The effects of context on early syntactic structure building
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Introduction

Background

Studies using Event-Related Potentials (ERP) indicate that the perception of a violated word category is reflected in a negative-going wave occurring at left anterior electrode sites (Friederici et al. 1993; Early Left Anterior Negativity; ELAN; Neville et al. 1991-11). This N-re sponses is extremely early. These previous studies used materials that violated strong grammatical expectations in noun phrases following determiners, prepositions or possessors. Hence, the very fast brain response may reflect perception of the mismatch between a strong category expectation and the incoming word, rather than detection of ungrammaticality in general.

The present study

The present study investigates whether early brain re sponses associated with local syntactic category violations can be modulated by expectations originating from non-local syntactic categories. The aim is to understand why the very early responses are found only with a special subclass of violations.

Method

Participants

- 28 paid native speakers of English (15 female), students of the University of Maryland, non of the participants of the off-line study participated in the EEG experiment.
- mean age 21.1 years
- normal or corrected to normal vision
- all were strongly right-handed

Procedure

- visual word-by-word presentation (RSVP)
- 500 ms/word on a screen followed by 200 ms blank screen
- black letters on light-gray screen
- grammatically judgment task

ERP results

Ellipsis resolution

Category violation

Agreement violation

Conclusion

Our data shows a left anterior negative going wave starting at 250 ms after the onset of the category violation (n) in the non-ellipsis condition. The analysis shows a component reflecting this effect is not present in the post-violation at the same word (n) in the grammatical ellipsis and non-violations conditions. Providing evidence that our context manipulation affects the processing of the local violation. However, the direct comparison of grammatical and ungrammatical *-n violations in the ungrammatical contexts is blunted by baseline differences due to divergent ERP waves preceding the critical position.

Possessive nuclear only exhibit a non-linearized negativity starting at 250 ms over anterior sites when compared to referring NP. A separate test of the same conditions at the preceding clause showed no such effect. Whether the effect as "Mac's" in the main clause reflects an integration attempt similar to the integration attempt observed either for processing deaccented elements (Finkbeiner, Schleussky & Friederici 2002) or for referring to context referents (Van Berkum, Brown & Hagoort 1999) needs to be clarified by further research. Furthermore, the comparison of both ungrammatical structures at "n" in the two contexts exhibited a LAN-like cost pattern followed by a reversal positivity for the structure in non-ellipsis contexts. This finding indicates the use of category information preceding the violation.

In sum, our results indicate that the contextual manipulations of local category expectations might affect early anterior brain responses to syntactic violations. Our data point to a discrepancy between local processes and context related computations. More empirical evidence is needed to support the claim that the early responses are specifically related to local expectations, rather than to violations in general.

References


