

The Bilingual Mind and Brain Book Series

Series Editors

Roberto R Heredia, Department of Psychology and Communication
Texas A&M International University
Laredo, TX, USA

Anna B. Cieslicka, Department of Psychology and Communication
Texas A&M International University
Laredo, TX, USA

Springer's Bilingual Mind and Brain Book Series is intended to advance and contribute to our understanding of the bilingual/multilingual mind and brain, both as an academic discipline and as a maturing research field. The Bilingual Mind and Brain Book Series is interdisciplinary in its scope and examines the bilingual mind/brain from such perspectives as psycholinguistics, cognitive psychology, cognitive science, and cognitive neuroscience, as well as applied linguistics and pedagogical approaches to second/foreign language learning. The Bilingual Mind and Brain Book Series is intended for the growing number of bilingual researchers and practitioners interested in understanding the behavioral aspects and neurobiology of bilingualism, as well as the dynamic character of the bilingual/multilingual/second language learner's mind. This book series will be of interest to the growing number of advanced undergraduate and graduate students interested in The Psychology/ Psycholinguistics of Bilingualism, Bilingual Cognitive Psychology, Cognitive Science, and Cognitive Neuroscience. For this reason, all collective volumes and monographs will include a number of thought provoking questions, suggested student research projects, and suggested readings. In short, The Bilingual Mind and Brain Book Series provides a continuous update of the most current work in the behavioral and neuropsychological research in the fields of bilingualism/multilingualism and second language acquisition. This book series contributes to the development and establishment of the Bilingual Cognitive Psychology and Bilingual Cognitive Neuroscience disciplines as subfields of Neuropsychology and Cognitive Neuroscience and fills a significant gap in the literature on the bilingual mind and brain. Have a book idea? Contact the Series Editors at bilingual.mind-brain@tamiu.edu.

Ute Schönpflug

Multilingual Text Comprehension

Cognitive, Developmental, and Educational
Aspects



Springer

Ute Schönpflug
Department of Developmental Science
Free University Berlin
Berlin, Germany

ISSN 2945-5952 ISSN 2945-5960 (electronic)
The Bilingual Mind and Brain Book Series
ISBN 978-3-031-43340-5 ISBN 978-3-031-43341-2 (eBook)
<https://doi.org/10.1007/978-3-031-43341-2>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2023

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Paper in this product is recyclable.

Dedicated to Walter and Eileen Kintsch

Preface

Text comprehension is an important skill for personal fulfillment and for achieving academic and professional success. It is also a complex skill, involving cognitive abilities that interact at different text levels. The special perspective of this book builds on research on multilingual children's comprehension of narrative and expository texts in the course of their cognitive development. Comparisons with corresponding findings of "monolingual" children raised and schooled in environments emphasizing L1 are intended to turn the readers' attention to the issue of what impact languages may exert on text comprehension. The chapters focus on text comprehension beyond basic biologically grounded processes such as phonological decoding of oral or written input, as multilingual children—even when proficient in each of their languages—are challenged at the text level rather than at the word and grammar level. The author of this book attempts to find answers to the question of whether text processing in a second or more languages suffers when bi-/multilingual children perform in their other languages as compared to their native first language. The book addresses developmental periods from early childhood to adolescence and young adulthood and covers listening and reading comprehension. Research about reading comprehension dominates text comprehension literature, but the broad developmental span targeted in this book requires that listening comprehension will be in the focus as well. The nine chapters of this book present new insights into the cognitive processes enabling and regulating multilingual text comprehension, which bear the potential to be beneficial for knowledge of multilingualism in general and for research in the domains of cognitive development, discourse linguistics, and education.

Texts in languages other than the comprehender's native language can only be processed by multilingual individuals who have basic language proficiencies in each language. The question of the extent to which language, and especially multilingualism, plays a crucial role in the construction processes of gist formation represents the leading theme of this book. Chapter 1 outlines the scope of the book and offers access to the concepts and their meaning in text comprehension research. Chapter 2 reports findings that offer potential explanations for the complex relationship between knowing and using language(s) and understanding texts. Chapter 3

introduces common methods of assessing text comprehension in children with reference to the languages involved. General developmental issues addressing cognitive abilities and skills relevant for text comprehension are addressed in Chap. 4, while research findings from the domain of text comprehension in preschool- and school-aged children are discussed extensively in Chap. 5. Chapter 6 presents issues related to the dynamics of text comprehension, asking about the time parameters of composite processes of comprehension. Chapter 7 is devoted to theories and models of text comprehension given multilingual and developmental constraints. The book author suggests a model derived from her data that proposes inferences as mediators between cross- and monolingual text input/output conditions and text comprehension. The model introduces bilingual language proficiency as a moderator. The final Chaps. 8 and 9 point out applications developed for training and interventions to improve understanding in from kindergarten age on to secondary school and issues in need of further clarification.

This book aims to develop a framework for fine-grained analyses of text comprehension skills that may foster our understanding of children's text comprehension and comprehension problems. These issues have meanwhile been discussed in the literature to such an extent that a critical selection, structuring, and organization of the research areas are necessary. As linguistic issues have prevailed in the psycholinguistic research, the linguistic surface structure of the text has already received a great deal of attention. The psychological approach shifts the focus from the linguistic surface to the mental representation of the text. From the point at which the meanings of the linguistic structures are identified, psychological researchers provide appropriate expertise to explore comprehension processes leading to the mental representation of a text.

The literature on children's text comprehension has a long history in the educational sciences. Multilingual text comprehension research, by contrast, essentially only spans the last two decades. Earlier research on bilingualism and multilingualism favored word-level and sentence-level language comprehension processes. In view of current global mobility and migration, there is an urgent need to investigate higher-order cognitive processes like text comprehension and to examine how they are affected by a multilingual comprehension task performed by a multilingual child.

The book author's own research is selectively integrated into this overview of international findings on children's text comprehension in the light of their multilingual competencies and multilingual texts. In addition to a summary of relevant literature, the author presents her own published and unpublished research results on L1-dominant, bi- and multilingual children's and young adults' text comprehension in their native language German, their second language English, and various other further languages. Whereas the L1-dominant sample consisted of three age groups (8-, 9-, and 10-year-olds), the bilingual sample comprised German fourth graders, aged 9 to 10 years, attending German-English bilingual schools, most of them from nursery school onward. The bilingual schools were public Europe Schools, a program dedicated to bilingual education from the first to sixth grade in Germany. The third group, comprising multilingual university students, were proficient in Polish (L1), German (L2), and English (L3).

This book reflects the need to clarify how proficiency in more than one language and language dominance can impact the higher-order cognitive processes of text comprehension under monolingual and crosslingual text input and output conditions. The author emphasizes developmental aspects of text processing, as educational applications should be based on the knowledge of how multilingual children's cognitive processes change during the developmentally decisive years for text comprehension.

Berlin, Germany
Autumn 2023

Ute Schönplüg

Acknowledgments

Over the last two decades, a group of multilingual psychology graduates contributed to the research reported in this book. Given their multilingual background and their study situation, they were motivated to ask and find answers to questions concerning multilingual functioning when understanding texts. They broadened the scope of the research bringing in new aspects in the planning and the analysis stage of the project. Moreover, they conducted most of the experiments. The author thanks first of all Lenka Küpping-Faturikova and Felicitas Frische for their valuable ideas and work. Anna Vierling contributed her nearly balanced bilingual language proficiency to setting up the experimental materials and collecting part of the data. I owe many thanks to the numerous students who took part in the series of experiments assembled under the heading *Monolingual and Multilingual Children's Development of Text Comprehension* and to their teachers who organized the experiments in their schools in the hope to be able to improve their students' text comprehension performance.

With great patience and native language proficiency in English, Sarah Mannion de Hernandez smoothed the linguistic surface of the manuscript. As a Cambridge University graduate, she followed the book author's discussion of the presented issues with critical text comprehension and thus helped to establish cohesion and coherence in the text of the book. The editing and production team chose the right format for what I had to say and I am grateful for their professional efforts.

With respect I acknowledge the impact of the work of Walter Kintsch, who passed away this Spring, and Eileen Kintsch from the Institute of Cognitive Science at the University of Colorado: Their research and theorizing elicited my interest in text comprehension processes. This book is dedicated to them and to Wolfgang Schönplüg, Free University Berlin, whose day-to-day support maintained my engagement and perseverance.

Thanks to Roberto Heredia and Anna Cieřlicka's engaged concern for bilingual research this book is published and may extend the aspects covered by their series on *The Bilingual Mind and Brain* to developmental and educational aspects. Published in this series, the book will hopefully reach an interested readership.

Contents

1	Issues and Questions in Text Comprehension	1
1.1	Text Comprehension and Text Production	1
1.2	Texts and Their Features	3
1.3	Text Genres	4
1.4	Text Processing	6
1.5	A Comprehensive View of Text Comprehension	7
1.6	Text Processing Modalities Listening and Reading	10
1.7	The Contribution of Working Memory	16
1.8	The Contribution of Long-Term Memory and Knowledge	17
1.9	The Contribution of Inferences	17
1.10	Comprehension Monitoring	19
1.11	Strategies to Improve Text Comprehension	20
1.12	Intelligence and Comprehension	21
1.13	Concluding Remarks	23
	References	23
2	Multiple Language Use and Text Comprehension	29
2.1	Multilingual Decoding and Encoding	29
2.1.1	Decoding	29
2.1.2	Encoding	34
2.2	Coactivation in Multilingual Text Processing	35
2.3	Comprehension of Content and Linguistic Surface Structure	38
2.4	Multilingual Tasks and Text Comprehension	39
2.5	Degree of Bilingualism and Its Consequences	41
2.5.1	Degree of Bilingualism and Automaticity of Picture Naming	41
2.5.2	Degree of Bilingualism and Comprehension	45
2.6	Cross- and Monolingual Tasks and Comprehension	47
2.7	Individual Differences and Text Comprehension	49
2.8	The Developmental Dynamics of Multilingualism	50
2.9	Concluding Remarks	51
	References	52

3	Assessment of Text Comprehension	57
3.1	Language-Dependent and -Independent Comprehension Assessment	57
3.1.1	Comprehension of Text and Graphics	57
3.1.2	Controlling for Decoding by Avoiding Verbal Input	59
3.2	Assessment of Text Readability	60
3.3	Comprehension in Two Modalities: Reading and Listening	61
3.3.1	Assessment of Reading Comprehension	61
3.3.2	Assessment of Listening Comprehension	64
3.4	Recall-Based Offline Measures	65
3.4.1	Recognition	66
3.4.2	Cued Recall of Text	67
3.4.3	Free Recall and Retell	68
3.4.4	Summary	71
3.4.5	Cloze Tests	72
3.5	Online Measures	73
3.5.1	Reading Fluency	74
3.5.2	Comprehension Monitoring and Control	75
3.5.3	Think-aloud Protocols and Probe Questions	76
3.5.4	Priming	77
3.6	Issues of Multilingual Assessment	79
3.7	Minimizing Effects of Decoding and Language	82
3.8	Age Effects in Multilingual Assessment	84
3.9	National and Cross-National Assessment	85
3.10	Concluding Remarks	87
	References	88
4	Multilingual Development of Text Comprehension	95
4.1	Multilingual Language Acquisition	95
4.1.1	Native Language in Discourse Development	97
4.1.2	Age of Multilingual Acquisition and Comprehension	98
4.1.3	Multilingual Vocabulary Growth and Comprehension	101
4.1.4	Acquisition of Multilingual Word Semantics Syntax and Comprehension	103
4.2	Development of Multilingual Narrative Skills	107
4.3	Effects of Degree of Bilingualism and Language of Text	110
4.4	Bilingual Children's Cohesion and Coherence Construction in Texts	113
4.5	Concluding Remarks	115
	References	116
5	Higher Order Cognitive Skills in Text Comprehension	121
5.1	Foundations of Macronarrative Comprehension Skills	121
5.2	Constructing the Propositional Textbase	122
5.3	The Support of Working Memory	125
5.3.1	Suppression/Inhibition of Irrelevant Information	126
5.3.2	Updating Information in Text Processing	128

5.4	Long-term Memory as a Knowledge Base	130
5.4.1	World Knowledge	130
5.4.2	Language as a Knowledge Base.....	132
5.5	Development of Macronarrative Comprehension Skills	133
5.5.1	Understanding the Sequence of Narrative Events	135
5.5.2	Use of Conventional Text Structure.....	136
5.5.3	Situation Model Construction	139
5.5.4	Inference Making.....	142
5.6	Comprehension Monitoring.....	145
5.7	Concluding Remarks	148
	References.....	149
6	Text Comprehension Dynamics: Time Parameters	157
6.1	Time Constraints and Text Comprehension.....	157
6.2	Text Reading Fluency	159
6.3	Timing of Comprehension and Fluency of Recall.....	159
6.4	Consolidation of the Mental Text Representation	164
6.5	Separating Types of Pause	167
6.5.1	Language Conditions and Pauses.....	167
6.5.2	Crosslinguistic Text Processing and Pauses.....	168
6.6	Composite Processes of Comprehension and Pauses	170
6.7	Does Comprehension Continue During Recall?	172
6.8	The Function of Gist Pauses: A Process Analysis	172
6.9	Concluding Remarks	175
	References.....	176
7	A Theoretical Model of Multilingual Text Processing.....	179
7.1	Requirements of a Model of Multilingual Text Comprehension... ..	179
7.2	Constructing a Multilingual Model of Text Comprehension.....	181
7.2.1	The Shallow Processing Hypothesis	182
7.2.2	Limited Automaticity in L2 Processing	184
7.2.3	Predictability of Text in L2	185
7.3	The Recall Component of Text Comprehension	186
7.4	Issues of Asymmetry	188
7.5	Retrieval of Mental Representation After Language Switching ...	189
7.6	A Model of Multilingual Text Comprehension	191
7.7	Developmental Perspective of the Model	196
7.8	Theoretical Afterthoughts	199
7.9	Concluding Remarks	201
	References.....	202
8	Educational Applications of Text Comprehension Research	205
8.1	Can Comprehension Be Trained?	205
8.2	Advantages and Disadvantages of Multilingualism.....	206
8.3	Modality-Specific Comprehension Training	208
8.4	Effects of Instructions on Comprehension.....	209

8.5	Improving Comprehension by Strategy Use	211
8.5.1	Rehearsal Strategy	211
8.5.2	Text Structure Strategy	213
8.5.3	Instructions for Situation Model Construction	216
8.5.4	Questioning Strategy	216
8.5.5	Instructing Inference Making.	217
8.5.6	Metacognitive Strategies: Monitoring Comprehension	219
8.5.7	Developmental Aspects of Monitoring	222
8.6	Improving Comprehension for L2 Learners	223
8.7	Text Comprehension as a Diagnostic Tool.	225
8.8	Interventions for Diverse Groups of Children	229
8.9	Concluding Remarks	230
	References.	230
9	Understanding Multilingual Children's Text Comprehension	237
9.1	Discourse and Text Comprehension.	237
9.2	Language Dominance and Text Comprehension	238
9.3	Cognitive Processes Contributing to Text Comprehension: A Framework	240
9.4	Assessment of Comprehension	242
9.5	Time Parameters of Text Retrieval.	243
9.6	An Empirical Model of Multilingual Text Comprehension.	244
9.7	Applications.	245
9.8	Critical Issues.	246
9.8.1	Coactivation	246
9.8.2	Online Assessment and Neuroscience	247
9.8.3	Semantic Networks and Multiple Language Use.	248
9.8.4	Comprehension of Hypertexts	249
9.9	Deep Comprehension.	250
	References.	251
	Author Index	253
	Subject Index.	259

About the Author

Ute Schönflug PhD., Prof. adj. emer., received her education at Northwestern University and in Germany. She taught developmental/educational psychology at Martin-Luther University (Halle/Germany) and Free University Berlin. She was associate editor of the *Journal of Cross-Cultural Psychology* for ten years and published part of her research in a volume on *Cultural Transmission*.

She is author and co-author of several psychology textbooks.

As an adjunct member of ICC, Boulder, CO, USA, her research interests focused on text processing in multilingual children. She has served the UGC/RGC in Hong Kong as member and reviewer of the Linguistics/Psychology Panel for the last years.