Investigating the Effect of Text Simplification on Reading Comprehension in Advanced L2 English Speakers

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Recent insights from the Text Simplification domain (Alva-Manchego *et al.*, 2025) show that text simplification can be adapted for different levels of language proficiency. However, few studies Berzak *et al.* (2025) investigate the actual reading improvements gained by simplified texts.

This study investigates whether algorithmically reducing English text complexity (from C1-C2 to B1-B2) genuinely improves reading comprehension for advanced C-level readers. The pool of participants consists of approximately 100 native Romanian speakers, with reading levels of C1 (27%) - C2 (63%), age 23-35, students enrolled in either Computer Science or Cognitive Science programs. We utilize a subset of the English stimulus texts from the MultiplEYE dataset (Kasperė *et al.*, 2026) and we augment the data with three additional C2-level texts: one argumentative text on Marxist feminist critical theory from a book by the sociologist Lise Vogel, an institutional text from the WHO on maternal, infant and young child nutrition, and an argumentative text from UNESCO about the ancestral practices in Yasuní Biosphere Reserve. This includes additional comprehension questions created using the MultiplEYE guidelines.

Several simplification strategies have been manually compared, with the best approach being based on Gemma 3 12B-IT using a multi-stage pipeline. After simplification, we verify that the comprehension questions are still answerable from the modified text. Each participant receives a random subsample of 50% original texts and 50% simplified texts, is asked to read and respond to the comprehension questions. Additionally, for each participant we conduct an English reading CEFR-level assessment using EF-SET, a vocabulary size estimation using Lextale, and a reverse digit span task. From a total of 113 participants, 16 have been removed due to accidental or text or question skips.

Additional post-hoc data analysis is ongoing, and preliminary empirical results from fitting GLMM models reveals a surprising trend: comprehension accuracy remains stable across both simplified and original texts, and simplified texts show no significant improvement in reading comprehension. However, reading times for the simplified texts exhibit a statistically significant reduction of approximately 20%. This suggests that for advanced learners, text simplification acts primarily as a processing optimizer rather than a necessary comprehension aid. Furthermore, there are significant interactions between the participants' grammar score and reading times, where participants with lower grammar scores show significant improvements in reading times ($p = 0.003$).

Finally, we report a critical methodological limitation regarding cohort generalization. An attempt to replicate the study with a substantial secondary cohort of nearly 30 high school students (aged 15-16) yielded compromised data. The inherent length and cognitive demand of the texts induced rapid fatigue and satisficing behavior (e.g., frequent skipping), rendering the experimental design suboptimal for this age group. This highlights a future need to calibrate the experiment construction adequately to different age groups.

References

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