The Routledge Handbook of Translation, Interpreting and Bilingualism

Edited by Aline Ferreira and John W. Schwieter
The Routledge Handbook of Translation, Interpreting and Bilingualism

Translation and interpreting can be seen as two special sub-types of bilingual communication. The field of bilingualism—from developmental, cognitive, and neuroscientific perspectives—is highly relevant to Translation and Interpreting Studies.

*The Routledge Handbook of Translation, Interpreting and Bilingualism* is the first handbook to bring together the related, yet disconnected, fields of bilingualism and Translation and Interpreting Studies. Edited by leading scholars and authored by a wide range of established authorities from around the world, the *Handbook* is divided into six parts and encompasses theories and method, the development of translator and interpreter competence and cognitive, neuroscientific and social aspects.

This is the essential guide to bilingualism for advanced students and researchers of Translation and Interpreting Studies and key reading on translation and interpreting for those studying and researching bilingualism.

**Aline Ferreira** is an associate professor of linguistics in the Department of Spanish and Portuguese at the University of California, Santa Barbara, where she is also director of the Bilingualism, Translation, and Cognition Laboratory and director of the Latin American and Iberian Studies Program. Her research appears in journals such as *Applied Linguistics Review, Frontiers in Psychology, Translation and Interpreting Studies, Translation, Cognition and Behavior, Spanish Journal of Applied Linguistics,* and *Reading and Writing*; and in books including *Cognitive Control and Consequences of Multilingualism* (2016); *The Routledge Handbook of Translation and Linguistics* (2018); *The Routledge Handbook of Translation and Methodology* (2022); and *The Routledge Handbook of Interpreting and Cognition* (Forthcoming).

**John W. Schwieter** is a professor of Spanish and linguistics and cross-appointed in psychology at Wilfrid Laurier University, and an adjunct professor of linguistics at McMaster University. He is also the director of the Language Acquisition, Multilingualism, and Cognition Laboratory and Bilingualism Matters at Laurier. His research interests include cognitive and neuroscientific approaches to multilingualism, language acquisition, translation and interpreting. His research appears in journals such as *Bilingualism: Language and Cognition, Cerebral Cortex* Frontiers in
His recent co-edited books include Second Language Acquisition Theory: The Legacy of Professor Michael H. Long (2022); Engaging in Critical Language Studies (2022); The Cambridge Handbook of Working Memory and Language (2022); and Introducing Linguistics: Theoretical and Applied Approaches (2021).

Together, Ferreira and Schwieter have co-edited Introduction to Translation and Interpreting Studies (2023); The Handbook of Translation and Cognition (2017); Psycholinguistic and Cognitive Inquiries into Translation and Interpreting (2015); and The Development of Translation Competence: Theories and Methodologies from Psycholinguistics and Cognitive Science (2014).
Routledge Handbooks in Translation and Interpreting Studies

Routledge Handbooks in Translation and Interpreting Studies provide comprehensive overviews of the key topics in translation and interpreting studies. All entries for the handbooks are specially commissioned and written by leading scholars in the field. Clear, accessible and carefully edited, Routledge Handbooks in Translation and Interpreting Studies are the ideal resource for both advanced undergraduates and postgraduate students.

THE ROUTLEDGE HANDBOOK OF TRANSLATION AND MEDIA
Edited by Esperança Bielsa

THE ROUTLEDGE HANDBOOK OF CONFERENCE INTERPRETING
Edited by Michaela Albl-Mikasa and Elisabet Tiselius

THE ROUTLEDGE HANDBOOK OF TRANSLATION AND METHODOLOGY
Edited by Federico Zanettin and Christopher Rundle

THE ROUTLEDGE HANDBOOK OF AUDIO DESCRIPTION
Edited by Christopher Taylor and Elisa Perego

THE ROUTLEDGE HANDBOOK OF TRANSLATION AND MEMORY
Edited by Sharon Deane-Cox and Anneleen Spiessens

THE ROUTLEDGE HANDBOOK OF SIGN LANGUAGE TRANSLATION AND INTERPRETING
Edited by Christopher Stone, Robert Adam, Ronice Quadros de Müller and Christian Rathmann

THE ROUTLEDGE HANDBOOK OF TRANSLATION AND RELIGION
Edited by Hephzibah Israel

THE ROUTLEDGE HANDBOOK OF TRANSLATION, INTERPRETING AND BILINGUALISM
Edited by Aline Ferreira and John W. Schwieter

Contents

Editors and editorial advisory board x
List of contributors xii

PART I
Introduction and overview of the *Handbook* 1

1 Interfaces of translation, interpreting, and bilingualism from
cognitive perspectives 3
* Aline Ferreira and John W. Schwieter

PART II
Theories and methods 9

2 The unique bilingual profile of translators and interpreters 11
* Yanping Dong

3 Theories and models in cognitive bilingualism 27
* Julia Festman and Gregory J. Poarch

4 Theories and models in cognitive translation and interpreting studies:
paradigms and legacy concepts 45
* Álvaro Marín García

5 Research methods in cognitive translation and interpreting studies
and bilingualism 57
* Przemysław Janikowski and Agnieszka Chmiel

PART III
Neurocognitive aspects of cognitive Translation and
Interpreting Studies and bilingualism 77

6 Interlingual reformulation as a window into the bilingual brain 79
* Adolfo M. García and Boris Kogan
Contents

7 Physiological measurement in translation and interpreting
  Paweł Korpals and Ana María Rojo López

8 A critical role for cognitive translation and interpreting studies in
  the study of brain plasticity: evidence from young bilingual adults
  Noelia Calvo

PART IV
Cognitive aspects of translation and interpreting studies and
bilingualism: architecture

9 Working memory in simultaneous and consecutive interpreting
  Barbara Moser-Mercer

10 Interference control in interpreting
  Hongming Zhao, Xiaocong Chen and Yanping Dong

11 Cognitive processing of subtitles: charting the future by mapping the past
  Sixin Liao and Jan-Louis Kruger

12 Identity, bilingualism, and Cognitive Translation and Interpretation Studies
  Aline Ferreira and Viola Miglio

13 False belief, perspective taking, and cognitive translation and
  interpreting studies and bilingualism
  Vanessa Diaz

14 Emotions in cognitive translation and interpreting studies
  Ana María Rojo López and Catherine L. Caldwell-Harris

PART V
Cognitive-developmental aspects of translation and
interpreting studies and bilingualism: dynamics

15 Cognitive translation and interpreting studies and bilingualism
  from developmental aspects
  Wolfgang Lörscher

16 Age, bilingualism, and cognition in translators and interpreters
  Eleonora Rossi, Antonio Iniesta and Megan Nakamura
17  Capacity, load, and effort in translation, interpreting and bilingualism
    Kilian G. Seeber and Rhona M. Amos  260

18  Cognitive flexibility in interpreting
    Giulia Togato and Pedro Macizo  280

PART VI
Aspects of translator and interpreter tasks and characteristics  299

19  Directionality in cognitive translation and interpreting studies
    Aline Ferreira  301

20  Translation and interpreting in bilingual and monolingual communities
    Christopher D. Mellinger  314

21  Translanguaging, Translation and Interpreting Studies, and bilingualism
    Eriko Sato and Ofelia García  328

22  The role of the bilingual self in translation and interpreting in
    international organizations
    Michael S. Boyd and Cherine Haidar Ahmad  346

23  Cognitive translation and interpreting studies, bilingualism, 
    and heritage languages
    Laura Gasca Jiménez  363

24  Training bilinguals to become translators
    Nataša Pavlović and Bogusława Whyatt  378

25  Training bilinguals to become interpreters
    Weiwei Wang and Lihua Zhang  394

Index  415
Editors

Aline Ferreira is an Associate Professor of linguistics in the Department of Spanish and Portuguese at the University of California, Santa Barbara, where she is also director of the Bilingualism, Translation, and Cognition Laboratory and director of the Latin American and Iberian Studies Program. Her research appears in journals such as Applied Linguistics Review; Frontiers in Psychology; Translation and Interpreting Studies; Translation, Cognition and Behavior; Spanish Journal of Applied Linguistics; and Reading and Writing; and in books including Cognitive Control and Consequences of Multilingualism (Benjamins, 2016); The Routledge Handbook of Translation and Linguistics (2018); The Routledge Handbook of Translation and Methodology (2022); and The Routledge Handbook of Interpreting and Cognition (Forthcoming).

John W. Schwieter is a Full Professor of Spanish and linguistics and cross-appointed in psychology at Wilfrid Laurier University and an adjunct professor of linguistics at McMaster University. He is also the director of the Language Acquisition, Multilingualism, and Cognition Laboratory and Bilingualism Matters at Laurier. His research interests include cognitive and neuroscientific approaches to multilingualism, language acquisition, translation and interpreting. His research appears in journals such as Bilingualism: Language and Cognition; Cerebral Cortex Frontiers in Psychology; International Journal of Bilingualism; International Journal of Bilingual Education and Bilingualism; International Journal of Psychophysiology; Language Learning; Neuropsychologia; Psychophysiology; Translation, Cognition and Behavior; and others. His recent co-edited books include Second Language Acquisition Theory: The legacy of Professor Michael H. Long (Benjamins, 2022); Engaging in Critical Language Studies (Information Age, 2022); The Cambridge Handbook of Working Memory and Language (2022); and Introducing Linguistics: Theoretical and Applied Approaches (Cambridge University Press, 2021).

Together, Ferreira and Schwieter have co-edited Introduction to Translation and Interpreting Studies (Wiley, 2023); The Handbook of Translation and Cognition (Wiley, 2017); Psycholinguistic and Cognitive Inquiries into Translation and Interpreting (Benjamins, 2015); and The Development of Translation Competence: Theories and Methodologies from Psycholinguistics and Cognitive Science (Cambridge Scholars, 2014).
Editorial Advisory Board

Fabio Alves
Federal University of Minas Gerais, Brazil

Yanping Dong
Zhejiang University, China

Jan-Louis Kruger
Macquarie University, Australia

Christopher D. Mellinger
University of North Carolina at Charlotte, USA

Ricardo Muñoz Martín
University of Bologna, Italy

Ana Rojo
University of Murcia, Spain
Contributors

The Contributors are international experts based at or affiliated with institutions and research centres in 16 countries, including: Argentina, Australia, Austria, Brazil, Canada, China, Croatia, Germany, Hungary, Italy, Kenya, the Netherlands, Poland, Spain, Switzerland, and the United States. Short bios of the contributors are found below.

Rhona M. Amos is a Research and Teaching Fellow at the Faculty of Translation and Interpreting at the University of Geneva, Switzerland, and holds a PhD in Interpreting Studies. She is a trainer for the MA in Conference Interpreting, the MAS in Interpreter Training, and the joint ICRC-University of Geneva course in Basic Conference Interpreting. In her research, she applies theories and methods from the field of Psycholinguistics to the study of interpreting, and focuses on predictive processing, the relationship between comprehension and production, and the concurrent activation of L1 and L2 during consecutive and simultaneous interpreting.

Michael S. Boyd is a Foreign Language Lecturer at Roma Tre University, Italy, Adjunct Professor at UNINT University (Faculty of Interpreting and Translation) in Rome and Legal Language Expert. He teaches courses in English language, applied discourse analysis for interpreters and translators and legal English. His research interests include Critical Discourse Analysis, Legal Linguistics, Interpreting Studies and New Media. He is co-editor of the volume The changing role of the interpreter (2017).

Catherine L. Caldwell-Harris is an Associate Professor at Boston University, USA, where she directs the Psycholinguistics Laboratory in the Department of Psychological and Brain Sciences. She has documented how bilinguals experience less emotion in their foreign language compared to their native language. Her diverse investigations into the emotions associated with language include lying, joking, and evaluating selfish/ethical dilemmas. Her study of Russian immigrants to the U.S. documented how young children “Englishify” the household, while older immigrants’ friendships maintain their native language. She had recently described an agent-based model of the factors influencing language-learning outcomes for immigrants to the U.S.

Noelia Calvo is a Postdoctoral Researcher under the supervision of Dr. Ellen Bialystok at the Lifespan Cognition and Development lab, York University, Canada. Her research focuses on the relationship between bilingualism, brain plasticity, and cognitive reserve. She is currently involved in different research projects that include examining the structural and functional brain adaptations in bilingual processing. Her recent publications have appeared in Brain and language; Brain structure and function; and Perspectives.
Xiaocong Chen is a Postdoctoral Research Fellow in the Department of Chinese and Bilingual Studies at The Hong Kong Polytechnic University in Hong Kong SAR, China. His research interests include speech variability during articulation, neuropsychological mechanisms for the processes of language production, as well as language control in bilingual/multilingual production.

Agnieszka Chmiel is University Professor and Head of the Department of Translation Studies at the Faculty of English, Adam Mickiewicz University in Poznań, Poland. Her research interests include conference interpreting, audio description and audio-visual translation. She has participated in many national and international research projects on conference interpreter training, audio description and respeaking. She currently leads an interdisciplinary research team that examines bilingual control mechanisms in conference interpreting and develops PINC, the Polish Interpreting Corpus. She has recently published in Interpreting, target, perspectives and has contributed a chapter to the Routledge Handbook of translation and cognition.

Vanessa Diaz is a Collegiate Assistant Professor in the Department of Psychology at Virginia Tech, United States, and a Faculty Fellow at Virginia Tech’s Center for Communicating Science. Her research interests include sociocognitive development, bilingualism, language development, executive functioning, metalinguistic awareness, and the development of intelligence gender stereotypes and female representation in Science, Technology Engineering, and Mathematics. Her recent publications appear in Bilingualism: Language and cognition, children, first language; and Developmental science.

Yanping Dong is a Professor of Psycholinguistics and Dean in the School of International Studies, Zhejiang University, China; Founding President of the Chinese Association of Psycholinguistics (2011–), Vice President of the Chinese Association for Comparative Studies of English and Chinese (2014–). She serves on the board of Bilingualism: Language and cognition (2011–), on the advisory board of the book series Bilingual processing and acquisition (2014–), and a number of other journals and book series. Her research concerns areas of psycholinguistics, neurolinguistics, second language acquisition and interpreting studies, with most research focusing on the psycholinguistics of bilingualism.

Aline Ferreira is an Associate Professor of linguistics in the Department of Spanish and Portuguese at the University of California, Santa Barbara, where she is also director of the Bilingualism, Translation, and Cognition Laboratory and director of the Latin American and Iberian Studies Program. Her research appears in journals such as Applied linguistics Review; Frontiers in psychology; Translation and interpreting studies; Translation, cognition and behavior; Spanish journal of applied linguistics; and Reading and writing; and in books including Cognitive control and consequences of multilingualism (Benjamins, 2016); The Routledge handbook of translation and linguistics (2018); The Routledge handbook of translation and methodology (2022); Introduction to Translation and Interpreting Studies (Wiley, 2023); and The Routledge handbook of interpreting and cognition (Forthcoming).

Julia Festman is a Full Professor of Multilingualism at University College of Teacher Education Tyrol in Innsbruck, Austria. Her main research focus is on multilingualism on the individual, cognitive, and educational levels. She combines psycholinguistic, neurolinguistic, and neuroscientific methods for investigating learning and processing of multiple languages. She has a particular interest in the effects of multilingualism on cognition and in the bilingual advantage.
debate. Together with Sophia Czapka, she has recently published a number of research papers on a project of multilingualism and cognition with children. Currently, she is co-authoring a book with John W. Schwieter on the cognitive neuroscience of bilingualism.

**Adolfo M. García** holds strategic positions in the US (Senior Atlantic Fellow at the Global Brain Health Institute, UCSF), Argentina (Director of the Cognitive Neuroscience Center at UdeSA; Adjunct Researcher at CONICET; Director of the Master’s in Language and Cognition at UNCuyo), Chile (Associate Research at USACH) and China (High-Level Talent for the Ministry of Science and Technology). He also serves as President of the Translation, Research, Empiricism, Cognition (TREC) Network. He has more than 190 publications, mainly focused on neuroscience and language science. He hosts the television show “Of brains and words”, the video series “Minds between languages,” and a radio column titled “Mind and communication.”

**Ofelia García** is a Professor Emerita in the PhD programs in Urban Education and Latin American, Iberian and Latino Cultures at The Graduate Center of the City University of New York, USA. García has published widely in the areas of bilingualism/multilingualism and bilingual education, language education, language policy, and the sociology of language. The American Educational Research Association has awarded her three Lifetime Research Achievement Awards—Distinguished Contributions to Social Contexts in Education (2019), Bilingual Education (2017), and Second Language Acquisition Leadership through Research (2019). She is a member of the U.S. National Academy of Education.

**Laura Gasca Jiménez** is an Assistant Professor of Spanish Linguistics and Translation Studies in the Department of Modern Languages and Literatures at Fairfield University in the USA. She holds a PhD in Spanish Linguistics from the University of Houston and an MA in Translation from Kent State University. She is the recipient of a “la Caixa” Foundation Postgraduate Fellowship and the winner of the 2019 ASELE-Routledge Research Award. Her main research areas are heritage language education and translation and interpreting pedagogy.

**Cherine Haidar Ahmad** has an MA in translation and interpretation and is currently pursuing a PhD at University of Geneva, Switzerland, on United Nations interpreters on field missions. She is a permanent staff interpreter at the United Nations Office in Geneva. Before joining the United Nations, she worked as a freelance interpreter and participated in field missions, especially for European institutions. She has taught interpretation in Italy and currently teaches interpretation at ISIT, Paris. She has published several poetry and literature translations in Arabic and Italian. Her working languages are Arabic, French, Italian, English and Spanish. Her main area of research is field missions.

**Antonio Iniesta** is a PhD candidate in the Department of Experimental Psychology at the University of Granada, Spain. He is a member of the Memory and Language Research Group in the Mind, Brain, and Behavior Research Center. He got his degree in Speech Therapy and his MA in Cognitive Neuroscience at the University of Granada in which he investigated writing intervention in children with dyslexia, from a behavioral and neural perspective. His recent research focuses on language coactivation and lexical and sublexical access and selection in bilingual writing exploring some modulators. Concretely, the impact that, the orthographic and phonological similarities, the language transparency, and the learning background, have on the phenomenon of language co-activation.
Przemysław Janikowski headed the Translator and Interpreter Training Department at the College of Foreign Languages in Częstochowa. Currently, he works at the Institute of Linguistics, University of Silesia, Poland. He is chief editor of the book series *Tłumaczenie ustne—teoria, praktyka, dydaktyka*. His research interests concentrate on psycho- and neurolinguistic aspects of interpreting, especially didactic and methodological perspectives. His recent publications include: “Multimodal processing in simultaneous interpreting with text: interpreters focus more on the visual than the auditory modality”, “The eye or the ear? Source language interference in sight translation and simultaneous interpreting”, and “Fluency parameters in the Polish Interpreting Corpus (PINC)”.

Boris Kogan holds a major in Psychology from the National University of Mar del Plata and serves as guest professor of the seminar “Bilingual Verbal Processing” within the Master’s in Language and Cognition at the National University of Cuyo. His doctoral studies are supported by a full scholarship from the National Scientific and Technical Research Council. His current projects deal with linguistic and cognitive processes in interpreters and other bilinguals. His work on these populations has led to papers in leading journals, such as *Brain and cognition; Neuropsychologia; Bilingualism: Language and cognition; Applied psycholinguistics; NeuroImage; and Perspectives.*

Paweł Korpal is an Assistant Professor at the Faculty of English of Adam Mickiewicz University, Poznań, Poland, a psychologist, and a practising translator and interpreter. He is involved in interdisciplinary research combining Interpreting Studies and psychology. His research interests include: stress and emotion in conference and community interpreting, cognitive processing in simultaneous interpreting, the use of eye-tracking in Translation and Interpreting Studies, as well as psychophysiological measures of emotional language processing.

Jan-Louis Kruger is a Professor of Linguistics at Macquarie University in Australia. His current work looks at the impact of subtitle speed and secondary visual tasks on cognitive processing evidenced by local and global eye movements during subtitle reading. He is on the editorial board of the *Journal of audiovisual translation.*

Sixin Liao obtained her PhD degree in Linguistics from Macquarie University in Australia, in 2021 after completing a coursework Master’s in Translation and Interpreting Studies at Manchester University in the UK. Her PhD project and recent publications in international journals cited in this chapter focus on using eye tracking combined with post-hoc measures to understand the reading of subtitles in multimodal contexts such as educational videos.

Wolfgang Lörscher studied English philology and political science and graduated at the University of Trier, Germany. He worked as an assistant at Essen University, where he did his PhD with a doctoral dissertation on teacher–pupil discourse in the foreign language classroom. His second, professorial dissertation was on the psycholinguistic analysis of mental translation processes and was published in 1991 as *Translation performance, translation process and translation strategies: A psycholinguistic investigation*. Since 1993 he has held a chair in English linguistics at the University of Leipzig and had been Dean and Vice-Dean of the Faculty of Philology for 14 years. He has conducted research and teaching in psycholinguistics, text and discourse analysis, translation studies, forensic linguistics, and systemic functional grammar.
Contributors

**Pedro Macizo** is a Full Professor of Psychology, Psycholinguistics and Neuroscience at the University of Granada and senior researcher at the Research Center for Mind, Brain and Behavior, Spain. He is author of more than 100 original publications, PI of several research projects funded by the Spanish Ministry of Science and Innovation, and his research interests cover very diverse topics, such as bilingualism and translation, psycholinguistics, numerical cognition, monetary processing, autism, working memory, cognitive control, embodied cognition. He has more than 20 years of experience in behavioral and neuroscientific techniques. Recent publications appear in *Frontiers in psychology, applied psycholinguistics; journal of experimental psychology: Learning, memory, and cognition; and Acta psychologica.*

**Álvaro Marín García** is an Assistant Professor at the School of Translation and Interpreting at the University of Valladolid, Spain. Previously, he has worked as a translation lecturer at the University of Essex (UK). He has also taught translation theory and practice at Kent State University (USA), where he completed his PhD in translation studies. His research interests are in cultural and intellectual history and its relation to translation practices, cognitive translation studies, and the epistemology of translation studies. He is currently investigating translation expertise from an emic perspective as well as new forms of theory development from a pluralistic methodology as applied to cognitive translation studies and translation history. His most recent publication is the collected volume coedited with Sandra Halverson *Contesting epistemologies in cognitive translation and interpreting studies* (2021).

**Christopher D. Mellinger** is an Associate Professor in the Department of Languages and Culture Studies at the University of North Carolina at Charlotte. Dr. Mellinger holds a PhD in Translation Studies from Kent State University, and certificates in Spanish–English interpreting and Spanish Translation/Localization Management from Wake Forest University. He is the co-editor of the journal *Translation and interpreting studies*. He is the co-author with Thomas A. Hanson of *Quantitative research methods in translation and interpreting studies* (Routledge, 2017), co-editor with Brian Baer of *Translating texts: An introductory coursebook on translation and text formation* (Routledge), and editor of *The Routledge handbook of interpreting and cognition* (forthcoming). He has co-edited special issues on community interpreting, translation, and technology (*Translation and interpreting studies*, 2018) and on translation process research (*Translation & interpreting*, 2015).

**Viola Miglio** is a Professor at the University of California, Santa Barbara, United States where she heads the Phonetics Lab and the Program in Hispanic Linguistics. She is a linguist whose main interests are phonology, language change, and translation. She has also worked on linguistic rights, and was entrusted with the management of the Barandiarán Endowed Chair of Basque Studies, which she currently holds. She has published a number of articles on Romance languages and Icelandic, as well as books, such as *Las Antiguas Literaturas Celtas y Germánicas* (1995/2014); *Markedness and faithfulness in vowel systems* (Routledge, 2005/2012); *Translation: The necessary foreign* (2011, with P. Balma and S. Boselli); *Language rights and cultural diversity* (2014); and *Basque whaling in iceland in the XVII century: Legal organization, cultural exchange, and conflicts* (2015), the last two with Xabier Irujo. She is also one of the authors of the *Íslensk–spanisk orðabók* (Icelandic–Spanish Dictionary, 2011). Her current projects are the phonology of Heritage Spanish, and translation quality assessment.
Barbara Moser-Mercer is a Professor Emerita and founder of InZone at the University of Geneva, Switzerland, Visiting Professor at the University of Nairobi, Kenya. She is engaged in strengthening African solutions that advance higher education in emergencies (HEiE) and currently coordinating the launch phase of the African Higher Education in Emergencies Network (AHEEN). Following her initial training as a conference interpreter she pursued her studies in psycholinguistics and cognitive psychology. Her research has focused on the development of expertise in complex cognitive skills of bilinguals, both from a cognitive psychology and a cognitive neuro-science perspective. These findings have been instrumental in informing the design and the development of student-centered multilingual digital learning environments in fragile contexts, which she has leveraged across several refugee camps in Africa and the Middle East.

Megan Nakamura is a PhD candidate at the University of Florida, United States, where she works with Dr. Eleonora Rossi in the Bilingualism, Language, and Brain lab. She received her BA from the California State Polytechnic University of Pomona in Language and Literature with a minor in Psychology and TESL. She is funded as a recipient of the NSF-graduate research fellowship program award. Her dissertation investigates the behavioral and neurophysiological signatures of language learning in its earliest stages. She uses experimental methods utilizing behavioral (linguistic and cognitive) and neural measures of language processing and learning. She primarily uses electroencephalography (EEG; ERPs and oscillations TFR). Her line of research centers on applying psycho/neurolinguistic and cognitive approaches to understanding bilingual language processing with an emphasis on uncovering the underlying mechanisms important for novel language learning and potentially bilingualism as a life experience and its implications for neuroplasticity.

Nataša Pavlović is a Professor at the University of Zagreb, Croatia, where she teaches translation theory and practice. She holds a PhD degree in Translation and Intercultural Studies from the University Rovira i Virgili in Tarragona, Spain. Her research interests include translator education, translation process research, translation technology, and research methodology. She has been co-editor of The interpreter and translator trainer since 2020. She is a member of the Translation, Research, Empiricism, Cognition (TREC) Network and COST action Language in the Human-Machine Era (LITHME).

Gregory J. Poarch is an Assistant Professor of English Linguistics and English as a Second Language at the University of Groningen, The Netherlands. His research interests cover psycholinguistic, cognitive, and social aspects of second-language acquisition and multilingualism, in particular cross-linguistic interaction and cognitive control in multilinguals, the multilingual mental lexicon, and the implications of societal multilingualism for language education. He is currently working in DFG-funded project together with Holger Hopp and Sarah Schimke.

Ana María Rojo López is a Professor of Translation at the University of Murcia, Spain. Her current research interests focus mainly on the study of the translation process, with special emphasis on the role of emotions, creativity and other personality and individual differences. Her interests also lie within audience reception analysis and the contributions of cognitive linguistics to translation studies. An external associate of the MC2 Lab, she currently coordinates a research project on emotions and translation based on the study of the translation and interpreting process through cortisol analysis, heart rate variability measurement, eye tracking, facial recognition, and reaction time analysis.
Eleonora Rossi is an Assistant Professor in Linguistics at the University of Florida, United States. She got her MA in Speech Pathology at the University of Padua (Italy) and her PhD in Linguistics at the University of Groningen (The Netherlands), in which she investigated language priming in agrammatic aphasic speakers. During her post-doctoral fellowship, she worked at Penn State University (US) on the neurocognition of bilingualism. Throughout her career she has built a strong cross-disciplinary research path by developing expertise in formal linguistics, neurolinguistics, psycholinguistics, and cognitive neuroscience. The overarching goal of her work is to understand the linguistics, and neurocognitive bases of bilingual language processing, and its neuroplasticity. Primary tools for her research include linguistic, behavioral and neural measures of language processing using electroencephalography (ERPs, TFR analysis, and RS-EEG), eye tracking, and magnetic resonance imaging (MRI). Her research has been funded by the National Science Foundation, and other European grant Institutions.

Eriko Sato is an Associate Professor in the Department of Asian and Asian American Studies at Stony Brook University, where she is also the director of Language Learning Research Center. Her research area includes translanguaging, multilingualism, intercultural communication, translation studies, language learning, and online language teaching. She has published research articles from scholarly journals such as Target, modern language journal, Translation and Translanguaging in Multilingual Contexts, and Language teaching research. Her recent research monograph is Translanguaging in Translation: Invisible Contributions that Shape Our Language and Society (Multilingual Matters, 2022). She has also published translations of Japanese folktales as well as Japanese textbooks and grammar references (17 titles in total) from Tuttle publishing, McGraw Hill, and Wiley. Sato is a recipient of AAUW Fellow (2019) and State University of New York Chancellor’s Award in Excellence in Teaching (2021).

John W. Schwieter is a Full Professor of Spanish and linguistics and cross-appointed in psychology at Wilfrid Laurier University and an adjunct professor of linguistics at McMaster University. He is also the director of the Language Acquisition, Multilingualism, and Cognition Laboratory and Bilingualism Matters @ Laurier. His research interests include cognitive and neuroscientific approaches to multilingualism, language acquisition, translation and interpreting. His research appears in journals such as Bilingualism: Language and cognition; Cerebral cortex; Frontiers in psychology; International journal of bilingualism; International journal of bilingual education and bilingualism; International journal of psychophysiology; Language learning; Neuropsychologia; Psychophysiology; Translation, cognition and behavior; among others. His recent co-edited books include Second language acquisition theory: The legacy of Professor Michael H. Long (Benjamins, 2022); Engaging in critical language studies (Information Age, 2022); The Cambridge handbook of working memory and language (2022); and Introducing linguistics: Theoretical and applied approaches (2021).

Kilian G. Seeber is an Associate Professor at the Faculty of Translation and Interpreting of the University of Geneva in Switzerland, where he is the Program Director of the Masters of Advanced Studies in Interpreter Training. Kilian is Principal Investigator at LaborInt, a laboratory dedicated to cognitive research into multilingualism and interpreting, as well as InTTech, a research laboratory dedicated to re-purposing existing or developing new technologies for interpreter training and practice. His main research interests include cognitive load and integration during multilingual and multimodal language processing.
Giulia Togato is an Assistant Professor of Translation Studies at the RGRLL Department, California State University Long Beach, United States, where she has recently started The Think2Talk Lab [Psycholinguistic Perspectives on Translation and Bilingualism]. Her research interests include cognitive and emotional aspects of figurative language processing in translation and bilingualism, embodied cognition in the first and second language, automaticity and cognitive control in translation and bilingualism. She obtained her PhD in Experimental Psychology and Behavioral Neuroscience at the University of Granada (Spain), where she also served as a postdoctoral researcher. She has 15 years of experience as a professional translator and consecutive interpreter, with special interest in scientific translation in the field of psychology. Recent publications appear in British journal of psychology, Canadian journal of experimental psychology; and Applied linguistics.

Weiwei Wang is an Associate Professor in the School of Interpreting and Translation Studies, Guangdong University of Foreign Studies, China. Her work focuses on interpreting quality assessment. She is particularly interested in understanding the patterns of interpreting competence development and potential causal factors in the evolution of the competence. Her papers are published in such journals as Frontiers in psychology, Chinese translators journal; and Foreign language world. She has led several research projects funded by the Ministry of Education, the China National Social Science Foundation, and the British Council. She is serving as the Deputy Secretary-General of the National Interpreting Committee of the Translation Association of China.

Bogusława Whyatt is an Associate Professor in the Faculty of English at Adam Mickiewicz University in Poznan, Poland. With her background in psycholinguistics, her research interests focus on translation process, expertise development and the interface between bilingualism and translation. She was the principal investigator in two large-scale TPR projects funded by the National Science Centre Poland—the ParaTrans project and the EDiT project. She has published chapters and articles on intralingual translation, directionality and the use of online resources. She is an experienced translator trainer and a freelance translator, member of TREC and CTER, and an external associate of the MC2 Lab.

Lihua Zhang is a Lecturer of Interpreting with over 20 years of experience in training in the School of Interpreting and Translation Studies at Guangdong University of Foreign Studies, China. She is also a practicing conference interpreter between Chinese and English. She is particularly interested in interpreting training. She has written and published in Chinese on the effect of feedback in interpreting learning and teaching and the delineation of shadowing exercise as an essential tool. She has published a textbook introducing interpreting preparation. She has participated in several research projects funded by the Ministry of Education, the China National Social Science Foundation, and the British Council.

Hongming Zhao is a Postdoctoral Research Fellow in the School of International Studies, Zhejiang University, China. His research interests include neurocognitive effects of interpreting training on executive functioning, language control in interpreters/bilinguals and interpreting competence.
Part I

Introduction and overview of the *Handbook*
Interfaces of translation, interpreting, and bilingualism from cognitive perspectives

Aline Ferreira and John W. Schwieter

Introduction

Bilingualism—a term often used interchangeably with multilingualism—is an interdisciplinary and multifaceted field. Researchers in bilingualism are interested in studying the acquisition, production, processing, and comprehension of two or more languages (Bhatia, 2018). In brief, bilingualism is concerned with the coexistence of more than one language system within an individual (Hakuta, 2009). For humans, the ability to learn and use multiple languages is not new, as evidenced by the many references to bilingualism in early writings such as Panini’s grammar of Sanskrit and religious texts. Similarly, the ability to translate and interpret between languages is not new. When considering that translation and interpreting are processes conducted by bilinguals, it is surprising that the fields of bilingualism and translation and interpreting studies (TIS) have developed their own research trajectories, often with very little dialogue between the two disciplines.

The Routledge handbook of translation, interpreting, and bilingualism is the first to bring together the related fields of TIS and bilingualism under the same cover. Given the extreme breadth of these interdisciplinary fields, which would be very difficult to cover within the same handbook, we specifically focus on cognitive aspects. Research on bilingualism and TIS from cognitive approaches have carved their own subdiscipline as can be seen when referencing them: ‘Cognitive Bilingualism’ (Schwieter & Ferreira, 2018), also referred to as ‘bilingual processing’ (Schwieter, 2015), and cognitive translation and interpreting studies (CTIS) (Schwieter & Ferreira, 2017; Xiao & Muñoz Martin, 2020). The overlapping nature between bilingualism and TIS, along with the fact that both disciplines are widely studied through a cognitive lens, demonstrates their ability to complement and learn from one another.

Overview of the handbook

Following this introductory chapter, Part II of the handbook is dedicated to theories and methods. In Chapter 2, Dong presents an in-depth description of the unique bilingual profile of translators and interpreters. The chapter takes the general bilingual population (i.e., “typical” bilinguals who are not translators or interpreters) as a reference point to compare and contrast
the uniqueness of translators and interpreters. The author specifically considers the cognitive demands that translation and interpreting involve in her characterization of this highly skilled bilingual population. Chapter 3, by Festman and Poarch, offers an overview of prominent theories and models in cognitive bilingualism. Key topics are discussed, such as the cognitive control required for bilingual language processing and the consequences of bilingualism for cognition.

Marín García (Chapter 4) reviews theories and models in CTIS and bilingualism by taking readers on a historical journey from the 1960s, and process-oriented research, to the state of the field today. Sophisticated models of the cognitive underpinning of translation are based on extremely sensitive data-gathering methods which offer significant insight on issues such as mediators’ typing, stress, emotions, brain plasticity, and peer-to-peer interaction. Marín García advocates that CTIS holds significant implications for the language industry, technological advancements, and other enterprises. In Chapter 5, Janikowski and Chmiel elaborate on some of the primary research methods used in CTIS and bilingualism. The chapter first discusses physiological measures such as MRI, EEG, eye-tracking, and galvanic skin response, and psycholinguistic tasks such as priming, lexical decision, picture naming, and the Stroop, Simon, and Flanker tasks. Janikowski and Chmiel also report on traditional methods (e.g., keystroke logging, corpora, interviews, etc.) as these measures have implications for cognitive-oriented research.

Neurocognitive aspects of CTIS are the topics of interest in Part III. In Chapter 6, García and Kogan offer insights into how interlingual reformulation can elucidate our understanding of the bilingual brain. Interlingual reformulation is any neurocognitive activity where language input is generated into a different language, irrespective of modality (García, 2019). The authors first discuss the neural organization of bilinguals’ linguistic systems. They then address the asymmetries between the two systems as hypothesized in pioneering models of the bilingual memory and the consequences of the co-activation of two languages in one mind. The chapter ends with sections on the role of interlingual reformulation in second-language (L2) word learning and brain plasticity. Chapter 7, by Korpel and Rojo López, reviews studies using physiological measures to examine language processes in translation and interpreting. The authors address the concept of embodied cognition and what the interaction between cognition and physiology reveals about translation and interpreting processes. The chapter elaborates in more detail on many of the physiological methods discussed by Janikowski and Chmiel (Chapter 5). These sections report on pioneering and ongoing work using these measures, along with a discussion on future research directions in work employing physiological methodologies. Finally, in Chapter 8, Calvo presents evidence for brain plasticity among young bilingual adults and its critical role in translation and interpreting. The author critically examines current research on experience-dependent neural plasticity among translators and interpreters and proposes avenues for future research.

In Part IV, the handbook then turns to discuss topics related to the cognitive architecture of translation and interpreting processes. Chapter 9, by Moser-Mercer, opens the section with a discussion on working memory and simultaneous and consecutive interpreting. The chapter begins by presenting working memory models and their implications for interpreting. Following this, Moser-Mercer reviews issues related to working memory, including updating and cognitive control, along with the notion of an interpreter advantage for working memory capacity. In Chapter 10, Zhao, Chen, and Dong discuss how interference is controlled in interpreting. They specifically explore how interference control in interpreting differs from that in general bilingual processing. The chapter begins by reviewing theories of bilingual language control and discussing how these theories can be used to explain interference control in interpreting. Zhao et al. then review the Attentional Control Model in interpreting (Dong &
Li, 2020) with a particular emphasis on the model’s predictions related to how interpreters may control interference arising from activated languages.

Chapter 11, by Liao and Kruger, presents the topic of cognitive processing of subtitles. The chapter opens with a brief overview of early research on how subtitles are processed. Against this backdrop, the authors discuss how a more complete picture of subtitle processing is emerging which uses innovative methods such as eye-tracking to investigate various aspects of subtitled products. They then review new research trajectories in related disciplines and topics (e.g., reading, multimedia learning, and multitasking). Finally, the authors identify uncharted territory for future work on subtitle processing and other audiovisual translation products. In Chapter 12, Ferreira and Miglo discuss the role of identity in CTIS. The authors first review how the two constructs of identity and bilingualism have been researched and interpreted. The chapter then transitions to assess research in CTIS on language production and comprehension, discourse processing, memory, attention, and expertise. Finally, they present a critical discussion on the benefits of examining identity and bilingualism in order to better understand how translation and interpreting tasks are performed.

False belief and perspective taking are the topics of focus in Chapter 13 by Diaz. The chapter brings to light the importance of considering sociolinguistic characteristics and psycholinguistic processes in research in CTIS and bilingual development. Diaz also reviews brain-imaging studies that examine the relationship between Theory of Mind and translation and interpreting processes. These topics include the activation of Theory-of-Mind-related brain areas during translation tasks and the activation of brain areas implicated in perspective taking when translating remarks whose meanings depend on context. Part IV concludes with Chapter 14, in which Rojo López and Caldwell-Harris discuss emotion processing in bilingual language use and translation processes. The chapter begins with a look at how individuals may feel a stronger emotional connection with their first language compared to a foreign language. Following this, the authors examine how emotions are processed in two languages and how decision-making is affected by the language used. The chapter concludes with a dialogue on implications for professional practice and future research.

The cognitive dynamics involved in TIS is the theme of Part V, which starts with Lörscher’s discussion on research development in translation processes since the mid-1980s. In the chapter, Lörscher presents a review of three research projects related to translation processes and how translation problems are solved. He explains the concept of natural translation and elaborates on models explaining the development of translation competence. The author also advocates for combining introspective protocols with other measures to better investigate translation processes. Chapter 16, by Rossi, Iniesta, and Nakamura, focuses on issues related to age, bilingualism, and cognition in translators and interpreters. They firstly review the dynamics of language processing, and how aging and neurophysiological changes in the brain are related. The authors then discuss how languages may remain relatively intact as over the lifespan and how bilingualism might have a positive effect on cognitive aging. Finally, the chapter reviews the effects and dynamics of translation and interpreting while exploring critical aspects such as L2 age of acquisition and relative experience with translation and interpreting.

In Chapter 17, by Seeber and Amos, the authors discuss three key terms in CTIS, namely, capacity, load, and effort. The authors refer to capacity as the maximum amount of cognitive resources that can be used by a mental system, load as the quantification of the processing demands required by tasks, and effort as the actual allocation of cognitive resources that are applied to tasks. They present a review on how monolingual tasks have been used to investigate an individual’s capacity to understand and produce language. The authors then consider how multilingual tasks have been used to assess language comprehension and production, code
mixing and code switching, written translation, post-editing, sight translation, consecutive interpretation, and simultaneous interpretation. Throughout their discussions, the concepts of capacity, load, and effort are interwoven, demonstrating their significant potential to reveal nuances of language processing, particularly with respect to the speed, modality, and directionality. Togato and Macizo Soria’s contribution (Chapter 18) is on cognitive flexibility. The authors begin by explaining its original conceptualization as a switching ability and examine work investigating whether it is domain-specific or domain-free ability. They also discuss cognitive flexibility as dependent on the person’s capacity to switch between two conceptualizations, which occurs due to a person’s capacity to learn and improves with experience. The authors also explain how attentional processes are related to cognitive flexibility and their relationship between cognitive flexibility and working memory in interpreters.

The handbook concludes with Part VI, which presents chapters on aspects of translator and interpreter tasks and characteristics. In Chapter 19, Ferreira presents an overview of research on directionality in CTIS over the past two decades. The chapter starts with a brief overview of key definitions. This is followed by a discussion on how working into a weaker language (L2) has been seen as less prestigious than working into a stronger language (L1), although very little empirical support has substantiated this claim. The chapter then explores written languages skills and directionality along with a look at how some studies in which less- and more-experienced professionals have offered a better description of the development of translation competence. The chapter concludes by advocating for collaboration across disciplines.

Chapter 20, by Mellinger, is about community translation and interpreting and its value to society. The author provides accounts of individual variations among professionals who work as community translators and interpreters and reviews inconsistencies in the field. The chapter transitions to a discussion on ethics and decision-making processes, explaining the unique aspects related to community translators and interpreters’ work (e.g., emotional management during task completion). He concludes by explaining how theoretical models are being revisited to account for aspects related to the context in which the task takes place (e.g., societal, interactional, and linguistic).

Sato and García, in Chapter 21, synthesize work on translanguaging and bilingualism. The chapter discusses the relation between translanguaging and translation and can have implications for language development. The authors elaborate on language education and the consequences of monolingualized classrooms being the norm. The chapter also presents a discussion on how education and reform movements view bilingualism. Sato and García discuss translation and translanguaging for language teaching and how translanguaging can complement classroom pedagogies. They also look at how textbooks have negatively affected language learning and teaching, and on how translanguaging can help to overcome cultural barriers and to better understand socio-political ideologies related to language use. The authors conclude the chapter by presenting an overview on translation in multilingual societies, focusing on aspects such as decolonization translations and creativity.

Chapter 22, by Boyd and Haidar, offers an overview of approaches to bilingualism that focus on the bilingual “self” in translation and interpreting tasks. The authors review the relationship between bilingualism, translation, and interpreting along with some of the misconceptions associated with them. After exploring research on the bilingual self (i.e., how individuals perceive their own bilingualism or bilingual identity), the authors present a multi-level methodological approach in which they address how identity is enhanced by shared domains of interest and community. Gasca Jiménez, in Chapter 23, presents an overview of CTIS, bilingualism, and heritage languages. She notes that language brokering research is disconnected from translation
and interpreting and heritage language education and underscores how various contexts of language brokering require distinct knowledge and experience. After looking at the psychological and cognitive impacts of language brokering, the chapter advocates against current practices in which language brokering goes unnoticed, despite the fact that it is a widespread phenomenon.

Chapter 24, by Pavlović and Whyatt, reviews pedagogies commonly used in translation. The authors highlight the importance of understanding the process of becoming a professional translator from a developmental perspective in which there is a conscious effort to learn how language works. The chapter moves to a review on how pedagogical practices in translation have changed over the past century, especially in Europe. The authors point out possible differences between translator training and education, along with translation competence models. The chapter then presents a review of learner-center pedagogy, process-oriented pedagogy, metacognitive processes, and feedback and assessment. Wang and Zhang, in Chapter 25, offer a review on training bilinguals to become interpreters. They explain how interpreting can be seen as a bilingual’s innate skill, a competence, and a profession. Following this, the chapter presents an overview of the intersection between bilingualism and language proficiency in interpreting. The chapter concludes with a call for more interpreting training studies that directly address the limitations and challenges that have been faced so far.

The Routledge Handbook of Translation, Interpreting and Bilingualism is the result of a collaborative effort to bolster our knowledge of and across these fields. We hope that readers will benefit from the engaging contributions that bring to the foreground challenges and new opportunities in CTIS and bilingualism. While it should be apparent that research in translation studies, interpreting studies, and bilingualism shares commonalities, this handbook offers direct insight from scholars from different subfields and regions across the world on these common grounds, while shedding light on future considerations that work towards leveraging the complementary nature of these disciplines.

References
Part II

Theories and methods
The unique bilingual profile of translators and interpreters

Yanping Dong

Introduction

To depict the unique bilingual profile of translators and interpreters, we have to take general bilinguals as the reference point, and to explore how translators and interpreters differ from general bilinguals. We deliberately ignore some superficial facts or observations, such as “Translators and interpreters are better in translation and interpreting”, “Interpreters are more interested in or concerned with current global affairs”, or “Translators pay more attention to cultural differences”. The critical question for the present chapter is how the intensive experience of translation and interpreting may change one’s way to perceive and process the world, especially languages. We will, first of all, briefly review how bilinguals may differ from monolinguals, which will depict the profile of general bilinguals, a reference point for translators and interpreters. Since most relevant research in the literature is concerned with the interpreter, we will devote more space to the discussion of the interpreter’s profile, and compare translators with interpreters and general bilinguals. If readers are interested in how translators and interpreters are different from monolinguals, they may simply add up the effects of the two experiences: general bilingual experience and translation/interpreting experience.

Translators and interpreters are first of all bilinguals, assumed and expected to be fluent in both languages. There are different types of bilinguals, depending on various factors, such as their second-language proficiency (e.g., balanced or unbalanced bilinguals), and whether people acquire their two languages during childhood (i.e., simultaneous or early bilinguals), or learn their second language later (i.e., successive or late bilinguals; Grosjean, 2013). “General bilinguals” in this context, when contrasted with translators and interpreters, are those who are more or less fluent in a second language (L2) but who do not have an intensive experience in translation or interpreting. They could be balanced bilinguals (almost equally fluent in both languages), or L2 learners, comparable in L2 proficiency to those who are being trained to be translators and interpreters. They may have received some training in translation and interpreting, but mainly as an exercise to enhance their L2.

Translators and interpreters are unique bilinguals who do written translation or oral interpreting regularly. Typically, they are translators and interpreters on the job market, but when
contrasted with comparable L2 learners in some empirical studies (see Dong & Zhong, 2019 for a review), they could be students receiving intensive translation or interpreting training for the purpose of being able to do the job of translation or interpreting, irrespective of how many of them could achieve the purpose in the end.

The basic approach to depict the unique bilingual profile of translators and interpreters is to identify what cognitive demands translation and interpreting may involve, especially demands that are beyond what a general bilingual communication task may require. We hope that this will help clarify not only the unique bilingual profile of translators and interpreters, but also the unique task demands of translation and interpreting, which may provide implications for translation and interpreting training, and for L2 education in general. What is worth mentioning is that most relevant empirical studies reviewed below are about typical and popular modes of interpreting on which students are trained in school.

Profile of typical bilinguals

What is the general bilingual like? This question is more meaningful when we compare the general bilingual with the general monolingual. That is, in what ways does learning or using a second language make someone different? This issue can be approached from different perspectives, but it has been mainly investigated from the cognitive perspective, probably due to people’s curiosity about mechanisms that work behind what is obvious. The general question from the cognitive perspective is: How is the mind of the bilingual speaker different from that of the monolingual speaker? Relevant studies in the literature cluster around two major questions: How does the bilingual speaker represent and process his or her two languages (and even the world) (when compared with the monolingual speaker)? How is the bilingual speaker’s processing ability different from the monolingual speaker?

Bilingual representation and processing

The first question involves research on bilingual representation and processing, especially at the lexical and syntactic levels. Much research has been conducted for bilingual lexical representation and processing. The Revised Hierarchical Model (Kroll & Stewart, 1994), for example, illustrates the asymmetrical relations between the first language (L1), the L2 and their shared concepts. Specifically, the connection from the L2 word form to the L1 word form is stronger than the connection in the other direction, and the shared concept has a stronger connection with the L1 word form than with the L2 word form. The Distributed Model (de Groot, Dannenburg & van Hell, 1994) expounds on the shared concept of the bilingual mental lexicon, and shows that the extent of the storage overlap is represented in terms of shared features in a distributed representation. Concrete words may share more conceptual nodes than abstract words. Building on the Distributed Model, the Shared (Distributed) Asymmetrical Model (Dong et al., 2005) illustrates the dynamic feature of the bilingual mental lexicon. That is, conceptual differences between translation equivalents may be first missed or neglected, and then integrated to some extent, but at the advanced stage of learning, there is also a “separatist” tendency to maintain the L1 conceptual system in the representation of L1 words and to adopt the L2 conceptual system in the representation of L2 words. This suggests that the bilingual speaker may differ, to some extent and at some stages, from the monolingual speaker even when they use the same L1 language.

In fact, the issue of language relativity (e.g., Slobin, 1996), when studied in the bilingual context, may show how learning and using an L2 may affect one’s representation and processing
of the world. It has been found that language can affect one’s sensitivity towards such concepts as color luminance (e.g., Athanasopoulos, 2009) and number (e.g., Athanasopoulos, 2006). Take color as an example. Two words in Greek, ‘ble’ and ‘ghalazio’, are used to describe what we call in English ‘dark blue’ and ‘light blue’. Athanasopoulos (2009) found that Greek–English bilinguals’ categorical sensitivity to the two shades of “blue” was associated with their lengths of stay in the UK, i.e., less sensitivity with longer stay.

**Bilinguals’ processing ability**

The second question (i.e., the bilingual’s processing ability) could be well exemplified in the “bilingual advantage” controversy. Although there has been research indicating a bilingual disadvantage in the vocabulary size of a given language or in slower responses in picture naming in a given language (e.g., Gollan, Montoya, Fennema-Notestine, & Morris, 2005), there has been much more research on the cognitive benefits of bilingualism, especially the benefits that can be generalized to the nonlinguistic domain of cognitive control (e.g., the ability to resist interference, to switch swiftly to the target). Such benefits in cognitive control are often covered by the term “bilingual advantage” (but see Poarch & Krott, 2019). Results from empirical research on bilingual advantage are not consistent, leading to many systematic reviews (e.g., Lehtonen et al., 2018; Li & Dong, 2020; Paap, Johnson & Sawi, 2015; Poarch & Krott, 2019) and theoretical speculations (Green & Abutalebi, 2013).

Green and Abutalebi (2013) tried to connect three common contexts of bilingualism with specific cognitive control functions. In a single-language context in which one language is used, the cognitive functions of goal maintenance, conflict monitoring, and interference suppression are required to maintain communication in a single language. In a dual-language context in which two languages are used alternatively, bilinguals may often switch between two languages, and task engagement and disengagement are additional requirements. In a dense code-switching context in which the bilingual adapts the words of one language to fit into the syntactic frame of another, opportunistic planning is required to make use of whatever comes most readily to hand, indicating the absence of suitable linguistic means rather than the flexible use of available means. In a word, according to Green and Abutalebi (2013), each bilingual context poses unique requirements for cognitive control, which suggests that intense experience in that context may strengthen one’s ability in those unique aspects of cognitive control.

As to how those unique aspects of cognitive control may get strengthened by one’s bilingual experience, most research focused on inhibitory control (also referred to as interference suppression) and cognitive flexibility (also shifting or switching ability) (see Dong & Li, 2015 for a review). Inhibitory control is investigated because it is believed that the bilingual’s two languages are activated even in a single-language context (e.g., Wu, Cristino & Leek, 2013a) and the non-target language has to be inhibited or suppressed (Green, 1998). Cognitive flexibility is investigated because a bilingual speaker frequently switches between two languages, and has to reactivate stimulus–response mappings after each switch (Hernandez, Martin, Barcelo & Costa, 2013). Although most relevant empirical studies have found supporting evidence in some indicator(s) of a bilingual advantage, the same studies may have failed to find evidence in other indicators, and there are also studies that have failed in securing any evidence (e.g., Paap & Greenberg, 2013).

In spite of controversies, recent research has found that factors such as L2 proficiency may affect the presence or absence of bilingual advantage. DeLuca, Rothman, Bialystok, and Pliatsikas (2020), for example, found that differences in the duration of bilingual experience and the extent of active language use predicted activation patterns in distinct brain regions,
indicating differences in neural recruitment as a result of diverse bilingual experiences. On the basis of previous research, Li and Dong (2020) took a dynamic view and indicated that the ecosystem of language experience (i.e., the ways or situations in which one learns or uses a language, especially a second language) and the expertise of the language learner/user (e.g., expertise in interpreting, video gaming, or music training) may affect one’s cognitive control ability.

To conclude this section, although we are aware of controversies (e.g., Paap et al. 2015), we may still conclude that learning and using an L2 may change one’s mind to some extent, including one’s representation and processing of the world (especially lexical concepts, e.g., Dong et al. 2005; color perception, e.g., Athanasopoulos et al., 2009), and one’s processing ability (especially cognitive control ability in inhibitory control and cognitive flexibility, e.g., DeLuca et al., 2020; Li & Dong, 2020).

The unique bilingual profile of interpreters

Similar to the above issue about general bilinguals, this issue about interpreters has to take general bilinguals as a reference point. The critical question is: how does interpreting training or experience change people? To answer this question, we have to analyze how the task of interpreting differs from a general bilingual task. The analysis of task characteristics may reveal insights into the cognitive processes underlying skill acquisition (Frank & Macnamara, 2021). Interpreting is certainly a complex and demanding task, and the mastery of the task may lead to a few sets of changes, which will be discussed in detail in the following subsections. First, compared with general bilingual speakers, interpreters may represent and process differently the two languages which they have to interpret between. Second, compared with general bilinguals, interpreters may have to recruit cognitive processes to a greater extent (e.g., working memory), which may then get strengthened because of intense practice. Third, compared with general bilinguals, interpreters may have experienced stronger stress, which may then change their psychology. These changes may first appear in interpreting tasks, and then transfer to non-linguistic or other linguistic tasks, becoming part of the interpreter’s cognitive profile.

Interpreters’ language representation and processing

 Compared with a general bilingual communication task, an interpreting task requires the interpreter to switch as accurately and as efficiently as possible between two languages (and often between two cultures). “Accurately” means interpreters must comprehend the input message correctly and transmit it in the other language without any mistake or ambiguity. “Efficiently” means that interpreters have to transmit the speaker’s messages in time without leaving out important messages due to the extreme time limit. Adaption to such extreme demands may change interpreters’ language representation and processing.

Interpreters’ between-language representation connections

 In an interpreting task, interpreters may not use the avoidance strategy as freely as general bilinguals, and between-language (or between-culture) connections should be strong enough for easy access. In a general bilingual situation, bilingual speakers may use the avoidance strategy (e.g., Laufer & Eliasson, 1993; Hubert, 2011), circumventing whatever they are not familiar with, often without being even noticed, no matter whether they avoid concerns language expressions or cultural differences. In a typical interpreting situation, however, interpreters could not control the input (either content or form or speed), and the avoidance strategy, in most
The unique bilingual profile of translators and interpreters

cases at least, could hardly be used without being considered a negative effect on interpreting quality. In addition, the transmission process is carried out under extreme time pressure, which means that interpreters cannot spend much time searching for the appropriate expressions during interpreting, and they thus have to establish the between-language (or between-cultural) “equivalents” in the mind, ready to be easily accessed. Laufer and Eliasson (1993) found that L2 avoidance was determined more by a systemic L1–L2 incongruence than by the inherent difficulty of L2 forms. Interpreters must be aware of all the between-language incongruences (e.g., word order difference between English and Arabic, Al-Rubai’i, 2004), and try to establish “equivalents”, which could be syntactic (e.g., SVO–SOV incongruence between English and German), semantic, pragmatic or cultural, etc. As for congruent between-language expressions, interpreters have to establish firm connections for these expressions so as to save processing time during interpreting.

In a word, the above analysis suggests that the interpreter’s bilingual mental lexicon must be different from that of the general bilingual speaker. First, the connections between the two languages should be stronger for the interpreter, either at the conceptual level as predicted by the Revised Hierarchical Model (Kroll & Stewart, 1994) or at the form level (e.g., for one-to-one translation equivalents memorized to save time in interpreting). Second, the interpreter must be more aware of the similarities and differences between the two languages, with the bilingual mental lexicon reaching the ideal state and marking out both shared and separate conceptual nodes for “translation equivalents”, as illustrated by the dynamic nature of the Shared (Distributed) Asymmetrical Model (Dong et al., 2005).

Although little research has been conducted on the differences between the interpreter’s and the general bilingual’s mental lexicons, there are many studies that have investigated how interpreting experience may enhance one’s lexical processing ability. To be brief, there has been research supporting interpreters’ better lexical processing ability as reflected in lexical search (e.g., verbal fluency in Santilli et al. 2019), lexical semantic processing (e.g., semantic categorization in Elmer et al. 2010) and between-language connections (e.g., Santilli et al. 2019), although Santilli et al. (2019) also show that interpreters do not have such enhanced lexical ability in simple lexical tasks such as picture naming or word reading. Christoffels et al. (2003) found that word access speed (as tested in the word translation task) did contribute to interpreting quality in an L2–L1 simultaneous interpreting (SI) task, and Dong and Lin (2013) demonstrated that with more interpreting training, the bilingual speaker was more likely to activate translation equivalents while still reading the input message. These empirical studies support the idea that the between-language connections are stronger for interpreters than for general bilinguals.

In fact, the close associations between languages established during interpreting training are part of the interpreting schema proposed by Dong and Li (2020) for language control in interpreting. In the typical mode of L2–L1 oral interpreting, for example, the L2 is connected to the auditory modality, and the L1 to the vocal modality. With training, these connections are fostered. In addition, with training, the L2 input drives the L1 output via transcoding (at the form level) or deverbalization (at the conceptual level); and the auditory–vocal connection formed during language learning early in life (e.g., listening to adults’ speech and mimicking their utterances) ensures the flow of messages from auditory to vocal. These connections for L2–L1 oral interpreting, once established with training or experience, are stored as a task schema (i.e., “networks detailing action sequences”, Green, 1998: 68), and works to ensure that no source language words would interfere in target language production. In terms of mental representations, the L2–L1 lexical connections should be stronger for interpreters than for general bilinguals if interpreters are mainly trained in the L2–L1 direction.
**Interpreters’ language-processing strategies**

To deal with the demanding task of interpreting, interpreters have to adopt a series of interpreting strategies. Specifically, interpreting strategies could be methods, techniques and actions used or taken to solve problems or improve interpreting qualities, including strategies of planning, monitoring, appraisal and repairing. Interpreting strategies could also be specific tactics used during interpreting to solve problems or to improve interpreting quality, including explicitation, compression, visualization, anticipation, etc. (Dong, Li & Zhao, 2019). In fact, a large part of interpreting training is devoted to strategy training, and the findings in Dong et al. (2019) suggest that interpreting strategy training is effective.

With a series of interpreting strategies, interpreters may be better at general language processing (not just at interpreting processing), compared with general bilinguals. Not much research has been conducted in this respect. An exception is anticipation, an interpreting strategy that has been associated with one’s ability in prediction or integration in general language processing. With the eye-tracking technique, Lozano-Argüelles, Sagarra and Casilla (2020) found that interpreting experience was associated with L2 morphological anticipation in the speed of spoken word recognition (compared with general bilinguals). In a brain-imaging study with the ERP (event-related potential) technique, Zhong, Dong and Liu (2022) asked participants with more or less interpreting experience to read sentences ending with expected words, related or unrelated violations, and found that more interpreting experience was associated with better semantic integration (i.e., smaller N400 amplitudes for expected words but not for violations, and broader scalp distribution of the differences between related and unrelated violations). As for how other interpreting strategies may influence interpreters’ general language processing, little research has been conducted. But since the strategy of anticipation can transfer to general language processing, it is reasonable to assume the same for other strategies.

To conclude this subsection, interpreters may differ from general bilinguals in language representation and processing. First, interpreters’ between-language (and between-cultural) representation connections should be stronger (so as to ensure easy access), with between-language differences more clearly represented in the mental lexicon (so as to ensure accuracy in rendition). These connections are part of the interpreting schema established during interpreting training or experience (Dong & Li, 2020), and the schema emphasizes that interpreting direction matters in the connections. Second, interpreters, being trained or experienced in interpreting strategies, may transfer their strategy skills to general language processing, resulting in more efficient processing of language.

**Interpreters’ cognitive control abilities**

Compared with general bilinguals, interpreters may have to recruit cognitive processes to a greater extent, such as working memory (WM), which may then get strengthened because of intense practice, and transferred from verbal tasks to non-verbal tasks (see Perkins & Salomon, 1992, for a discussion on mechanisms of learning transfer). The benefits in cognitive control brought by interpreting experience could be covered by the term “interpreter advantage”. Cognitive control is a set of top-down processes that are needed during cognitive performance, and is often used interchangeably with “executive functioning” and “executive control” in the literature (especially in research on bilingual advantages). Another term is attentional control which shares most of its major functions with cognitive control, although “attentional control” emphasizes more the management of one’s attention (e.g., focused attention and distributed attention, Dong & Li, 2020). According to Miyake et al. (2000) and Diamond (2013),
the three widely recognized core functions of cognitive control are WM, inhibitory control and cognitive flexibility. With these core functions, people can perform more complex functions such as coordination, reasoning, planning, and problem solving.

**Interpreters’ working memory and short-term memory**

Compared with the general bilingual communication task, the task of interpreting puts a lot of demand on memory, including WM and short-term memory (STM). Different from STM, WM refers to top-down processes that enable us to keep something in mind and at the same time manipulating it mentally for successfully performing a task such as translating one language into another. Specifically, STM is measured by its span, i.e., by its size (e.g., in a digit task in which digits are presented and then correctly recalled), while WM is measured either by its span (e.g., in a backward digit task in which the recall of the digit list must be in backward order), or by its updating function (e.g., in an n-back task in which participants have to recall the item that was for example 2 or 3 items back).

The recalling process in interpreting, especially in consecutive interpreting (CI), seems a very demanding exercise on WM updating (Dong, Liu & Cai 2018). In a CI task, the interpreter would listen to a stretch of source language input, and then recalls as accurately as possible in another language what has been conveyed in the input, probably with the aid of notes taken during listening. This is similar to the updating process in which information has to be updated to be able to accomplish a task. With the n-back task to test updating in a pretest and a posttest, Dong et al. (2018) found that updating efficiency in both tests predicted CI performance, and an interpreter advantage in WM updating emerged after 32 hours of interpreting training (plus 40 hours of after-class practice). This advantage has been supported in other studies (e.g., Henrard & Van Daele, 2017; Morales et al., 2015).

Much more research has been conducted on the relationship between WM span and interpreting performance, but the results are quite mixed, probably due to a number of limitations in some of the empirical studies (e.g., small sample size, see Dong et al., 2018 for an analysis). Two meta-analysis studies have tried to integrate the mixed results. Mellinger and Hanson (2019) found a positive relationship between professional interpreters’ WM and interpreting performance. Wen and Dong (2019) found evidence supporting an interpreter advantage in both WM and STM spans. But these advantages were more expressed in verbal memory tasks (e.g., reading span) than in numerical/letter or spatial tasks. In addition, the level of interpreter expertise significantly moderated the presence of these advantages, with no advantage for beginner interpreters and no difference in the advantage between intermediate and expert interpreters.

In a word, it seems that interpreting training would firstly enhance one’s ability in WM updating and then in STM and WM spans. This contrast between updating and spans is probably due to that the most obvious cognitive demand for the novice interpreter is to keep up with the pace of the source language input, updating and transmitting information as efficiently as possible. The impact of interpreting experience on memory may be more complex than described here, but relevant empirical research is lacking.

**Interpreters’ interference control**

Compared with general bilinguals, interpreters may have to face a greater influence from the other language (source language, SL) when they are producing messages in the target language (TL). This issue of language control (i.e., how to present SL interference during TL production) has been accounted for by theories (e.g., Christoffels & de Groot, 2005) based on the Inhibitory...
Control Model (Green, 1998) that was proposed for language control in general bilingual processing. Briefly speaking, the inhibition-based models proposed differential activation of language subsets, e.g., with the TL output highly activated and the SL output inhibited (Grosjean, 1997), or with the output lexicon more activated than the input lexicon (Christoffels & de Groot, 2005). Dong and Li (2020) argued that inhibition-based models do not work well for language control in interpreting, especially for language control in simultaneous interpreting, and proposed a language control model for interpreting based on focused (or selective) attention and the interpreting schema of language-modality connections. In the account of focused attention, the cognitive function of “target enhancement” (together with “task disengagement”) replaces the role of inhibition in inhibition-based accounts. Both types of accounts can be tested by tasks such as the Flanker task, but interpretations are different, with one emphasizing the inhibition of the non-target language, and the other emphasizing the enhancement of the target language.

Since interpreters have to overcome strong and constant influence from the SL while producing the TL, their resistance to interference (i.e., interference control) may be enhanced by interpreting experience. Among the several relevant behavioral studies in the literature (e.g., Köpke & Nespoulous, 2006; Yudes et al., 2011; Timarová, Čeňková, Meylaerts, Hertog, Szmalec & Duyck, 2014; Morales et al., 2015; Dong & Liu, 2016; Babcock & Vallesi, 2017), no evidence was found supporting an interpreter advantage in interference control except for Timarová et al. (2014) that reported some weak evidence. Dong and Zhong (2017) reasoned that the behavioral methods were probably not sensitive enough, and with the ERP technique used for the Flanker task, the authors found that interpreting experience contributed to earlier attentional processing, interference monitoring and target enhancement along the time course of processing in situations of interference.

The “temporal” nature of an interpreter advantage in interference control as revealed in Dong and Zhong (2017) reveals how interpreting experience has changed one’s way of interference control. And yet, one single study is far from enough to identify the effects of interpreting experience, and more studies using the ERP technique are needed.

**Interpreters’ cognitive flexibility**

No matter whether it is translation or interpreting, both types of task require more frequent and regular switches between their languages than a general bilingual communication task. Switching in the task of interpreting is especially demanding because the interpreter works under extreme time pressure, alternating between receiving a message in one language and producing it in another language (usually) every few minutes in CI and almost simultaneously in SI. In a general bilingual situation, on the other hand, the bilingual speaker usually sticks to one language, and switches to another language only when communication in that language is no longer efficient or practicable. Although general bilinguals may also switch between two languages intensely, this is not a typical case for general bilingual communication. To be brief, switching between two languages in an interpreting task, when compared with switching in a general bilingual task, is more frequent and demanding (with time pressure), and it is probably an interpreter trainee’s first goal to be able to follow the rhythm or speed of the SL speaker, alternating between the two languages without delay or disfluency.

Adaption to this demand on switching between two languages may enhance one’s cognitive flexibility. Cognitive flexibility (also referred to as switching ability, mental set shifting ability) refers to our ability to flexibly disengage our attention from an old target and switch to a new target, adjust to new demands and rules, and change perspectives or approaches to problems. The tasks typically used to measure cognitive flexibility (related to interpreting experience) is
The unique bilingual profile of translators and interpreters

the color–shape task or the Wisconsin card sorting task (WCST). Switching in WCST is rule-based, with “correct” or “wrong” feedback indicating whether participants’ response is consistent with the current underlying rule or not (i.e., match the response card with a stimulus card by their shared color, shape or number). Empirical research (e.g., Yudes et al. 2011; Dong & Liu, 2016) has found evidence supporting an interpreter advantage in cognitive flexibility as tested by WCST.

Switching in the color–shape task is task-based. The task could be bivalent, with each stimulus containing two attributes (e.g., color or shape in the stimulus of a green square), or univalent (e.g., a colorless square, or a green patch of color), and consists of “single-task blocks” (judging on only one attribute throughout) or “mixed-task blocks” (judging on either of the two attributes, according to the presented stimuli in the univalent version or cues before the stimuli in the bivalent version). Switch cost (i.e., difference between switch and non-switch trials in the mixed-task blocks) and mixing cost (i.e., difference between non-switch trials in the mixed-task blocks and trials in the single-task blocks) are respectively taken as reflections of transient control involved in task switching, or of sustained control necessary for maintaining two competing task/response sets or for monitoring the environmental cues signaling task switches (Braver, Reynolds & Donaldson, 2003). Employing both the univalent and bivalent versions of the color–shape switching task, Zhao and Dong (2020) found that an interpreter advantage in switch cost only appeared in the univalent version, and a marginally significant interpreter advantage in mixing cost only appeared in the bivalent version with interpreters of advanced L2 proficiency. Together with other studies (see Table 2.1), these results suggest that interpreters may first develop an advantage in local transient control in task switching and then in global sustained control.

In short, compared with general bilinguals, interpreters may be better in cognitive flexibility, with this ability probably first reflected in rule-based switching (as tested in WCST), in local transient control in task–based switching (as tested in the color–shape switching task) and then in global sustained control in task–based switching. But more research is certainly needed to depict possible changes of the interpreter’s profile in cognitive flexibility.

Interpreter’s coordinating skill

Interpreting, as compared with general bilingualism, is more demanding in multi-tasking. This multi-tasking feature is formulated in the Effort Models of Gile (1997/2002), according to which, SI = L (“listening”) + P (“production”) + M (“memory”) + C (“coordination”);

Coordination is a cognitive control function dealing with multiple tasks. And this demand of interpreting on coordination may in turn enhance one’s coordination skill. With professional simultaneous interpreters and corresponding controls (consecutive interpreters and translators), Strobach et al. (2015) employed a dual-task consisting of an auditory task and a visual task. When compared with the controls, the interpreters revealed exclusively better performance in the dual-task condition in relation to the single-task condition, suggesting an interpreter advantage in coordination. In another measurement of the same study, the fMRI brain imaging data also supported an interpreter advantage in coordination (Becker et al., 2016).

However, Morales et al. (2015) and Padilla et al. (2005) did not find evidence supporting an interpreter advantage in coordination. Padilla et al. (2005) asked professional interpreters, other professionals and psychology students to perform a dual-task consisting of a free recall task and a visual tracking task, and the interpreter group did not differ from the other two groups in coordination. Morales et al. (2015) asked professional interpreters and general bilingual controls to perform a dual-task composed of a visual and an auditory n-back tasks, and there was no group difference in coordination.

The different findings in the above two sets of studies is probably due to that the latter two studies did not employ sensitive and strictly controlled measurements. That is, Morales et al. (2015) focused on the accuracy of performance, and Padilla et al. (2005) adopted tasks with non-speeded responses. In contrast, the paradigm used in the former two studies involves two tasks with speeded responses, with either response time as the major index (Strobach et al., 2015) or with brain imaging data reflecting group differences (Becker et al., 2016). It is thus reasonable to say that interpreting enhances the skill of coordination, and compared with general bilinguals, interpreters are better at coordination.

To conclude this subsection, with more and more empirical research accumulated, the picture for the interpreter’s unique bilingual profile in cognitive control becomes clearer, although more research is needed to further explore its developmental trajectory, or verify some of its details. Briefly speaking, compared with general bilinguals, interpreters are better in working memory and short-term memory (starting from the intermediate stage of training, especially when measured by verbal tasks), in interference control (when measured by the ERP technique), in cognitive flexibility (probably performing better first in rule-based switching and in local switch cost in task-based switching, and then with more interpreting experience, better in global monitoring in task-based switching), and in the skill of coordination (when measured by two tasks that require speeded response, with response time as the major data index).

**Psychological and other aspects**

Interpreting puts a lot of stress on people, and may thus influence one’s psychology, such as self-efficacy and anxiety. Self-efficacy, i.e., people’s belief in their abilities to perform well in events affecting their lives (Bandura, 1997), is often covered by different terms in interpreting research such as ‘confidence in success’, ‘expectancy of goal attainment’, and ‘self-confidence’ (e.g., Jiménez Ivars, Pinazo Catalayud, & Ruiz i Forés, 2014; Shaw, 2011; Timarová & Salaets, 2011). Although little research has been conducted on whether interpreters differ from general bilinguals in self-efficacy, there is research indicating the close relationship between self-efficacy and interpreting performance. For example, Jiménez Ivars et al. (2014) found that specific self-efficacy was significantly correlated with interpreting competence ($r = .27$, etc.)
The unique bilingual profile of translators and interpreters

$p < .05$). Using a similar design with multiple tests on interpreting competence, Lee (2018) found a more robust correlation ($r = .754, p < .05$).

Since interpreting is a rather stressful activity, the ability to manage stress or anxiety must be critical to successful interpreting performance (Moser-Mercer, 2008). There are two types of anxiety: trait anxiety and state anxiety (Spaelderger, Gorsuch & Lushene, 1970). Trait anxiety, as part of one’s personality, is a stable tendency of stress and worrying in threatening situations, while state anxiety is experienced in a particular and temporary situation that poses threatening demand or danger. As for trait anxiety, Gerver (1971) found that among professional interpreters, those with lower trait anxiety were less affected by noisy working conditions (while conducting interpreting). As for state anxiety, the findings were not consistent. For example, Jiménez Ivars and Pinazo Calatayud (2001) did not find a significant correlation between state anxiety and interpreting performance by using the STAI questionnaire that measures general state anxiety. Dong et al. (2013) did find significant correlation between the two ($r = -.417, p < .01$) by using a scale measuring specifically interpreting anxiety (i.e., state anxiety for interpreting). A scale measuring state anxiety for interpreting probably works better if it aims at the interpreting task. As for how interpreting experience may change one's anxiety level, not much research has been conducted, especially longitudinal research. Riccardi et al. (1998) found that interpreters and interpreting students scored lower in trait anxiety than people in the control group, probably due to self-selection or interpreting experience.

Perspective taking is another aspect that may be related to interpreting experience, although little research has been conducted yet. Interpreting (or more broadly, translation) can be taken as mediation between two parties (and often between two cultures), as indicated by the term “multilingual mediated communication” in Martin and Halverson (2020). And it is therefore an activity that requires perspective taking, as “interpreters need not only reconstruct and meta-represent the context and the interpretation intended by the author to themselves; they also need to identify differences between the original and the target audiences’ background knowledge” (Szpak, Alves & Buchweitz, 2020:137). Since perspective-taking is significant in many ways (e.g., Lamm, Batson & Decety, 2007), and the ability or the way of perspective-taking can be modulated by culture (e.g., Wu, Barr, Gann & Keysar, 2013b), it is worthwhile to investigate whether or how interpreting experience may modulate perspective taking.

To sum up, interpreters may differ from general bilinguals in such psychological aspects as self-efficacy and anxiety and in other aspects such as perspective taking, but we do not know much at the present stage, let alone the developmental trajectories of these aspects when one moves from an interpreting trainee to an expert.

**The unique bilingual profile of translators**

Written translation is another type of bilingual experience. Similarly, the question here is: *how may translators differ from general bilinguals?* Not much research has been conducted on this question. But we may get a glimpse of the answer by comparing the task features of (written) translation, interpreting and general bilingual processing.

As for language processing, both translation and interpreting require appropriate rendition of messages in the TL received in the SL. It is therefore possible that what has been found for interpreters’ between-language representation connections is also true for translators (i.e., stronger connections for translation equivalents and stronger awareness of cross-language similarities and differences, for translators than for general bilinguals). Translation may differ from interpreting in that translation (especially translation of literary works) is more demanding in TL wording, because the final written product may have to stand up to close scrutiny by various
readers across time and space. Translators are therefore probably better in the TL than general bilinguals, even better than interpreters, at least in aspects that are crucial to translation such as the elegance of expressions.

As for cognitive control, both translation and interpreting require frequent and regular switching between SL comprehension and TL production. And yet, translation generally does not require fast and immediate responses, and translators could control their own pace, while the pace of language comprehension, production and switching in interpreting is usually controlled by the speaker not the interpreter. In terms of cognitive control, therefore, translation is less demanding. Probably due to this difference, a few studies that tested translators’ cognitive control abilities mainly took them as a control group for the experimental group of interpreters (Van de Putte et al., 2018; Henrard & van Daele, 2017; Dong & Liu, 2016; Babcock et al. 2017). Two of them (Dong & Liu, 2016; Babcock et al., 2017) tested general bilinguals at the same time. With a longitudinal design, Dong and Liu (2016) found that, compared with general bilingual experience, the experience of interpreting (32 class hours) produced significant advantages in both WM updating (but not WM spans) and cognitive flexibility (tested by a univalent color-shape switching task), but translation (32 class hours) produced only a marginally significant advantage in WM updating. Also with a longitudinal design, Babcock et al. (2017) found interpreting training produced a larger gain in short-term memory (tested by a letter span task) than translation or other training, with no translator advantage for memory (STM and WM), interference control or cognitive flexibility (but since there were only 10 translators, more research is needed).

In a word, as for possible cognitive control differences between translators and general bilinguals, empirical evidence is far from enough to reach even a tentative conclusion. Since translation also requires frequent and regular cross-language switching, translators (with enough intensive experience) may be better than general bilinguals in cognitive flexibility. Henrard and van Daele (2017) did show that translators were better than monolinguals in cognitive flexibility. But since bilingual experience may also bring about an advantage in cognitive flexibility (Hernandez et al., 2013), it is hard to tell whether this advantage was due to general bilingual experience or the additional experience of translation. In addition, receiving a length of input information and producing it in another language is similar to an exercise in WM updating (Dong et al., 2018), and that is probably why Dong & Liu (2016) found that translation students were marginally better than general bilingual students in WM updating.

Translators may differ from general bilinguals in other ways, such as perspective taking (see above), but little research has been conducted yet.

Conclusion

To systematically depict the unique bilingual profile of translators and interpreters, we have to take general bilinguals as the reference point, and analyze what cognitive demands translation and interpreting may involve, especially demands that are beyond what a general bilingual communication task may require. Adaptation to these demands tends to strengthen cognitive processes associated with such demands, and thus gradually shapes one’s cognitive profile.

The unique bilingual profile of interpreters is much clearer than that of translators, due to a lack of relevant empirical research on translators. Briefly speaking, interpreters may differ from general bilinguals mainly in three aspects: (1) language representation and processing (e.g., stronger between-language representation connections and stronger awareness of cross-language similarities and differences; more and better use of language processing strategies such
The unique bilingual profile of translators and interpreters

as prediction); (2) cognitive control abilities (e.g., better WM and STM; better interference control; better cognitive flexibility; better coordination skill); (3) psychological and other factors (e.g., better in perspective taking; changes in self-efficacy and anxiety). If monolinguals are taken as the reference, an integration of these differences with the general bilingual’s profile constitutes the profile of interpreters.

Although much has been done for the issue of how interpreting experience may change people, there is much more waiting to be investigated or further verified, and the same issue for translation experience is almost a virgin land. Many of the remaining questions have been mentioned in the summaries above, such as the question of whether interpreters or translators employ language processing strategies better than general bilinguals. In addition, since translation or interpreting is mainly to transmit ideas from one language into another, does the intensive experience of translation and interpreting suppress people’s nature to produce their own ideas? Little is known about this question up till now.

References


