Singular vs. Plural *Themselves*: Evidence from the Ambiguity Advantage

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Background. Recent work has documented changes in the distribution of *they* and the antecedents to which *they* refers [1, 2]. Other work has investigated the processing of *they* and *themselves* with both singular and plural antecedents [3, 4]. In an eyetracking while reading study, [3] showed that *they* incurs a processing cost when its antecedent is singular (*someone*) rather than plural (*some people*). [3] proposed that *they* first initiates a search for a plural antecedent, and only accommodates a singular antecedent when no plural is found. [4] found that *themselves* elicits a P600 with singular antecedents that are gendered (*John*), but not with singular antecedents with ambiguous gender (*the participant*). [4] suggest that *they* is unspecified for gender, and the processing cost of singular *they* is due to a gender rather than number mismatch. However, studies have not examined the processing of *themselves* when both singular and plural antecedents are available in the same sentence. This configuration is necessary to test if *themselves* preferentially refers to plural antecedents, as proposed by [3].

Experiment. n=57; 12 observations/participant/condition. We extend previous work on the ambiguity advantage [5-7] to test if *themselves* first triggers a search for plural antecedents, as proposed by [3]. In sentences like those in Table 1, we disambiguate relative clause (RC) attachment height with the reflexive *themselves*. In AMBIG, both N1 and N2 are plural. In LOW, only N2 is plural, and in HIGH, only N1 is plural. Thus, if *themselves* first searches only for a plural antecedent, then the RC must attach to N2 in LOW and to N1 in HIGH. Previous work [5-7] has demonstrated an ambiguity advantage when RC attachment height is disambiguated by reflexive gender and semantic plausibility, i.e. reading times at the point of disambiguation were faster in AMBIG compared to when the RC must attach LOW or HIGH. We expect this same ambiguity advantage if *themselves* prioritizes plural antecedents. If, instead, singular and plural antecedents were treated equally by *themselves*, all three conditions would be ambiguous because the number of the antecedents would not force low or high attachment, and there should be no differences in reading times across conditions.

Method. Participants read sentences in the Maze task [8], in which participants are presented with two words at a time and must pick the word that forms a grammatical continuation with the preceding material in order to advance through the sentence. This task is thought to encourage incremental processing and more localized effects than self-paced reading.

Results. Reaction times are plotted in Figure 1. We fit a Bayesian linear mixed effects model [9] to RTs at the disambiguating reflexive and spillover prepositions. Attachment was coded into two contrasts: High Attachment (HIGH vs. AMBIG) and Low Attachment (LOW vs. AMBIG). No effect of Low Attachment was found at either reflexive or spillover, but English has a low attachment bias, so any cost of disambiguating to low attachment in the LOW condition would be small; this is not evidence against an ambiguity advantage. We found a main effect of High Attachment at the reflexive (66.29 ms, [39.00, 92.81]) and preposition (24.27 ms, [1.02, 46.43]). This is a clear replication of the ambiguity advantage: there was a processing cost when only N1 was plural. This cost indicates that the reflexive *themselves* does preferentially refer to plurals, forcing disambiguation to the dispreferred high attachment parse.

Discussion. We found evidence of an ambiguity advantage: participants spent more time reading *themselves* in HIGH compared to AMBIG conditions. This is only expected if *themselves* preferentially refers to plural antecedents, forcing high attachment in HIGH. This constitutes novel evidence for [3]'s proposal that *they* accommodates singular antecedents only when no plural is available. However, many nouns in our experiment were gendered, and [4] found that singular *themselves* is costly only when a singular antecedent is also gendered. It is thus possible that *themselves* does not prioritize plurals over non-gendered singulars. Follow-up work testing different antecedents in a retrieval interference paradigm is underway.

ATTACHMENT	[…] received a lot of media attention.
AMBIG(UOUS)	The **partners**$_{N1}$ of the **attorneys**$_{N2}$ who paid **themselves** from the settlement
LOW	The partner$_{N1}$ of the **attorneys**$_{\mathbf{N2}}$ who paid **themselves** from the settlement
HIGH	The **partners**$_{\mathbf{N1}}$ of the attorney$_{N2}$ who paid **themselves** from the settlement

Table 1. Sample item.

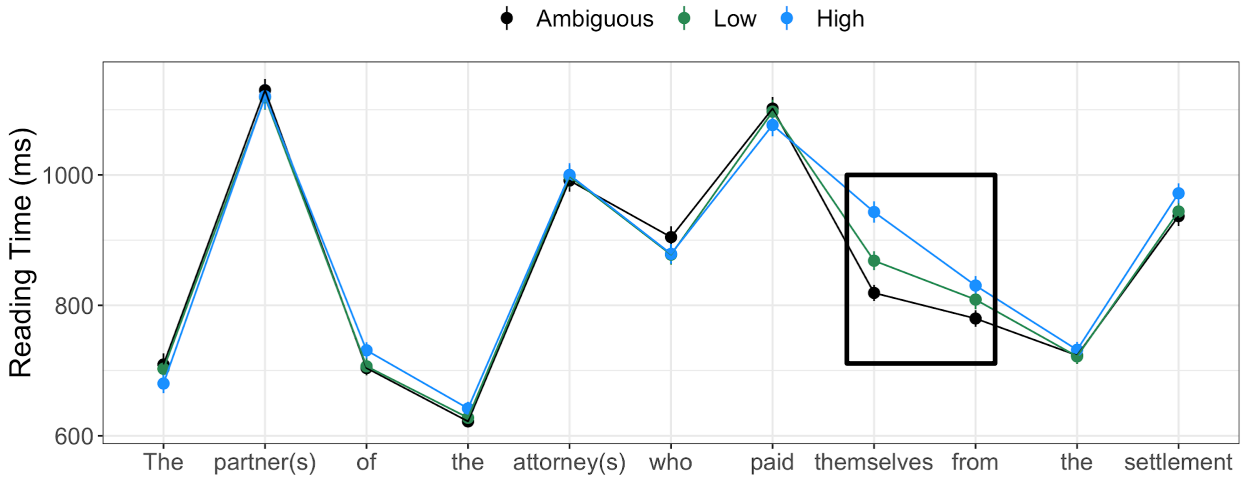

Figure 1. Mean reading times by word. Error bars indicate standard error of the mean.

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