Discourse events influence verb integration and argument prediction: Evidence from ERPs

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It is an open question, which role the discourse context plays in influencing the predictions of verbal complements during incremental sentence comprehension. One recent study by Metusalem et al. (2010) suggests that verbal expectations for its arguments are largely unaffected by discourse context. However their study did not directly contrast the influence of discourse context to that of verb information on the integration of verbal arguments.

In our study we investigated both the integration of the verb and its argument with the discourse context as a function of semantic fit between the verb and the context. We presented a context sentence followed by a sentence containing either a fitting or non-fitting verb followed by a noun, which either fit well with the context or not, but always fit well with the verb (A-D) independent of context. We thus have a 2x2 design with the factors Verb congruency and Noun congruency.

Analysis of the data revealed a centro-parietal negativity on the critical verb between 400 and 600 ms after word onset (A&B: *opened* versus C&D: *closed*, p = .03), showing an integration effect for the incongruent verb (Kutas and Hillyard, 1984).

An analysis on the noun revealed a main effect of the factor verb congruency (p = .02) and noun congruency (p = .0001) as well as a significant interaction (p = .02).

Single comparisons between the context-*congruent* (A: *bottle*) versus the context-*incongruent* (B: *window*) noun after the semantically fitting verb showed a strong increase in the N400 amplitude, even though both nouns were equally plausible direct objects for the verb. The noun comparison after the non-fitting verb (C vs. D) showed a similar yet reduced N400 effect: The context-*incongruent* (D: *window*) noun elicited larger N400 amplitudes than the context-*congruent* (C: *bottle*) noun.

The N400 amplitude for the context-congruent noun was larger after the non-fitting verb (C) than after the fitting verb (A). For the context-incongruent noun this effect was reversed: The amplitude after the non-fitting verb (D) was smaller than after the fitting verb (B).

Our findings suggest that integration of the verb and noun is fundamentally determined by the context. Further, while integration of the noun is modulated by the verb, this does not override contextual expectations, contra the findings of Metusalem et al (2010). If the verb was playing a predominant role in expectation generation, one would expect a much larger reduction or even extinction of the N400 effect after the incongruent verb, due to override of context information. It rather seems that the verb is treated like any other meaningful element in the context, which leads to more specific expectations in conditions A and B, resulting in a larger effect of expectation violations. These results challenge psycholinguistic accounts in which prediction is controlled by the verb, but are generally in line with recent studies on the influence of distinct cues (verbal information, discourse context) on semantic/pragmatic processing of meaningful elements (vanBerkum 2004, Kuperberg 2007).

Material:
Context: Als Jan am Wasserkasten vorbeikommt, will er etwas trinken.
    As Jan walks past a waterbox, he wants to drink something.
A. Deshalb **oeffnet** er die **Flasche** mit aeusserster Sorgfalt.
   Therefore he **opens** the **bottle** carefully.
   [fitting verb, context-congruent noun]
B. Deshalb **oeffnet** er das **Fenster** mit aeusserster Sorgfalt.

Therefore he **opens** the **window** carefully.

[fitting verb, context-incongruent noun]

C. Deshalb **schließt** er die **Flasche** mit aeusserster Sorgfalt.

Therefore he **closes** the **bottle** carefully.

[non-fitting verb, context-congruent noun]

D. Deshalb **schließt** er das **Fenster** mit aeusserster Sorgfalt.

Therefore he **closes** the **window** carefully.

[non-fitting verb, context-incongruent noun]

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