

Morphological decomposition in German-English bilinguals

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Background: This study investigated the processing and representation of morphologically-complex derived words by German-English bilinguals in their second language (English), compared to English monolinguals. Previous research in German has found decomposition of all derived words irrespective of their semantic transparency, with semantically opaque verbs priming their stems (e.g. verstehen ‘understand’ - STEHEN ‘stand’) comparably to semantically transparent verbs [1–3]. However, research in English has found no overt priming for opaque relationships [4], suggesting that only transparent words might be decomposed in English. An explanation for this cross-linguistic difference is the morphological systematicity of German; its productive and rich morphological system may lead to decompositional processing across the board [1, 5]. Morphological processing in German-English bilinguals therefore presents a strong test case for mechanisms of transfer between different languages. To this end we investigated whether German-English bilinguals tested in their L2 behave similarly to English speakers, or whether they also decompose morphologically complex words across the transparency spectrum, like in their native German. Existing evidence suggests that decomposition effects are mediated by proficiency [6], measured here with the LexTALE test [7].

Method: The study used a cross-modal priming paradigm, with auditory primes (e.g. disagree) followed by visual targets (AGREE). Participants completed a lexical decision task across four conditions:

- transparent: ‘disagree → AGREE’ (morphologically, semantically, and form-related);
- opaque: ‘display → PLAY’ (morphologically- and form-related, but semantically unrelated);
- form/phonological: ‘dismiss → MIX’ (morphologically and semantically unrelated, form-related);
- unrelated: ‘disprove → EAT’ (morphologically, semantically, and form unrelated).

265 participants completed the task using the online platform Prolific. Data were analysed from 117 monolingual English participants (53% male, average age = 31.2) and 115 German-English bilinguals (50% male, mean age = 29.7) of varying English proficiency (mean LexTALE score = 88.1, range = 63.8 - 100). 12 self-reported monolinguals with low LexTALE scores were excluded to ensure native proficiency, and 21 further participants were excluded for low accuracy and careless responding.

Results: Preliminary results from linear mixed effects models (LMM) on inverse-transformed latencies (.002), with the priming effect also varying by condition ($F(3, 25610.1) = 28.31, p < .001$); see Figure 1a and 1b for condition means. There was no main effect of group ($F(1, 230.0) = 0.70, p = .403$), but there were significant = 8.02, $p < .001$). Critically, we also saw a significant three-way interaction between group, condition, and prime type ($F(3, 25609.6) = 4.71, p = .003$), indicating that the priming pattern across conditions differed between groups. Figure 1c summarises the results, showing clear priming effects in transparent and opaque conditions, with larger magnitude in bilinguals than monolinguals. Post-hoc tests confirmed significant group differences in transparent ($z = 3.82, p < .001$) and opaque conditions ($z = 2.27, p = .023$), but not in the form condition ($z = 0.04, p = .971$). Although LexTALE was not significant in the LMM, bilinguals showed a significant weak negative correlation ($r = -0.2, p = .033$) between LexTALE score and priming effect for transparent items.

Discussion: Morphological priming was observed in both groups, with priming considerably more prominent in transparent than in opaque pairs, in line with previous results in English [4]. Yet while bilinguals showed the same overall pattern as monolinguals, their priming effects were of a significantly larger magnitude, and less-proficient bilinguals showed larger priming effects for transparent

items. This implies that the compositional nature of German affects English morphology processing and may be somewhat mediated by proficiency, providing an important insight into the mechanisms of morphological processing and cross-linguistic transfer.

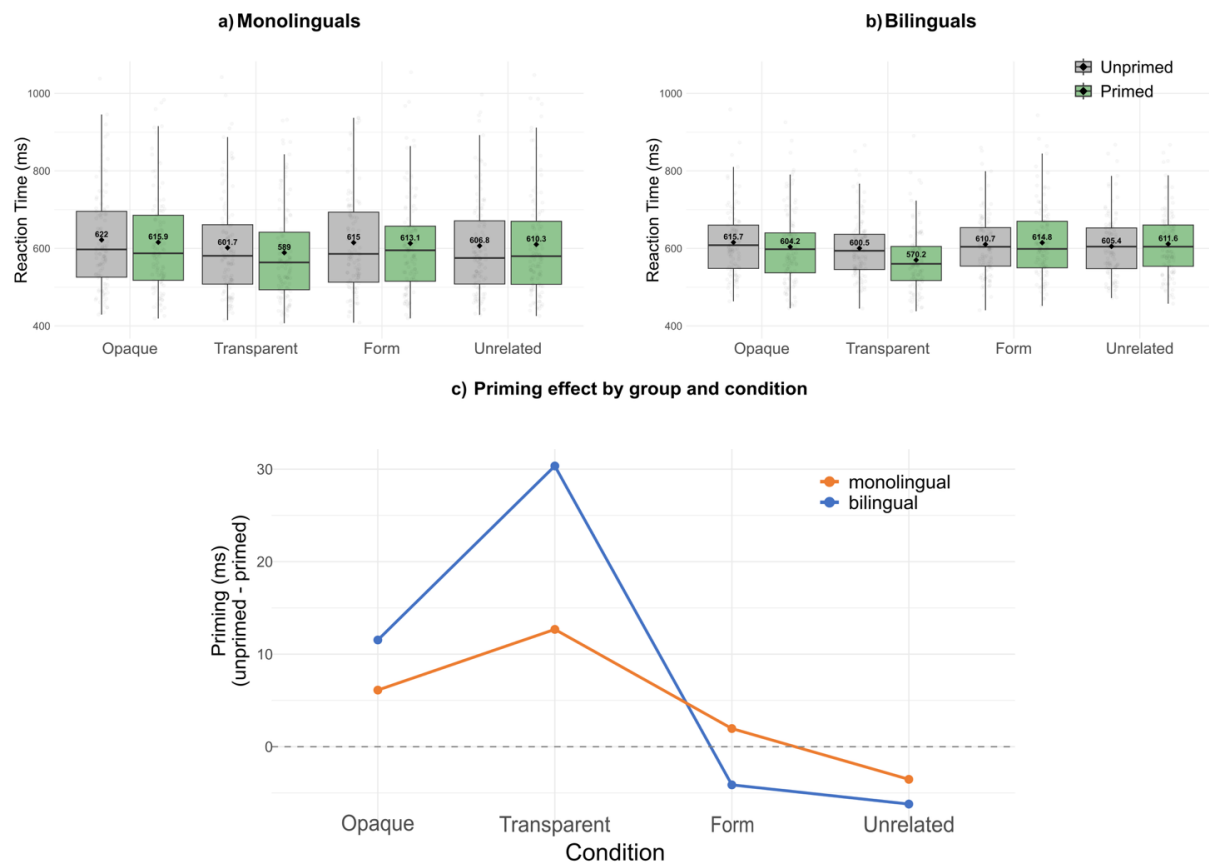


Figure 1: 1a) Box plots of reaction times in each condition for monolingual participants. 1b) Box plots of reaction times in each condition for bilingual participants. 1c) Summary of the priming effects in each condition for the bilingual and monolingual groups.

References

- [1] Bozic, M., Smolka, E., Alex, P., Mcmanus, F., & Schwarz, J. (2025). UNDER-STANDING the effects of semantic transparency, affix position and task on the processing of complex German words. *Language, Cognition and Neuroscience*, 40(9), 1232–1251. <https://doi.org/10.1080/23273798.2025.2522269>
- [2] Smolka, E., Preller, K., & Eulitz, C. (2014). Verstehen ("understand") primes "stehen" ("stand"): Morphological structure overrides semantic compositionality in the lexical representation of German complex verbs. *Journal of Memory and Language*, 72, 16–36. <https://doi.org/10.1016/j.jml.2013.12.002>
- [3] Smolka, E., & Libben, G. (2017). Can you wash off the hogwash? -semantic transparency of first and second constituents in the processing of German compounds. *Language, Cognition and Neuroscience*, 32(4), 514–531. <https://doi.org/10.1080/23273798.2016.1256492>
- [4] Marslen-Wilson, W., Tyler, L., Waksler, R., & Older, L. (1994). Morphology and meaning in the English mental lexicon. *Psychological Review*, 101(1), 3–33. <https://doi.org/10.1037/0033-295x.101.1.3>
- [5] Günther, F., Smolka, E., & Marelli, M. (2019). Understanding" differs between English and German: Capturing systematic language differences of complex words. *Cortex*, 116, 168–175. <https://doi.org/10.1016/j.cortex.2018.09.007>
- [6] Diependaele, K., Duñabeitia, J., Morris, J., & Keuleers, E. (2011). Fast morphological effects in first and second language word recognition. *Journal of Memory and Language*, 64(4), 344–358. <https://doi.org/10.1016/j.jml.2011.01.003>
- [7] Lemhöfer, K., & Broersma, M. (2012). Introducing LexTALE: A quick and valid Lexical Test for Advanced Learners of English. *Behavior Research Methods*, 44(2), 325–343. <https://doi.org/10.3758/s13428-011-0146-0>