

Sentential or not? – An Experimental Investigation on the Syntax of Fragments

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1 Background

The notion of sentence is central to linguistic theory. In generative syntax, the sentence has long served as a root node for all well-formed structures, and in more recent versions of the theory, high syntactic projections in the left periphery, as CP or ForceP, are assumed to encode information such as mood, force (Rizzi 1997), information structure and assertivity (cf. Krifka 2014). Sentences are as well assumed to be the linguistic entities which encode propositions, whose meaning is derived from their constituents bottom-up.

However, in many text types and registers, e.g. newspaper headlines (1), dialogues (2), text messages or chats, apparently nonsentential utterances are used in order to convey the propositional message otherwise attributed to full sentences.

- (1) *Merkel allein unter Scharfmachern*
Merkel alone among agitators
'Merkel alone among agitators.'

(SZ online, 12.2.16)¹

- (2) *A: Was gibt es in Hannover?*
what gives it in Hannover?
'What can one do in Hannover?'

B: Eine Stadtbesichtigung oder einen Theaterbesuch.
a city.tour or a visit.to.theater
'A city tour or a visit to the theater.'

(TüBa-D/S², s83)

These examples are fragments in the sense of Morgan (1973), i.e., nonsentential utterances, which express propositional content and have illocutionary force despite lacking a finite verb (1) or being only a sequence of noun phrases at the surface level (2). As is acknowledged in the literature (e.g. Merchant 2004; Stainton 2006), fragments may appear discourse-initially without any preceding context (see, e.g. (3)):

¹ Article available unter <http://sz.de/1.2863991>, last access July 16, 2017.

² Example (2) is taken from TüBa-D/S, a corpus of spoken German (Stegmann et al. 2000).

- (3) *Abby and Ben are at a party. Abby sees an unfamiliar man with Beth, a mutual friend of theirs, and turns to Ben with a puzzled look on her face.
Ben says: "Some guy she met at the park."*

(Merchant 2004: 661)

The riddle which arises from this observation is how an apparently nonsentential structure can be used to communicate aspects of meaning which are thought to be available to sentences only. The solutions provided for this problem in the literature can be grouped into two approaches: on the one hand, nonsentential approaches (Culicover & Jackendoff 2005; Barton & Progovac 2005; Stainton 2006) argue that fragments are derived by syntax as subsentential expressions and have to be enriched pragmatically to full propositions. On the other hand, ellipsis-based, or sentential, approaches argue that fragments are underlyingly sentential or derived from full sentences by syntactic mechanisms. Among the sentential approaches, movement and deletion accounts (e.g. Merchant 2004; Weir 2015) can be distinguished from those formulating constraints on what can be elided in situ (e.g. Reich 2007) in order to account for the observed distribution and properties of fragments.

In this paper, I present a series of experiments testing the predictions of some of these accounts in English and German, which are briefly reviewed in section 2. In section 3, I first investigate evidence from case connectivity effects that supports the assumption of unarticulated structure in fragments, before I shift towards the more specific prediction of Merchant's (2004) movement and deletion account. Sections 4 and 5 present replications of experiments which Merchant et al. (2013) adduce as evidence in favor of a movement and deletion account. In section 6, I present an experiment on a different phenomenon (multiple prefield constituents in German). I argue that the data on multiple prefield constituents challenge Merchant's account. Section 7 discusses the experimental results in the light of the competing theories of fragments.

2 Accounts of Fragments

2.1 Fragments as Bare XPs: Barton & Progovac (2005)

Barton & Progovac (2005) sketch a nonsentential account of fragments in a Minimalist framework. Their analysis is constrained by the data type they focus on, i.e. 'telegraphese' utterances found in the ETP corpus (Libben & Tesak 1994). As discussed in Barton (1998), the data are characterized by frequent omissions of functional elements as articles, first person subject pronouns and auxiliary verbs. While Barton (1998) divides the fragments found in the corpus between true nonsententials (e.g. DP fragments) and those generated by the application of specific deletion rules fragments (Barton 1998: 45), Barton & Progovac (2005) treat all of these cases as genuinely nonsentential.

Barton & Progovac (2005) argue that Barton's (1998) deletion rules are unmotivated from a Minimalist perspective in the sense of Chomsky (1995). Instead, they propose that fragments are a well-formed output of syntax, and that they are derived by regular syntactic mechanisms assumed in Minimalism, such as Merge

and Move. In order to account for fragments, they propose two modifications to standard syntax. First, they argue that derivation may stop at any maximal projection XP, provided the output is well-formed. Consequently, the short answer in (4) is analyzed as VP, and DP short answers (3) as DP. These XP fragments are enriched pragmatically to propositions in the theory, but the authors provide no sketch of such a mechanism.

- (4) *What does John do all summer?*
Play baseball.

(Barton & Progovac 2005: 81)

The second modification they propose is the Case Feature Corollary (CFC), which loosens case feature checking requirements in fragments. Progovac et al. (2006: 338-341) distinguish between uninterpretable, i.e. structural, case features that are distinguished from interpretable ones, which are associated with a specific θ -role. Only the former have to be checked before spell-out, while the latter can be interpreted by semantics.

The CFC is taken to account for several phenomena, such as the unavailability of nominative case marking in English DP fragments as (5a-b), for which Barton & Progovac (2005: 77) argue that (structural) nominative case may not be checked due to the lack of a finite verb. In English, this results in default accusative case marking. The authors note that the opposite pattern holds for full sentences with a finite verb (5c-d).

- (5) *Who can eat another piece of cake?*
a. *?*I/?*We/?*He/?*She*
b. *Me/Us/Him/Her*
c. *I/We/He/She can.*
d. **Me/*Us/*Him/*Her can.*

(Barton & Progovac 2005: 77)

Barton & Progovac make clear predictions for what can constitute a possible fragment. First, it follows from their approach that only a maximal XP can be a fragment (but see Progovac 2006 for fragments as small clauses), so that there is no straightforward explanation of sequences of fragments which do not form a single constituent. This is the case in (1) above, which consists, at least on a surface level, of two constituents: the *Merkel* and *allein unter Scharfmachern* 'alone among agitators'. Second, due to the CFC, they predict that fragments should only appear in default case or semantically interpretable case. The question of which case is uninterpretable might be controversial, but arguably a good indicator is that morphological case marking changes in function of the syntactic environment of a DP despite the fact that its θ -role remains the same. For instance, in German passivization (6), the patient receives accusative case in active voice, but nominative in passive sentences.

- (6) a. *[Peter]_{Nom} isst [den Kuchen]_{Acc}.* (active)
 Peter eats the cake
 'Peter eats the cake.'
- b. *[Der Kuchen]_{Nom} wird von Peter gegessen.* (passive)
 the cake is.being of Peter eaten
 'The cake is being eaten by Peter.'

2.2 Movement and Deletion: Merchant (2004)

In contrast to the nonsentential account that in principle eliminates the concept of sentence from syntax, Merchant (2004) and other sentential accounts of fragments propose the opposite: fragments have sentential meaning, because they are sentences, at least at some level of derivation. His account, which also operates in a Minimalist framework, is motivated by the observation of similarities between ellipsis, such as sluicing, within sentences and short answer fragments. The possibly most striking similarity is captured by the *P-stranding generalization*, which states that only languages which allow for preposition stranding under sluicing allow for it in fragments (see section 4 of this paper for a discussion). He takes this as evidence that both are derived by the same mechanism.

Merchant (2004) assumes that fragments are derived by movement from a normal sentence (7a). The future fragment (7b) undergoes syntactic movement to the specifier of a left-peripheral projection FP.³ This movement is driven by an [E] feature on F, which triggers ellipsis, that is, non-articulation on PF, of its complement (7c). Movement occurs either because [E] may have an EPP feature (Merchant 2004: 671) or to evacuate non e-given constituents from the ellipsis site (Weir 2015). Semantically, [E] requires a partially identical propositional antecedent, from which the unpronounced structure can be recovered.⁴

- (7) a. *This is some guy she met at the park.*
 b. *Some guy she met at the park.*
 c. *[Some guy she met at the park]_i this is t_i.*

Merchant's account makes precise predictions on what expressions may occur as fragments. Concerning case marking, unlike Barton & Progovac (2005), he predicts that fragments exhibit the same case marking as they do in full sentences, as case features are checked in the base position in the fragment before moving to Spec, FP. Fragments should therefore be able – and in fact, require – to receive the same structural case marking as in a full sentence. Furthermore, there could be evidence for the movement itself. If, as Merchant (2004: 687) argues, this movement is regular A'-movement, restrictions on A'-movement should restrict fragment derivation as well. Consequently, only those constituents which may be moved to a left-peripheral position in regular sentences are expected to occur as fragments at

³ Despite Merchant (2004: 675) does not commit himself to this claim, the label is tentatively associated to FocP, probably due to the observation that frequently a fragment would constitute the focus in the respective full sentence (cf. Reich 2007).

⁴ See Merchant (2004: 716-732) for a discussion on discourse-initial fragments.

all.⁵ The experiments presented in this paper investigate both evidence for covert sentential structure in general and specific evidence for movement in fragments.

3 Experiment 1: Fragments and Case

3.1 Background

As discussed in section 1, the most fundamental distinction between accounts of fragments concerns the question of whether fragments are underlyingly sentential or not. A diagnostic which has been used to investigate whether a sentence is elliptical and thus contains unarticulated structure, is correlated behavior between fragments and their fully sentential counterparts, known as *connectivity effects*. Merchant (2004) discusses several of these effects as evidence in favor of his theory, e.g. case connectivity (Merchant 2004: 676) and binding data (Merchant 2004: 679). In this paper, I will focus case connectivity effects.

Merchant exemplifies the basic observation with (8): in German, DP short answers (8a) bear the same case morphology as in a full sentence (8b). If one assumes that case has to be licensed, or in Minimalism checked, by some other element, this indicates that there is unarticulated structure in fragments, e.g. a verb assigning dative to its indirect object in (8). According to Merchant, the pattern in (8) is attested crosslinguistically (e.g. in Greek, German, Korean, Russian).

- (8) *Wem_{Dat} folgt Hans?*
whom_{Dat} follows Hans
'Who is Hans following?'
- a. *Dem_{Dat}/*Den_{Acc} Lehrer.*
b. *Dem_{Dat}/*Den_{Acc} Lehrer folgt Hans.*
the_{Dat}/*the_{Acc} teacher follows Hans
'(Hans is following) the teacher.'

(Merchant 2004: 677)

Still though, data such as (8) can be explained by Barton & Progovac' (2005) account as well. The CFC predicts only structural, i.e., uninterpretable case features to be unavailable in fragments, so dative should in principle be available (provided it is analyzed as interpretable). Accusative, assumed to be a structural case in German (McFadden 2007: 234; Schütze 2007: 52), is unavailable for the same reason. Consequently, Barton & Progovac (2005) predict the same ratings for (8) as Merchant does.

The predictions of both accounts differ though on structural case-marked fragments. Recall that Barton & Progovac (2005) argue on the grounds of data in (5), repeated here as (9), that DP short answers are unable to receive structural case morphology, because there is no verbal head which might assign nominative (structural) case to the fragment. On the other hand, according to sentential

⁵ But see Weir (2015) for a version of the movement and deletion account which assumes a distinct motivation for fronting of a constituent in fragments and sentences.

accounts of fragments, there is such an unarticulated verb in fragments, which can, and, in fact, has to, check the case features of its arguments.

- (9) *Who can eat another piece of cake?* (= (5))
 a. ?*I/?*We/?*He/?*She
 b. *Me/Us/Him/Her*

As for German, as accusative is assumed to be structural and nominative to be the default case, the pattern in (9) should be reversed, which is intuitively correct. Evidence that DP fragments can have accusative (structural) case morphology in German would thus support sentential accounts, while a preference for nominative (default) case is predicted by a nonsentential account.

3.2 Materials and Method

Experiment 1 tests these predictions by comparing DP fragments exhibiting structural (accusative) case morphology to such with default nominative case marking (10a-b) in German. To make case marking more prominent, nouns in the fragments were preceded by a case-marked adjective (*doppelter/doppelten* 'double') if required. Specifically, the indefinite accusative article *einen* is frequently phonologically reduced to the nominative *ein*, so that the nominative article alone could have been ambiguous.

- (10) *Thomas sitzt im Café an einem Tisch und liest in seiner Zeitung. Als der Kellner an seinen Tisch kommt, sagt Thomas:*

'Thomas is sitting at a table in the cafeteria and reading his newspaper. As the waiter approaches his table, Thomas says:'

- a. "*Einen_{Acc} doppelten_{Acc} Espresso.*" Accusative
 b. "*Ein_{Nom} doppelter_{Nom} Espresso.*" Nominative
 'A double espresso.'

Fragments were preceded by a short context story which included no "linguistic" context, as direct speech, which might serve as an antecedent. Despite the fact that such short answers are frequently used in the literature to exemplify claims on fragments, according to Klein (1981: 52) they are adjacency pairs, and thus possibly no genuine fragments. According to Klein, adjacency pairs are two separate linguistic expressions, e.g. produced by two different discourse participants, whereby the first expression serves as antecedent for ellipsis in the following one. The absence of any preceding linguistic context in the discourse-initial fragments (10) ensured that the stimuli were unambiguous fragments. A pre-test confirmed that the sentences had a highly salient sentential alternative, which required accusative case marking, as (11) for (10).

- (11) *Ich hätte gerne einen doppelten Espresso.*
 I have.SBJV with.pleasure a double espresso
 'I'd like a double espresso.'

70 subjects participated in the main experiment, which was conducted using the LimeSurvey online survey tool. 4 subjects were excluded due to failure to reject ungrammatical controls containing grammatical violations as number and/or gender mismatches between noun and article. 20 items in 2 case conditions (10 each) were

mixed with 47 fillers (including controls) and the 20 items from experiment 2 (see below). The items were distributed by a Latin square into four lists and presented in individually fully randomized order. Subjects were asked to rate the naturalness of the target sentences, which were highlighted by italic font, on a 7-point Likert scale with labeled extremes (1 = very unnatural, 7 = very natural). The experiment took 25 minutes on average to complete. Subjects were compensated with a lottery of 10 × 30 euros among all participants.

3.3 Results

The data were analyzed with Cumulative Link Mixed Models (CLMMs) computed with the ordinal package in R (Christensen 2015). I used a backward model selection process, starting from the full model including all main effects and two-way interactions and subsequently excluded those predictors from the model for which a likelihood ratio test did not reveal any significant improvement of model fit. Unless stated otherwise, this basic procedure was used for all data analyses in this paper.

Besides the independent variable (IV) fragment case (CASE), the availability of a possible conventionalized construction “An X, please” (XPLEASE), which paraphrases the fragment in some of the items (e.g. (10a), repeated here as (12)), was included in the model. For the purpose of the experiment, it would be necessary to factor out the possibility of observing better ratings for accusative only because of a conventionalized structure used in these contexts, which could be analyzed as a shorthand in the sense of Stanley (2000: 409).

(12) *Einen doppelten Espresso.*
'A double espresso.'

The most striking observation is the significant main effect of CASE ($z = -8.24$, $p < .0001$), showing that accusative case-marked fragments were rated significantly better ($\mu = 4.19$, $\sigma = 2.08$) than nominative ones ($\mu = 3.55$, $\sigma = 2.0$). Despite this mean being lower in absolute terms than the one for short answer fragments in experiment 2 (see section 4.3), this shows that accusative fragments are at least as acceptable as nominative ones.

In addition to the effect of CASE, there was a significant main effect ($z = 3.36$, $p < .001$) of XPLEASE, suggesting better ratings for potential XPLEASE constructions (cf. Fig. 1). Nevertheless, there was no significant interaction with CASE. XPLEASE fragments thus received better overall ratings, but these were not responsible for the relatively high acceptability of accusative.

3.4 Discussion

The data indicate that, in contrast to claims made by Barton & Progovac (2005), fragments may exhibit accusative case marking even in absence of licensing linguistic context. If the analysis of accusative as a purely structural case in German is correct, this constitutes a challenge for the nonsentential account, as it is unclear how uninterpretable case features can be checked in absence of a verbal element. The data rather suggest that at some level of language production fragments have a sentential structure, only part of which is pronounced.

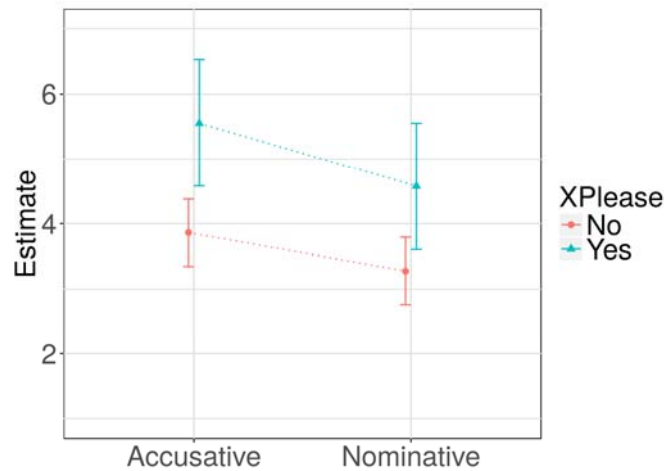


Fig. 1: Estimates for exp. 1

In absolute terms, nominative was still rated better than ungrammatical controls. This is not unexpected under a sentential account, since a nominative fragment could be derived from a different structure where the fragment receives nominative case marking. Following a nonsentential account though, nominative is expected not only to be possible, but also to be the only option available, an assumption which is falsified by the experimental data.

4 Experiment 2: Preposition Stranding

The experiment on case marking suggests that fragments have some kind of underlying structure, which is able to license structural case marking. In this section I address the question of what the unpronounced structure and the derivation of the fragment look like, specifically, whether there is evidence of syntactic movement of the fragment, as argued by Merchant (2004). To test this, I replicated and extended two experiments by Merchant et al. (2013), which the authors present as evidence for the assumption that movement to a left-peripheral position is a necessary step in the derivation of fragments. This section discusses their experiment on preposition stranding (P-stranding) in German and my replications, while section 5 is concerned with their experiment on complement clause topicalization.

4.1 Background

Merchant (2001: 92) observes that only languages which allow for P-stranding under *wh*-movement do so under sluicing. He argues that this crosslinguistically valid *P-stranding generalization* shows that sluicing is derived by *wh*-movement as is the word order in normal *wh*-questions. In Merchant (2004: 686-687), he makes a similar observation for short answers: languages which allow for P-stranding, as English (13), allow for the omission of the preposition in short answers. In languages without P-stranding, such as German (14), structurally analogous to (13), it is impossible to omit the preposition.

- (13) *Who was Peter talking with?*
 a. *Mary.*
 b. *Mary_i Peter was talking with t_i.*

(Merchant 2004: 685, ex. 72)

- (14) *Mit wem hat Anna gesprochen?*
 with whom has Anna spoken
 a. **(Mit) dem_{Dat} Hans.*
 (with) the_{Dat} Hans
 b. **[Dem_{Dat} Hans]_i Anna hat gesprochen mit t_i.*
 [The_{Dat} Hans]_i Anna has spoken with t_i

(Merchant 2004: 686, ex. 78)

As Merchant notes, this is predicted by his approach. In order to generate (13a) or (14a) from a full sentence according to the movement and deletion approach, it is required to extract the fragment DP out of the PP *with Mary / mit dem Hans*. This is possible in a P-stranding language as English (13b), while in German, the preposition has to be pied-piped with the DP to the sentence-initial position before ellipsis occurs (14b).

Merchant et al. (2013) investigate the acceptability of PP and DP short answers in German experimentally and confirm the above grammaticality judgements. In items as (15), PP short answer fragments were rated significantly better than DP short answer fragments (see Table 1). The contrastive focus triggered by the negation in the short answers was presumably included in order to test the items in a context which licenses focus fronting in German.

- (15) *Willst du auf den_{Acc} TORHÜTER verzichten?*
 want you on the goalkeeper do.without
 'Do you want to do without the goalkeeper?'
 a. *Nein, auf den_{Acc} STÜRMER.*
 b. **Nein, den_{Acc} STÜRMER.*
 no, (on) the striker
 'No, (without) the striker.'

(Merchant et al. 2013: 24)

This is only part of the picture though, since the degraded ratings for the investigated fragment short answers could arise due to a mismatch between the structure being asked for (a PP) and the one given in the answer (a DP) and might be observed in P-stranding languages as well.

4.2 Materials and Method

I replicated the study by Merchant et al. in English and German in order to test for a crosslinguistic difference between both languages. Given the P-stranding generalization, Merchant's theory predicts that DP answers should be possible in English, and possibly preferred, when there is P-stranding in the question (17a). In German, the pattern should replicate the one reported by Merchant et al. (2013). In contrast to the study by Merchant et al., I did not use contrastive foci in the short

answers but constructed them as answers to information questions. Sample items are given in (16) and (17), whereby the German (16) is analogous to the English (17).

- (16) *Martin packt in seiner WG am Küchentisch ein Geschenk ein. Sein Mitbewohner Nils fragt ihn: "Für wen ist denn das Päckchen?"*
 a. *Martin sagt: "Für meinen Vater."*
 b. *Martin sagt: "Meinen Vater."*
- (17) *Jake gets home from shopping. He sits down at the table and begins to wrap a present. His roommate Seth asks him: "Who is the present for?"*
 a. *Jake says: "For my Dad."*
 b. *Jake says: "My Dad."*
 c. *Jake says: "For my Dad this is./My dad this is for."*

The German items were presented together with experiment 1. Each subject rated 20 items, 10 in each condition. For the English experiment, the German materials were translated to American English by a native speaker and presented to 54 native speakers of American English together with the items from the English version of my experiment 3 in individually fully randomized order. In the English experiment, the short answers were rated both as fragments and in a left-peripheral position (17c) in order to test for the acceptability of the sentential structure.⁶ In order to allow for comparability of the experiments, this was tested as a between subjects variable, thus participants saw only fragments or sentences. 6 of the subjects were excluded due to low performance on ungrammatical controls, which contained, e.g. wrong auxiliaries or voice. The English speakers were recruited via the prolific.ac crowdsourcing platform and participated for £2.

4.3 Results

The final model for the German items reveals a highly significant effect of P-stranding ($z = -12.99$, $p < .0001$) replicating the results of Merchant et al. (2013). In absolute figures, the difference between conditions was even more extreme than in their study (see Table 1).

Table 1: Mean (sd) ratings for PP and DP fragments in Merchant et al. (2013) compared to the experiments presented here

Condition	German (Merchant et al.)	German frag. (Exp. 2)	English frag. (Exp. 2)	English sent. (Exp. 2)
Pied-piping (PP)	5.99 (1.64)	6.61 (1.01)	5.62 (1.49)	2.63 (1.48)
P-stranding (DP)	4.76 (2.03)	4.33 (2.05)	6.28 (1.24)	2.27 (1.31)

The final model for the English data shows highly significant main effects of CONDITION (Pied-piping/P-stranding) ($z = -4.48$, $p < .0001$) and UTTERANCE (sentence/fragment) ($z = -12.45$, $p < .0001$). DPs are preferred over PPs and topicalization structures rejected. The latter finding is in line with Weir's (2015) observation that focus fronting in English is restricted to contrastive focus in the sense of Krifka (2007), i.e. when a contextually salient alternative is excluded.

⁶ In German, it was not necessary to additionally test left dislocation structures, as P-stranding is undisputably ungrammatical in German.

Independent models fit to fragments and sentences only indicate that fragments are significantly better as DPs than as PPs ($z = -3.73$, $p < .001$), but there is no such significant difference for sentences ($z = 1.64$, $p > .1$). The extremely low ratings for both sentential variants suggest a floor effect reflecting probably nothing but the rejection of fronting non-contrastive constituents.

4.4 Discussion

The data from both German and English match the predictions of the movement and deletion approach. In English, where P-stranding is allowed, DP short answers to questions with P-stranding are preferred, while in German, which disallows it, DP answers are highly degraded. A potential problem for the movement and deletion account are the low ratings for both sentential variants of the highly acceptable fragments. This shows that the structures from which fragments are presumably derived are not acceptable in contexts in which fragments are. Nevertheless, this might be explainable if one is willing to adopt Weir's (2015) account of PF-only last resort movement.

A further concern for the movement and deletion account is that Barton & Progovac (2005: 89) offer an alternative explanation for this, without assuming unarticulated structure at all in fragments. Without going into detail, they argue that the preposition is involved in case feature checking in languages with strong, morphologically reflected, case features, such as Serbian. Case determined by a preposition behaves thus rather like a structural than like a semantically interpretable case. Crucially, the languages which disallow for P-stranding according to Merchant (2004: 686-687) all exhibit morphological case marking on the noun. Thus, the impossibility to omit the preposition in German short answers such as (16) could be either due to movement restrictions or the necessity to check uninterpretable case features. The data are thus expected to arise under a nonsentential account as well, independently of the (un)availability of P-stranding in a language.

5 Experiment 3: Complement Clause Topicalization

5.1 Background

The first experiment in Merchant et al. (2013) investigates movement restrictions of complement clauses (CCs) in English. The experiment is based on the observation, attributed to Stowell (1981), that topicalized CCs must be headed by an overt complementizer (18a-b), even though the complementizer is optional in the CC's postverbal base position (18c).

- (18) *What did Sam predict?*
- a. *That McCain would win, he predicted.*
 - b. **McCain would win, he predicted.*
 - c. *He predicted (that) McCain would win.*

- (19) *What did Sam predict?*
 a. *That McCain would win.*
 b. **McCain would win.*

(adapted from Merchant et al. 2013: 32, ex. 13)

Following the same reasoning as in the P-stranding experiment, Merchant et al. (2013) argue that short answer fragments as (19) should have obligatory complementizers as well, since they would have to be derived from an ungrammatical structure otherwise. Under a nonsentential account, this pattern is unexpected because both fragments in (19) are maximal XPs. In their experiment, Merchant et al. tested short answers like (19) and found that the variant with the overt complementizer is rated significantly better. They attribute these data on fragments to the movement restrictions observed in sentences.

Notwithstanding, the study has several possible shortcomings. First, Merchant et al. (2013) tested the CCs as fragments only but not as topicalized CCs in a full sentence. The authors assume that the introspective pattern in (18a-b) accounts for the empirically observed (19a-b), but some native speakers of American English consulted by me cast doubt upon the generality of these judgements. As the validity of the topicalization data in (18) is crucial to the experiment, this calls for an empirical verification of the pattern. If it could not be verified, the ungrammaticality of (19b) can't be attributed to topicalization restrictions. Second, half (n=8) of the items tested involve CCs which have been embedded under a PP (20). These structures, as discussed by Merchant (2004: 690), are special in that the in situ structure is ungrammatical for both CC types (20c), while the same pattern as attributed to other CCs holds for topicalized and fragment CCs.⁷ In any case, it is not clear whether the presumable restrictions in (20) are comparable to those in (18).

- (20) *What are you ashamed of?*
 a. **(That) I ignored you.*
 b. **(That) I ignored you, I am ashamed of.*
 c. **I am ashamed of that I ignored you.*

(adapted from (96)-(98), Merchant 2004: 690)

Among the remaining 8 items, some contained factive matrix verbs, e.g. *What did John regret? – (That) he joined the Navy* (Merchant et al. 2013: 31). Factive verbs, which presuppose the truth of their complement, e.g. *to conceal*, are widely assumed to require, or at least strongly prefer, CCs without complementizers (cf. Kiparsky & Kiparsky 1970; Hegarty 1992). Merchant (2004: 689f.) himself cites a related observation of Morgan (1973), that complementizers may not be omitted when the speaker “does not believe or subscribe” to the content of the CC. Consequently, if the verb disallows for complementizer-less CCs in general, any structure derived from it will be degraded, independently of whether the CC is moved to the left periphery or whether the matrix clause is PF deleted in situ.

I first replicated and extended the study by Merchant et al. (2013) in German. CCs were tested both in a left-peripheral position and as fragments in order to verify the grammaticality judgements for left-peripheral CCs provided in Merchant et al. (2013). Second, in German, CCs headed by *dass*, the German equivalent of *that*,

⁷ Merchant refers to Webelhuth (1992) for a theory of these data.

are verb-last and verb-last CCs obligatorily require a complementizer (21b). CCs without overt complementizers are verb-second and thus (as in English) formally identical to a verb-second matrix clause (21a). Besides these two conditions, Subjunctive verb-second CCs were tested as well. Subjunctive is used as a mean to mark an utterance as reported speech in German and is a cue towards interpreting a clause as embedded under a matrix verb. This excludes an analysis of a verb-second CC as an indirect answer (Merchant et al. 2013: 21-22) which does not allow for embedding and thus serves as a comparison baseline for the V/2 indicative CCs, which (theoretically) might be indirect answers. For the same purpose, all items were embedded under a context story making it implausible that the speaker was in the epistemic position to give an indirect answer.

5.2 German: Materials and Method

(21) [Context story] *This weekend a famous painting has been stolen from the museum. The newscaster is reporting on the investigation of the robbery. The investigators are currently discussing how the burglar got into the building.*

Newscaster: *“Was glaubt Kommissar Wagner?”*

Reporter:

- a. *“Der Täter ist durch das Fenster eingestiegen (, glaubt er).”* V/2 ind
the criminal is through the window entered believes he
- b. *“Dass der Täter durch das Fenster eingestiegen ist (, glaubt er).”* V/L
that the criminal through the window entered is believes he
- c. *“Der Täter sei durch das Fenster eingestiegen (, glaubt er).”* V/2 subj
the criminal is through the window entered believes he

‘What does inspector Wagner believe?’ – ‘(That) the criminal entered through the window (he believes).’

The facticity issue was addressed by testing only non-factive matrix verbs (*glauben* ‘to believe’, *meinen* ‘to mean’ and *sagen* ‘to say’). A corpus search showed that in the German newspaper corpus TüBa-D/Z (Telljohann et al. 2004) each of the three verbs occurs with each of the CC types investigated. As discussed above, all CCs were tested both as fragments and in full sentences (21a-c).

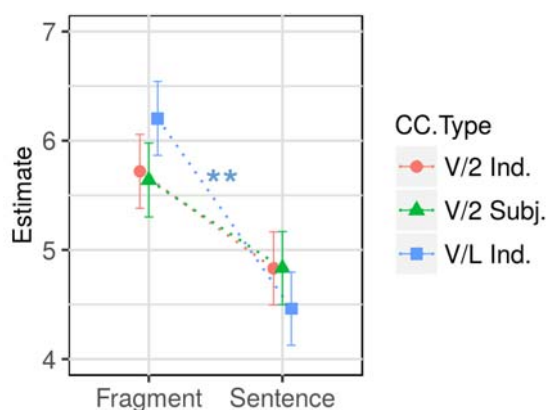


Fig. 2: Estimates for exp. 3, German

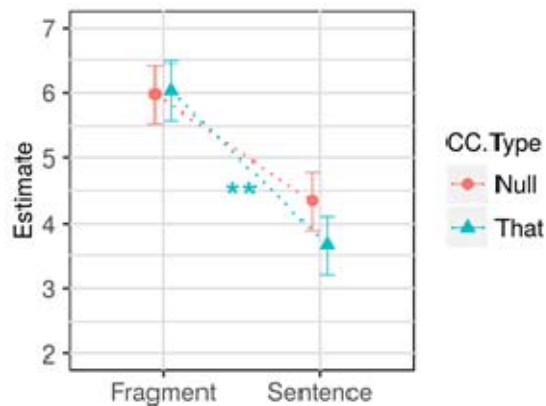


Fig. 3: Estimates for exp. 3, English

In order to reduce the number of conditions per subject and to have ratings for probable marked topicalization structures due to the redundant CC, UTTERANCE (sentence/fragment) was tested as a between subjects variable. Each subject saw 21 items (7 per condition), which were mixed with 24 items from an unrelated experiment and 40 additional fillers and presented in as individually fully randomized order. The experiment was conducted over the web via LimeSurvey. In total, 83 undergraduate students of Saarland University participated in the experiment for participation in a lottery. All were native speakers of German.

5.3 German: Results and Discussion

Fig. 2 indicates that overall fragments were rated better than sentences, while there were only slight differences between CC types. A CLMM fit to the complete data set reveals a significant interaction between UTTERANCE and CC.TYPE verb-last ($z = -5.05$, $p < .0001$). This indicates that verb-last fragments are significantly better as fragments than as topics in full sentences. Independent models, fit to fragment data only and to sentence data only, confirm this. For sentences, verb-final CCs are marginally worse ($z = -1.86$, $p = .063$), while they are significantly better as fragments ($z = 4.37$, $p < .0001$).

The equal acceptability of all CC types as topics in full sentences suggests that the experiment doesn't allow for the evaluation of Merchant's (2004) theory because the assumption that some types of topicalizations are ungrammatical is not confirmed at least for German. Subsequent differences in acceptability between the fragments must be attributed to other factors, as the markedness of subjunctive mood in spoken language.

One possible explanation for the small difference between conditions could be the fact that subjects' ratings reflect rather whether the target sentence fitted pragmatically into the context than subtle grammatical properties. This was addressed in a follow-up study testing the same items with modified contexts together with experiment 4 below. The context story was longer, but the dialogue consisted only of a question-answer pair, yielding items analogous to the English (22). With the exception of slightly different ratings due to the presence of different fillers in both versions of the experiment, the effect remains in principle identical. The only difference is a significant preference ($z = 2.04$, $p < .05$) for subjunctive

mood in topicalized CCs. Again, this is not the pattern expected according to Merchant's account, as the data and the predictions are opposed to each other.

Excluding differences in the design, a crosslinguistic difference between English and German with respect to CC topicalization is an alternative explanation for the differing results. This possibility was addressed with a replication of the experiment in English.

5.4 English: Materials and Method

The German items from experiment 3 were translated into American English and rated by native speakers. Items were presented together with the English items of experiment 2 via prolific.ac (see section 4.2). Each subject rated 20 items (10 per condition). CC conditions were equivalent to the ones in the Merchant et al. (2013) experiment, that is, all CCs were tested with and without an overt complementizer *that* (22).

- (22) [Context story] *This weekend a famous painting has been stolen from the museum. The newscaster is reporting on the investigation of the robbery. The investigators are currently discussing how the burglar got into the building.*
Newscaster: *"What does inspector Wagner believe?"*
Reporter:
a. *"The criminal entered through the window (he believes)."*
b. *"That the criminal entered through the window (he believes)."*

5.5 English: Results and Discussion

Fig. 3 summarizes the data from the English version of experiment 3. A CLMM fit to the complete data set reveals a strong main effect of UTTERANCE ($z = -4.04$, $p < .0001$), which indicates that short answers are strongly preferred over topicalization structures across conditions. CLMMs fit to topicalized CCs only show that topicalized CCs without complementizers were rated significantly ($z = -5.72$, $p < .0001$) better than those with, contrary to the grammaticality ratings in Merchant et al. (2013). For fragment CCs, there is no significant difference in acceptability depending on the presence of the complementizer. This contrasts with the effect reported by Merchant et al. (2013).

The comparison between the data reported by Merchant et al. (2013) and my experiment 3, in addition to the German data, indicates that the apparent evidence for movement is founded on the seemingly wrong assumption that complement clauses without an overt complementizer may not be topicalized. Neither in English, nor in German there was any sort of evidence for this assumption. This suggests in the first place that, if topicalization of all investigated CCs is equally possible, CC topicalization does not allow for interesting conclusions regarding Merchant's theory. The subtle differences in acceptability between fragments CCs in German must therefore be attributed to, e.g. processing factors, but not to movement restrictions. Some German short answer CCs differ significantly, yet the differences are small and their average ratings are much higher than those of ungrammatical controls.

6 Experiment 4: Multiple Prefield Constituents

6.1 Background

In the previous sections I argued that neither P-stranding nor CC topicalization data do strongly confirm nor disconfirm the movement and deletion account. Therefore, in the last experiment presented here, I focused on a well-known restriction of movement to a left-peripheral position, multiple prefield constituents in German.

The German declarative matrix clause is generally assumed to be strictly verb-second, that is, the finite verb occupies the position known as left bracket and has to be preceded by exactly one constituent in the prefield (23). The constituent in the prefield may be of almost any category, the remainder of arguments and adjuncts in the sentence follows the finite verb.

- (23) *[Peter] [will] [in eine Wohnung] [ziehen], [die im Zentrum liegt].*
Peter wants into a flat to.move which in.the center lies
Prefield Left bracket Midfield Right bracket Postfield
'Peter wants to move into a flat which lies in the center.'

Despite this well-known generalization, Müller (2003) shows that in fact a large and diverse number of multiple constituents may appear in the prefield. Some examples are given in (24).

- (24) a. *[Vermutlich] [vom gleichen Täter] wurden zwei Tankstellen*
probably of.the same criminal were two gas.stations
in Hemsbach und Heidelberg überfallen.
in Hemsbach and Heidelberg assaulted
'Probably by the same criminal two gas stations in Hemsbach and Heidelberg were assaulted.'

(Müller 2003: 32)

- b. *[Vor drei Wochen] [in Memphis] hatte Stich noch in drei Sätzen gegen*
before three weeks in Memphis had Stich still in three sets against
Connors verloren.
Connors lost
'Three weeks ago in Memphis Stich had still lost in three sets against Connors.'

(Müller 2003: 38)

- c. *[Studenten] [einem Lesetest] unterzieht er des öfteren.*
students a reading.test submits he the frequently
'Students a reading test he submits frequently.'

(Müller 2003: 59)

As discussed in section 2.2, according to Merchant (2004), movement of fragments targets a left-peripheral position. He does not comment on whether it is a focus position, but, if fragments are assumed to be derived from regular sentences and there is no additional landing site in the left periphery of fragments, there is only one

preverbal landing site available in German. If this is right, according to the movement and deletion approach, only those sequences which might appear together in the prefield of a full sentence are possible fragments. The restriction holds specifically for German and other verb-second languages, as the only possibility to fill the prefield with two apparently independent constituents would be to merge them before movement. In languages with a more rich left periphery it could be possible that other constituents are moved to different left-peripheral positions above the head carrying the [E] feature and thus survive ellipsis.

6.2 Materials and Method

In order to test the prediction that those and only those XP-YP sequences which may occur in the prefield are possible fragments, five different configurations discussed by Müller (2003) were tested, again, both as fragments (25a) and in the prefield of full sentences (25b). As double prefield configurations are restricted to specific information-structural contexts (cf. Müller 2005; Bildhauer 2011), all items were preceded by a context story eliciting the appropriate information structure. For instance, in (25), this is the contrastive topic (Büring 2016) status of the first prefield constituent *seinem Chef* ‘his boss’ and the contrastive focus status of *eine E-Mail* ‘an e-mail’ (Müller 2003: 59). This rules out the possibility of degraded ratings due to pragmatic infelicity.

(25) *Hätte er der Personalabteilung ein Fax schicken sollen?*
 has.SBJV he the HR.department a fax send shall
 ‘Should he have sent a fax to the HR department?’

a. *Nein, seinem Chef eine E-Mail.* Direct object, indirect object
 no his boss an e-mail
 ‘No, his boss an e-mail.’

b. *Nein, seinem Chef eine E-Mail hätte er schicken sollen.* DO,IO
 no his boss an e-mail has.SBJV he send shall
 ‘No, his boss an e-mail he should have sent.’

Sample items for the five prefield configurations are given in (25), (26), (28). Three of them are presumably grammatical and two ungrammatical. As discussed above, (25) should be fine. In (26a) a local and a temporal adverbial or PP occur in the prefield, this is presumably acceptable as well. In order to assure that none of the constituents modifies the other one and thus has to be analyzed as adjoined, there is always a temporal and a local one. In (26b) an argument occurs preverbally with a sentential adverb. The adverb *angeblich* ‘allegedly’ clearly takes scope over *in seiner Stammkneipe* ‘in his favorite pub’ only, as it presupposes that someone is behind the mentioned event. This might indicate that it forms a unique constituent with the noun or DP. Müller (2003: 31) nevertheless cites example (27), by Jacobs (1986: 112) that such adverbs can’t occur inside a PP, which indicates that they may be semantically associated with the noun, but not syntactically modify it, as, e.g. adjectives do. Nevertheless, even if one argues that the prefield in, e.g. (26a) and (26b) is a single constituent, which is generated by other movement operations before fronting, this does not question the idea of the experiment. If they are single constituents, both fragments and sentences should be acceptable in this case, unlike for other configurations, which are not.

- (26) a. *Wann hast du Hans denn getroffen?*
 when have you Hans then met
 'So when did you meet Hans?'

[Heute morgen in der U-Bahn] habe ich ihn getroffen. Loc,Temp
 today morning in the subway have I him met
 'This morning in the subway I met him.'
- b. *Wo war Herr Veit zum Tatzeitpunkt?*
 where was Mr Veit to.the time.of.crime
 'Where was Mr Veit at the time of the crime?'

[Angeblich in seiner Stammkneipe] war er zum Tatzeitpunkt. SAdv, XP
 allegedly in his favorite.pub was he to.the time.of.crime
 'Allegedly in his favorite pub he was at the time of the crime.'
- (27) **Peter träumt von vermutlich/sogar/nicht ihr/Luise/Geld.*
 Peter dreams of probably/even/not her/Luise/money
 'Peter dreams of probably/even/not her/Luise/money.'

(Jacobs 1986: 112)

Besides these three presumably grammatical multiple prefield configurations, two ungrammatical patterns were tested (28). First, Müller (2003: 59) notes that a preverbal subject and an additional argument are ungrammatical. Intuitively though, the fragment derived from the prefield in (28a) (*Ich die Spülmaschine* 'I the dishwasher') seems to be relatively fine. The other presumably ungrammatical configuration involves a prefield consisting of two constituents which are not clause mates (Fanselow 1993, quoted in Müller 2003). In (28b), *den Hund* 'the dog' is the direct object of the embedded verb *ärgern* 'to bother', while *Paul* is the indirect object of the matrix verb *verbieten* 'to forbid'. Note that, unlike (28a), there is no subject involved in the multiple prefield sequence in (28b). The prefield itself should thus be acceptable if the constituents were not extracted from different clauses (28c) as it consists of the direct and indirect object like the presumably grammatical (25).

- (28) a. *Wer möchte welche Aufgabe übernehmen?*
 who wants which task take.on
 'Who wants to take on which task?'

 **[Ich die Spülmaschine] möchte übernehmen.* Subject, XP
 I the dishwasher want take.on
 'I want to take on the dishwasher.'
- b. *Wem hast du verboten, wen zu ärgern?*
 whom have you forbidden who to bother
 'Who did you forbid to bother who?'

 **[Paul den Hund] habe ich verboten, zu ärgern.* Different Clauses
 Paul the dog have I forbidden to bother
 'I forbid Paul to bother the dog.'
- c. *Paul den Hund habe ich geschenkt.*
 Paul the dog have I given.as.present
 'I gave Paul the dog (as present).'

Subjects rated a total of 35 items (7 for each prefield configuration). Like in experiments 2 and 3, UTTERANCE (sentence/fragment) was a between subjects variable. The items were presented together with the short context items of experiment 3 and 25 unrelated fillers including ungrammatical controls. 38 undergraduate students of Saarland University participated in the study. All were native speakers of German and rewarded with the participation in a lottery.

6.3 Results

The final CLMM fit to the complete data set included a strong main effect of UTTERANCE ($z = -9.5$, $p < .001$). Fragments were strongly preferred across all prefield configurations. Fig. 4 shows that this does not hold in the same degree for all XP-YP sequences. In order to quantify these differences, independent models were fit to sentences and fragments only. For sentences, there was no significant difference between DO,IO and Different Clauses. All remaining pairings differed significantly. For fragments, there was no significant difference between Different Clauses and DO,IO and between SAdv,XP and Loc,Temp, but for all other combinations.

6.4 Discussion

The data show that fragments are preferred over sentences in the experimental setting. Nevertheless, this difference is subject to a large extent of variation between the tested prefield configurations. This is reflected in significant interactions between UTTERANCE and PREFIELD which are unexpected if only the sequences acceptable in the prefield yield possible fragments.

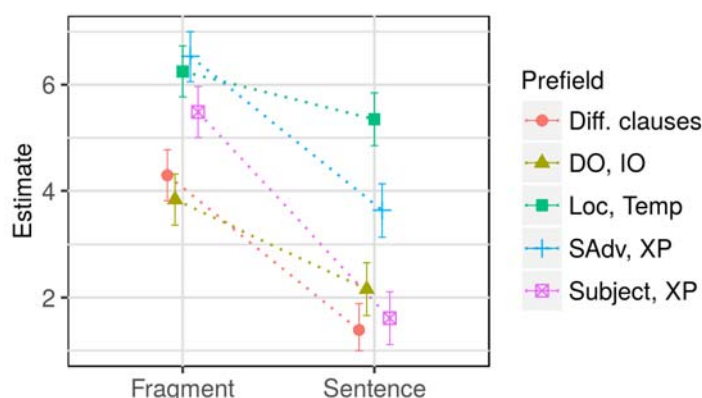


Fig. 4: Estimates for exp. 4

The movement and deletion account as sketched by Merchant (2004) might be able to account for at least some of the data which seem to contradict it at first glance, specifically the surprisingly high ratings for the sequences consisting of non clause-mates as fragments. Ellipsis is widely assumed to be able to “repair” ungrammatical structures, as movement out of islands (cf. Merchant 2008; Müller 2011), according to Merchant (2004: 706) by deleting intermediate traces, which would cause

ungrammaticality. This could account for the better ratings for the different clause mates condition as fragments than as sentences.

This however, does still not explain the effect on the Subject, XP condition. In this case, trace deletion is not able to account for the interaction between UTTERANCE and the prefield configuration, which is rated acceptable as fragment but unacceptable in the prefield. Merchant (2004: 711) attributes this difference to repair by ellipsis as well, but it is unclear what the mechanism behind it should be. The data on multiple prefield constituents thus indicate that not only configurations which are acceptable as sentences are fine as fragments, as predicted by Merchant's account.

7 General Discussion

I have presented a series of experiments which test whether fragments are sentential at all and, if so, what their underlying structure is. The first experiment showed that fragments might exhibit accusative case marking in absence of a linguistic antecedent for ellipsis. The acceptability of structural case marking in fragments, which is assumed to be required only for linguistic purposes indicates derivation from some linguistic structure, rather than a 'Mentalese' Logical Form, as suggested by Stainton (2006).

I then proceeded to evaluating the predictions of Merchant's (2004) influential movement and deletion account. First, I presented replications in German and English of two experiments Merchant et al. (2013) present as evidence in favor of movement and deletion. These experiments were taken as evidence for movement to a left-peripheral position. The first of these experiments is based on the P-stranding generalization, the observation that only languages, which allow for P-stranding allow for DP short answers to PP questions. The data both in the original experiment and my replications in German and English yield the expected pattern. An alternative explanation for this behavior, in line with Barton & Progovac' nonsentential account, is that in languages with strong case features, prepositions play a crucial role in case checking, like the verb does in structural case marking, and thus may not be omitted. The P-stranding data are consequently not a very strong evidence in favor of Merchant's theory.

The data on CC topicalization seem to be stronger evidence for this. Merchant et al. (2013) argued that only CCs with overt complementizers may be topicalized and so only those may appear as fragments. Their data confirm this prediction. I showed that at least part of the effect might be due to factive matrix verbs in the experiment and the lack of a comparison baseline. When testing only factive matrix verbs and CCs both as topics and as fragments, there was no meaningful difference in acceptability for the CCs as topics. This indicates that CC topicalization in the languages investigated is not the appropriate testing ground for Merchant's theory.

In experiment 4, I investigated XP-YP fragments in German, which the movement and deletion account predicts to be acceptable as fragments only when they may occur in the prefield. This was not the case for all investigated sequences, specifically not in case of sequences of the subject and another argument (29), which are not widely accepted in the prefield but though still acceptable as

fragments. This is unexpected with respect to Merchant's, but compatible with, e.g. Reich's (2007) approach, who derives fragments by in situ deletion.

(29) *Wer hat was bestellt?*

who has what ordered
'Who ordered what?'

Ich das Schnitzel.

I the scallop
'I the scallop.'

In addition to the assumption of landing sites above FP, which might be motivated in languages with a rich left periphery, a possible explanation for the acceptability of XP-YP fragments is that the fragment derivation involves last resort movement as argued by Weir (2015). According to Weir, movement applies on PF only in order to empty the ellipsis site of non e-given constituents before deletion applies. For German, one would have to assume landing sites in or before the prefield, which are available in fragments only. One would therefore have to assume a richer left periphery in German than commonly assumed and explain why part of it is not accessible in full sentences. However, by making these additional assumptions, one loses one of the most appealing aspects of the movement and deletion account. The observation of correlated behavior between fragments and sentences is traded for a set of assumptions, which are not independently motivated and whose only use is to explain differences between fragments and sentences.

The acceptability of XP-YP sequences is hard to explain under Barton & Progovac' account as well. It is unclear how the DPs should be merged without a verbal projection relating them to each other. Progovac' (2006) small clause account could be an option, but Reich (2014) argues that in German there are no small clauses. Possibly, proponents of the nonsentential account could claim that short answers are elliptical and form an adjacency pair with the question, while other fragments are genuinely nonsentential. However, this is probably not Barton & Progovac' (2005) intention, as they present short answer data as evidence in favor of their account.

In short, the experiments presented here taken together are difficult to bring in line with a nonsentential account of fragments as suggested by Barton & Progovac (2005). I also showed that the experimental evidence in favor of the movement and deletion account might be either due to experimental parameters or receive an explanation under a non-movement account of fragments as well. The data from German multiple prefield constituents speak partially against the movement and deletion account, unless one argues that movement generating fragments is different to the one occurring in regular sentences. If both the nonsentential approach and a movement and deletion approach as sketched by Merchant (2004) should be rejected, in a next step the specific predictions of alternative approaches, as, e.g. in situ PF deletion (Reich 2007) or Weir's (2015) last resort movement and deletion account, should be subject to experimental evaluation.

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