On the variability of COMP-trace effects: a processing explanation

COMP-trace effects have proven to be extremely challenging ever since their discovery in the 70-ties (Perlmutter, 1971). Part of the problem is their variability across and within languages (i.e. differences in sensitivity between closely related languages like German, Dutch and English, anti-*that*-trace effects in English). Based on an acceptability judgment experiment, I show that COMP-trace effects extend beyond subject extraction: they are also present for non-subject extraction. Such an effect is unexpected under standard accounts of COMP-trace effects, but follows naturally from the assumption that the processing of complementizers comes at an additional cost. I propose that the strength of a COMP-trace violation is further influenced by two additional factors, namely the presence of overt case marking and SOV word order, and that this explains the difference in sensitivity to COMP-trace violations between English, German and Dutch.

Previous acceptability judgment data (Cowart, 1997) has shown that the presence of *that* also causes a significant drop in acceptability for object extraction. However, this *that*-effect for object extraction could be due to a general preference for omitting *that*. To this end, the current judgment task included non-extraction constructions with and without *that* (ex. 1 & 2), next to subject and object extractions with and without *that* (examples 3-6). 132 native speakers of English rated these sentences on a scale from 1 (unacceptable) to 10 (acceptable). The results in Graph 1 show that for non-extraction constructions, the presence of *that* had no effect, but under extraction, it causes a significant drop in acceptability for object extraction ($p = 0.000$, $r = 0.48$) as well as subject extraction ($p = 0.000$, $r = 0.87$), where the effect is stronger. I will show that this pattern of results is also visible in corpus data.

Example experimental items
1. Hector hopes that Maxine will sell her boat.
2. Roland believes Deanna may plant a tree.
3. Who did Edward say that will tease Ashley?
4. Who did Edward say will tease Ashley?
5. Who did Edward say that Ashley will tease?
6. Who did Edward say Ashley will tease?

Graph 1: results
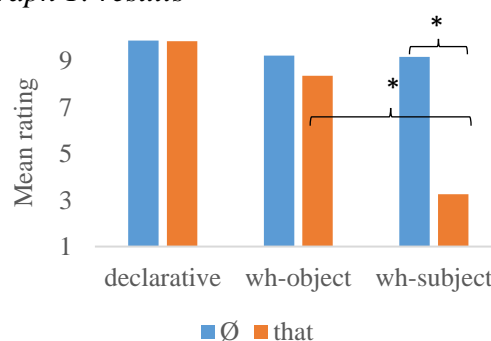
I propose that clauses without *that* are easier to process because they are truncated and hence structurally less complex (cf. Doherty, 2000; Ishii 2004; Rizzi & Schlonsky 2007). I attribute the fact that the effect becomes visible under extraction to the well-known fact that extraction constructions are more difficult to process than non-extraction constructions (see amongst others, Kluender & Kutas, 1993). Furthermore, I follow Hawkins (2004), who proposes that deletion of the complementizer in English comes with another processing advantage: it makes immediate integration of the wh-phrase possible since the embedded clause then starts with the finite verb. Such a processing advantage is not available in German and Dutch, due to SOV word order. In this case, although deleting the complementizer would shorten the filler-gap dependency, it would delay the construction of an embedded clause until the embedded verb is encountered. According to Hawkins proposal, the latter would increase the complexity of the construction in this respect. This explains why the complementizer is retained in German and Dutch, and that in cases where it is deleted, verb movement to C is necessary (i.e. so-called embedded V2 clauses). Moreover, as Hawkins points out, his proposal is able to account for the anti-*that* trace effects with adverbials in English.

Next, German and Dutch appear to differ in their sensitivity to COMP-trace violations, at least with transitive verbs: judgment data from German shows a subject/object asymmetry (Featherston, 2005; Kiziak, 2010), but Dutch doesn't (Strik, 2008; Schippers 2016). Following Kiziak 2010, I link this to the absence of overt case marking combined with SOV word order. As Kiziak points out, with transitive verbs, SOV word order in German (and Dutch) gives a superficial work-around for COMP-trace violations, since the gap cannot be immediately detected. Regarding case marking, Kiziak shows that the absence of case marking on the wh-phrase and embedded object diminishes the COMP-trace effect in German. Following Ferreira & Patson's (2007) 'good enough' approach, she proposes that the absence of case marking allows for a sloppy reading of the extracted wh-phrase as an object. Thus, case marking and word order conspire in disguising COMP-trace violations. Dutch, lacking case marking altogether, makes COMP-trace violations with transitive verbs therefore particularly difficult to detect.

In sum, I propose that COMP-trace effects are partly due to processing related factors, explaining their variability. First, the presence of a complementizer induces an extra processing load, which is also at work for non-subject extraction. In English, deleting the complementizer reduces complexity and allows for immediate integration of the wh-phrase and construction of the embedded clause. In German and Dutch, on the other hand, there is no such pay-off due to the verb final word order of embedded clauses. Furthermore, in the absence of overt case marking, subject extractions are locally and/or globally ambiguous, which superficially repairs a COMP-trace violation. Finally, I will argue that although processing consideration do play an important role in explaining COMP-trace effects, they cannot be reduced to it. Processing factors alone cannot account for the pattern attested in the current study, and fail to account for the fact that COMP-trace effects do reappear with intransitive verbs in Dutch. Thus, there appears to be something inherently problematic with extracting subject. Following Rizzi & Shlonksy (2007) I attribute this to the so-called freezing effect of subjects, which can be crosslinguistically observed.

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