

## Argument and adjunct attachment in head-final constructions of Dutch

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Syntactically, prepositional phrases (PPs) can be arguments or adjuncts, depending on the lexical selection conditions of the verb with which they combine. Experiments on English have shown that PP arguments are usually processed faster than PP adjuncts (e.g., Boland & Blodgett, 2006; Schütze & Gibson, 1999), arguably because arguments, but not adjuncts, are anticipated based on the argument structure of the verb. This raises the question how PPs are processed in head-final constructions, in which they precede the corresponding head, and their function becomes clear only after this phrase-final head is processed.

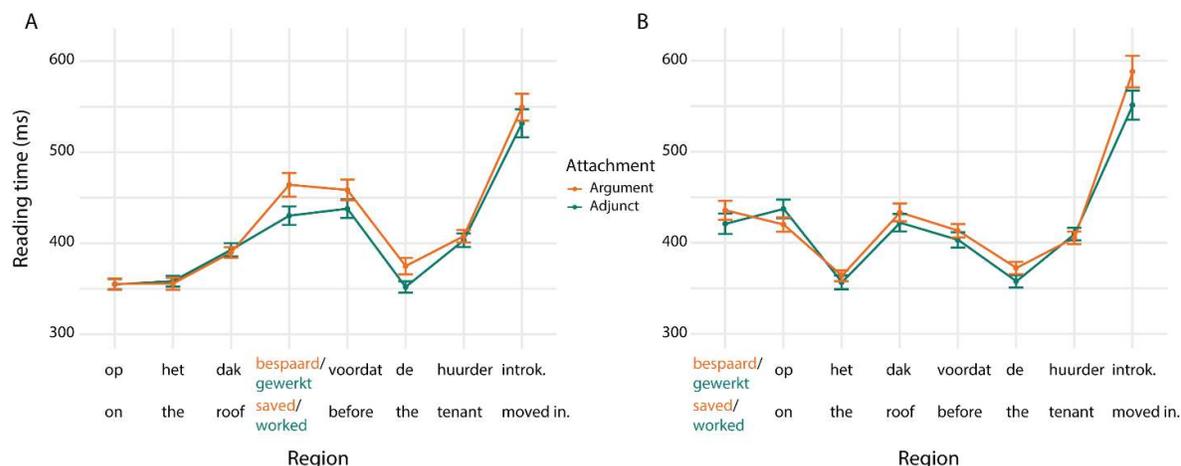
We address this question by means of a self-paced reading task, in which we compare reading times (RTs) in Dutch verb-final constructions that contain preverbal argument and adjunct PPs. While some studies have investigated the incremental interpretation of preverbal PPs (Konieczny, Hemforth, Scheepers, & Strube, 1997) as well as their influence on subsequent processing of phrase-final verbs (e.g., Levy & Keller, 2013), ours is the first study in which the preverbal PPs are (temporarily) fully ambiguous between argument and adjunct attachment. It is therefore an ideal opportunity to probe the default attachment decisions for preverbal PPs.

Our sentence stimuli consisted of participle constructions with a PP, selected on the basis of a pretest ( $n = 48$ ) with three argumenthood diagnostics (Schütze & Gibson, 1999). In our final set of 40 items we manipulated the verb (transitive vs. intransitive) and the order of verb and PP (PP-V vs. V-PP) in a two-by-two design. The PP was either an argument or an adjunct, depending on the transitivity of the verb. For example, the PP ‘op het dak’ *on the roof* in ‘De aannemer heeft op het dak bespaard/gewerkt’ *The contractor has on the roof saved/worked*, is either an argument (of ‘save’) or an adjunct (to ‘work’). Crucially, whereas the verb in items with a postverbal PP (i.e., ‘... saved/worked on the roof’) reveals its argument structure before the PP is presented, allowing the parser to anticipate the syntactic function of the upcoming material, the verb in items with a preverbal PP does not.

48 Dutch native speakers (38 female,  $M_{\text{age}} = 23.5$  years,  $SD = 3.7$ ) participated in the experiment. For purposes of analysis only, the data were divided into three regions: the verb, the PP, and a three-word spill-over region. In sharp contrast with previous literature, we did not find differences in reading times for arguments and adjuncts in V-PP constructions (Fig. 1B). In PP-V constructions, on the other hand, transitive verbs (for which the PP was an argument) were read more slowly than intransitive verbs (see Fig. 1A), and this effect spilled over into subsequent regions. These effects are independent of the specific verbs we used, which were controlled for frequency and predictability.

Based on these results we propose that language users assume preverbal PPs to be adjuncts by default. This type of attachment is correct in case the eventual verb is intransitive, but incorrect for transitive verbs. In the latter case, the syntactic structure has to be reanalyzed, incurring additional processing difficulty. This processing difficulty is reflected in our data as increased RTs at the verb and subsequent regions. We argue that the default attachment of PPs as adjuncts in verb-final constructions is the most economic analysis, because a) PP adjuncts are very common, yet PP arguments are rare, and b) reanalysis of incorrectly attached adjuncts is theoretically less costly than reanalysis of incorrectly attached arguments. More specifically, incorrectly attached adjuncts can simply be ‘lowered’ from their A-bar position to an A position closer to the verbal head (i.e., [<sub>VP</sub> [PP ] [<sub>VP</sub> [ PP V]]]), while incorrectly attached arguments require the parser to rebuild the VP entirely to include a hierarchically higher adjoined position that does not exist in the structure so far. In an attempt to minimize such costly reanalysis (see Hale, 2011), we claim that the parser assumes that preverbal PPs are adjuncts, despite the fact

that this could lead to postulation of unnecessary material (contra Frazier, 1990). Our findings thus indicate that there is not a default preference for argument attachment, contrary to what has long been thought.



**Figure 1.** Reading times per word in PP-V constructions (A) and V-PP constructions (B).

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