

Backward NPI dependencies in Dutch: An ERP investigation

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The backward licensing of dependencies constituted by a Negative Polarity Item (NPI) and negation has received little attention in the processing literature [1]. NPI-negation dependencies can be used to elucidate if the same active search mechanism present both in wh-gap [2, 3, 4] and backward anaphora dependencies [5, 6] is triggered in NPI dependencies. This study examined whether the parser triggers a search for a licenser (e.g. negation) immediately upon encountering a NPI in backward NPI dependencies in Dutch where the NPI appeared linearly before its licenser [7,8].

The experimental sentences contained the NPI *ook maar iets* within an embedded sentence; the NP linearly preceded negation even though negation was in a structurally higher position in the matrix clause. We tested whether the processing of NPI-dependencies is affected by the distance from the NPI to negation. We increased the distance at different positions in the sentence (main clause and embedded clause) to evaluate if it affected the parsing of the sentence differently. We predicted that increasing the distance at the embedded clause where the NPI is contained -as in (1b) and (1c) - would be less costly for the parser than increasing the distance at the main clause right after the copula *is* where negation is highly required- as in (1d) and (1e).

We conducted an ERP experiment where EEG was continuously recorded while 24 native speakers of Dutch read silently 35 sentences such as (1a-e) interspersed with 35 fillers and answered a comprehension question for every sentence. ERP results show that negation *niet* evoked a central anterior negativity in the time window 200-600 ms at all conditions with respect to (1a) (significant interaction of factors Condition and Position (Anterior, Central, Posterior); $F(8,184)=2.554$; $p=0.038$). This negativity was bigger in amplitude at (1d) ($A>D$; $p<0.001$) and (1e) ($A>E$; $p<0.001$) where the extra material was included after the main verb *is* when compared with (1b) ($A>B$; $p=0.0023$) and (1c) ($A>C$; $p=0.0046$) where the extra material was included after the NPI in the embedded clause.

Results show that there is a search started for a licenser when there is an NPI in the input that needs to be licensed. Increasing the linear distance between the NPI and its licenser creates disruption in processing, particularly if material is inserted at the main clause. This is shown by the amplitude of the central anterior negativity elicited in (1b),(1c),(1d) and (1e) conditions at negation. The anterior negativity increased in amplitude as material was inserted in the main clause with respect to sentences where material was inserted in the embedded clause, indicating an increase on the parsing difficulty. Taken as a whole, results support an active search approach to NPI—neg dependencies where the position for negation is actively searched for.

1a. [Dat de man **ook maar iets** gezegd heeft] is **niet** waarschijnlijk.
That the man anything said has is not probable.

1b/c. Dat de man **ook maar iets**(b/c) {over zijn problemen}(c) {tegen zijn moeder} gezegd heeft is **niet** waarschijnlijk.
That the man anything over his problems to his mother said has is not probable.

1d/e. Dat de man **ook maar iets** gezegd heeft is (d/e){in dit geval} (e){om verschillende redenen} **niet** waarschijnlijk.
That the man anything said has is in this case for different reasons not probable.

References

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