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Effects of complexity on the acceptability of long-distance wh-dependencies

This study concerns a grammaticality judgment task in Dutch investigating the effects of complexity on the acceptability of long-distance (LD) and partial wh-movement (PM) constructions, exemplified in (1) and (2), respectively. Both constructions are attested in Dutch, although LD-movement is more common (cf. Barbiers et al. 2008, Schippers 2008, Strik 2009).

Dutch

- (1) [_{CP} *Wie zei Mark* [_{CP} *t_{wie} dat hij t_{wie} had bedankt?*]]
Who said Mark that he had thanked
'Who did Mark say he thanked?'

Dutch

- (2) [_{CP} *Wat zei Mark* [_{CP} *wie hij t_{wie} had bedankt?*]]
What said Mark who he had thanked
'Who did Mark say he thanked?'

PM-constructions have the same interpretation as their LD-movement counterparts, but differ from them syntactically. Instead of moving the wh-phrase to its matrix scope position as in (1), it is moved no further than the intermediate CP. The matrix CP is

instead occupied by a so-called scope marker *wat* ‘what’. Nonetheless, the intermediate wh-phrase does take matrix scope. PM-constructions are either analyzed as involving two separate movement chains (cf. Dayal 1994), which are only linked semantically, or as a continuous chain with intermediate spell-out of the wh-phrase (cf. McDaniel 1989).

Many Germanic varieties, including German, Dutch and Frisian have both LD and PM constructions in the language. One open question is what determines the choice for one construction over the other, both within and between particular languages. In this study, we investigated the role of the complexity by experimentally manipulating the length of the dependency.

It is well known that long-distance wh-dependencies are difficult to process. This is usually contributed to the relatively large distance between the wh-phrase and its gap (cf. Phillips et al. 2005). An uncontroversial assumption in formal syntax is that wh-movement leaves intermediate traces at clause edges. It appears that such intermediate traces may facilitate processing, as suggested in a study by Gibson & Warren (2004). An important difference between LD-constructions and PM-constructions is that the intermediate chain links in LD-movement constructions are deleted at PF. In case of partial movement, however, the long-distance dependency is spelled out strictly local. This may play an important factor in favoring PM-movement over LD-movement once the complexity of the dependency increases. We tested this hypothesis by means of a grammaticality judgment task in which 34 native speakers of Dutch were asked to rate wh-dependencies on a scale from 1-10, where 10 represents ‘very acceptable’. Constructions as in (1) and (2) with one embedding were compared to the more complex cases in (3) and (4) with two embeddings.

Dutch

- (3) [CP *Wie zei Jantine* [CP t_{wie} *dat zij dacht* [CP t_{wie} *dat zij* t_{wie} *had herkend?*]]]
 Who said Jantine that she thought that she had recognized?
 ‘Who did Jantine say that she thought that she had recognized?’

Dutch

- (4) [CP *Wat zei Jantine* [CP *wat zij dacht* [CP *wie zij* t_{wie} *had herkend?*]]]
 What said Jantine what she thought who she had recognized
 ‘Who did Jantine say that she thought that she had recognized?’

To control for length effects and to abstract away from irrelevant lexical differences, declarative counterparts to (1)-(4) were also tested, and both the raw scores of the wh-dependencies and the difference scores (computed by subtracting the scores of the wh-dependencies from their declarative counterparts) were analyzed in a repeated measures ANOVA.

The raw scores showed that LD-constructions were judged significantly better than PM-constructions, and that constructions with one embedding were rated higher than those with two embeddings. However, there was no interaction between type of movement and length of the dependency, contrary to what is to be expected if partial movement increases the acceptability of longer wh-dependencies. Interestingly, however, on closer inspection it turned out that two groups of speakers could be distinguished, namely PM-speakers and LD-speakers. PM-speakers were those who rated PM constructions with one embedding higher than their LD-counterparts. For this group, there was a length effect, but only for the PM-constructions: PM-constructions

with two embeddings (PM-2) were rated lower than those with one embedding (PM-1), while there were no significant differences between the LD-movement constructions (see Figure 3). The LD-movement speakers showed a reverse result: they judged LD-movement with two embeddings (LD-1) lower than the LD-constructions with one embedding (LD-2), but there were no significant differences between the PM-constructions (see Figure 1). Similar effects were observed for the difference scores, illustrated in Figure 2 and 4.

FIGURE 1. RAW SCORES LD-SPEAKERS.

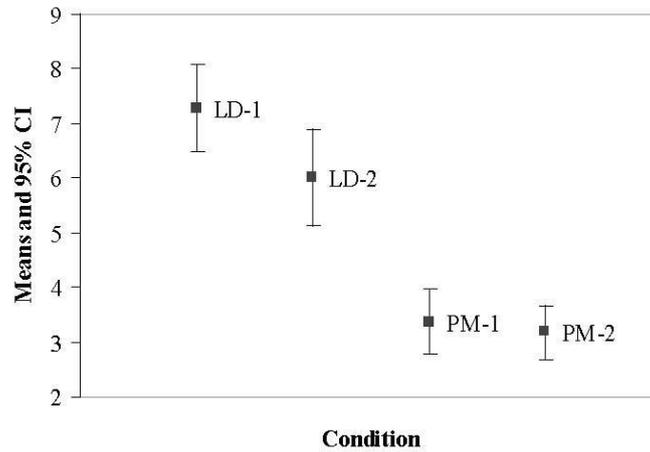


FIGURE 2. DIFFERENCE SCORES LD-SPEAKERS.

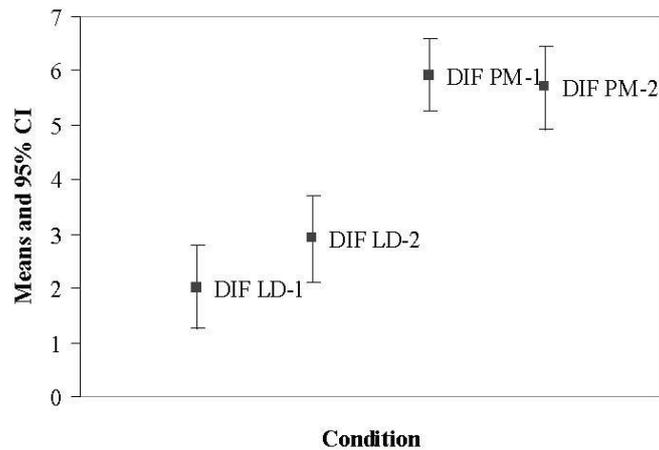


FIGURE 3. RAW SCORES PM-SPEAKERS.

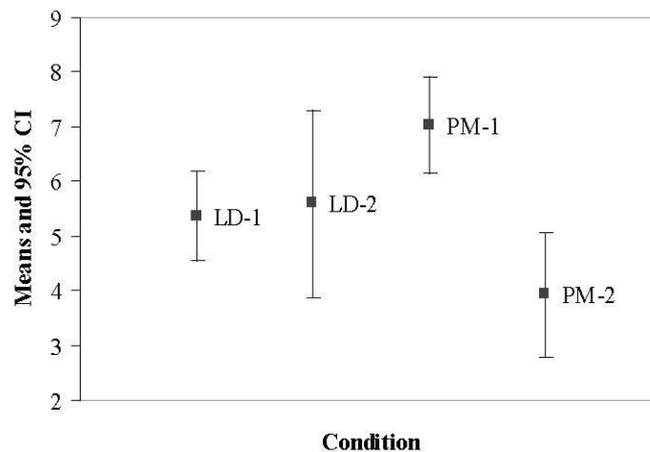
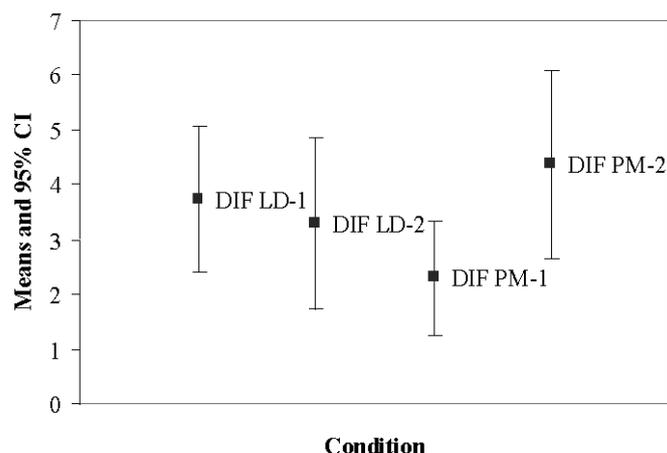


FIGURE 4. DIFFERENCE SCORES PM-SPEAKERS.



A number of interesting conclusions can be drawn from these results. First of all, it turns out that grammaticality judgment scores reflect the degree of complexity of a construction, even though the participants in this experiment were specifically instructed not to pay attention to the complexity or length of the items. Second, this effect is persistent even when the difference scores between the extraction sentences and equally long declaratives are being considered. The data therefore form important evidence for the hypothesis that acceptability judgments (amongst other things) reflect syntactic complexity (cf. Gibson 1998; Fanselow & Frisch 2006).

Third, the current study provides no evidence for the hypothesis that partial wh-movement chains improve the acceptability of longer movement chains: for the LD-speakers the complexity effect was only observed for LD-constructions, while for the PM-speakers the PM-constructions with two embeddings were worse than the ones with one embedding.

Finally, the data discussed here also provide evidence for the idea that partial wh-movement and LD-movement are in complementary distribution: separate groups of speakers can be distinguished that clearly have a preference for one construction over the other. Furthermore, these groups are able to differentiate between complex and simpler variants only for the most preferred constructions. The fact that for the PM-speakers the difference between LD and PM constructions is less pronounced than it is for the LD-speakers is very likely due to underlying frequency differences (cf. Ford & Bresnan 2010), since LD-movement is still much more prevalent in Dutch.

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