyntactic processing as revealed by fMRI and ERP methods. *Studies in Second Language Acquisition* 33, 91–125.
- Tomasello, M. 2003: *Constructing a language: a usage-based theory of language acquisition*. Cambridge, MA: Harvard University Press.
- Tomlin, R.S. and Villa, V. 1994: Attention in cognitive science and second language acquisition. *Studies in Second Language Acquisition* 16, 183–203.
- Toohy, K. 2000: *Learning English at school: identity, social relations and classroom practice*. Clevedon: Multilingual Matters.
- Toohy, K. 2001: Disputes in child L2 learning. *TESOL Quarterly* 35, 257–78.

- Toohy, K. and Norton, B. 2001: Changing perspectives on good language learners. *TESOL Quarterly* 35, 307–22.
- Towell, R. and Hawkins, R. 1994: *Approaches to second language acquisition*. Clevedon: Multilingual Matters.
- Towell, R. and Hawkins, R. 2004: Empirical evidence and theories of representation in current research in Second Language Acquisition. *Transactions of the Philological Society* 102, 131–7.
- Tran-Chi-Chau, 1975: Error analysis, contrastive analysis and students' perception: a study of difficulty in second language learning. *International Review of Applied Linguistics* 13, 119–43.
- Trofimovich, P., Ammar, A. and Gatbonton, E. 2007: How effective are recasts? The role of attention, memory, and analytical ability. In Mackey, A. (ed.) *Conversational interaction in second language acquisition*. Oxford: Oxford University Press, 171–96.
- Trude, A. and Tokowicz, N. 2011: Negative transfer from Spanish and English to Portuguese pronunciation: the roles of inhibition and working memory. *Language Learning* 61, 259–80.
- Truscott, J. 1999: What's wrong with oral grammar correction. *The Canadian Modern Language Review* 55, 437–55.
- Truscott, J. and Sharwood Smith, M. 2004: Acquisition by processing: a modular perspective on language development. *Bilingualism: Language and Cognition* 7, 1–20.
- Truscott, J. and Sharwood Smith, M. 2011: Input, intake, and consciousness – the quest for a theoretical foundation. *Studies in Second Language Acquisition* 33, 497–528.
- Tsimpli, I. and Dimitrakopoulou, M. 2007: The interpretability hypothesis: evidence from wh-interrogatives in second language acquisition. *Second Language Research* 23, 215–42.
- Tsimpli, I. and Sorace, A. 2006: Differentiating interfaces: L2 performance in syntax-semantics and syntax-discourse phenomena. In Bamman, D., Magnitskaia, T. and Zaller, C. (eds) *Proceedings of the 30th Annual Boston University Conference on Language Development (BU)*. Somerville, MA: Cascadilla Press, 653–64.
- Turley-Ames, K.J. and Whitfield, M.M. 2003: Strategy training and working memory past performance. *Journal of Memory and Language* 49, 446–68.
- Tyler, A. 2008: Cognitive linguistics and second language instruction. In Robinson, P. and Ellis, N.C. (eds) *Handbook of cognitive linguistics and second language acquisition*. Abingdon: Routledge, 456–89.
- Tyler, A. 2012: *Cognitive linguistics and second language learning: theoretical basics and experimental evidence*. Abingdon: Routledge.

SECOND LANGUAGE LEARNING THEORIES

- Ullman, M. 2001a: The neural basis of lexicon and grammar in first and second language: the declarative/procedural model. *Bilingualism: Language and Cognition* 4, 105–22.
- Ullman, M. 2001b: A neurocognitive perspective on language: the declarative/procedural model. *Nature Reviews/Neuroscience* 2, 717–26.
- Ullman, M. 2004: Contributions of memory circuits to language: the declarative/procedural model. *Cognition* 92, 231–70.
- Ullman, M. 2005: A cognitive neuroscience perspective on second language acquisition: the declarative/procedural model. In Sanz, C. (ed.) *Mind and context in second language acquisition*. Georgetown: Georgetown University Press.
- Ullman, M. 2006: The declarative/procedural model and the shallow structure hypothesis. *Applied Psycholinguistics* 27, 97–105.
- Ushioda, E. 2009: A person-in-context relational view of emergent motivation, self and identity. In Dörnyei, Z. and Ushioda, E. (eds) *Motivation, language identity and the L2 self*. Bristol: Multilingual Matters, 215–28.
- Ushioda, E. and Dörnyei, Z. 2012: Motivation. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge, 396–409.
- Vainikka, A. and Young-Scholten, M. 1996a: The early stages in adult L2 syntax: additional evidence from Romance speakers. *Second Language Research* 12, 140–76.
- Vainikka, A. and Young-Scholten, M. 1996b: Gradual development of L2 phrase structure. *Second Language Research* 12, 7–39.
- Vainikka, A. and Young-Scholten, M. 1998: The initial state in the L2 acquisition of phrase structure. In Flynn, S., Martohardjono, G. and O'Neil, W. (eds) *The generative study of second language acquisition*. Mahwah, NJ: Lawrence Erlbaum, 17–34.
- Vainikka, A. and Young-Scholten, M. 2007: Minimalism vs. organic syntax. In Karimi, S., Samian, V. and Wilkins, W. (eds) *Phrasal and clausal architecture: syntactic derivation and interpretation. In honor of Joseph Emonds*. Amsterdam: John Benjamins, 319–38.
- Vainikka, A. and Young-Scholten, M. 2011: *The acquisition of German: introducing organic grammar*. Berlin: De Gruyter Mouton.
- van der Lely, H. 1998: Guest Editor: Special Issue on Specific Language Impairment. *Language Acquisition* 7.
- Van Lier, L. 1994: Forks and hope: pursuing understanding in different ways. *Applied Linguistics* 15, 328–46.
- VanDen Noort, M., Bosch, P. and Hugdahl, K. 2006: Foreign language proficiency and working memory capacity. *European Psychologist* 11, 289–96.

- VanPatten, B. 2002: Processing instruction: an update. *Language Learning* 52, 755–803.
- VanPatten, B. 2004: Input processing in SLA. In VanPatten, B. (ed.) *Processing instruction: theory, research, and commentary*. Mahwah, NJ: Lawrence Erlbaum Associates, 5–32.
- VanPatten, B. 2007: Input processing in second language acquisition. In VanPatten, B. and Williams, J. (eds) *Theories in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum, 115–36.
- VanPatten, B. 2012: Input processing. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge.
- VanPatten, B. and Williams, J. 2007: Introduction: the nature of theories. In VanPatten, B. and Williams, J. (eds) *Theories in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum, 1–16.
- Vargha-Khadem, F. and Liegeois, F. 2007: From speech to gene: the KE family and the FOXP2. *Advances in Consciousness Research* 68, 137–48.
- Vendler, Z. 1967: Verbs and times. In Vendler, Z. (ed.) *Linguistics and philosophy*. Ithaca, NY: Cornell University Press, 97–121.
- Verspoor, M.H. and Tyler, A. 2009: Cognitive linguistics and second language learning. In Ritchie, W.C. and Bhatia, T.K. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 160–80.
- Vickers, C.H. 2007: Second language socialization through team interaction among electrical and computer engineering students. *Modern Language Journal* 91, 621–40.
- Vihmann, M. 2009: Word learning and the origins of phonological systems. In Foster-Cohen, S. (ed.) *Language acquisition*. Basingstoke: Palgrave Macmillan, 15–39.
- Vygotsky, L.S. 1962: *Thought and language*. Cambridge, MA: MIT Press.
- Vygotsky, L.S. 1978: *Mind in society: the development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Vygotsky, L.S. 1987: *The collected works of L.S. Vygotsky: Volume 1, Thinking and speech*. New York: Plenum Press.
- Walter, C. 2004: Transfer of reading skills to L2 is linked to mental representations of text and to L2 working memory. *Applied Linguistics* 25, 315–39.
- Wardhaugh, R. 2010: *An introduction to sociolinguistics*. 6th edition. Malden, MA: Wiley-Blackwell.
- Watson, J. 1924: *Behaviorism*. New York: Norton.
- Watson-Gegeo, K.A. 2004: Mind, language, and epistemology: toward a language socialization paradigm for SLA. *Modern Language Journal* 88, 331–50.

SECOND LANGUAGE LEARNING THEORIES

- Watson-Gegeo, K.A. and Nielsen, S. 2003: Language socialisation in SLA. In Doughty, C. and Long, M.H. (eds) *Handbook of second language acquisition*. Oxford: Blackwell, 155–77.
- Weissenborn, J. 1992: Null subjects in early grammars: implications for parameter-setting theories. In Weissenborn, J., Goodluck, H. and Roeper, T. (eds) *Theoretical issues in language acquisition: continuity and change in development*. Hillsdale, NJ: Lawrence Erlbaum.
- Wells, G. 1999: *Dialogic inquiry: toward a sociocultural practice and theory of education*. Cambridge: Cambridge University Press.
- Wells, G. 2009: *The meaning makers: learning to talk and talking to learn*. 2nd edition. Bristol: Multilingual Matters.
- Wen, Z. 2012: *Working memory and second language learning*. Bristol: Multilingual Matters.
- Wenger, E. 1998: *Communities of practice: learning, meaning, and identity*. Cambridge: Cambridge University Press.
- Wertsch, J.V. 1985: *Vygotsky and the social formulation of mind*. Cambridge, MA: Harvard University Press.
- Wertsch, J.V. 1995: The need for action in sociocultural research. In Wertsch, J.V., Del Río, P. and Alvarez, A. (eds) *Sociocultural studies of mind*. Cambridge: Cambridge University Press, 56–74.
- Wertsch, J.V. 1998: *Mind as action*. Oxford: Oxford University Press.
- Wertsch, J.V. 2007: Mediation. In Daniels, H., Cole, M. and Wertsch, J.V. (eds) *The Cambridge companion to Vygotsky*. Cambridge: Cambridge University Press, 178–92.
- Wertsch, J.V., Del Río, P. and Alvarez, A. (eds) 1995: *Sociocultural studies of mind*. Cambridge: Cambridge University Press.
- White, J. 1996: *An input enhancement study with ESL children: effects on the acquisition of possessive determiners*. PhD dissertation, McGill University.
- White, L. 1989: *Universal grammar and second language acquisition*. Amsterdam: John Benjamins.
- White, L. 1992: Long and short verb movement in second language acquisition. *Canadian Journal of Linguistics* 37, 273–86.
- White, L. 2003: *Second language acquisition and Universal Grammar*. Cambridge: Cambridge University Press.
- White, L. 2007: Linguistic theory, Universal Grammar, and SLA. In VanPatten, B. and Williams, J. (eds) *Theories in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum, 37–55.
- White, L. 2009a: Grammatical theory: interfaces and L2 knowledge. In Ritchie, W. and Bhatia, T. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 49–68.

- White, L. 2009b: Some questions about feature re-assembly. *Second Language Research* 25, 343–8.
- White, L., Travis, L. and MacLachlan, A. 1992: The acquisition of wh- question formation by Malagasy learners of English: evidence for universal grammar. *Canadian Journal of Linguistics* 37, 341–68.
- Whong, M. 2011. *Language teaching: linguistic theory in practice*. Edinburgh: Edinburgh University Press.
- Wickens, C. 2007: Attention to the second language. *International Review of Applied Linguistics* 45, 177–91.
- Wilkinson, S. 2002: The omnipresent classroom during summer study abroad: American students in conversation with their French hosts. *Modern Language Journal* 86, 157–73.
- Williams, G. 2008: Language socialization: a systemic functional perspective. In Duff, P.A. and Hornberger, N.H. (eds) *Encyclopedia of language and education: Volume 8, Language socialization*. New York: Springer, 57–70.
- Williams, J.N. 1999: Learner-generated attention to form. *Language Learning* 49, 583–625.
- Williams, J.N. 2004: Implicit learning of form-meaning connections. In VanPatten, B., Williams, J., Rott, S. and Overstreet, M. (eds) *Form-meaning connections in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum Associates, 203–18.
- Williams, J.N. 2005: Learning without awareness. *Studies in Second Language Acquisition* 27, 269–304.
- Williams, J.N. 2009: Implicit learning in second language acquisition. In Ritchie, W.C. and Bhatia, T.K. (eds) *The new handbook of second language acquisition*. Bingley: Emerald Group, 319–53.
- Williams, J.N. 2010: Initial incidental acquisition of word order regularities: is it just sequence learning? *Language Learning* 60 (Supplement 2), 221–44.
- Williams, J.N. 2012: Working memory and SLA. In Gass, S.M. and Mackey, A. (eds) *The Routledge handbook of second language acquisition*. Abingdon: Routledge.
- Williams, J.N. and Kuribara, C. 2008: Comparing a nativist and emergentist approach to the initial stage of SLA: an investigation of Japanese scrambling. *Lingua* 118, 522–53.
- Williams, J.N. and Lovatt, P. 2003: Phonological memory and rule learning. *Language Learning* 53, 67–121.
- Williams, M. and Burden, R.L. 1997: *Psychology for language teachers*. Cambridge: Cambridge University Press.

SECOND LANGUAGE LEARNING THEORIES

- Wode, H. 1976: Developmental sequences in naturalistic L2 acquisition. In Hatch, E. (ed.) *Second language acquisition*. Rowley, MA: Newbury House, 101–17.
- Wode, H. 1981: *Learning a second language*. Tübingen: Gunter Narr Verlag.
- Wood, D., Bruner, J. and Ross, G. 1976: The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry* 17, 89–100.
- Wray, A. 2002: *Formulaic language and the lexicon*. Cambridge: Cambridge University Press.
- Wray, A. 2008: *Formulaic language: pushing the boundaries*. Oxford: Oxford University Press.
- Wu, S.-L. 2011: Learning to express motion events in an L2: the case of Chinese directional complements. *Language Learning* 61, 414–54.
- Wulff, S., Ellis, N.C., Römer, U.T.E., Bardovi-Harlig, K. and Leblanc, C.J. 2009: The acquisition of tense-aspect: converging evidence from corpora and telicity ratings. *Modern Language Journal* 93, 354–69.
- Yang, Y. and Lyster, R. 2010: Effects of form-focused practice and feedback on Chinese EFL learners' acquisition of regular and irregular past tense forms. *Studies in Second Language Acquisition* 32, 235–64.
- Year, J. and Gordon, P. 2009: Korean speakers' acquisition of the English ditransitive construction: the role of verb prototype, input distribution, and frequency. *Modern Language Journal* 93, 399–417.
- Yoshida, R. 2010: How do teachers and learners perceive corrective feedback in the Japanese language classroom? *Modern Language Journal* 94, 293–314.
- Young, R. 1991: *Variation in interlanguage morphology*. New York: Peter Lang.
- Yuan, B. 2001: The status of thematic verbs in the second language acquisition of Chinese. *Second Language Research* 14, 248–72.
- Zinchenko, V.P. 1995: Cultural-historical psychology and the psychological theory of activity: retrospect and prospect. In Wertsch, J.V., Del Río, P. and Alvarez, A. (eds) *Sociocultural studies of mind*. Cambridge: Cambridge University Press, 37–55.
- Zobl, H. 1980: The formal and developmental selectivity of L1 influence on L2 acquisition. *Language Learning* 30, 43–57.
- Zobl, H. 1995: Converging evidence for the 'acquisition-learning' distinction. *Applied Linguistics* 16, 35–56.

Subject index

- A over A condition 71
acculturation theory 46, 52
acquisition-learning hypothesis 2, 40–2
active/passive/middle voice 232
activity theory 56, 226–7, 232–5; and
internet communication 234–5; and
L2 vocabulary acquisition 233–4
adult learners 12, 15, 16, 39, 40, 90, 93,
109, 129, 164, 176, 181, 190, 196, 211,
218, 230, 266–7, 271–2
affect in L2 use 280–1
Affective Filter Hypothesis 45–6
age 20; critical 20
agency, learner 25, 58
anxiety, language 24
appropriation 228, 236, 246, 266
aptitude, language 21
Arabic language 201–2, 214
Aspect Hypothesis 203–6, 217, 218
associative learning 103–14, 128, 130;
attention blocking 105; construction
learning 108–9; and frequency 104;
implicit learning of form-meaning
connections 110–14; overshadowing
103, 104–5; statistical learning and
connectionist accounts 106–8
associative-cognitive CREED 103
attention 146–51; allocation of during
L2 performance in production
150–1; and incidental attention to
form 149–50; *see also* noticing
attention blocking 105–6
attention control 182
attitudes, language 22
audiolingualism 51
autobiographical narrative 279–80
automaticity 110–11
automatized knowledge 140–1, 145
Autonomous Induction theory 58, 115
awareness 146–51
Basic Variety 56, 197–8, 217, 218, 287;
constraints on 198–9
behaviourist learning theory 10, 13, 16,
17, 21, 28–31, 47, 50
Bilingual Syntax Measure 37, 39
bilingualism 55, 59, 155
biological foundation of language 51,
68
brain: relationship between language
and 66–8
Broca's aphasia 67
Burmese language 80
Cantonese language 94, 275, 278
child language 8, 10, 14, 15, 30–5, 36,
51, 65–7, 68, 208, 251, 288
CHILDES project 8, 288
Chinese language 37, 38, 75, 86, 252–3,
255, 258–9
Chomskyan linguistics 8, 9, 27, 30–1,
47, 49, 51, 61, 185, 186, 246–7
chunk use 15
clarification checks 162
clarification requests 48, 160
classroom-based learning 21, 24, 42;
discourse 219, 264; instruction
99, 148; language socialization in
L2 263–9; peer interaction 241–3;
routines 266–8; teacher mediation
in L2 236–9
clefting 9
code switching 189, 278
Cognition Hypothesis 150
cognitive deficits 66–7
cognitive linguistics 206–10, 245, 291
cognitive theory of language learning
30, 49, 98–129, 243, 286; and
classroom research 129; evaluation
of 125–9, 156–9; general, implicit
learning mechanisms 98–129;

SECOND LANGUAGE LEARNING THEORIES

- cognitive theory of language learning
– *contd*
input-based emergentist
perspectives 99–114; modularity vs.
unitary views of 11–12; processing-
based perspectives 114–24; role of
memory systems and conscious
learning 130–59
- cognitive psychology 27, 47, 54, 103
- communicative approach 45
- communicative needs 15, 49, 200, 216,
218–19
- communicative pressure 193
- communities of practice 269–75
- competence: and Universal Grammar
64–5; vs. performance 7–8, 17, 247,
248
- Competition Model 102–3
- complexity theory 9, 98, 288
- Comprehensible Input Hypothesis 17,
44
- Comprehensible Output Hypothesis 17
- comprehension checks 162
- computer-aided techniques 288
- computer-mediated communication
170, 233
- computer modelling 56, 106–8, 127,
286
- concept-based instruction 60, 244–5,
249, 291
- confirmation checks 48, 160, 162
- connectionism 12, 56, 106–8, 125, 126,
286; computer modelling 106, 127,
286
- conscious awareness *see* noticing
- conscious learning 156–9
- consciousness 110
- Conservative Analysis 36
- constructionism/constructionist 55,
103, 108–9, 144
- Constructive Analysis (CA) 29–30
- Continuity Hypothesis 134
- Contrastive Analysis 35, 40, 50, 53
- conversation analysis (CA) 5, 211,
250–1, 285
- corpus linguistics 8, 9, 15
- creativity 14–15, 30
- creolization 46, 52
- Critical Period Hypothesis 55, 58, 68–9,
87, 90
- culture: developmental links between
language and 261–3
- Czech language 276
- declarative knowledge 140, 141–4, 145,
156, 168–9
- declarative memory 59, 127, 131–3
- Default Past Tense hypothesis 205
- detection 147
- Detroit African-American speech
253–4
- developmental sequences 84, 165, 186,
213, 252, 290; *see also* Basic Variety;
morpheme studies
- Discourse Completion Task 211
- Distributional Bias Hypothesis 205
- double stimulation 225
- Dutch language 196, 208
- dynamic assessment 60, 240–1
- effect sizes 166
- Efficiency-Driven Processor (EDP) 99,
120–5, 128; Efficiency Requirement
121; empirical research on SLA and
124; and first language acquisition
122–3; and other L2 theories 125;
and working memory 121–2
- egocentrism 225
- emergentism 59, 60, 90–1, 99–114, 123,
126, 127, 128, 130, 188, 286; input-
related factors 99–103; learner-
related factors 103–14
- emotion 45
- English as a lingua franca (ELF) 9, 23
- English as a Second Language (ESL) 85
- entrenchment 105

- environmental language 10, 11, 30, 48, 98, 163
- Error Analysis 35–6
- errors 13, 28, 51, 52, 168; and feedback 57, 168–74
- ethnography of communication 57, 269–70, 282
- European Science Foundation (ESF) project 56, 188, 195–201, 218, 247, 287; aims and findings 196–8; constraints on the Basic Variety 198–9; development beyond the Basic Variety 200–1
- Event Related Potentials (ERPs) 59, 111, 133
- explicit knowledge 136–42, 156; and Skill Acquisition Theory 139–42; defining and measuring 136–9; experimental laboratory and classroom research into role of 143–4
- Failed Functional Features Hypothesis 93
- feature checking 76
- Feature Reassembly Hypothesis 94
- feedback 168–75, 180, 186; negative 163, 178, 179; and noticing 179–82; Output Hypothesis and role of prompts in corrective 175–9; regulatory scale for error 237; use of stimulated recall and learners' perceptions of 180–1
- Fijian language 80
- finite utterance organization (FUO) 197, 200
- Finnish language 16, 196
- first language, role of the 49
- first language acquisition *see* L1 acquisition
- fluency 18, 43, 143, 150, 157
- fMRI (functional Magnetic Resonance Imaging) 59
- focalization devices 200
- Foreign Language Classroom Anxiety Scale 24
- form-meaning connection: implicit learning of 110–14, 126
- form-to-function analysis 191–5
- formalist model 8–9
- formulaic sequence 15
- fossilization 15–16, 142, 158
- free variation 252
- French language 14, 23, 29, 35, 81–2, 84–5, 88–9, 208, 232, 243–4, 256–7, 274, 280–2
- frequency 104
- fringe consciousness 110
- functional categories *see* Universal Grammar
- functional Magnetic Resonance Imaging (fMRI) 59
- functionalism 8–9, 49, 52, 56, 188, 261, 286–7; Aspect Hypothesis 203–6, 217, 218; early studies of L2 learning 189–95; and European Science Foundation project 195–201; evaluation 216–19; form-to-function analysis 191–5; and interlanguage 189, 191–2, 216–17; on the language learner 218–19; on language learning and development 217–18; past time reference 195; and pragmatics 195, 210–16; propositional encoding 194–5; scope and achievements of 216; and thinking for speaking 206–10, 216, 218; and time talk 201–3
- Fundamental Difference Hypothesis 55, 130, 135
- future time *see* temporality
- gender 25, 257, 258, 259, 279–80, 284
- general model of second language learning 3–5
- generative linguistics 30, 53, 58, 65, 69, 73

SECOND LANGUAGE LEARNING THEORIES

- German language 53, 118–19
Gilbertese language 80
grammaticality judgement tests 7, 93,
95–6, 110–11, 137, 172, 173, 174, 285
grammar *see* syntax/syntacticization;
Universal Grammar
- habits 28, 29, 50
head parameter 73–5, 84–5
head-first language 74
head-last language 74
history of second language learning
research 27–60
Hmong language 191–2
honorifics 167
- identity 25, 276–80; and adolescent
L2 learners 277–9; adult
transformations 276–7; definition
276; and motivation 23
immersion programmes 48, 54, 57,
169–70, 175, 243–4, 256–7, 266
implicit knowledge 136–7, 138
implicit learning 126, 147–8; of form-
meaning connections 110–14; and
noticing 147–8
Implicit Tallying Hypothesis 147
incidental attention to form 149–50
incomplete success 15–16
infinite utterance organization (IUO)
see Basic Variety
Inflection Phrase (IP) 76, 82, 85–6
information processing 12, 18, 47–8,
54, 139, 285; empirical research
linked to 142–6; and learning
strategies 144–6; *see also* Skill
Acquisition Theory
Initial State 86–7
innate mechanisms for language
learning 10–11, 31, 47, 51, 63, 65, 68,
69, 104, 125, 128, 185
inner speech 56, 226
input 17
input-based emergentism 99–114,
123
Input Hypothesis 44, 46, 48, 54, 160,
184, 185, 186, 290
Input Processing Theory 56, 180, 218
instructed language learning 25, 291
interaction 18, 160–87, 287; evaluation
183–7; and L2 acquisition 163–8;
and language learner 186–7; learner
characteristics and engagement
182–3; and nature of language
185–6; and nature of learning 186;
and noticing 186; and Output
Hypothesis 161, 175–9, 184; and
problem of ‘noticing’ 179–82; and
psycholinguistic view 18; role of
feedback 168–75; and sociolinguistic
view 18, 19; and stimulated recall
180–1, 187; and Working Memory
154, 159
Interaction Hypothesis 48, 160, 161,
162–3, 168, 179, 184, 185, 186
Interface Hypothesis 89
interlanguage 13, 16, 36, 43, 49, 51, 188,
287, 290; definition 9; and European
Science Foundation project 195–
201; and functionalism 189, 191–2,
216–17; and sociolinguistics 287–8;
and time talk 201–2; and variability
252, 253, 256–60
internal mechanisms *see* innate
mechanisms
internet communication: and activity
theory 234–5
Interpretability Hypothesis 93
interrogatives 33, 40, 71, 83
Isomorphic Mapping Hypothesis 124
Italian language 88, 102
- Japanese language 59, 72, 74, 80, 85, 91,
209, 230–1, 242–3, 266–7
- Kaluli language 262

- knowledge: distinction between declarative and procedural 47, 130–1, 140–1; distinction between implicit and explicit 52; and learning 137
 knowledge of language 62–5
 Korean language 93, 166–7, 209, 229–30
 L1 acquisition 31–5, 52, 55, 98; and Efficiency-Driven Processor 122–3; influence on L2 learning 16–17; and Universal Grammar 65–9
 L2 motivational self system model 23, 60
 language: levels of 6–7
 Language Acquisition Device (LAD) 45, 47, 286
 language attitudes 22
 language education: and second language learning research 289–91
 language learning process 10–19
 language learning strategies 22, 144–6
 language play 228
 language processing 57, 59, 98, 99, 106, 110, 116, 161, 285
 language related episodes (LREs) 244
 language socialization 260–9, 283; developmental links between language and culture 261–3; in the L2 classroom 263–9
 language stages 31–4
 language teaching 13, 26, 28, 35, 42, 51, 58, 156, 287–8, 289–90
 language transfer 16–17, 44, 49, 96
 languaging 176, 232, 241–6
 Lao language 191, 192
 Latin 105
 learner-related factors *see* associative learning
 lexical categories *see* Universal Grammar
 Lexical Functional Grammar (LFG) 115–16
 Lexical Parameterization Hypothesis 76
 life histories 279–80
 linguistic research, aims of 61, 62–5
 linguistics 20, 30; *see also* sociolinguistics
 literacy skills: as predictors of L2 aptitude 21, 24
 long-term memory 152
 manipulation 231
 markedness 54
 markers 253
 meaning-based perspectives 188–219
 mediation 221–2, 235–9, 247; teacher mediation in L2 classroom 236–9
 memory/memory system 21, 31–6, 127, 156–9; declarative-procedural model 59, 127, 131–3; evaluation of 156–9; long-term 152; online L2 processing of morphosyntax 133–6; role of biologically driven changes in 131–3; short-term to long-term 47, 54; *see also* Working Memory
 meta-analysis 100
 metalinguistic knowledge 137, 138–9
 metaphor 5, 206
 microgenesis 56, 224–5, 236, 238–9
 migrants 49, 118, 189, 192, 196, 273–4, 280, 281, 283
 Minimal Trees approach 57, 92
 Minimalist Program 58, 62–3, 69, 87–8; parameters in 75–7
 modality 126, 150, 189, 201
 Modern Language Aptitude Test (MLAT) 21
 modularity: and L2 learning 12; vs. unitary views of cognition 11–12
 Modulated Structure Building model 59
 MOGUL (Modular On-Line Growth and Use of Language) 60, 285
 Monitor Hypothesis 42–3

SECOND LANGUAGE LEARNING THEORIES

- Monitor Model 37, 41–6, 53
Morpheme Acquisition Orders 43
morpheme studies 32, 36–41, 52, 102
morphology 6, 58, 88, 94, 103, 105, 118, 202
morphosyntax 150, 168, 216; online processing of 133–6
motivation 22–3, 26, 51, 280;
 components of 23; and identity 23;
 integrative and instrumental 23, 51;
 and L2 motivational self system 60
Move α 71
multi-propositional utterances (MPUs) 194
multicompetence 9
multilingualism 9, 17
- Natural Order Hypothesis 43–4
naturalistic language learning 42, 45, 113, 118, 193, 196, 203–4, 216, 227, 242, 285, 289
nature–nurture debate 10–11
negation 13, 14, 33, 43, 77, 90, 251
negative evidence 18–19, 161, 163, 168, 179
negative feedback 163, 178, 179
negotiation of meaning 18, 48, 160, 161, 184, 233, 236
nominal utterance organization (NUO) 197
noticing 55, 146–50, 182–3, 186;
 interaction and problems of 179–82;
 links to learning 148–9
Noticing Hypothesis 147
- object-regulation 229
ontogenesis 224–5
operating principles 34–5, 47
optionality 87
order of acquisition 32, 41; *see also*
 developmental sequences
other-regulation 222
output 17, 18, 54
- Output Hypothesis 48, 161, 179, 184;
 and role of prompt in corrective feedback 175–9
overshadowing 103, 104–5
- parameters *see* Universal Grammar
parataxis/syntacticization 192–3, 194, 217
parsing 21, 44, 115, 142, 186
partial span scoring 152
passive sentences 71
past tense acquisition: and Aspect Hypothesis 203–6
past time reference 193–4, 195
peer-to-peer dialogue 241–4
perceptual saliency 100, 101, 119
performance: vs. competence 7–8, 17, 247, 248
phonological short-term memory 151, 152–3, 154
phonology 6, 7, 12, 58
phrase structure 77–82
phylogenesis 224–5
pidgin languages 46, 52, 252
pidginization 46, 52
Plato's problem 30–1
Polish language 271, 272
Portuguese language 118, 146
positive evidence 18, 161, 168
postmodernism 289
poststructuralism 25
power relations 25, 273–4
pragmalinguistics 210
pragmatic constraints 198–9
Pragmatic Expansion 213
pragmatics 7, 52, 59, 210–15, 218, 287;
 vs. syntactic modes of expression 189–90, 192
prefabrication 15
prepositions 32, 121, 207, 237
Principal Components Analysis 138
Principles and Parameters' model 47

- private speech 56, 59, 225–6, 227–32, 244, 245, 247
- pro-drop language 88
- proceduralized knowledge 47, 130–1, 139–40, 143, 145
- Processability Theory 44, 99, 115–20; computational mechanisms 116; feature unification 116–17; Hypothesis Space 116–17, 120
- processing-based perspectives 114–24
- processing capacity 163
- processing constraints 99
- Processing Instruction 150, 290
- prompts 161, 171, 175–9
- pronoun system 30, 35, 66, 84–5, 89, 122, 200, 262, 263
- property theory 3, 61, 95, 99, 108, 125, 248
- propositions 193; encoding of 194–5
- prototypicality 109
- psycholinguistics 15–16, 18–19, 20, 27
- psychological variables 50
- psychology 30
- Punjabi 196, 197, 271
- reading span 152
- recasts 57, 161, 170–1, 174, 179, 181
- reflection time 112
- reflexive pronouns 66, 93
- regulation 56; other- 222; self- 222, 227–9, 235, 237, 239, 248
- relative clauses 40, 43, 54, 71, 122, 134, 166, 167, 195, 260
- repair 170, 179, 236, 242
- Representational Deficit Hypothesis 93
- repetition 48, 160, 230
- requests: development of 212–15
- routines 14–15
- Russian language 92
- saliency *see* perceptual saliency
- satellite-framed languages 208–9
- scaffolding 56, 222–3, 224
- second language learning research: future directions 288–9; and language education 289–91; main achievements of recent 286–8
- selective attention 163
- self-confidence 24
- self-monitoring 180
- self-regulation 222, 227–9, 235, 237, 239, 248
- self-report procedures 148–9
- semantic propositions 193
- semantics 6, 8, 96, 135, 206, 208, 232
- Shallow Structure Hypothesis 134–5
- short-term memory, phonological 151, 152–3, 154
- simple recurrent network (SRN) 106
- simplification 253
- situated second language learning 269–75
- Skill Acquisition Theory 60, 136, 143–4, 154, 156, 157, 158; experimental laboratory and classroom research 143–4
- social class 25
- social identity *see* identity
- social turn 24, 27, 57, 247, 260, 289
- socialization *see* language socialization
- sociocultural theory 5, 26, 56, 60, 220–49, 287; activity theory 56, 226–7, 232–5; applications of to second language learning 227–46; and dynamic assessment 240–1; evaluation 246–9; languaging 241–6; mediation and mediated learning 221–2, 235–9; microgenesis 56, 224–5, 236, 238–9; ontogenesis 224–5; peer interaction in the classroom 241–4; phylogenesis 224–5; private and inner speech 225–6, 227–32, 244, 245, 247; scaffolding 222–3, 224; scope of research 246–8; view of language 248; view of language learning 248–9; Zone of Proximal Development (ZPD) 223–4, 235–46

SECOND LANGUAGE LEARNING THEORIES

- sociolinguistics 9, 16, 56, 57, 250–84;
accounts of the L2 learner 283–4;
communities of practice and
situated second language learning
269–75; and conversation analysis
(CA) 250–1; evaluation of 282–4;
and identity 276–9; and interaction
18, 19; second language socialization
260–9; and variability in second
language use 251–60, 282; view
of interlanguage 287–8; view on
language learning and development
283
- Spanish language 36, 37, 38, 88, 92, 203,
205, 233, 240, 245
- spatial location 201
- Specific Language Impairment (SLI)
67
- speech acts 210, 211
- speech community 19, 46, 253, 269
- speech events 269, 270
- speech production 179–80
- Standard English 191
- statistical learning 12, 106–8, 127, 128
- stimulated recall 180–1, 187
- structuralism 8, 28
- structuralist linguistics 7, 30
- structure-dependency principle 70–1,
73, 84, 122–3
- subjacency principle 91, 93
- Swahili language 77, 233
- Swedish language 16, 263–6
- syntax/syntacticization 6, 52, 58, 95,
134, 189–90, 192–3, 194, 217, 218
- systematicity 13–14, 14, 40, 43
- task-based learning 25
- Teachability Hypothesis 119–20, 290
- temporality 201, 217; future time
reference 189; lexical stage 201;
morphological stage 201; past time
reference 193–4; pragmatic stage
201
- theme-rheme 190
- theory: definition 2–3
- theory of mind 235
- think-aloud technique 154
- thinking for speaking hypothesis
206–10, 216, 218
- time talk 201–3
- Trade-off Hypothesis 150
- transfer *see* language transfer
- transition theories 3, 98–9
- transnational student communities
272–3
- Turkish language 80, 209
- typological universals 54
- Unified Competition Model 102
- Universal Grammar (UG) 10, 11, 12, 17,
47, 51, 55, 57, 61–97, 130, 285, 286; A
over A condition 71; aims of 62–5;
and competence 64–5; evaluation
94–7; functional categories 72–3, 82,
85, 87–8, 92; inflection phrase 76,
85–6; Initial State 86–7; interfaces
88–9; and L1 acquisition 65–9,
77–82; and L2 acquisition 89–94;
not UG-constrained 64, 83, 90–1;
UG-constrained 64, 83; full transfer/
full access 91–2; full/direct access
64, 83, 91, 115; partial access 64,
83, 92–4; and L2 grammars 64;
lexical categories 62–3, 72, 73, 82,
92; Minimalist Program 75–7, 87–8;
and move α 71; parameter-setting
77–82, 84–9; phrase structure 77–82;
principles 69–73; verb-raising 86
- uptake 57, 179, 180
- usage-based theory 227, 248
- utterances 193, 217, 229;
developmental levels 197–8
- Valueless Features Hypothesis 92
- VARBRUL 56, 254–5, 258, 259

- variability 13–14; external/social 252, 253; and interlanguage 252, 253, 256–60; internal/linguistic 252; quantifying L2 253–6; quantitative studies of 253; and sociolinguistics 251–60; and VARBRUL tool 254–5
 verb-argument constructions (VACs) 109
 verb morphology 105, 196, 201, 202, 202–3, 203, 206, 217; finite vs. non-finite 82; modal auxiliaries 206–7; past tense 73, 104, 105, 133, 176, 193, 204–5, 239, 256; third person 42, 131, 139, 142, 253; verb-raising 86–7
 vicarious responses 230–1
 Vietnamese language 192–5
 vocabulary learning 154, 167
 Wernicke's aphasia 67–8
 Williams syndrome 66–7
 willingness to communicate (WTC) 24
 working memory (WM) 121–2, 123, 127–8, 151–2, 157, 159, 243, 285; defining and measuring 151–3; as a fixed aptitude or trainable 155–6; and inhibition 155; and interaction 154, 159; measuring capacity of 152–3; models of use in L2 research 151–2; and peer interaction 243; promotion of learning 182; role of in SLA 153–5
 Zone of Proximal Development (ZPD) 56, 223–4, 227, 235–46, 246, 248; and dynamic assessment 240–1; peer-to-peer dialogue and 'languaging' within the 241–4

Name index

- Abrahamsson, N. 20, 87, 90
Abutalebi, J. 155
Aitchison, J. 31, 68
Al-Gahtani 211, 214, 215
Aljaafreh, A. 236–9, 248
Altarriba, J. 139
Álvarez, A. 224
Ambridge, B. 82, 103
Ammar, A. 171, 172–3, 174
Andersen, R.W. 47, 54, 139, 203, 205
Anderson, J.R. 12
Appel, G. 220
Archibald, J. 7, 58
Auer, P. 109
- Baddeley, A.D. 151, 152
Bailey, N. 37, 52
Bardovi-Harlig, K. 7, 15, 193, 201–2, 210, 218
Bartke, S. 66
Basnight-Brown, D.M. 139
Bayley, R. 56, 204, 253, 255, 256
Becker, A. 201
Belletti, A. 89
Bellugi, U. 31, 32, 66
Beretta, A. 25
Bhatia, T.K. 1
Bialystok, E. 52, 155, 156
Biber, D. 8
Birdsong, D. 58, 87
Bishop, D. 11, 66
Blackledge, A. 25
Bley-Vroman, R. 55, 90, 130, 135
Block, D. 16, 24, 27
Bloomfield, L. 28
Blum-Kulka, S. 212
Boers, F. 206, 207
Boyd, J.K. 109
Braine, M. 34
Bremer, K. 274, 277, 280–1
- Broede, P. 201
Brooks, F.B. 233
Brooks, P. 135
Brown, R. 31, 32, 37, 41, 52, 100
Brumfit, C.J. 289
Bruner, J. 221
Burt, M. 36, 37, 39, 52, 53
Bybee, J. 104, 115
Bygate, M. 25
Byrne, D. 139
- Cadierno, T. 56, 109, 209
Cameron, L. 98
Caplan, D. 68
Carroll, J.B. 21
Carroll, S. 58, 115, 125, 201
Carter, R. 5, 8
Cazden, C. 32
Cekatie, A. 262–6
Chamot, A.V. 12, 22, 47, 145
Chan, C. 64, 93
Chater, N. 120
Chaudron, C. 168
Chen, C. 135
Chen, H.-Y. 144, 148, 150
Choi, S. 209
Chomsky, N. 6, 7, 9, 10, 11, 30–1, 34, 47, 51, 61–3, 69, 75, 77, 95
Christiansen, M.H. 106, 114, 120, 156
Clahsen, H. 53, 134
Cleermans, A. 107, 110
Clément, R. 24
Collins, L. 101, 102, 109, 289
Conway, A. 152
Cook, V.J. 1, 9, 25, 55, 71, 73, 74
Corder, S.P. 35–6, 51
Cowan, N. 147
Crago, M.B. 67
Curtiss, S. 69

- Dale, P.S. 21
 Daller, H. 7
 Daniels, H. 221, 222, 227
 de Guerrero, M.C.M. 228
 de Jong, N. 141, 143
 de la Fuente, M.J. 176
 de Villiers, J. 65, 70, 82
 De Villiers, P.A. 37
 DeKeyser, R. 18, 60, 87, 100, 111, 135,
 136, 140–1, 142, 143
 Dekydtspotter, L. 88
 Del Río, P. 224
 Dewaele, J.M. 20
 Di Sciullo, A.-M. 65
 Dienes, Z. 107, 110, 149
 Dietrich, R. 201, 203–4
 Dimitrakopoulou, M. 93
 Dimroth, C. 196, 198
 Dittmar, N. 49, 52, 189, 190
 Domínguez, L. 65, 75, 89, 204, 205
 Donato, R. 223
 Döpke, S. 1
 Dörnyei, Z. 20, 23, 60, 155
 Doughty, C. 25, 144, 171, 291
 Duff, P. 19, 57, 247, 250, 260, 273
 Dulay, H. 27, 29, 36, 37, 39, 52, 53
 Duranti, A. 260

 Eckert, P. 270
 Egi, T. 181
 Elgort, I. 7
 Ellis, N.C. 12, 15, 59, 102, 103, 105, 106,
 108, 109, 139, 147, 149, 158, 169, 185
 Ellis, R. 13, 14, 20, 24, 25, 32, 36, 40, 110,
 111, 136, 137–8, 139, 158, 161, 169,
 170, 171, 174, 252, 290
 Elman, J. 103, 115
 Engeström, Y. 225, 226, 227
 Eubank, L. 69, 92
 Evans, V. 206
 Eysenck, M. 152, 155

 Félix-Brasdefer, J.C. 212, 213, 214

 Felser, C. 134, 153
 Filiaci, F. 89
 Firth, A. 6, 7, 57, 251
 Flynn, S. 47, 53, 91
 Fodor, J.A. 11
 Foley, W.A. 260
 Foster-Cohen, S. 10
 Frawley, W. 49, 228–9
 French, R.M. 110
 Freudenthal, D. 10
 Friedman, N.P. 155
 Fries, C. 28, 30, 50
 Fromkin, V. 6
 Fukui, N. 72

 Ganschow, L. 24
 Gardner, R.C. 22–3, 24, 51
 Gass, S.M. 3, 16, 40, 48, 134, 154, 155,
 156, 164, 180, 184, 187
 Gathercole, S.E. 152
 Gerken, L. 114
 Gindis, B. 240
 Givón, T. 9, 52, 188, 189, 192–3, 195
 Goldberg, A.E. 109
 Goldschneider, J. 100
 Goo, J. 154, 166, 168, 185
 Gopnik, M. 67
 Gordon, P. 109
 Granger, S. 8
 Gregg, K. 3, 42, 69
 Grondin, N. 87
 Grüter, T. 134, 135
 Guasti, M. 82
 Gullberg, M. 209

 Haegeman, L. 82
 Halliday, M. 7, 8, 9, 188
 Hama, M. 112, 148
 Han, Y. 15, 136
 Hansen, J.G. 7
 Harrington, M. 152, 153
 Harris, T. 82, 108
 Hatch, E. 183, 228, 236

SECOND LANGUAGE LEARNING THEORIES

- Havik, E. 135
 Hawkins, R. 12, 42, 59, 60, 64, 73, 75, 77, 78, 80, 81, 84, 85, 86, 87, 93, 95, 98, 108, 285
 Haznedar, B. 87
 Heath, S.B. 260
 Heller, M. 281
 Hernández-Chávez, E. 36
 Herschensohn, J. 20, 58, 73, 75, 77, 86, 135, 153
 Hitch, G. 151
 Holmes, J. 155, 251
 Hopper, P. 104, 115
 Howard, K.M. 269
 Howatt, A.P.R. 28
 Huebner, T. 49, 52, 191-2, 195
 Hufeisen, B. 17
 Hulstijn, J. 43, 111, 137
 Hulstijn, W. 43
 Hyltenstam, K. 20, 54, 87, 90
- Indefrey, P. 135
 Ionin, T. 7, 91, 92, 96, 115
 Izumi, S. 17, 48, 161, 179-80
- Jackson, C.N. 135
 Jenkins, J. 15, 16, 68
 Jeon, K.S. 161, 166-7, 168
 Jiang, N. 134, 135
 Johnson, J. 55, 90
 Johnson, K. 11
 Johnston, M. 164, 176
 Jordan, G. 5
 Juffs, A. 7, 152, 153, 156
- Kanagy, R. 266
 Kasper, G. 5, 7, 59, 210, 211, 251
 Keck, C.M. 166, 168-9
 Kellog, D. 249
 Kessler, J.L. 118, 120
 Kita, S. 209
 Klein, W. 56, 188, 196-200
 Klima, E. 31, 32
- Klingberg, T. 155
 Kozulin, A. 240
 Kramersch, C. 234
 Krashen, S. 2, 12, 17, 25, 37, 41-6, 48, 52, 53, 54, 146, 160
 Kroll, J.F. 135, 155
 Kuribara, C. 108
- Lado, R. 28, 29, 50, 51
 Lafford, B.A. 287
 Lai, C. 67
 Lakoff, G. 9
 Lam, W.S.E. 278
 Lamb, M. 23
 Lambert, W.E. 51
 Langacker, R.W. 9, 188, 206
 Lantolf, J. 5, 49, 56, 60, 209, 220, 221, 222, 225, 227, 228, 236-9, 240, 244-5, 247, 248, 249
 Lapkin, S. 220, 243-4, 249
 Lardiere, D. 58, 64, 65, 69, 75, 87, 88, 160
 Larsen-Freeman, D. 9, 47, 57, 98, 106, 108
 Lave, J. 270
 Lavov, W. 253
 Lee, J. 93, 154, 155, 156, 229
 Lenneberg, E. 51, 68
 Leontiev, A.N. 226, 232
 Leow, R.P. 112, 146, 147, 148
 Leung, J. 86, 114, 148
 Levelt, W. 179
 Li, X. 258-9, 260
 Liegeois, F. 67
 Lieven, E. 15, 82, 103
 Lightbown, P.M. 66
 Linck, J.A. 135
 Lindstromberg, S. 206, 207
 Liskka, S. 93
 Littleton, K. 221, 223
 Loewen, S. 110, 137, 144, 171
 Long, M. 5, 6, 47, 48, 53, 160, 162-3, 168, 285, 291
 Longa, V. 11, 67, 68

- Lorenzo, G. 11, 67, 68
 Lovatt, P. 154
 Luk, Z.P. 101
 Lyster, R. 57, 161, 169, 170, 171, 174

 McCafferty, S. 228, 229, 233
 McCarthy, A. 8
 MacDonald, M.C. 156
 McDonough, K. 161, 176–7, 179
 MacIntyre, P.D. 23, 24
 McKay, S.L. 277, 281
 Mackey, A. 3, 148, 149, 154, 161, 164,
 165–6, 168, 176, 178, 179, 180–1, 182,
 184, 185, 187
 McLaughlin, B. 12, 42, 43, 47, 54, 139
 MacWhinney, B. 102–3, 111, 135, 139,
 288
 Madden, C. 52
 Magnan, S.S. 287
 Marsden, E. 110, 111, 114, 144, 148, 150
 Masgoret, A.-M. 22, 23
 Matthiessen, M.A.K. 9
 Meisel, J. 53, 70, 82, 90
 Mercer, N. 221, 223
 Mirman, D. 106
 Misyak, J.B. 106, 114
 Miyake, A. 151, 155
 Mogford, K. 11, 66
 Montrul, S. 88, 89
 Morgan-Short, K. 144
 Mougeon, R. 256–7
 Moyer, A. 7
 Müller, N. 1
 Muñoz, C. 20
 Myles, F. 8, 14, 15, 42, 87

 Nabei, T. 171
 Naiman, N. 22
 Nakamura, D. 109
 Nassaji, H. 239, 247
 Negueruela, E. 245–6
 Neumann, O. 150
 Newmark, L. 51

 Newport, E. 55, 90
 Newson, M. 71, 73, 74
 Nicholas, H. 179
 Nielsen, S. 263
 Norris, J. 58, 144, 147, 288
 Norton, B. 25, 58, 271–2, 273–4, 276–7,
 281, 284

 Ochs, E. 260, 261–2
 O'Grady, W. 60, 120–5, 126, 128, 157–8
 Ohta, A.S. 59, 230, 242–3, 249, 266–7,
 287
 Oliver, R. 164
 Olson, D.R. 221–2
 O'Malley, J.M. 22, 47, 145
 Ortega, L. 5, 58, 144, 147, 288, 289
 Oxford, R. 22, 144, 145
 Ozyürek, A. 209

 Paradis, M. 59, 67, 87, 131–2
 Patrick, D. 269
 Pavlenko, A. 1, 25, 279, 284
 Pekarek Doehler, S. 5
 Penner, Z. 82
 Perdue, C. 56, 188, 196–200
 Peters, A.M. 12
 Pfänder, S. 109
 Philp, J. 169, 181
 Piaget, J. 11, 30, 220
 Piatelli-Palmarini, M. 11
 Pica, T. 48, 162, 179
 Pienemann, M. 44, 53, 54, 57, 115–20,
 125, 126, 164, 176, 290
 Pinel, P. 67
 Pinker, S. 34, 67
 Platt, E. 233
 Plonsky, L. 145
 Poehner, M.E. 220, 240, 249
 Poole, D. 263
 Preston, D. 253, 254–5
 Prévost, P. 87

 Radford, A. 74, 81, 82

SECOND LANGUAGE LEARNING THEORIES

- Rai, M. 153
 Ramat, G. 205
 Rampton, B. 25
 Ranta, E. 57, 169, 170
 Regan, V. 258
 Renaud, C. 88
 Révész, A. 154, 182
 Richards, J. 36, 52
 Ringböm, H. 16
 Rispoli, M. 8
 Ritchie, W.C. 1
 Rivers, W.M. 28
 Roberts, L. 135, 153
 Robinson, P. 20, 21, 25, 111, 114, 143,
 144, 147, 150, 155, 206
 Roehr, K. 137, 138, 142, 151
 Roeper, T. 65, 70, 82
 Roever, C. 211, 214, 215
 Rogers, V. 86
 Rogoff, B. 221
 Romaine, S. 252, 256
 Rosa, E. 146
 Rose, K. 7, 59, 210
 Rothman, J. 89
 Russell, J. 171
- Sagarra, N. 105, 153, 170
 Saito, K. 161, 171, 174
 Salaberry, M.R. 203, 204
 Samuda, V. 25
 Sanz, C. 144
 Sato, C. 52, 192-5, 217, 218
 Scarcella, R. 42, 43
 Schachter, J. 75, 93
 Schegloff, E.A. 250
 Schieffelin, B. 260, 261-2
 Schmidt, R. 55, 127, 138, 146-7
 Schneider, S. 139
 Schumann, J. 46, 49, 52, 251
 Schwartz, B. 42, 57, 64, 87, 91, 115, 168
 Scott, R. 110
 Sealey, A. 5
 Sebba, M. 46
- Seedhouse, P. 211
 Sekerina, I. 135
 Selinker, L. 13, 15, 27, 36, 40, 51
 Serratrice, L. 65, 87, 89
 Shah, P. 151
 Sharwood Smith, M. 27, 60, 98, 125, 285
 Sheen, Y. 161, 179, 187
 Shehadeh, A. 161
 Shiffrin, R.M. 139
 Shintani, N. 111
 Shirai, Y. 47, 101, 203, 205
 Siegmüller, J. 66
 Simard, D. 147
 Sinclair, J. 15
 Singleton, D. 20
 Skehan, P. 21, 55, 150, 155
 Skinner, B.F. 10, 28, 30, 50, 51
 Slavakova, R. 89, 90
 Slobin, D. 31, 34-5, 47, 208-9
 Smith, N. 11, 56, 67, 69
 Snyder, W. 82
 Sokolik, M. 56
 Song, S. 249
 Sorace, A. 7, 14, 65, 87, 89
 Spada, N. 66, 144, 171, 172-3
 Sparks, R. 21, 24
 Speas, M. 72
 Speciale, G. 154
 Spolsky, B. 3, 4
 Sprouse, R. 57, 64, 87, 91, 115
 Stam, G.A. 209
 Strauss, S. 267
 Stubbs, M. 6, 8
 Sunderman, G. 134, 155
 Swain, M. 17, 48, 54, 134, 161, 175,
 175-6, 220, 232, 239, 241, 243-4, 244,
 247
 Sweetser, E. 206
- Tagliamonte, S.A. 254
 Taguchi, N. 210
 Tajfel, H. 276
 Talmy, L. 9, 19, 206, 208

- Talmy, S. 268-9, 270
 Tarone, E. 253
 Terrell, T. 138
 Thomas, M. 27, 86, 91
 Thorndike, E. 28
 Thorne, S. 60, 220, 222, 225, 227, 228,
 234, 240, 244-5, 248
 Tokowicz, N. 111, 135, 155
 Tolentino, L. 135
 Tomasello, M. 12, 15, 103, 109, 227, 235,
 248
 Tomlin, R.S. 147
 Toohey, K. 270-1, 272
 Towell, R. 12, 42, 73, 78, 81, 84, 85, 95,
 98, 285
 Tran-Chi-Chau 36
 Trofimovich, P. 182-3
 Trude, A. 155
 Truscott, J. 60, 98, 125, 168, 171, 285
 Tsimpli, I. 11, 65, 67, 93
 Turley-Ames, K.J. 155
 Tyler, A. 109, 206, 207

 Ullman, M. 12, 59, 132, 133, 135, 141,
 142
 Ushioda, E. 23

 Vainikka, A. 57, 87, 92
 van der Lely, H. 67
 Van Lier, L. 25
 VanDen Noort, M. 153
 VanPatten, B. 6, 13, 14, 56, 105, 115,
 134, 150, 180
 Varela, E. 171
 Vargha-Khadem, F. 67
 Varonis, E.M. 48
 Verspoor, M.H. 206
 Vickers, C.H. 273
 Vihmann, M. 12

 Villa, V. 147
 Vygotsky, L.S. 49, 220, 220-1, 223, 224,
 225, 226, 241, 245

 Wagner, J. 5, 57, 211, 251
 Walter, C. 152, 153
 Watson, J. 28
 Watson-Grego, K.A. 263
 Weissenborn, J. 82
 Wells, G. 221, 222, 235
 Wen, Z. 152, 154, 155
 Wenger, E. 270
 Wertsch, J. 221, 227
 Wexler, K. 82, 108
 White, L. 47, 55, 64, 65, 66, 69, 77, 86, 87,
 89, 91
 Whitfield, M.M. 155
 Wickens, C. 150
 Wilkinson, S. 169
 Williams, G. 260
 Williams, J.N. 6, 13, 14, 106, 107, 108,
 110, 111-12, 113, 114, 136, 138, 144,
 148, 151, 152, 154
 Williams, M. 23
 Wong, W. 147, 277, 281
 Wood, D. 222
 Wray, A. 15
 Wulff, S. 205

 Yang, Y. 169
 Year, J. 109
 Yoon, J. 88
 Young, R. 252-3
 Young-Scholten, M. 57, 87, 92
 Yuan, B. 86

 Zinchenko, V.P. 226
 Zobl, H. 42

