Language Development and Age

The anecdotal view of language acquisition is that children learn language with apparent ease, no instruction, and in very little time, while adults find learning a new language to be cognitively challenging, labor-intensive, and time-consuming. In this book Herschensohn examines whether early childhood is a critical period for language acquisition after which individuals cannot learn a language as native speakers. She argues that a first language is largely susceptible to age constraints, showing major deficits past the age of twelve. Second language acquisition also shows age effects, but with a range of individual differences. The competence of expert adult learners, the unequal achievements of child learners of second languages, and the lack of consistent evidence for a maturational cut-off, all cast doubt on a critical period for second language acquisition.

JULIA HERSCHENSOHN is Professor and Chair of the Department of Linguistics at the University of Washington. Her recent publications include *The Second Time Around: Minimalism and L2 Acquisition* (2000).

Language Development and Age

Julia Herschensohn

CAMBRIDGE
UNIVERSITY PRESS

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo, Delhi

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9780521872973

First published 2007

Printed in the United Kingdom at the University Press, Cambridge

A catalogue record for this publication is available from the British Library

ISBN 978-0-521-87297-3 hardback

To the memory of my mother, Jean Gallivan Rogers, and my surrogate mothers, Mary Gallivan, Eleanor Gallivan Lent and Sylvia Rosenbaum Herschensohn

Contents

Figures

Tables

Preface

The notion of a critical period for acquisition of first and subsequent languages is the topic of this book, which investigates the following questions:

(i) What is the evidence for a critical period for language acquisition?
(ii) Is there a critical period for first language acquisition?
(iii) Is there a critical period for subsequent language acquisition?

These questions raise corollary issues concerning the nature of language acquisition, variables that drive and constrain it, and the role of biological maturation. The book demonstrates that first language (L1) is in large part susceptible to age constraints, whereas second language (L2) – a term conventionally referring to any language learned after the first – is only indirectly so affected. Evidence from L1 shows a clear effect of age on acquisition, for language is not thoroughly acquired if age of onset passes seven years, and it is acquired with major deficits if age of onset passes twelve. Evidence from L2 acquisition also shows effects of age of onset, but the range of variation due to individual and socio-motivational differences prohibits a strict definition of a sensitive period for L2. Indeed, the L2 competence of expert adult learners, the unequal achievements of child L2 learners, variation of L2 endstate for learners with different L1 and the lack of consistent empirical evidence for a maturational cutoff, all cast doubt on a critical period for second language acquisition (L2A). Furthermore, the reasons for the deterioration of acquisition potential are only partly maturational, since experience with the native tongue shapes the neural networks of the brain dedicated to language.

This book investigates the question of a critical period for both L1 and L2A, reporting on the extensive empirical research done in the past decade (and earlier) that has mainly been published in articles. It reviews very recent literature on non-typical development in L1 and L2 (e.g. Williams Syndrome, Specific Language Impairment), evaluates relevant psycho-linguistic and neurolinguistic studies, and considers recent debates of the critical period question.

The first chapter traces the history of the notion critical/sensitive period from the nineteenth century, giving examples from other species' development as well as non-linguistic aspects of human behavior. It reviews Lenneberg's seminal work on the biological foundations of language and subsequent research based on his premises. The chapter concludes with a discussion of two theory families, domain-specific nativism and domain-general associationism. While favoring an innatist approach, the book nevertheless subscribes to the necessity of taking both innate predisposition and environmental experience into account.

Chapter 2 describes first language acquisition (L1A) using a framework that includes the importance of both innate predisposition/linguistic universals and environmental experience. The third chapter considers whether there is a critical period for L1A, using evidence from a range of empirical data on atypical acquisition, by deprivation of environment or deprivation of organismic system. The former is exemplified by late L1 learners of sign language, the latter by cognitively impaired individuals. Despite major language deficits of late L1 learners, even the biological data does not indicate a threshold of offset after which L1A is totally impossible.

Chapters 4 and 5 describe patterns and stages of L2A and then examine the evidence adduced for a critical period for this phenomenon. Studies of child/adult L2A, age-linked deterioration in grammar acquisition and expert adult learners show that there is questionable substantiation for L2 age sensitivity. The sixth chapter pursues the question further by examining non-biological L2 influences and biological studies of L2 neural processing. The final chapter reexamines the facts presented in the previous six to arrive at conclusions for L1A and L2A.

This book has profited from a great deal of input and help from colleagues and friends. I wish to thank Michael Herschensohn, Marc Jampole and fifteen graduate seminar students for reading the entire manuscript and making very helpful comments throughout. For reading and commenting on an entire chapter or more, I thank Susanne Carroll (who actually read two), Joe Emonds, George M. Martin (who also read two and encouraged me to look into olidodendrocytes), Fritz Newmeyer and Martha Young-Scholten. For more general discussion and support I acknowledge John Archibald, Debbie Arteaga, Dalila Ayoun, Barbara Bullock, David Birdsong, Robert DeKeyser, Laurent Dekydtspotter, Cheryl Frenck-Mestre, Randall Gess, Judy McLaughlin, Silvina Montrul, Florence Myles, Toshi Ogihara, Lee Osterhout, Joyce Parvi, Philippe Prévost, Bonnie Schwartz, Mike Sharwood-Smith, Roumyana Slabakova, Kathryn Speranza, Rex Sprouse, Jeff Stevenson, Jacqueline Toribio, Jonathan Washington, Lydia White and Richard Wright. Thanks also to my family and friends for all their encouragement.

Acknowledgments

The author and publisher acknowledge with thanks permission granted to reproduce in this book the following material previously published elsewhere or in the public domain.

Figures 1.1, 6.1 and 6.2 are furnished by the National Institute of Neurological Disorders and Stroke of the National Institutes of Health which offers this material in the public domain to be freely copied. We greatly appreciate this NINDS-prepared information, thanking the NINDS and the NIH.

Figure 3.1 is reprinted with permission of the American Speech-Language-Hearing Association from p. 1266 of Rachel I. Mayberry (1993), First-language acquisition after childhood differs from second-language acquisition: the case of American Sign Language, *Journal of Speech and Hearing Research* 36, 1258–1270.

Figures 5.1, 5.3 and 6.3 are reprinted with permission from Elsevier Ltd. from (respectively) p. 79 of Jacqueline Johnson and Elissa Newport (1989), Critical Period effects in second language learning: The influence of maturational state on the acquisition of English as a second language, *Cognitive Psychology* 21, 60–99; p. 240 of David Birdsong and Michelle Molis (2001), On the evidence for maturational constraints in second language acquisition, *Journal of Memory and Language* 44, 235–249; and p. 204 of Lee Osterhout, Judith McLaughlin and Michael Bersick (1997), Event-related brain potentials and human language, *Trends in Cognitive Sciences* 1, 203–209.

Figure 5.2 is reprinted with permission from The Perseus Books Group from p. 68 of Ellen Bialystok and Kenji Hakuta (1994), *In Other Words* (New York: Basic Books).

Abbreviations

2L1A	bilingual first language acquisition
ABSL	Al-Sayyid Bedouin Sign Language
CPH	Critical Period Hypothesis
DS	Down Syndrome
EOI	Extended Optional Infinitive [period]
FFFH	Failed Functional Features Hypothesis
FTFA	Full Transfer/Full Access
HAS	High Amplitude Sucking
ISN	Idioma de Señas Nicaragüense ("Nicaraguan Sign Language")
L1A	first language acquisition
L2A	second language acquisition
LAD	Language Acquisition Device
LSN	Lenguaje de Señas Nicaragüense ("Nicaraguan sign pidgin")
MLU	Mean Length of Utterance
OI	Optional Infinitive [period]
PDP	Parallel Distributed Processing
PLD	Primary Linguistic Data
PPVT	Peabody Picture Vocabulary Test
RI	Root Infinitive
SLI	Specific Language Impairment
SLM	Speech Learning Model
TD	Typically Developing
UG	Universal Grammar
V2	verb second
VOT	Voice Onset Time
WS	Williams Syndrome