Visual Antecedents Not Only License Ellipsis But Also Facilitate Sentence Comprehension Generally: A Self-paced Reading Study of English Verb Phrase Ellipsis

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One of the most hotly debated topics on ellipsis in theoretical as well as psycholinguistic literatures has been whether there is a phonologically null syntactic structure being constructed in the elliptical site [1, 2, 3] or there is simply a pointer-like mechanism that lacks an internal structure. [4, 5, 6] There has been rich evidence produced from both sides of the debate, and to this day, the argument is far from being settled.[7] For both accounts, however, a general consensus is that comprehenders require some structurally isomorphic antecedent to be stored in working memory, which can later be utilized to fill the elliptical gap for successful interpretation, at least for those constructions categorized as surface anaphora. [8, 9, 10] What if this syntactic antecedent is replaced with visual information such as an image depicting an action? Can comprehenders still integrate the visual cue with the unfolding discourse representation and subsequently retrieve such information to resolve an ellipsis downstream? If the answer to this question is yes, that would suggest the possibility that comprehenders are not building a syntactic structure in the elliptical gap, but rather they are simply reactivating the antecedent stored in working memory at the time of encountering an ellipsis for interpretation. This will provide strong counter-evidence against the syntactic reconstruction account and support for the pointer-mechanism account. To this end, the current study employed one of the most well-investigated examples of surface anaphoric ellipsis–English Verb Phrase ellipsis, to test this radical hypothesis. Verb Phrase Ellipsis has been argued to require relatively strict structural parallelism between the antecedent and the ellipsis site [8, 9, 10], thus providing an optimal testing ground for this novel investigation.

Sixty L1 English readers viewed images depicting actions followed by sentences with elliptical gaps. Participants were first shown a sentence fragment such as “Last Friday afternoon, Joanna was”, followed by an image of a woman knitting a scarf. Subsequently, a sentence with an elliptical gap was displayed: “Elise was too because…”. Participants’ reading times at the ellipsis sites (“was too”) and spillover regions were compared to those of the controls to examine whether the elliptical resolution with a visual antecedent was successfully licensed. Apart from the Verb Phrase Ellipsis condition, the non-ellipsis canonical condition (e.g., “Elise was reading because…”) and the Do-it anaphora condition (e.g., “Elise was doing it too because…”) were also included to probe whether the observed effects may generalize to canonical sentence processing and/or processing of another anaphoric type (i.e., deep anaphora).

Linear mixed model analyses show that visually-situated processing of ellipsis appears to have some processing advantage over its linguistic counterpart–but surprisingly, not at the ellipsis region itself but rather at the subsequent spillover regions. At the critical verb region, the reading times for the ellipsis sentences with visual antecedents did not significantly differ from those of the ellipsis sentences with linguistic antecedents. But at the two subsequent regions, the reading times were significantly shorter for the visual antecedent condition, compared to the

linguistic antecedent condition. Furthermore, this same facilitatory effect was also observed for the non-ellipsis canonical condition and the Do-it anaphora condition with visual antecedents.

The results suggest that (1) comprehenders are indeed capable of capitalizing on nonlinguistic visual antecedents to license ellipsis resolution in online sentence comprehension, and (2) following (1), parsers are likely not building phonologically null syntactic representations at the elliptical site but instead, reactivating the previously stored visual antecedent for successful interpretation; thus providing support for the pointer mechanism, and (3) regardless of whether there was antecedent retrieval involved (ellipsis condition vs non-ellipsis condition vs Do-it anaphora condition), sentences with visual antecedents yielded a facilitatory effect, indicating that visually-situated sentence processing generally imposes less cognitive demand on the parsing system, compared to linguistically-situated sentence processing.

References

1. Arregui, A., Clifton Jr, C., Frazier, L., & Moulton, K. (2006). Processing elided verb phrases with flawed antecedents: The recycling hypothesis. *Journal of memory and language*, *55*(2), 232-246.

2. Kim, C. S., Kobele, G. M., Runner, J. T., & Hale, J. T. (2011). The acceptability cline in VP ellipsis. *Syntax*, *14*(4), 318-354.

3. Kim, H., Orth, W. J., & Yoshida, M. (2024). Incremental structure building in the processing of ellipsis. *Quarterly Journal of Experimental Psychology*, 17470218241280567.

4. Martin, A. E., & McElree, B. (2008). A content-addressable pointer mechanism underlies comprehension of verb-phrase ellipsis. *Journal of Memory and Language*, *58*(3), 879-906.

5. Martin, A. E., & McElree, B. (2009). Memory operations that support language comprehension: evidence from verb-phrase ellipsis. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *35*(5), 1231.

6. Martin, A. E., & McElree, B. (2011). Direct-access retrieval during sentence comprehension: evidence from sluicing. *Journal of memory and language*, *64*(4), 327-343.

7. Phillips, C., & Parker, D. (2014). The psycholinguistics of ellipsis. *Lingua*, *151*, 78-95.

8. Sag, I. A., & Hankamer, J. (1984). Toward a theory of anaphoric processing. *Linguistics and philosophy*, 325-345.

9. Murphy, G. L. (1985). Processes of understanding anaphora. *Journal of Memory and Language*, *24*(3), 290-303.

10. Tanenhaus, M. K., & Carlson, G. N. (1990). Comprehension of deep and surface verb phrase anaphors. *Language and Cognitive Processes*, *5*(4), 257-280.