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Doctoral dissertation

From translation process and product to reception: Investigating cognitive effort of the translator and the reader

Abstract

Translation is a complex cognitive act aimed at producing a functionally effective text for its readers (Chesterman 1998; Shreve 2009). Over the past decades, *Translation Process Research* has focused on the *cognitive effort* that translators invest in transforming a source text into a target text (Alves 2015; Jakobsen 2014; Kruger 2016). To gauge *cognitive effort*, understood as the amount of mental resources exerted in performing a translation task (Hunziker Heeb 2020; Hvelplund 2011), researchers have used advanced methodologies such as keylogging and eye-tracking. In parallel, product-oriented studies have focused on analysing the features and quality of translated texts (Baker 1993; Koby et al. 2014), also in relation to translation process data and metrics that serve as a proxy for cognitive effort (Dragsted 2012; Whyatt 2019). While profound insights have been gained into both the translator's cognitive effort and translation quality of the product, the reception of the translated text by the reader has been theoretically assumed rather than empirically tested (Kruger and Kruger 2017; Walker 2021a). A crucial link has been missing in this equation: empirical evidence of whether, and how, the translation process and the quality of the product affect the way readers read and receive the translated text (Kruger and Kruger 2017; Walker 2021a). An empirical gap thus persists in understanding whether, and how, the translator's cognitive effort and the resulting translation quality affect the reader's cognitive effort put into the process of reading and receiving translated texts (*translation reception*). This highlights the need for developing an integrated approach that empirically connects the domains of translation process, product, and reception.

To address this research gap, the primary aim of the present PhD project is to investigate whether and how the translator's cognitive effort invested in the whole-text translation process, and the resulting quality of that translated text, affect the cognitive effort readers exert when reading that translation. To this end, this PhD thesis proposes a novel, integrated research trajectory that bridges the empirical domains of translation process, product, and reception within a unified conceptual and methodological framework. The thesis rests on **two complementary experimental studies** carried out to trace cognitive effort in translation production and reception. First, the **translation process-and-product study** examined the cognitive effort of professional bidirectional translators (Polish L1, English L2). To examine the cognitive effort during the translation of whole texts in both directions (L1→L2 and

L2→L1), two process-oriented methods were applied: *keylogging* and *eye-tracking*. Then, the **translation reception study** used *eye-tracking* to examine the *cognitive effort* of readers who were native speaker of Polish (the target language of the translation) with high proficiency in the source language (L2 English) of the translated text. The primary focus of the investigation and analysis centred primarily on their *cognitive effort* as they read the whole-text translations of high and low quality produced into their L1 in the first study.

The results of the studies were reported across five constituent *Research Articles* investigating the cognitive effort of the translators and of the readers. **Article 1** (Tomczak and Whyatt 2022) established the linguistic profile of professional bidirectional translators (their language dominance and L2 proficiency) and focused on their cognitive effort during the process of lexical selection (i.e., the process of selecting the word which, in the translator's judgment, best conveys the meaning of a word from the source text; *lexical selection effort*) and the quality of their lexical choices. The findings showed a pronounced asymmetry dependent on translation direction and text type: lexical selection was cognitively more demanding and less successful in L1→L2 translation, in particular for more descriptive (*product descriptions*) than expressive texts (*film reviews*), as evidenced by lower verbal fluency scores in L2, more frequent (and automatically produced) vocabulary errors, and a greater reliance on online resources (OR) in this direction (longer and more frequent use of OR), confirming the L2 cognitive disadvantage.

Building on this, **Article 2** (Whyatt, Witczak, and Tomczak 2021) zoomed in on the translators' cognitive effort associated with their information-seeking behaviour. It found that consulting OR is itself a cognitively taxing process (*information searching effort*), significantly increasing overall task duration and translators' average fixation durations, taken as proxies for cognitive effort, particularly for more descriptive texts (vs. expressive). Crucially, this cognitive effort was modulated by directionality and text type: translators performed significantly more OR searches, including more complex, cross-linguistic checks, and consulted bilingual resources more often when working into their L2, particularly for descriptive texts. This may indicate that resolving uncertainty in the weaker language requires greater cognitive effort.

Having investigated the translators' cognitive effort, this thesis advanced towards its main integrative objective. The foundation laid by *Articles 1 and 2* set the stage for the thesis's turn towards translation reception and reader experience. **Article 3** (Whyatt, Witczak, Tomczak-Łukaszewska, and Lehka-Paul 2023) served as a methodological bridge, pioneering the integration of translators' keylogging data from the *translation process*, assessed translation quality data (*product*) with eye-tracking data from readers of those same translations (*reception*). The reported exploratory study found no straightforward relationship between the translator's cognitive effort and the reader's cognitive effort. However, it revealed that translation quality significantly affected the reading experience: readers exhibited increased cognitive effort (longer *dwell time*) when reading a low-quality (LQ) translation compared to a high-quality (HQ) one. **Article 4** (Whyatt, Tomczak-Łukaszewska, Witczak, and Lehka-Paul 2025) extended these results with more participants, confirming that readers had to work harder (longer *dwell time*) to understand an LQ translation containing translation errors. A fine-grained analysis showed that different error types (e.g. logical inconsistencies vs. lack of cultural

adaptation) elicited distinct patterns of increased processing effort during reading for comprehension.

Finally, *Article 5* (Tomczak-Łukaszewska 2025) introduced the dimension of reader-specific factors into the interplay. The analyses reveal that the reader's linguistic profile, particularly more years of using the source language (L2 English), was associated with lower cognitive effort during the reading of a translation into their native language (L1 Polish). Furthermore, it revealed a significant interaction between the translator's cognitive effort and translation quality in shaping the reader's experience: readers exerted more cognitive effort while reading the translation containing errors (LQ) when the translator's effort was low, whereas for the HQ translation, higher translator's cognitive effort led to the increased reader's cognitive effort, possibly due to more complex syntax reflecting the complexity of the ST. Additional moderated mediation analyses carried out to further explore the relationships between the reader's linguistic profile and their cognitive effort during reading a translated text revealed that a reader's proficiency in the source language (their L2) mediated the relationship between their number of years of L2 use and cognitive effort during the reading of the translated text, but only when the translation was of low quality (LQ). This may suggest a compensatory effect: higher proficiency in the source language may mitigate the processing difficulty of reading a suboptimal translated text, partially compensating for flawed translation quality. The finding underscores that individual reader characteristics fundamentally affect the reception of translated texts, thereby corroborating the assumed interaction between text and reader (Kruger and Kruger 2017). The reader's cognitive effort during translation reception is thus not determined solely by text and its features, but arises from a complex interplay between translation quality, the translator's invested cognitive effort, and the reader's individual resources, including their linguistic profile.

All in all, the findings of this PhD project offer novel, evidence-based insights into the intricate interplay and relationships between translation production and reception. They show that the cognitive effort invested during whole-text translation and the quality of the resultant product are indeed reflected in the reader's cognitive effort, but this relationship is complex and dependent on the type of error and the reader's own linguistic background. By empirically integrating data from process, product, and reception, this thesis moves beyond studying these domains in isolation and provides a unified framework for understanding how the translator's cognitive effort and decisions ultimately shape and resonate with the reader's experience. It thereby demonstrates the value of an integrated approach for obtaining a fuller picture of mediated communication in Translation Studies.

Keywords: cognitive effort, translation process, translation product, translation quality, translation reception, reading process, professional bidirectional translators, directionality, text type, bilingual readers, keylogging, eye-tracking