

No Evidence for Inhibition Control or Interlingual Homograph Interference in Bilingual Sentence Processing: A Self-Paced Reading Study

Niranjana Hegde Bhimanakone Satyanarayana (bsniranjanahegde@gmail.com)¹, Emilia Ellsiepen¹, John Duff²

¹Department of Language Science and Technology, Saarland University, ²Department of Linguistics, University of California Los Angeles

Bilingual word recognition models assume non-selective lexical access, with parallel activation across languages causing competition [1]. Interlingual homographs incur L2 processing costs, attributed to inhibition or lexical factors such as frequency and neighborhood density [1,2]. Building on Pivneva et al. [3], we reexamine the role of inhibition control using tighter controls and introduce later-presented translation equivalents to test inhibitory aftereffects through self-paced reading times.

We tested cross-linguistic interference and inhibition control using German–English interlingual homographs in L2 English reading by native German speakers (N = 76). Interlingual homographs (IH) and control words (C1) were embedded in identical low-constraining sentences, followed by translation equivalents (TE; English forms of suppressed German meaning of IH) and control words (C2) to assess IH-induced inhibitory aftereffects. Participants also completed inhibition control tasks (squared Simon task, Stroop task, and Flanker task), an English background questionnaire, and LexTALE. A composite inhibition score was computed by averaging scores from all tasks to reduce task-specific variance and provide a more reliable estimate of domain-general inhibition control [4].

Reading times were analyzed using linear mixed-effects models at the homograph/control region (P1) and the subsequent translation equivalent/control region (P2; including Spillover 1). We found no reliable IH effects at P1 or downstream and failed to replicate the predicted modulation by inhibition control [4] (Figure 2). Likewise, TEs showed no evidence of IH-induced inhibitory aftereffects (Figure 3). Instead, inhibition control was associated with general reading speed and L2 proficiency, suggesting broader domain-general contributions.

These findings suggest that SPR may be less sensitive to item-specific interference than the eye-tracking evidence in [3], and that the absence of inhibitory aftereffects, unlike [1], may reflect greater temporal distance between critical items. The lack of a relationship between inhibition control and interference costs may instead reflect substantial inter-individual variability. Overall, the mixed results suggest that processing slowdowns are not universal and may depend on methodological differences across tasks [2].

References

- [1] Macizo, P., Bajo, T., & Martín, M. C. Inhibitory processes in bilingual language comprehension: Evidence from Spanish–English interlexical homographs. *JML*, 63(2), 232–244, 2010.
- [2] Dijkstra, T., Timmermans, M., & Schriefers, H. On being blinded by your other language: Effects of task demands on interlingual homograph recognition. *JML*, 42(4), 445-464., 2000.
- [3] Pivneva, I., Mercier, J., & Titone, D. Executive control modulates cross-language lexical activation during L2 reading: evidence from eye movements. *JEP: Learning, Memory, and Cogn.* 40, 787, 2014.
- [4] Burgoyne, A. P., Tsukahara, J. S., Mashburn, C. A., Pak, R., & Engle, R. W., Nature and measurement of attention control. *JEP: General*, 152 (8), 2369. 2023

Figures and Tables

Figure 1: Distribution of composite inhibition control scores (N = 64)

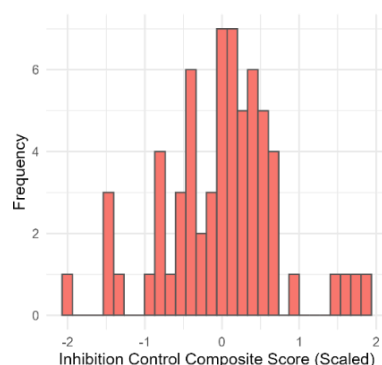


Table 1: An example item block with 4 conditions

“MARY WAS CLEANING HER (P1) WHEN HER NEW TOY (P2) FELL OFF THE STUDY TABLE.”

Condition	P1	P2
IH + TE	BOOT	BOAT
C1 + TE	BOWL	BOAT
IH + C2	BOOT	TRAIN
C1 + C2	BOWL	TRAIN

Figure 2: Predicted Log Reading Times of P1 Word Types by Inhibition Control Score

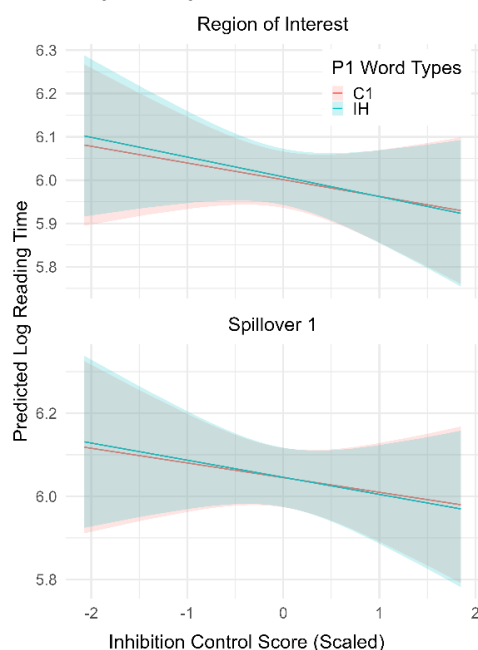


Figure 3: Predicted Log Reading Times of P2 Word Types by Inhibition Control Score

