

Ji, Meng and Oakes, Micheal, eds. (2019) *Advances in Empirical Translation Studies: Developing Translation Resources and Technologies*, Cambridge: Cambridge University Press, 284 pp., ISBN: 9781108423274 (Hardback)/ISBN: 9781108525695 (e-Book), USD 110.00.

Empirical translation studies evolve rapidly, together with the development of advanced research methodologies. The integration of the research paradigms of socially oriented and data-driven approaches in empirical studies expands current translation studies. It is in this context that the book *Advances in Empirical Translation Studies: Developing Translation Resources and Technologies* co-edited by Meng Ji and Michael Oakes brings insight into tackling practical research issues by applying mentioned two paradigms to empirical translation studies. With the contributions by edge-cutting researchers and experts, the book aims at mitigating division between theoretical and applied translation studies, contributing to the expansion of translation studies in general.

This 13-chapter book is organized under an umbrella of three sections. Section I (Chapter 1) works as a conclusive review of previous studies on the topic and an introduction, which demonstrates the underlining understanding of empirical studies for the following chapters. Section II (from Chapter 2 to Chapter 12) illustrates the development of different analytical instruments that can be applied in the studies of social phenomena as a cross-cultural and cross-lingual level. Section III (Chapter 13) states the opportunities and challenges ahead for empirical translation studies. This book, as a whole, draws on empirical translation studies as diverse as multilingual analytical instruments, treatment of semantics in machine translation, automated semantic annotation systems, application of Sketch Engine, translation readability evaluation tools, reordering techniques, speech-to-speech translation technologies, etc.

The book starts with Ji's overview of empirical translation studies in the past four decades (p. 1-12). Challenging the intra-disciplinary division between pure and applied research presented in the Holmes-Toury map of translation studies (Toury 1995), Ji argues a new understanding in which the data- and technology-intensive instruments developed by empirical translation studies advance both applied and theoretical translation studies. As a representative in empirical research methodology, corpus-related translation studies facilitate the discovery of patterns in translation products and processes. In her view, on one hand, this research paradigm benefits theoretical translation studies by proving hypotheses and theories.

On the other, the information extracted from corpora can also guide better translation practice and education from the perspective of applied translation studies. The interactions between pure and applied translation studies imply that empirical translation studies have the potential to develop linguistic data-based instruments for analysing social phenomena and events.

The following chapters exemplify specific case studies to demonstrate how multilingual analytical tools could be applied to interdisciplinary empirical translation research. In Chapter 2 (p. 13-27), a multilingual environmental terminology framework is scaffolded by Ji to develop a new multilingual environmental performance assessment instrument, to evaluate the multi-sector interactions on the pressing issue of environmental protection. Michael Oakes introduces multiple statistical test techniques to verify pre-existing theories or to derive hypothesis in Chapter 3 (p. 28-52), including, but not limited to t-test, ANOVA, Principle Component Analysis (PCA), etc. With corpus-based approaches, the author compares the use of high-frequency words in English translation in the corpus of Europarl Corpus of Native, Non-Native and Translated Texts (ENNTT); and corpus-driven approaches are deployed to explore the differences of translated English from various source languages.

Chapter 5 and 8 are both centred around health translation issues. Meng Ji contributes Chapter 5 (p. 77-93) analysing the translation and dissemination of the World Health Organization Drinking Water Quality Guideline in Japan. She argues that the corpus study can be used to configure and analyse the complex process of the transmission of world health-policy materials from international organizations to industrial sectors as end-users in national contexts. Meanwhile, in Chapter 8 (p. 145-163), together with Zhaoming Gao, Ji develops computerized health translation readability evaluation tools consisting of a computerized Chinese text lexical profile analyzer and a data-driven analytical instrument, to predict the linguistic readability of translated Chinese health materials.

Several updated corpus tools or functions are also introduced to readers. Laura Löfberg and Paul Rayson in Chapter 6 (p. 94-109) introduce a semantic annotation tool, named the UCREL Semantic Analysis System (USAS), in detail, and the development of multilingual semantic annotation instruments under the framework of USAS. Readers will get knowledge of Sketch Engine, as translation memory, after a detailed introduction by Sara Moze and Simon Krek in Chapter 7 (p. 110-144). While Sketch Engine is well known as a monolingual

application, Sara and Simon emphasize it as a translator-assistant tool, which can provide a translator with several synonyms, antonyms and compare collocates.

Chapter 4, 9, 11 and 12 orient the research into the field of machine translation (MT), by researching semantics treatment and improving translation accuracy in MT. Mark Seligman in Chapter 4 (p. 53-76) distinguishes the perceptually-grounded semantic approaches from perception-free semantic approaches, concluding that breaking the door of perception is significant towards an understanding of cognition. Masaaki Nagata, in Chapter 9 (p. 164-176), focusing on the stark difference of word order in English and Japanese, investigates how to improve the accuracy of machine translation between distant languages. In Chapter 11 (p. 198-216), Constantin Orăsan and his colleagues explore a hybrid machine-translation method integrating statistical MT with translation memory by describing the innovative procedures of the project from beginning to the end. Chapter 12 (p. 217-251), another contribution by Mark Seligman together with Alex Waibel, presents the past, present, and future of automated speech translation, with a specific review of the field's technologies, approaches, companies, projects, and use cases.

Theoretically, the significance of the book is to break the stereotype between empirical and descriptive translation studies. As argued by the editors in Chapter 1 and Chapter 13, in Toury's map, descriptive translation is often considered as part of the branch under the pure translation studies, while this book argues that the dynamics between descriptive and empirical translation studies would benefit the translation studies in general, and worth more attention in the field. This point of view is more a complementary insight into the translation theories, rather than a thorough reshuffling of the classic hierarchy in translation studies. The authors include extensive citations to explain, so with a little effort a reader could acquire the new insight for the field of empirical translation studies from this book.

From application perspectives, a point worth mentioning is how it expands the horizon of translation studies into the engagement of solving real-life issues. Chapter 2 develops a new ranking scheme to look into the social mechanism that impacts a country's environmental performance. Chapter 5 leverages structural equation modelling to study translation adaptation in Japan of WHO drinking water guidelines, which could further explore social awareness and regulation of drinking water among different sectors. Chapter 8 displays how empirical, analytical instruments advance multicultural and multilingual health-literacy and

public health promotion. Treating translation studies as a lens, language experts explore proofs to investigate and solve social issues with linguistic data and multi-level comparison.

This book presents diverse approaches and techniques in empirical translations to solve social issues. Case studies introduce the application of multiple innovative technologies and new functions of existed tools, for example, t-test, linear regression, ANOVA, multi-level/mixed modelling and PCA in Chapter 3, multilingual automatic semantic annotation systems in Chapter 6, Sketch Engine suite in Chapter 7. Furthermore, four chapters discuss technology for MT, including semantic treatment in Chapter 4, word order improvement between distant languages in Chapter 9, data-driven hybrid approach in Chapter 11, and speech-to-speech translation technologies in Chapter 12. Technological advancement enables scholars to explore larger linguistic and paralinguistic data than ever before, which further enlarges the application potentials of empirical translation studies into descriptive translation studies.

Except for the mentioned advantages of the book, the categorization of chapters could be more systematic. The chapter could have grouped according to their fields of research, for example, social application of empirical translation studies (Chapter 2, 5, 8), technologies in empirical translation studies (Chapter 3, 6, 7), empirical machine translation studies (Chapter 4, 9, 11, 12) and audio-visual translation studies (Chapter 10). Besides, as the title of the book shows, ‘developing translation resources and technologies’, it would be better balanced if more attention and contributions are attached to the part of translation resource development. *Advances in Empirical Translation Studies: Developing Translation Resources and Technologies* is a highly informative and illuminating collection of latest studies in empirical translation studies and its application in descriptive translation to solve social issues. Its innovative perspective, explorative efforts, rich corpus resources and avenues of critical thinking make it a truly valuable book for teachers, researchers and translators. The research approaches, new corpus resources, novel technologies and inspiring findings are paving the way for future studies.

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