Referential processing of context-(in)dependent entities: Evidence from ERPs
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During referential processing, a linguistic expression refers to a semantic entity. This entity either exists independently of the particular situation of utterance or depends on the immediate situation for unambiguous reference (cf. Hawkins, 1978; Löbner, 1985). Instantiations of context-independent entities are proper names (e.g. Hillary Clinton), inherently definite nouns (the weather), or indexicals (I, you), while the majority of nouns and third person pronouns belong to the class of context-dependent entities (the table, he). The following two ERP experiments investigated whether this conceptual distinction has a bearing on language comprehension. Two reading comprehension studies were conducted in German. Based on previous findings, a negativity peaking around 400ms (N400) was predicted to index the degree of referential processing (Streb et al., 1999; Burkhardt, 2006), with context-dependent entities showing a more pronounced negativity over context-independent entities.

Experiment 1 investigated the establishment of pronoun-antecedent relations of context-independent indexicals (i.e. first and second person pronouns) vs. context-dependent third person pronouns. Indexicals refer to the participants in a communication situation (i.e. speaker, addressee), while third person pronouns refer to varying discourse entities and depend on contextual information during referential processing. Indexicals therefore carry inherent content (I=speaker, you=hearer) – albeit with variable character – while third person pronouns change their content as a function of context (she=the psychologist, my neighbor, Barbara,...). This indicates that referential interpretation is highly context-dependent in the case of third person pronouns, and limited to speaker/hearer-reference in the case of indexicals. In terms of language processing, this suggests that the search for an antecedent is more demanding for third person pronouns. Statistical analyses revealed significant differences between 350-550ms post-onset. Context-dependent third person pronouns elicited a more pronounced negativity compared to context-independent indexicals. (Frequency cannot account for this (i.e. less frequent words elicit an enhanced N400) since indexicals are less frequent in German than third person pronouns.)

Experiment 2 examined referential processing of context-independent nouns, i.e. nouns that refer to concepts that are common to all situations and are based on general knowledge (the weather, the flora, the presence,...) vs. context-dependent nouns, i.e. nouns that must be specified by the context to obtain unambiguous reference (the view, the flower, the strategy,...). All items were matched for frequency and length. The prediction that context-dependent entities show a more enhanced negativity analogous to Experiment 1 was borne out. This was supported by statistical analyses in the window from 350-550ms.

These two studies looked at referential processing of differing linguistic expressions, pronouns and nouns. Despite their differences in form and function, both studies taken together reveal that the inherent context-dependence or context-independence of the respective entities has consequences for sentence comprehension. In both studies, a more pronounced negativity over centro-parietal electrodes was observed for context-dependent entities, indicating that referential processing depends on the degree with which an entity must be specified by the context. This suggests that the N400 is also sensitive to this (pro)noun-inherent semantic feature and it demonstrates that referential processing relies on the qualitative difference of context-(in)dependence. This feature should therefore be implemented as part of an accessibility hierarchy in models of referential processing.

Examples Experiment 1: Hannah erzählte, dass der Junge, den ich / sie filmte, gelächelt hat.  
Hannah said that the boy whom I / she filmed has smiled.

Examples Experiment 2: Ich denke, dass die Flora / die Blume doch meistens sehr bunt aussieht.  
I think that the flora / the flower usually looks very colorful.