

A Simple Argument for Subject Gaps

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Relative clauses have figured prominently in the research on real-time language processing. How is it that speakers are able to identify a verb's arguments so quickly and effortlessly, even when these arguments are not overtly present in the sentence or when they are not in the canonical word order? How do speakers recognize the presence of gaps in constructions like relative clauses and *wh*-questions, and how do they go about filling them? I will not address these questions directly in this paper. I will focus here on the syntactic properties of these constructions. In particular, I argue that even when there is no overt change in word order, subject relatives contain a gap that must be filled by *wh*-movement.

The derivation of relative clauses in English, as in many languages, is standardly assumed to involve movement of the *wh*-word or phrase from its underlying position to [Spec,CP] as sketched in (1).

- (1) The gymnast admired the professor [_{CP} [_{NP} whose bad jokes]_i [_S students complained about *e_i*]]

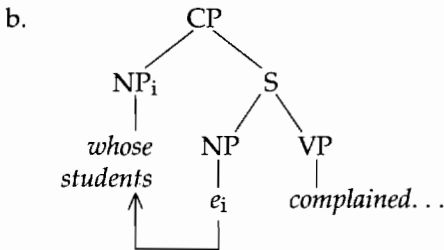
The moved *wh*-phrase leaves behind an empty category *e* called a trace in the position from which it moved; the (potentially long-distance) dependency between the moved constituent and the trace is formally represented by co-indexing, as shown by the subscript *i*.

When the *wh*-phrase is the complement of a verb or a preposition, as in object relatives, *wh*-movement is overt. Suppose, however, that the *wh*-phrase is the grammatical subject of the matrix verb in the relative clause, as in the sentence in (2).

- (2) The gymnast admired the professor whose students complained about his bad jokes.

For subjects relatives, there is no overt change in word order, since English lacks an overt relative complementizer in C. Nonetheless, it is standard to assume that *wh*-movement effects the same structural change in subject relatives as it does in object relatives, even though in the case of subject relatives such movement is string-vacuous (Balogh et al., 1998; Swinney & Zurif, 1995; Swinney et al., 1996; Zurif et al., 1993). Thus the sentence in (2) is assumed to have the syntactic representation sketched in (3), where the *wh*-phrase has moved to [Spec,CP] leaving behind a trace in its underlying position as subject of the verb *complained*.

- (3) a. The gymnast admired the professor [_{CP} [_{NP} whose students]_i [_S e_i complained about his bad jokes]]



The assumption that *wh*-movement always has the same structural effect regardless of the extraction site may be considered the null hypothesis. But is there theory-independent, empirical evidence for such string-vacuous movement? In his papers, Zurif refers to Clements, McCloskey, Maling, and Zaenen (1983), who provide cross-linguistic evidence for string-vacuous movement based on data from three “exotic” languages: Icelandic, Kikuyu, and Irish. Icelandic for example has a movement rule known as stylistic fronting (SF) which optionally preposes nonfinite verb forms (inter alia) from their normal position after the finite verb to “first position” in the clause:

- (4) a. Verðbólgan varð verri, en [hafði verið búist við]
inflation was worse, than had been expected Prt
- b. Verðbólgan varð verri, en [búist hafði verið við]
inflation was worse, than expected had been Prt

This preposing of nonfinite verb forms applies only in clauses which lack subjects (Maling, 1980). The relevant question, then, is whether it can apply to clauses in which the subject has been questioned or relativized. If *wh*-movement applies string-vacuously to subject noun phrases (NPs), removing them from their clause, then we predict that SF will be able to

apply; however, if syntactic theory rules out string-vacuous movement, we predict that SF will not apply. It is the first prediction which turns out to be correct:

- (5) a. Lögreglan veit ekki, hver [framið hafi glæpinn]
 the.police know not, who committed has the.crime
 Embedded question
 b. þetta er maðurinn, sem [framið hafi glæpinn]
 this is the.man, that committed has the.crime.
 Relative clause

For those who are suspicious of data from other languages, I would like to provide here a simple argument using empirical evidence from English, which demonstrates just as clearly the need for string-vacuous *wh*-movement in the case of subject relatives. There are certain adverbial phrases which can be fronted to clause-initial position, but which cannot occur between the subject and the finite verb, as illustrated in (6). This judgment is even sharper when the subject NP is a pronoun, as in (6d).

- (6) a. This heat wave would be considered cold *in Tucson*.
 b. *In Tucson*, this heat wave would be considered cold.
 c. *London's heat wave *in Tucson* would be considered cold.
 d. **It *in Tucson* would be considered cold.

Where does the frontal adverbial move to? As illustrated in (7), the fronted adverbial must follow the complementizer *that* in an embedded clause.

- (7) a. I guess that *in Tucson*, this heat wave would be considered cold.
 b. *I guess *in Tucson* that this heat wave would be considered cold.

I assume, therefore, that the fronted adverbial is not moved to [Spec,CP],¹ but remains inside the embedded S, perhaps adjoined to S. Whatever one assumes about the attachment of the fronted adverbial, it is clear that it must precede the subject NP.

Now suppose that such an adverbial phrase occurs inside a relative clause. Several papers have discussed that fact that the presence of a sentential adverbial between a complementizer *that* and its complement S (or IP) leads to a suspension of the *that*-trace effect (Culicover, 1993;

¹As assumed by Browning (1996), among many others.

Deprez, 1994; Browning, 1996). However, these papers do not mention the consequences of adverbial fronting for string-vacuous movement. This even simpler "adverb effect" is illustrated in (8):

- (8) a. London was experiencing a heat wave [which would be considered cold *in Tucson*].
 b. London was experiencing a heat wave [which *in Tucson* would be considered cold].
 c. *London was experiencing a heat wave *in Tucson* [which would be considered cold].

The fact that the relative pronoun must precede the fronted adverbial phrase indicates that *wh*-movement not only can, but *must* move the subject NP from its underlying position to a position to the left of the fronted adverbial, a position which under current theoretical assumptions is identified as [Spec,CP].

- (9) London was experiencing a heat wave [_{CP} [_{NP} which]_i; [_S in Tucson *e_i* would be considered cold]]

It seems clear, therefore, that syntactic representations must allow for string-vacuous movement.² Even subject relatives contain a relative gap which must be filled by the moved *wh*-constituent.

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²After writing this article, I discovered that McCawley (1998, pp. 444 and 481, n. 11) independently makes the same argument, namely, that a relative pronoun may be "followed by a constituent which can be a left modifier of S but not of V":

- (i) a person who for years has been harassing me (=50a)
 (ii)?? He for years has been harassing me. (=50b)
 (iii) For years he has been harassing me. (=50b)

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