Predicting Cognitive Effort in Translation Production

Yuxiang Wei
Centre for Translation and Textual Studies
Dublin City University
Ballymun Road, Dublin 9
Dublin, Ireland
yuxiang.wei3@mail.dcu.ie

Abstract

In view of the "predictive turn" in Translation Studies (Schaeffer et al., 2019), there has been increasing interest in investigating particular features of the text which can predict translation efficiency and the cognitive load of translating and post-editing. However, hypotheses of such kinds have often been on the basis of descriptive means in lack of rigorous statistical test on a large scale. In this regard, this paper seeks to empirically study the cognitive effort of translating and Machine Translation (MT) post-editing in relation to different predictor variables including word frequency, word translation entropy, and syntactic choice entropy, making use of a large dataset from the CRITT Translation Process Research Database (CRITT TPR-DB, see Carl et al., 2016) which incorporates multiple languages and translation production modes.

Cognitive effort is measured by eye-movement behavioural data, assuming that an increase in the number or duration of eye fixations on particular words or lexical items of the text indicates an extra processing cost in producing the translation of the corresponding items. These measures of cognitive effort are statistically correlated with frequency and entropy values of the Source Text words, followed by a qualitative analysis of the instances where these variables tend to cause increased processing effort in the translating and post-editing process.

With a particular focus on ambiguity resolution and the influence of formulaic expressions, the qualitative analysis intends to explain whether and how the resolution of the competition between different interpretations of a potentially ambiguous item causes additional processing effort in translating and post-editing, as well as to study the influence of context on this disambiguation process. This analysis complements the statistical correlation between the eye fixation data and the frequency/entropy values of the source text, in an effort to explore dependable means for predicting the cognitive effort of translating and post-editing.

This investigation sheds light on possible correlations of the statistical metrics of the textual material to fixation-based measurements of cognitive effort in translation production, so that the effort can be predicted via these variables. Complemented by the qualitative analyses, it also contributes to the description, explanation, and prediction of translating and post-editing behaviour.

References

Carl, Michael, Moritz Schaeffer, and Srinivas Bangalore. 2016. The CRITT Translation Process Research Database. In Michael Carl, Srinivas Bangalore, and Moritz Schaeffer (Eds.), *New Directions in Empirical Translation Process Research* (pp. 13-54). New York: Springer.

Schaeffer, Moritz, Jean Nitzke, and Silvia Hansen-Schirra. 2019. Predictive turn in translation studies: Review and prospects. In Stanley D. Brunn and Roland Kehrein (Eds.), *Handbook of the Changing World Language Map*. Cham, Switzerland: Springer.