

Researching Cognitive Processes of Translation

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“Cognitive approaches to translation and interpreting may be considered the oldest empirical research area of modern Translation Studies (TS)”, according to Ricardo Muñoz Martín (2017: 555). James S. Holmes, in his foundational paper, “The name and nature of translation studies” (1972), characterised descriptive translation studies (DTS) into three kinds: product-oriented, function-oriented and process-oriented DTS, where “process-oriented DTS concerns itself with the process or act of translation itself” (2001: 177). However, systematic translation process research (TPR) as an area of study was established only in the early 1980s. Beginning with the rationalist approaches, and progressing on to observational methods, think-aloud protocols (TAPs) began to be used in TPR. With the advent of IT and medical technology, techniques such as key-logging, screen recording, eye tracking, and neuroimaging began to be applied in order to understand the process of translation.

Researching Cognitive Processes of Translation attempts to address the challenges and issues that have risen up during the span of around 40 years of TPR, and also to present new and innovative methods that can provide deeper insight into what Holmes designated as the “‘little black box’ of the translator’s ‘mind’” (2001: 177). This volume edited by Defeng Li, Victoria Lai Cheng Lei, and Yuanjian He, is divided into 8 chapters in 2 parts, with three chapters in Part 1 based on theoretical models, and five chapters in Part 2 which focus on methods and applications.

In chapter 1 titled, “Suggestions for a New Interdisciplinary Linguo-cognitive Theory in Translation Studies”, Juliane House calls for a renewal of interest in the linguistic focus of a text and what takes place in the mind of the translator during the process of translating a text rather than concentrating on external elements such as socio-cultural, ideological, historical factors and the reader. House then proceeds to examine critically the validity and reliability of the methods currently used in TPR. She questions the premise that mental process can be verbalised, which is the fundamental assumption behind the methodology of TAP.

In examining translation-behaviour research, which has commonly used eye-tracking, keylogging, and screen recording, House asserts that these methods can only measure observable behaviour. While they can be useful indicators of translation difficulties, they cannot be taken as substitutes for mind-processes. The ecological validity of neuro-imaging studies, which rely on word-and-sentence based tasks, is called into question, as translation is a largely text-based activity. In addition, House points out that most of these studies have not been replicated. She asserts that before plunging directly into experimental studies, a theoretical framework with sufficient descriptive and explanatory potential needs to be identified, and cites the neurolinguistic theory of bilingualism posited by Michel Paradis as being highly relevant for Translation Studies.

Yuanjian He, in the next chapter, “Translating and Interpreting as Bilingual Processing: The Theoretical Framework”, takes up from where Juliane House leaves off. He presents an integrated perspective to language processing by combining the theories of Noam Chomsky’s universal grammar, Steven Pinker’s computational theory of language processing of the mind, Annette M. B. De Groot’s neurocognitive bilingualism,

and Michel Paradis' theory of neurofunctional control in the bilingual brain. The hypothesis that memory and computation are two processing mechanisms that compensate and complement each other especially in simultaneous interpreting and in translation is also put forward.

The third chapter, "Outline for a Relevance Theoretical Model of Machine Translation Post-editing" by Michael Carl and Moritz Schaeffer elaborates a computational framework based on Sperber and Wilson's relevance theory (RT) and Roger Levy's noisy channel model for post-editing machine translation (PEMT). Wilson and Sperber state, "The central claim of RT is that the expectations of relevance raised by an utterance are precise and predictable enough to guide the hearer towards the speaker's meaning" (2006: 607). When applied to translation, it becomes that the goal of a translation is to achieve adequate contextual effects for the target text reader without unnecessary processing effort. Because MT systems do not have access to the context of the texts, nor can they take into account the intentions and implications of the source text or the target audience, it results that the source and target share the same context, which allow for the same implicatures in machine translation. This effectively reduces the task of post-editing to checking the similarity of explicatures of the source and the target texts.

Arnt Lykke Jakobsen, in chapter 4, "Segmentation in Translation: A Look at Expert Behaviour", points out that translation occurs in short bursts or segments, rather than continuously. The greater the continuity of the produced text, the greater is the indication of the optimal performance of the translator. Cognitive processing, on the other hand, is indicated by the amount of pauses. Jakobsen suggests the use of key-logging softwares to record the typing behaviour of the translator, which can then be used to study the cognitive

processing activity. This information can be combined with gaze data from an eye-tracker to identify what segments of the text was read at specific points of time by the translator. Jakobson asserts that this data provides evidence of segmentation at a deeper level than what has most often been assumed in TPR. He also suggests that the segments identified from gaze data have the appearance of being closer to the way translation takes place in the brain, which is through the cognitive processing of minimal translatable units.

In the next chapter, “Explore the Brain Activity during Translation and Interpreting Using Functional Near-Infrared Spectroscopy”, Fengmei Lu and Zhen Yuan make a case for the greater application of fNIRS in TPR. Functional Near-Infrared Spectroscopy (fNIRS) functions on the principle that neural stimulus results in a local increase in the blood flow, blood volume and blood oxygenation in the brain, and measures the change of absorption coefficient of the near-infrared light between 650 nm and 950 nm. Compared to other neuroimaging techniques such as functional magnetic resonance imaging (fMRI) and positron emission tomography (PET), fNIRS has the advantages of portability, convenience and low cost. More importantly, it offers unsurpassed high temporal resolution and quantitative information that can identify rapid changes in the dynamic patterns of brain activities. In addition, continuous and non-invasive monitoring of brain activity in real life conditions and in everyday environments is possible using fNIRS. It has to be also noted that in addition to the immense potential it offers to the field of Translation and Interpreting Studies, fNIRS promises greater ecological validity in comparison with other neuroimaging techniques like EEG, fMRI and PET. However, the research study using fNIRS (Quaresima et al. 2002) discussed in this chapter consisted of translating a small set of very short sentences. This brings up the question of artificiality that was

discussed in the first chapter of this volume, but this can be rectified in future studies.

Chapter six, “Translation in the Brain: Preliminary Thoughts About a Brain-Imaging Study to Investigate Psychological Processes Involved in Translation”, by Fabio Alves, Karina Szpak and Augusto Buchweitz, seeks to present some ideas regarding the possibility of incorporating neuro-scientific and behavioural data in the study of the inferential nature of the translation process. The theoretical framework is drawn from the pragmatics of Paul Grice, relevance theory of Sperber and Wilson, metarepresentation of Ernst-August Gutt and on the theory of mind by Baron-Cohen et al. The authors also propose an experimental setup with 40 participants made up of 20 professional translators and 20 students, who would be presented with two types of stimuli in both eye-tracking and fMRI conditions: the first a set of complex clause-sentences where the dominant clauses present two distinct propositional forms of the same message, and the second, a set of suprasentential elements where critical main clauses are repeated in implicatures or in explicatures. Using this experimental setup, the authors expect that the inferential nature of the translation process can be investigated through an interdisciplinary method.

Sanjun Sun, in chapter 7 titled, “Measuring Difficulty in Translation and Post-editing: A Review”, begins by clarifying conceptual issues such as difficulty, mental workload, cognitive load and other related terms. The article then proceeds to examine studies on difficulty in human translation and in the post-editing of machine translation (PEMT), with special attention given to the measurement of cognitive effort in post-editing. Translation difficulty can be defined as the amount of cognitive resources consumed by a translator for a translation task. Post-editing of machine translation, “involves

a human editor revising an MT output up to an acceptable level of quality” (Kit and Wong 2015: 225). The author cites Krings (2001) who identified three dimensions of post-editing effort: temporal effort (time), technical effort, and cognitive effort. The author acknowledges that not all the studies cited in the review are equally valid due to factors such as small sample size, text type, domain, language directionality, and professional experience. The need for these studies to be replicated is also highlighted.

In the final chapter of this volume, “Translation Competence as a Cognitive Catalyst for Multiliteracy – Research Findings and Their Implications for L2 Writing and Translation Instruction”, Susanne Göpferich studies how L2 writing is influenced by translation competence. The rejection of the grammar-translation method and the assumption that the use of L1 can have a negative impact on L2 development has resulted in the dismissal of L1 to L2 translation in the foreign-language pedagogy. The author reviews empirical investigations that show that translation has both advantages and disadvantages for L2 writing pedagogy, and that the suppression of L1 can have adverse effects on the epistemic function of writing and stunt creativity. The advantages include the minimising of cognitive overload, greater critical evaluation and derivation of meaning from the L2 text. However, for those with lesser translation skill, this can result in fixedness upon the source-text. Göpferich also puts forward the concept of “transliteracy”, which refers to the fact that academic writers often read and draw on materials from more than one language.

Translation competence is a major factor in transliteracy, and its lack can hamper adequate comprehension of source material in different languages. The chapter closes with a call for more focus on the development of translation competence, which is

a must, given that our societies are becoming increasingly multicultural and multilingual.

Researching Cognitive Processes of Translation is one of the latest volumes from an area that promises great scope for further development and growth in the future, fuelled by both the rising interest in the functioning of the human brain and the technological advances in the field of Medicine and Information Technology. The sooner this book becomes outdated, the greater the progress achieved in the area of Translation Process Research, which can be considered to be, in fact, the objective of this book.

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