

The dual nature of subjecthood: Unifying subject islands and *that*-trace effects

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Overview: Filler-gap dependencies have long been shown to be processed more easily when the gap is associated with the subject position than with object position (e.g., Holmes & O'Regan, 1981). Yet there are (at least) two environments where this 'subject advantage' flips: (i) a dependency *within* a subject NP ('subject island'; Ross, 1967), and (ii) dependency of a subject NP in an embedded clause with a complementizer ('that-trace effect'; Perlmutter, 1968): both cause ill-formedness as in (1) and (2) respectively (yet their object counterparts don't).
(1) *Which car did [the color of__] please Jo? (2) *Which car did Mary think [that _ pleased Jo]?
We propose a unified account of (1) and (2), which we test with a series of rating experiments.

Background: Abeillé et al. (2020) argue for (1) that, as subjects are default topics, *wh*-focusing a sub-constituent of a subject as in (1) creates a topic-focus clash, giving rise to ill-formedness. Note, however, that this account overgeneralizes: when a *wh* filler is "*in situ*" (but still focused, as in "[The color of *which car*] pleased John?"), the result is grammatical despite the discourse clash. Therefore, ill-formedness of (1) must be specific to filler-gap dependency formation.

Proposal: We propose the COMBINATORIAL DISCOURSE ROLE HYPOTHESIS in (3):

(3) A dependency chain bears maximally one discourse role: a combinatoric of filler and gap.

In both (1) and (2), the parser cannot associate filler and gap with a combinatoric discourse role, because the gap position (i.e., subject NP in 1, *that*-clause in 2) falls within a constituent already bearing a unique discourse role itself ("topic" for subject NPs; see Rizzi, 1990 on discourse status of *that*-clauses). Thus, (3) cannot hold, and the non-resolved clash between topic status of the (subject) gap and focus status of the filler causes ill-formedness, as per Abeillé et al.

Experiment 1 offers evidence for our unified account of (1) and (2). We suggest that the well-known alleviation of that-trace effect by adverbials (Culicover, 1992) occurs because the presence of an adverb weakens the topic status of the embedded subject, so the penalty for violating (3) is milder. This predicts that adverbials should ameliorate *subject islands* as well. We ran a 2x2 grammaticality rating study (crossing presence of adverbial with gap location, see A1) via Amazon's *Mechanical Turk* (32 subjects). Mean z scores are shown in Figure 1. A linear mixed-effects model revealed significant main effects and interaction (all $ps < .001$). Importantly, planned comparisons showed that presence of an adverbial significantly *increased* ratings for subject NPs ($t = 2.6$; $p = .01$), in line with our hypothesis, but *decreased* them for object NPs ($t = -4.2$; $p < .0001$), indicating that an adverbial does not increase grammaticality *generally*.

Experiment 2 tests a further prediction; since an embedded *that*-clause, unlike a null clause, already bears a unique discourse function, an object gap should also violate (3) and incur a penalty (albeit mild, since objects are default foci already). We ran a 2x3 study, crossing complementizer (*that*, null) with Q type (subject *wh*Q, object *wh*Q, *Yes-No*Q; see A2). Figure 2 shows mean ratings. As expected, subject *wh that* Qs were rated worse than subject *wh* null Qs ($p < .0001$) and crucially, ratings were worse for object *wh that* Qs compared with object *wh* null Qs ($p = .0017$). This indicates a mild object *that*-trace effect, which is unpredicted by current generative syntactic accounts (Anti-Locality; Erlewine, 2020) or prosodic accounts of *that*-trace (Sato & Dobashi, 2016), but correctly predicted under the discourse approach we propose.

Experiment 3 follows Abeillé et al., testing whether *that*-t effects are weaker inside relative clauses compared to *wh* questions (A3). We conducted three further ratings studies, comparing subject *that*-t RCs (Exp 3a: restrictive RCs; Exp 3b and 3c: non-restrictive RCs) with subject *that*-t *wh*Qs (Exp 3a and 3b: matrix *wh*Qs; Exp 3c: embedded *wh*Qs), crossing dependency type with complementizer type in a 2x2 design. Results (Fig. 3) showed that subject *that*-t violations are rated better in RCs vs. in *wh*Qs (planned comparison $t = -2.1$, $p = .03$) when the ratings for null *wh* Qs vs. null RCs are equal ($t = .035$, $p = .97$), consistent with an account in which the function of the construction (i.e., the filler is focused as in *wh*Qs but not in RCs) impacts ratings.

Conclusion: Whereas the long-attested "subject advantage" may arise from syntactic-semantic factors, we propose that all "anti-subject" effects (as in 1 and 2) arise from discourse factors.

Supplemental Materials

A1. Sample stimuli (Experiment 1)

- No Adverb, Subject NP gap:** Which car did [the color of _] delight Jo?
- Adverb, Subject NP gap:** Which car, according to rumor, did [the color of_] delight Jo?
- No Adverb, Object NP gap:** Which car did Jo adore [the color of_]?
- Adverb, Object NP gap:** Which car, according to rumor, did Jo adore [the color of_]?

A2. Sample stimuli (Experiment 2)

- Subject whQ:** Which family member did Lucy think {that/∅} could drive grandad home?
- Object whQ:** Which family member did Lucy think {that/∅} Kate could drive home?
- Yes-No Q (baseline):** Did Lucy think {that/∅} Kate could drive grandad home?

Figures

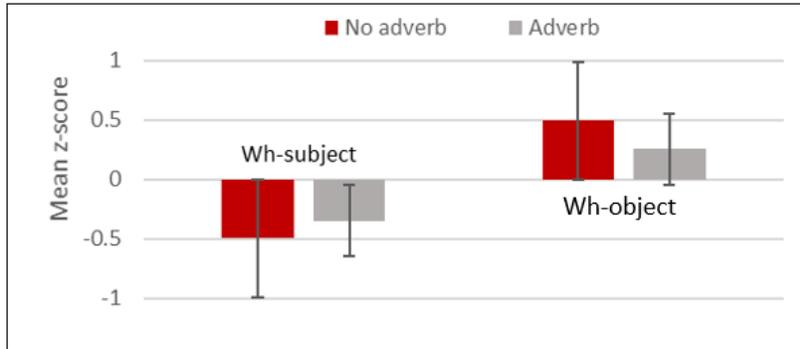


Figure 1. Results of Experiment 1

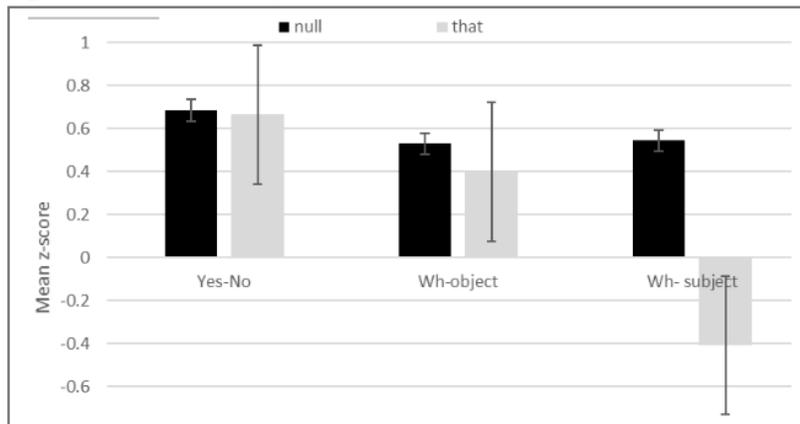


Figure 2. Results of Experiment 2

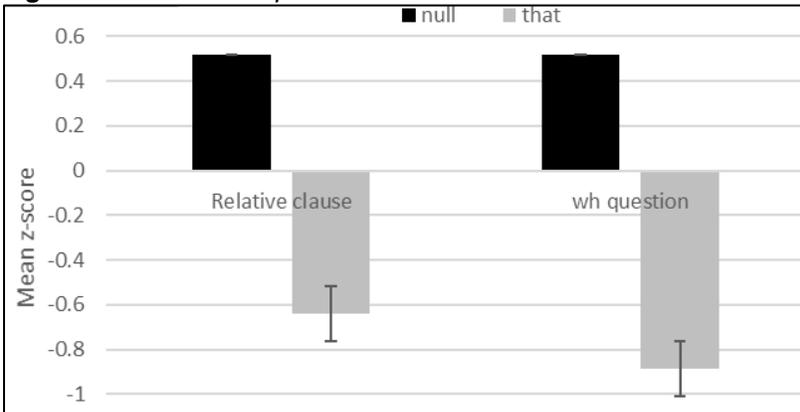


Figure 3. Experiment 3: Results for participants with equal null whQ-null RC baseline ratings

A3. Sample stimuli (Experiment 3)

- That whQ:** Which family member did Lucy think that could drive grandad home?
- Null whQ:** Which family member did Lucy think could drive grandad home?
- That RC:** The family member, who Lucy thought that could drive grandad home, knew Pat.
- Null RC:** The family member, who Lucy thought could drive grandad home, knew Pat.

References

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