

***That*-trace effects without traces: an experimental investigation**

Summary. In this paper we will argue that *that*-trace effects as they occur in German have nothing to do with traces. Rather, the deviance of subject extraction from the embedded clause is due to a violation of a general (not subject-related) PF-based EPP-requirement of the German middle field. We will demonstrate this by comparing cases of extraction with examples without extraction that contain Verb Projection Raising (VPR) structures in the embedded clause: both structures involve the sequence complementizer + finite verb, and both are perceived as degraded. The empirical part of the presentation rests on four experiments in which the positioning of the finite verb in the verbal complex as well as its adjacency to the complementizer are systematically varied.

Introduction: *That*-trace effects in German. In the 1980s, German was claimed to lack strong configurationality and as a consequence of this not to show the *that*-trace effect. Nevertheless (see the empirical study of Featherston 2005), the effect appears in constructions where (due to the absence of an intervening adverb) the trace can only be postulated in the highest clausal position below C°, cf. (1). This echoes Rizzi & Shlonsky's (2007) generalization in terms of a subject-freezing effect; but the effect may equally well arise with quirky subjects, scrambled objects (data not reported here) and with movable adverbs (cf. (2)), showing that the effect is unrelated to subjecthood:

- (1) Wer glaubst du, dass __ ?*(morgen) kommt?
who.NOM believe you that tomorrow comes
'Who do you think will come tomorrow?'
- (2) Gestern finde ich nicht, dass __ ?*(getanzt) hätte getanzt werden sollen.
yesterday find I not that danced had.SUBJ danced become should
'As for yesterday, I think there should not have been any dancing.'

The examples improve markedly if an adverb is present (the adverb intervention effect, Culicover 1993). Generally, extraction seems to be barred from the highest position in the middle field, which is normally occupied by topics thereby suggesting that *that*-trace effects reduce to topic-trace effects.

***That*-trace effects as a violation of the EPP.** In a series of experiments we will show that the highest functional position is indeed involved in the *that*-trace effect; but importantly, this is neither related to movement nor to topicality but to a PF-based occurrence restriction, henceforth referred to as "EPP".

Experiments 1/2: *wh*-extraction + order in the verb cluster. In a speeded grammaticality experiment we compare subject extraction from embedded clauses that have variable orders in the verb cluster, i.e. which have either ascending (1-3-2, Aux-V-Mod) or descending (3-1-2, V-Aux-Mod) order:

- (3) a. Wer glaubst du, dass __ ?*(immer) **hat beten wollen**, bevor der Unterricht begann?
who believe you that (always) has pray wanted before the class began
b. Wer glaubst du, dass __ ?*(immer) **beten hat wollen**, bevor der Unterricht begann?

Fronting the infinitive leads to an improvement (3b). The difference vanishes as soon as an adverb separates complementizer and finite verb. A parallel experiment on Flemish, involving two-verb clusters with either V-Aux or Aux-V order, replicated this finding. The results converge with those of a questionnaire study on Dutch by den Dikken (2007). Since fronting of the infinitive in (3b) can hardly be related to topicality, the improvement cannot be subsumed under the adverb intervention effect that allows subject extraction from a lower non-topical position. Instead, there seems to be a more general requirement to fill the position before the finite verb, e.g. by an adverb (1)/(2), or by an infinitive (3b).

Experiment 3: complementizer + finite verb sequences without extraction. Experiment 3 (magnitude estimation) investigates embedded clauses in which the finite verb (Aux) appears directly after the complementizer. While such examples cannot be constructed in English, German offers this possibility due to its impersonal passives. (4) contrasts Verb Raising (VR) with VPR: (4a) contains a PP complement (*darüber*) that precedes the Aux, whereas in (4b) the PP is enclosed in the VPR-cluster:

- (4) a. dass (sofort) *darüber hätte* informiert werden sollen, ...
that immediately about.it had.SUBJ informed become should
'that one should have (immediately) informed people about it ...' VR
b. dass ?*(sofort) **hätte** *darüber* informiert werden sollen, ... VPR

While the addition of the adverb *sofort* does not affect the grammaticality of (4a), it leads to a significant improvement in (4b). This shows that the sequence of complementizer + finite V is degraded independently of movement. We are led to the hypothesis that the degradation typically observed with so-called *that*-trace effects has nothing to do with traces/extraction. Rather, the degradedness is linked to the linear sequence complementizer + finite V.

Experiment 4: comparing complementizer + finite verb sequences with and without *wh*-extraction. We test this hypothesis in experiment 4. The goal is to directly compare the structures in (1)/(2) with those in (4). In linear terms, the examples are close to identical:

- (5) a. Wer glaubst du, dass __ (gestern) **hätte** verunglücken können?
 who believe you that yesterday had.SUBJ have.an.accident can
 ‘Who do you believe could have had an accident yesterday?’
 b. Wer glaubt, dass (gestern) **hätte jemand** verunglücken können?
 who believes that yesterday had someone have.an.accident could
 ‘Who believes that someone could have had an accident yesterday?’

First results of this magnitude estimation study show that the examples are indeed parallel: Without the adverbial *gestern* both sentences are markedly degraded, while insertion of the adverbial leads to a significant improvement in both cases.

Capturing the effect. Our data show that there is a general EPP-requirement in the German middle field that requires the specifier of the highest functional head to be overtly filled by an arbitrary constituent (including non-finite verbs). Under a right-branching verb cluster, this will be the specifier of the highest vP, under a left-branching verb cluster, this may also be TP if *haben*-inversion requires the projection of TP and the verb targets T. The EPP is then relative as e.g. in Grimshaw (1997) and refers to the specifier of the highest inflectional projection

Explanation and implications. The variant of the EPP that we propose is very similar to the one argued for in Holmberg (2000) in that it is a) phonological as it requires overtness and b) insensitive to syntactic category. As a consequence, the constituent satisfying the EPP need not check any other formal features (as in Landau 2007). Importantly though, the PF-based EPP we propose for German differs from that postulated in Holmberg (2000) and Landau (2007) in that it does not hold derivationally, but at surface structure, i. e. for the final PF-representation. This converges with the results in van Craenenbroeck & den Dikken (2006) who show that EPP-satisfaction is not necessary if I/T is elided: under sluicing, the subject can stay within vP. Since I/T is introduced before the ellipsis licenser C and thus should be able to attract the subject, the absence of subject raising suggests that the EPP does not hold derivationally. Furthermore, given the free word order in the German middle field there is little evidence that attraction and thus minimality are involved in EPP-satisfaction, unlike in Stylistic Fronting. The EPP in German is thus phonological in its purest form. There is no selection and no Agree. All that is required is that the specifier of the highest functional head be filled by overt material. As a side-effect of this requirement, subject extraction from embedded clauses whose highest specifier remains unfilled is degraded. This creates the illusion of a *that*-trace effect.

In other languages, there can be additional restrictions on EPP-satisfaction. We will argue that the EPP in English is also representational but differs from German in involving attraction (long subject extraction without *that* will be shown to involve a different, parenthetical structure).

References

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