(Mis)interpreting agreement attraction: Evidence from a novel dual-task paradigm
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Cue-based memory retrieval theories (e.g., McElree, 2000; Lewis & Vasishth, 2005; Van Dyke, 2007; Wagers et al., 2009) provide an explicit account of real-time linguistic dependency formation that specifies how linguistic representations are encoded and later accessed in memory. However, existing theories are underspecified about how the products of memory retrieval are integrated into higher levels of semantic and discourse processing during real-time comprehension. Here, we report data from a novel dual-task design, which combines self-paced reading with a speeded forced choice task (Pittman & Smyth, 2005), showing that misretrieval in processing a formal dependency (agreement) also has an impact on interpretive dependency formation, but only in a small subset of the trials in which grammatical misretrieval occurs. These results thus suggest another mechanism by which interpretations unfaithful to the linguistic input may be generated (Ferreira & Patson, 2007).

In agreement attraction, the processing of a subject-verb agreement violation is facilitated by similarity-based interference from a structurally irrelevant noun that matches the plural number marking on the verb (attractor). We investigate whether agreement attraction leads comprehenders to erroneously interpret the attractor as the thematic subject. In our experiment, participants (N=64) read sentence fragments of the form ‘The bed by the lamp/lamps was/were undoubtedly quite’ in a self-paced reading paradigm with centered display, immediately followed by a speeded forced choice task between two adjectives (e.g.: comfortable / bright) to complete the sentence. Adjectives were normed (N=32) such that one was plausible only for the head noun and the other was plausible only for the attractor noun. If misretrieval of the attractor in processing the formal subject-verb agreement dependency causes comprehenders to erroneously assign the subject’s thematic role to the attractor, it should be reflected in the adjective choice in agreement attraction configurations. While previous results on the impact of agreement attraction on interpretation have been mixed, (e.g., Lau et al., 2008; Thornton & MacDonald, 2007; Patson & Husband, 2016) the current study provides an important advance by directly combining a speeded interpretive outcome measure with an online measure of processing at the agreement violation (SPR), allowing both morphosyntactic and interpretive errors to be evaluated in the same trials.

The SPR data illustrated the expected agreement attraction profile: a large slowdown for agreement violations, which is reduced in the presence of an attractor matching the number cue of the verb (figure 1). Critically, although accuracy rates in the forced choice task were very high overall, we indeed found a significant grammaticality by number interaction (p = .03). In the ungrammatical conditions participants were more likely to choose the attractor-matching adjective when the attractor was plural, i.e. in an agreement attraction configuration (figure 2). At the same time, the choice of the attractor-matching adjective was only 5.6% higher in the attraction condition, and yet data from a speeded acceptability judgment task with the same materials (N=24) suggests that the rate of attraction errors is closer to 17%. This indicates that the interpretive error occurs on only a subset of attraction trials. In sum, these findings suggest that misretrieval of the number-matching attractor at least sometimes causes comprehenders to misinterpret the attractor as the subject of the sentence, but that these computations are also somewhat independent.
**Figure 1:** Region-by-region average RTs in self-paced reading (error bars indicate standard error of the mean, N=64)

**Figure 2:** Choice of adjective matching the head noun in the forced-choice task (in %)

**References**