

The Relationship between Phonological Viability and Syntactic Complexity

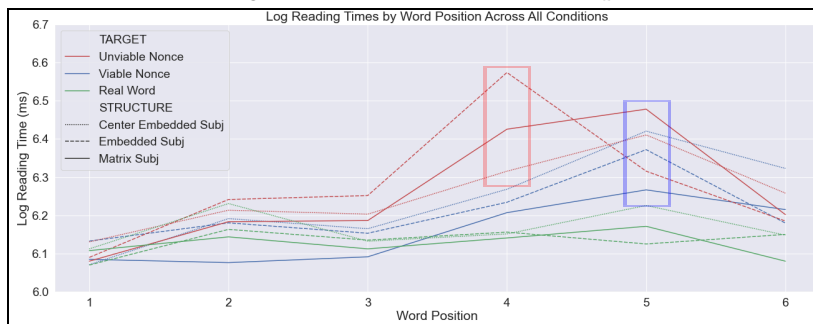
John R. Starr, Marten van Schijndel, Helena Aparicio | Cornell University

In this study, we examine the phonology-syntax interface, focusing on how phonotactic viability interacts with online processing of different syntactic structures. **Experiment.** We ran a self-paced reading experiment (N=20) where participants read 27 sentences with different phonotactic TARGETS in certain STRUCTURES (Table). Each TARGET (rows in Table) varies phonotactic viability in the onset position: REAL targets are words in the lexicon (“brick”), VIABLE targets are phonotactically-valid gaps in the lexicon (“blick”), and UNVIABLE targets are phonotactically-invalid words (“bnick”). Each STRUCTURE (columns in Table) increases syntactic difficulty: MATRIX clauses are the least difficult to process, EMBEDDED clauses more difficult, and CENTER-EMBEDDED clauses most difficult (Rayner et al. 1992). All TARGETS appear in a fixed position (position 4); the words in positions 5 and 6 were identical across all conditions. We collect reading times (RTs) at all positions, with higher RTs indicating increased processing. **Results** are visualized in the Figure; all findings have been statistically

	Matrix Subject	Embedded Subject	Center-embedded Subject
Real Word	Last night the <u>brick</u> smashed through ...	I hoped the <u>brick</u> smashed through ...	The window the <u>brick</u> smashed through ...
Viable Nonce	Last night the <u>blick</u> smashed through ...	I hoped the <u>blick</u> smashed through ...	The window the <u>blick</u> smashed through ...
Unviable Nonce	Last night the <u>bnick</u> smashed through ...	I hoped the <u>bnick</u> smashed through ...	The window the <u>bnick</u> smashed through ...

confirmed with linear mixed-effects models. We focus on comparisons between UNVIABLE and VIABLE targets to unveil the influence of phonotactic viability when processing each STRUCTURE. We find that UNVIABLE targets lead to longer RTs than VIABLE and REAL targets in all STRUCTURES at position 4 (red box in Figure). These results suggest phonotactic unviability strongly influences the initial processing of

the TARGET, regardless of STRUCTURE. However, prior work notes that syntactic processing occurs after the initial display of the stimulus (Van Gompel & Pickering 2006). As such, we examine position 5. We report a significant increase in UNVIABLE RTs compared to all other TARGETS for the MATRIX condition, but no significant increase in RTs compared to VIABLE targets for both the EMBEDDED and



CENTER-EMBEDDED conditions (blue box in Figure) in position 5.

Discussion. These findings suggest that the phonological influence on syntactic processing after the initial stimulus is most present when syntactic difficulty is low, while more complex

syntactic structures reduce the impact of phonological viability. In total, these results are inconsistent with a strictly modular view of the grammar previously proposed (Chomsky 1965; inter alia): phonology is independent at first (position 4), but then interacts with syntax later on (position 5). Instead, we support previous offline research that shows a bidirectional relationship at the syntax-phonology interface, such as studies on flexible-ordering phenomena like binomials (Benor & Levy 2005; Ryan 2017), genitive/dative constructions (Shih 2017), and noun-adjective pairs (Blake 2022).