

Memory load manipulation in self-paced reading tasks: the case of pronouns interpretation

Introduction: Many factors are believed to affect the interpretation of pronouns such as the memory load on speakers, their working memory capacity (WMC), ambiguity of the context and pronoun types in each language. Through two moving window self-paced reading tasks (Just et al. 1982), the present study is aimed at exploring: (i) how WMC, ambiguity of the sentence and pronoun types affect pronoun resolution in Persian and English, and (ii) whether and how different methods of manipulating the memory load affect the results. To date, our findings in Persian show no effect of WMC and the object preference for overt pronouns as well as a facilitative role of increasing the memory load through adding to the distance between pronouns and antecedents.

Background: There are three general views regarding the effect of the memory load on pronoun resolution. The first view predicts an impeding role for the memory load (Streb et al. 2004) with a slower reading time of pronouns under high memory load. The second view suggests a facilitative role for memory load (Hammer et al. 2008) in that individuals might not notice constraints or ambiguities under high memory load conditions which, in turn, helps them to read pronouns more easily. According to a third view, memory load and WMC come into play only in ambiguous contexts (Nieuwland & Van Berkum 2006). However, all of these studies have implemented ERP methodology and manipulated the memory load linguistically through increasing the distance between pronouns and antecedents. Additionally, in a pro-drop language like Persian null pronouns are believed to be more subject-oriented and overt pronouns more object oriented (Carminati 2002). Based on this, two research questions are developed: 1) How do linguistic manipulation of the memory load (making antecedents farther away from pronouns), WMC of individuals and pronoun types affect pronoun resolution in Persian? 2) How does non-linguistic manipulation of the memory load change the results in English with only one type of pronoun?

Materials & Procedure: In the first experiment, Persian monolinguals read a set of trials with a null or overt pronoun in the subject position of the adverbial clause which is forced to refer back to either the subject or object of the matrix clause based on the number agreement. The memory load is manipulated by inserting an adjunct phrase after the subject of the main clause as in (1).

(1) pesar_i (dar pârk)/ be mard-hâ_j / darhâlike ø|u_i râh mi-raft / salâm kard
boy_i (in park)/ to man-PL / while ø|he road DUR-went.3SG / hello did.3SG
'The boy in the park said hello to the men while he was walking.'

In a separate session, the WMC of individuals is measured through Mojtabazadeh's test (2006).

In the second experiment, to remove the effect of the pronoun type and explore the effect of context ambiguity, WMC and non-linguistic manipulation of the memory load, a set of similar trials are constructed in English (a non-prodrop language) such that the pronoun selects either only one antecedent (2a) or two antecedents (2b).

(2) a. Ted/smiled/at Sue/while he/was clapping. b. Ted/smiled/at Ben/while he/was clapping.

To manipulate the memory load non-linguistically, a picture depicting a set of geometric shapes is shown prior to a group of trials and participants decide on the truth of a statement following the trial about the initial picture (*e.g. The circle was above the square*).

Preliminary Results: Thus far, the results of the Persian study show that in line with previous hypothesis (Nieuwland & Van Berkum 2006), there is no effect of WMC due to the non-ambiguity of the context, whereas the memory load appears to have a facilitative role ($p=.0062$). Moreover, null pronouns show no preference in selecting antecedents ($p\text{-value}=.927$) whereas overt pronouns are more object-oriented especially under no memory load condition ($p\text{-value}=.043$) which casts doubt on the universality of PAH. The findings of the English study will show whether studies of this type (segmented self-paced reading vs. ERP) need to take into account the method of memory load manipulation.

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