**Discourse context modulates phonotactic processing**

*John R. Starr & Marten van Schijndel* (Cornell University)

**Introduction**. Previous linguistic research has shown that phonotactic judgments are often gradient: *blick* > *ʔbwick* > **bnick* (Albright, 2009; Bailey & Hahn, 2001; Chomsky & Halle, 1965). To reduce the possibility of noise from other aspects of processing beyond those that are phonological, the majority of these studies isolate the nonce target from any context. However, language processing requires the individual to manage multiple signals simultaneously (phonological, syntactic, semantic, etc.). As such, it is unclear whether previously-found phonological judgments persist when a nonce target is placed in a larger discourse context. Recently, Starr et al. (2023) found that the timing of phonotactic judgments for viable (*blick*) and unviable (**bnick*) nonce targets varies according to the syntactic structure that the target appears in (Figure 1B for stimuli; Figure 2 for results): phonological distinctions between viable and unviable targets surfaced immediately for embedded clauses and later for non-embedded clauses. To explore how the presence of discourse context modulates on-line phonotactic processing, we conduct a self-paced reading study that adds context sentences before the stimuli of Starr et al. (2023).

**Experiment**. Participants (N=65) read a one-sentence CONTEXT {*meaningful, random*} followed by a sentence with an orthographically-transparent phonological TARGET {*viable, unviable*} as the subject of a syntactic STRUCTURE {*matrix subject, embedded subject*} (Figure 1A→1B). We collect reading times (RTs) at each word; phonological judgments are borne out during reading when there are shorter RTs for acceptable phonological targets (*viable*) than unacceptable ones (*unviable*). Our critical region consists of the target POSITION (*position 4*) and the post-target POSITION (*position 5*). **Results** are visualized in Figure 3. To test how the presence of discourse context modulates phonological judgments, we fit a linear mixed-effects model to each STRUCTURE that predicts the log-transformed RTs of each word in the critical region, with fixed effects of TARGET, POSITION, CONTEXT, and their full interactions, along with random effects for participant and item. In the *matrix* model, we find a significant interaction between TARGET and POSITION: *viable* targets are read faster than *unviable* targets in *position 4* ($\beta$=-0.13, $p<0.05$), but not in *position 5*. In the *embedded* model, we find no significant effects. **Discussion.** We observe that phonological judgments surface differently depending on the STRUCTURE that they occur in, supporting Starr et al. (2023). However, the presence of a discourse context, regardless of type (meaningful/random), affects whether judgments appear: non-embedded clauses continue to display distinctions in phonological judgments, while embedded clauses do not. Broadly, these findings support a model of phonotactic processing that is sensitive to discourse context, where computation of phonological judgments may not complete depending on other linguistic factors.

**Replication study**. To confirm that the results of our experiment are not an artifact of reading two sentences (our study) instead of one (Starr et al., 2023), we ran a small replication study of Starr et al. (2023) using two-sentence stimuli. Participants (N=20) read experimental sentences prior to context sentences (Figure 1B → 1A); as there is no preceding sentence when reading the TARGET, the results should be identical to Starr et al. (2023). We replicate their results (Figure 4), further supporting our primary findings that discourse context modulates phonotactic processing.

**(A)** Context sentences:

| | Context Type |
|---|---|
| **Meaningful** | There was a loud crashing sound nearby. |
| **Random** | There was a music festival all week. |

**(B)** Starr et al. (2023) stimuli:

| | Matrix Subject | Embedded Subject |
|---|---|---|
| **Viable** | Last night the *blick* smashed through… | I hoped the *blick* smashed through… |
| **Unviable** | Last night the *bnick* smashed through… | I hoped the *bnick* smashed through… |
| | 1 2 3 **4** **5** 6 | 1 2 3 **4** **5** 6 |

**Figure 1**: (A) Example context sentences. CONTEXTS were controlled for length and structure. Meaningful contexts predict the verb of the experimental sentence; random contexts do not. (B) Example experimental sentences that show two TARGETS in two STRUCTURES. All TARGETS appeared in position 4 of each experimental sentence; the critical region is highlighted. Words in positions 3-6 were identical across both STRUCTURES.

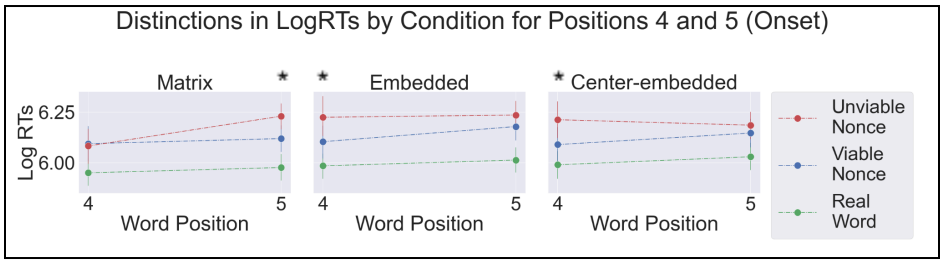


**Figure 2**: Results of Starr et al. (2023). Significant differences are starred. In our study, we examine only VIABLE/UNVIABLE targets and MATRIX/EMBEDDED structures.

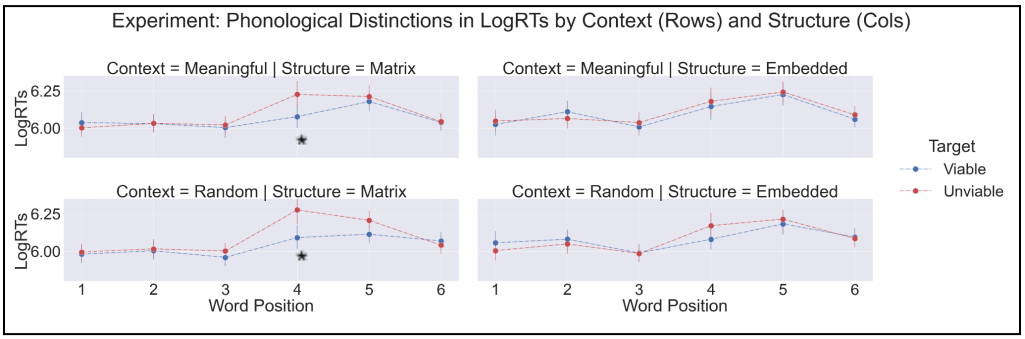


**Figure 3**: Experimental results. Significant differences are starred. Phonological distinctions surface immediately for MATRIX structures. No other significant differences are found.

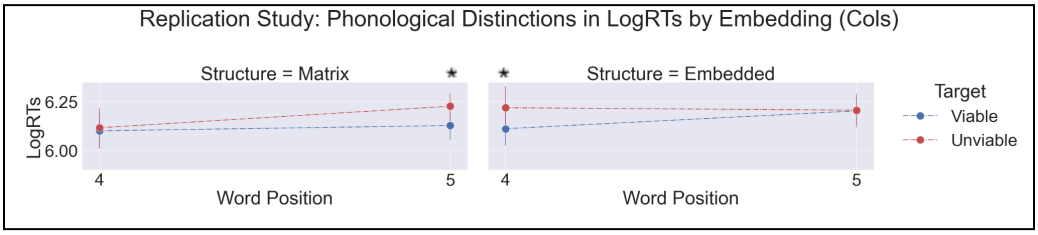


**Figure 4**: Replication study results that reproduce the left & middle columns of Figure 2.

**References.** Albright, A. (2009). *Phonology*. | Bailey, T. & Hahn, U. (2001). *Journal of Memory and Language*. | Chomsky, N. & Halle, M. (1965). *The Sound Pattern of English*. | Starr, J.R., Aparicio, H., & van Schijndel, M. (2023). *30th Manchester Phonology Meeting*.