

“Context can!”: Contextual accommodation in exophoric and anaphoric verb phrase ellipses
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Introduction: Traditional accounts of ellipsis interpretation have posited that ellipsis sites are resolved under syntactic or semantic identity with an overt antecedent [1-6, *inter alia*]. A challenge to this approach comes from observations that exophoric (antecedentless) verb phrase ellipses (VPE) can be licensed by appropriate non-linguistic contexts [7]. We conducted two experiments to investigate the nature of the exophoric VPE licensing. Our experiments also examine the broader question of how linguistic and non-linguistic information interact to license VPE in general. Our results provide evidence that the interpretation of both exophoric and regular VPE constructions can be affected by salient non-linguistic information from the discourse context. But, such effects are best characterized as accommodation, because the presence of an overt linguistic antecedent imposes strong constraints on whether and how the non-linguistic information should be incorporated into the interpretation.

Experiment Design: Six scenarios were created for the current study. For each scenario, linguistic context is set up as a short conversation between two characters (e.g., a son and a father), and non-linguistic context is set up via visual comic strips (3 panels for each scenario) that provide the general discourse background. An example is shown in Table 1. In the linguistic conversation between the son and his father, the father’s response is always a VPE construction, “We can’t”. The son’s inquiry varied in three different ways: (i) He uttered nothing (Exophoric Antecedent condition); (ii) He requested candy bars, but with no explicit numeral information (Unmodified Antecedent condition); (iii) He requested candy bars with explicit numeral information (Modified Antecedent condition). The non-linguistic information in the comic strips also varied in three different ways (see Table 1), with the numeral information of the requested candy bars changing from Unavailable, to Available, to very Salient. These manipulations created 9 variations of each scenario. For each of the 9 variations, we asked the participants to rate (on a 1-7 scale) how likely it was that the VPE uttered by the father could be interpreted in a certain way. We focused on two possible interpretations: (i) the Unmodified Interpretation: the father is negating an unmodified bare plural; and (ii) the Modified Interpretation: the father is negating a plural modified by a numeral. Each of the 6 critical scenarios therefore had a total of 18 (9x2) variations. Each participant saw only one variation for each item. There were also 10 filler scenarios.

Comic Strip Context	Antecedent	Response	VPE Interpretation
<i>Unavailable:</i> Father and son stand in grocery store aisle near candy bars.	<i>Exophoric:</i> [no antecedent]	Father: We can’t.	<i>Unmodified:</i> On a scale from 1 to 7, where 1 is the least likely and 7 is the most likely, how likely do you think it is that the father meant: We can’t buy any candy bars. <i>Modified:</i> ...We can’t buy five candy bars, but maybe we could buy fewer.
<i>Available:</i> Son places five candy bars in cart at one time.	<i>Unmodified:</i> Son: I want to buy candy bars!		
<i>Salient:</i> Son conspicuously places five candy bars in cart one at a time.	<i>Modified:</i> Son: I want to buy five candy bars!		

Experiment 1: Native English-speaking subjects (n=146) were recruited using Amazon Mechanical Turk. An overall mixed-effects model on the z-transformed rating scores showed a significant three-way interaction between Comic Strip Context, Antecedent, and Interpretation ($p < .001$). Separate analyses were done for each type of Antecedent (i.e., based on the boy’s utterance).

For the Exophoric conditions, there was a significant interaction between Comic Strip Context and the VPE Interpretation ($p < .001$). The rating of the Unmodified Interpretation of the VPE decreased as a function of the salience of numeral information provided in the Comic Strip Context, while the rating of the Modified Interpretation increased (all p ’s $< .05$). This indicates that exophoric ellipses are recoverable based on non-linguistic information and that participants were sensitive to the experimental manipulation of the contextual salience.

For the Unmodified Antecedents, there was again a significant interaction between Comic Strip Context and the VPE Interpretation ($p < .05$). Paired comparisons indicated that Comic Strip Context had no effect on ratings for the Unmodified Interpretation (all p ’s $> .3$). However, the Modified Interpretation was rated higher in the Salient Context than in both the Unavailable ($p < .01$) and the Available Context ($p < .001$). This suggests that the interpretation of VPE can sometimes contain information that is made salient by the discourse context, even if such information is not present in the linguistic antecedent.

For the conditions with Modified Antecedents, Comic Strip Context played no reliable role in determining ratings of the Interpretations. This suggests that information included in an antecedent cannot be omitted from an ellipsis interpretation regardless of whether the information is contextually salient.

Experiment 1 Discussion: Experiment 1 showed that salient information from the non-linguistic context, even when it is not represented explicitly in an antecedent utterance, can affect the interpretation of VPE. However, the effect of non-linguistic information is constrained in significant ways. The influence of the non-linguistic context is most pronounced for the exophoric conditions. When an explicit linguistic antecedent is present, VPE interpretation is not allowed to omit any of the antecedent information, regardless of the discourse context, as shown by the Modified Antecedent conditions. However, additional information not present in the antecedent can be added to the VPE interpretation, provided such information is made very salient in the context, as shown by the Unmodified Antecedent conditions. But, it is worth noting that even in the Unmodified Antecedent conditions, with the Salient numeral information from the comic strip context, the dominant/preferred interpretation of the VPE is still the one that is faithful to the linguistic antecedent (i.e., the Unmodified Interpretation is rated higher than the Modified Interpretation), in contrast with the exophoric conditions. We suggest that the primary consideration in VPE interpretation is exact linguistic identity to the linguistic antecedent. Secondary to this is a mechanism that allows for accommodation of additional interpretations. The interpretation(s) generated in this module are the only ones available for exophoric ellipses, since they have no antecedent, and are subordinate to the antecedent-identical reading when there is an antecedent. The accommodation mechanism is asymmetrical, allowing information into the interpretation that was not present in the antecedent, but not allowing the omission of information that was present in the antecedent.

Experiment 2: Experiment 2 (subj. n=174) was designed to exclude the possibility that what we considered as the accommodated VPE interpretations in Experiment 1, when there is an explicit linguistic antecedent, could be possible interpretations anyway had the the elliptical site recovered only information identical to the explicit linguistic antecedent. The exclusion of this possibility would suggest that the accommodated VPE interpretations observed in Experiment 1 are triggered by VPE-specific mechanisms, instead of some global strategy of accommodation in comprehension. The procedure was identical to Experiment 1 except that in the Unmodified and Modified Antecedent conditions, a fully spelled-out response replaced the elliptical response (e.g., in the father’s response in Table 1). The response VP was identical to the VP in the antecedent (Unmodified: “We can’t buy candy bars.” Modified: “We can’t buy five candy bars.”). This manipulation is not relevant for the exophoric conditions in Experiment 1, so we will not discuss the exophoric conditions below.

The Modified Antecedent conditions in Experiment 2 showed identical results for the effect of Comic Strip Context to Experiment 1 (Figure 2). The crucial comparison between the two experiments is the Unmodified Antecedent conditions, especially for the Modified VPE interpretation (the locus of the effect in Experiment 1). Analysis on the ratings of the Modified Interpretation with an Unmodified Antecedent yielded a marginal interaction between Comic Strip Context and Experiment ($p < .1$, Figure 3). Paired comparisons suggest that the Modified Interpretation was considered more strongly in Experiment 1 with a Salient context than all other conditions in Figure 3 (all p 's $< .01$), suggesting that interpretations incorporating highly salient non-linguistic information are more available for elliptical utterances than their spelled-out non-elliptical counterparts.

Conclusion: In two experiments, we showed that VPE interpretation is more nuanced than previously considered. Salient non-linguistic information absent from the explicit antecedent can be used in VPE interpretation through VPE-specific accommodation mechanisms. However, these accommodation mechanisms are secondary to the primary mechanism that licenses VPE through exact linguistic identity.

References: [1] Hankamer & Sag (1976); [2] Fiengo & May (1994); [3] Chung, et al. (1995); [4] Dalrymple, et al. (1991); [5] Hardt (1993); [6] Merchant (2001); [7] Miller & Pullum (2013).

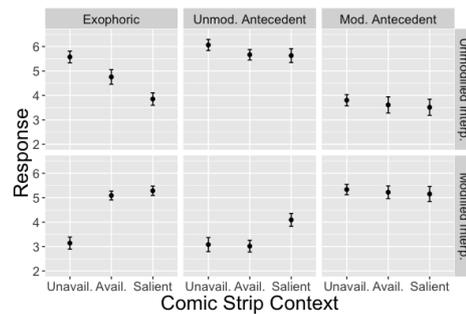


Figure 1: Experiment 1 results. Error bars: Std. error.

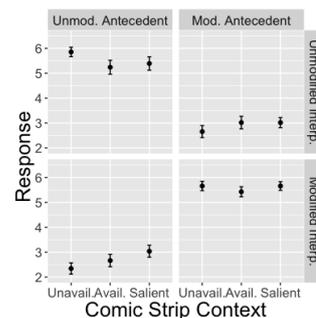


Figure 2: Experiment 2 results. Error bars: Std. error.

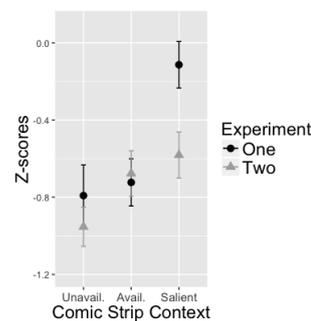


Figure 3: Comparison of Unmodified Antecedent, Modified Interpretation z-scores for two experiments. Error bars: Std. error.