

What is special about fronted focused objects in German?
A study on the relation between syntax, intonation, and
emphasis

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1 Introduction and outline¹

This thesis is concerned with objects occupying the German prefield. The prefield is the syntactic position preceding the finite verb in V2 clauses. It is a formal requirement that this position be filled in declarative clauses of V2 languages, and in the majority of cases, the subject or an adverbial is located there. However, other constituents can also appear in the prefield, for example the direct object as in (1):

- (1) Eine Garnele hat Georg gegessen.
a prawn has Georg eaten
'Georg ate a prawn.'

It has been proposed that a sentence with an object in the prefield like (1) comes with a specific interpretative requirement: for example, that the object must have operator properties (Fanselow 2002), that it must be interpreted exhaustively (Frey 2004, 2005) or as emphasized (Frey 2010). In this thesis, I will be mainly concerned with the latter proposal. In the first part of the thesis I will pursue the question whether it is possible to implement a direct relation between the fronting operation and an emphatic interpretation in syntax, as proposed by Frey (2010). I will argue that this proposal is problematic for a number of reasons, the main one concerning the optionality and gradience of the phenomenon, which is difficult to capture in an account representing the emphasis requirement directly in the syntax. I will argue that it is more adequate to represent a connection between word order and emphasis at a pragmatic level.

In the second part of the thesis, I will approach the question whether it is desirable to establish a direct connection between word order and emphasis at all from an empirical point of view. The evidence provided by Frey (2010) consists to a large part of interpretative contrasts between sentences containing a focused object in a fronted position and in situ. In order to verify these observations experimentally, I conducted a written forced choice study. The results show that Frey's (2010) observation that fronted focused objects are more emphatic in German can indeed be confirmed. I will, however, propose an alternative explanation, which does not involve a direct syntax-emphasis relation, but instead an indirect one, mediated by prosody. The main idea is that fronting a focused object does not only change the word order of a sentence, but it also affects the realization of its pitch accent. Since it is well-known that emphasis is related to prosody, it is conceivable that it is the prosodic changes accompanying the fronting operation that really cause the more emphatic interpretation. To test this hypothesis, I conducted a production and a perception study. The production study shows that the typical realization of a focused object in initial position order differs from a focused object in sentence-internal position with respect to prosodic features that are

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known or conjectured to be related to emphasis, such as peak height, peak alignment, and relative prominence. The perception study then shows that if these prosodic differences are eliminated in auditory materials, the difference in the perceived degree of emphasis that was observed with written materials vanishes. I take this as evidence that the relation between emphasis and word order is indeed at least partly an indirect one, and as a step towards disentangling syntactic and prosodic effects that are usually conflated; however, the scope of the conclusions that can be drawn is limited due to a potential confounding factor that emerges due to the methodology that was employed: by making the object phonetically identical in fronted and in clause-internal position, a difference in perceived pitch height might arise due to the positional difference within the utterance. Potential further steps that might be taken in order to overcome these limitations will be pointed out.

The thesis is structured as follows. Section 2 constitutes the theoretical part of the thesis. I will first provide an overview of approaches to prefield movement in German in section 2.1, with particular attention to the mechanism that is used to derive the special pragmatic status of fronted elements. In section 2.2, I look more into the model proposed in Frey (2010) and into the notion of emphasis that plays a central role in it. In section 2.3, I discuss several problems with this particular implementation, and in section 2.4, I give an outlook on possible alternative ways of linking emphasis to word order that have been proposed in the literature. 2.5 provides an interim summary. Section 3 constitutes the empirical part of the thesis. In section 3.1, I describe my idea that increased emphasis of fronted focused objects might arise merely indirectly via increased prosody in comparison to the in situ position. The following sections include the experimental studies that I conducted to put this proposal to the test. In section 3.2, I present the written forced-choice study, in section 3.3 the production study, and in section 3.4 the perception study. Section 4 concludes the paper and provides an outlook on possible future work.

2 Theoretical part: can emphasis be represented in syntax?

2.1 The prefield position in German

2.1.1 The topological model

There is a tradition of dividing a German sentence into several subparts which is referred to as ‘das Topologische Feldermodell’ (Drach 1937). According to this model, the complementizer in subordinate verb-final clauses (*weil* ‘because’ in (2a)) and the finite verb in verb-second (V2) main clauses (the perfect tense auxiliary *ist* in (2b)) share the same structural position.

- (2) a. ...weil der Frosch die Fliege gefangen hat.
 because the frog the fly caught has
 ‘...because the frog has caught the fly.’
- b. Der Frosch hat die Fliege gefangen.
 the frog has the fly caught

‘The frog has caught the fly.’



In declarative main clauses, exactly one constituent has to precede the finite verb. This position is called *Vorfeld* or *prefield*; in (2b), it is filled by the subject *der Frosch* ‘the frog’. The area following the complementizer/the finite verb, but preceding the non-finite parts of the verb (if any), is referred to as the *Mittelfeld* or *middlefield*, and optionally, constituents can also appear after the non-finite verbs in the *Nachfeld* or *postfield*, as illustrated in (3).

	Vorfeld		Mittelfeld		Nachfeld
(3)		...weil	der Frosch die Fliege	gefangen hat.	
	Der Frosch	hat	die Fliege	gefangen.	

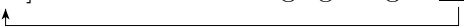

2.1.2 Filling the prefield is a movement operation

Drach (1937) points out that the most economic rule-system that can capture this specific sentence structure is one in which the word order of V2 clauses is derived from the word order of subordinate sentences in the following way: (i) the verb is moved to the initial position, (ii) exactly one other constituent is placed to the left of the verb. This idea was first formalized within a generative framework by Bierwisch (1963) in terms of a transformation rule of the form $X_1 X_2 X_3 \rightarrow X_1 X_3 X_2$ bringing the verb (corresponding to X_3) into the second position (p. 111). What will appear in the first position depends on transformations that are applied *before* the V2 second rule, and which include facultative fronting of a nominal or adverbial constituent (p. 90–106) in main clauses; the verb fronting does not affect the previously established relative order of the other elements. Thiersch (1978: 35–40) proposes a different system consisting of two rules—first, the verb is fronted to the initial position, and then some XP can be fronted to the position preceding it (in declarative main clauses, this is obligatory). A similar system was proposed for Dutch by Koster (1975). The difference between the two rule systems is illustrated in (4) and (5).

(4) Derivation of an object-initial sentence in Bierwisch’s system:

- a. [die Fliege] der Frosch ___ gefangen hat

- b. die Fliege [hat] der Frosch gefangen ___


(5) Derivation of an object-initial sentence in Thiersch’s system:

- a. [hat] der Frosch die Fliege gefangen ___

- b. [die Fliege] hat der Frosch ___ gefangen


Thiersch’s arguments for choosing this option over Bierwisch’s proposal include the facilitation of deriving verb-first structures as found in imperatives and yes/no-questions, for which Bierwisch needs to formulate exceptions of the verb-movement rule. Thiersch’s system has been

widely adopted since, and I will also follow it in this thesis. In more recent analyses within the Minimalist Framework, it is typically assumed that the verb and the prefield constituent are located in the head and specifier, respectively, of a functional projection in the C-domain. Some approaches along these lines will be discussed in more detail in the following sections.

2.1.3 Minimal vs. non-minimal movement to the prefield

The analyses presented above share the assumption that all constituents that appear to the left of the finite verb in a German declarative clause have been moved there by the same operation, and they occupy the same structural position. Following Gärtner & Steinbach (2003), I will call this kind of approach the *symmetrical* approach. This assumption was challenged by Travis (1984: 120–129), who argues that there is an important difference between sentences with a subject in the prefield and sentences with an object in the prefield. She shows that object fronting is more restricted: weak object pronouns cannot occur in the prefield, but all subject pronouns can. She argues that this difference should be accounted for in structural terms (i.e., that an *asymmetrical* approach should be employed), and she proposes to extend her independently motivated analysis of Yiddish to German. According to this analysis, subject-initial main clauses in both languages involve a left-headed IP, with the finite verb in I and the subject in SpecIP; only sentences with another element in initial position involve verb movement to C and of the prefield constituent to SpecCP. Thus, a subject-initial sentence would differ structurally from an object-initial sentence in the following way (ignoring traces/copies):

- (6) a. [_{IP} Der Frosch [_I hat] [_{VP} die Fliege gefangen]].
 b. [_{CP} Die Fliege [_C hat] [_{IP} [_{VP} der Frosch gefangen]]].

Travis' argument concerning restrictions on pronoun fronting was called into question later by Gärtner & Steinbach (2003).² However, the idea to assign different structures to subject vs. object-initial sentences was taken up in Fanselow (2002) in order to account for another difference between the two sentence types. Fanselow reports that objects in the prefield must have a special pragmatic status like being a focus or a topic³ (p. 4), whereas there is no pragmatic restriction on prefield subjects. However, he rejects Travis' analysis, because of the fact that sentences with a temporal or sentence-level adverb in the prefield are also pragmatically unrestricted (this was previously noted by Frey 2000), and it seems unwarranted to assume that they can appear in a structural position designated for subjects. Instead,

²They argue that even under the asymmetrical approach, a specific rule is required to ban weak pronouns from appearing in SpecCP, and it is not clear why this is preferable to a rule simply banning weak object pronouns from the prefield position that would be required under the symmetrical approach. They also provide data showing that fronted weak object pronouns are acceptable under specific morpho-phonological and discourse-related conditions.

³Special pragmatic properties of prefield constituents are mentioned also in earlier descriptions: e.g., Engel (1972: 40–42) claims that a prefield element has to have an *Anschlußfunktion* ('continuation function') or a *Themafunktion* ('topic function'), where the latter includes also the so called *Kontrastfunktion* ('contrastive function').

Fanselow proposes to adopt the Finiteness projection FinP, which is a functional projection above the IP/TP level and was suggested by Rizzi (1997) as a the lowest layer of the C-domain. Fanselow assumes that the verb moves to Fin in German V2 clauses, and then SpecFinP is obligatorily filled with some phrase; this operation is assumed to be subject to the Minimal Link Condition (Chomsky 1995), i.e. only the syntactically closest element can be fronted. That is why by default, the structurally highest element in the middlefield (typically the subject or a high adverbial) moves to the prefield. The situation is different for wh-questions—in this case, it is possible for a structurally lower element to move to the prefield. For this, it has to be assumed that the presence of an operator requires fronting of an element bearing a wh-feature. Fanselow discusses two options: either Fin can also host operator features, or there is an additional functional layer providing a landing site for operator-related movement as it occurs in questions; this could be the CP layer, which is standardly assumed to be the projection targeted by wh-movement. Based on a survey of V2 structures in other languages, Fanselow decides in favor of the latter option in order to be able to account for specific cross-linguistic differences. He assumes that for sentences containing focal or topical material, the same mechanism as for wh-questions can apply: a *foc/top* operator can be located in the higher functional projection, which can attract the closest constituent carrying a focus/topic feature.

A similar asymmetrical analysis is adopted by Frey (2004)⁴: he distinguishes between Formal Movement, an A-movement operation that is triggered by an EPP feature and fronts the closest element in the middlefield to SpecFinP, and genuine \bar{A} -movement, an \bar{A} -movement operation that is triggered by an operator feature and fronts an element with a corresponding feature to SpecKontrP, which is a higher functional projection in the left periphery.

In these approaches, minimal and non-minimal fronting are treated as asymmetrical in two ways: non-minimal movement is assumed to involve both a different operation than minimal movement (triggered by an operator feature), and a different landing site (in a structurally higher position). This type of approach with (at least) two functional projections above the TP level is illustrated by the leftmost structure in (9).

In Fanselow (2004), the second option mentioned in Fanselow (2002) is adopted: every case of prefield movement is assumed to target the same position, namely SpecCP. If there is only an EPP feature in C, the closest element is attracted; if there is an operator feature in addition, the closest constituent carrying the corresponding feature is attracted. It can also be a part of a constituent carrying the corresponding feature that is moved, and Fanselow argues that formal and not semantic/pragmatic properties are relevant for deciding which part is moved. If a feature is marked morphologically as in the case of the wh-feature, the part carrying this marking can be fronted alone, as in (7). If a feature is marked prosodically as in the case of focus in German (pitch accents indicated by capital letters), the part carrying the leftmost pitch accent can be fronted alone, as in (8).

⁴This proposal is also presented in Frey (2005) and Frey (2006); the articles share the core assumptions that are discussed here, therefore I will continue to refer only to Frey (2004).

- (7) Was_i hast du [_{t_i} für Bücher]_{wh} gelesen?
 what have you for books read
 ‘What kind of books have you read?’
- (8) ‘What did you do last weekend?’
- a. [Die BÜCHER]_i hab ich [_{t_i} ins REGAL]_{focus} gestellt.
 the books have I into.the shelf put
 ‘The books, I put into the shelf.’
- b. #[Ins REGAL]_i hab ich [die BÜCHER _{t_i}]_{focus} gestellt.
 ‘Into the shelf, I put the books.’

This is an instance of a structurally symmetrical approach in the sense that there is no difference in the resulting structural complexity between minimal and non-minimal movement; but there is an asymmetry in the movement operations, as only non-minimal movement is operator-induced. This is illustrated schematically in (9b).

- (9) a. asymmetrical structures, asymmetrical operations: b. symmetrical structures, asymmetrical operations: c. symmetrical structures, symmetrical operations:
-

A very different analysis is proposed in Müller (2004): he suggests that a V2 structure is the result of a single remnant movement operation of an emptied vP, containing only v and whatever was moved to the phase edge (SpecvP); i.e., the verb and the prefield constituent are fronted in a single step. He assumes that subjects and adverbs can be merged in any order in the edge of the vP and can thus unrestrictedly appear in the prefield. As for other elements, in particular objects, their movement to SpecvP has to be triggered by some feature or feature bundle. Müller refers to this feature as Σ and notes that it accounts for the “relative markedness” (p. 12) of object-initial vs. subject-initial clauses. Thus, although the specific mechanism is very different from the approaches discussed before, Müller (2004) can also be considered an instance of a system that is symmetrical with respect to the structures involved in minimal vs. non-minimal fronting, but not with respect to the operations: in both cases, the element occurring in the prefield is located in SpecvP (and the whole vP is fronted to a functional projection above the TP), but only in non-minimal fronting feature-driven movement of the prefield element is assumed to take place.

structure operation	symmetrical	asymmetrical
symmetrical	Fanselow & Lenertová (2011) Grewendorf (2002)	—
asymmetrical	Fanselow (2004) Müller (2004)	Fanselow (2002) Frey (2004, 2005, 2010)

Table 1: Overview over prefield theories categorized by whether they involve the same structure / operation for minimal and non-minimal fronting

Finally, there are also approaches in which minimal and non-minimal fronting are assumed to undergo the same type of operation and target the same structural position. One example of this is Grewendorf (2002), although he mainly discusses properties of wh-movement rather than information-structure related movement. Grewendorf assumes that at least clause-internally, both wh-movement and fronting of other elements is triggered by an EPP feature and targets SpecFinP; however, wh-phrases move on covertly to a higher projection (FokP) for reasons of interpretation. Long-distance movement across clause boundaries is assumed to always target SpecFokP. This distinction accounts for the lack of weak crossover effect in clause-bound wh-movement, under the assumption that SpecFinP is a non-operator position and the effect only arises when the wh-element is located in an operator position (this would be the case for long wh-movement, which shows the weak cross-over effect).

An in a sense even more radically symmetrical approach was proposed more recently by Fanselow & Lenertová (2011), who argue that movement to the prefield always targets SpecCP and is always triggered by the Edge feature in C that requires its specifier to be filled, which is comparable to the effect of an EPP feature (for details concerning the Edge feature, see Chomsky 2008). This symmetrical type of approach does not distinguish non-minimal from minimal fronting neither with respect to the resulting structure nor to the operation that is involved; it is illustrated by the schematic tree (c) in (9).

2.1.4 Different sources of the pragmatic markedness of object-initial sentences

In the previous subsection, structural differences between minimal and non-minimal fronting in the different approaches were discussed. In this section, I will focus on how these theoretical assumptions relate to the reported increased pragmatic markedness of object-initial main clauses in comparison to subject or adverb initial ones, and which predictions can be deduced for them. An overview is provided in Table 2.

In Fanselow & Lenertová’s (2011) syntactically symmetrical approach, the pragmatic markedness of object-initial sentences is explained by certain ideas concerning linearization. They adopt Fox & Pesetsky’s (2005) assumption that syntactic structures are linearized by means of ordering statements of the form $X > Y$, which cannot be altered once they were introduced. In contrast to Fox & Pesetsky’s (2005) system, however, Fanselow & Lenertová do not assume that linearization statements are only introduced when a spellout domain (phase)

	fronted object has to be...	crossed elements have to be...
Fanselow & Lenertová (2011)		deaccented, if fronted element is accented
Fanselow (2002)	operator-like (wh, topic, focus)	
Fanselow (2004)	carrying the leftmost formal marking of an operator feature (wh, topic, focus)	
Müller (2004)	carrying feature Σ that is also responsible for scrambling	
Frey (2004)	exhaustive	
Frey (2010)	exhaustive or emphasized	

Table 2: Restrictions on non-minimal prefield movement following from the discussed theories

is completed, but that they can in principle be introduced at any point during the linearization; crucially, they assume that accented elements have to be linearized immediately when they are merged. It follows that two accented elements cannot cross each other: an ordering statement determining their relative order ($X > Y$) is introduced as soon as the higher accented element (X) is merged, and the statement would need to be deleted or altered if the lower element Y moved across X . This explains why an object-initial sentence can occur when the object is in narrow focus as in (10), but not in an all-new context as in (11): in (11a), an accented element (indicated by capitals) crossed another accented element, which is not possible under Fanselow & Lenertová’s assumptions about linearization; in (11b), the object has crossed an unaccented element, which is syntactically possible (the relative order of subject and object can be changed during the derivation, because the ordering statement does not have to be introduced immediately when the subject is merged), but deaccenting the subject is not licensed in an all-new context.

- (10) What did the frog catch?
 Die FLIEGE hat der Frosch gefangen.
 ‘The fly, the frog caught.’
- (11) What happened?
 a. #Die FLIEGE hat der FROSCH gefangen.
 b. #Die FLIEGE hat der Frosch gefangen.

The observation that object-initial sentences are pragmatically more restricted than subject-initial sentences is thus captured more indirectly here than in the syntactically asymmetrical approaches.

In the asymmetrical approaches (Fanselow 2002, 2004, Müller 2004, Frey 2004, 2010), the difference in markedness is established by the assumption of a minimality condition of some kind: if the attracting feature is not specified further (i.e., it is just an EPP/Edge feature), the

closest element will be attracted, which will typically be the subject or an adverb. Thus, no restrictions are formulated for fronted subjects; the formal requirement of filling the prefield position is enough to motivate their movement. In contrast, fronting another element is only possible if the attracting feature is more specific; then the closest element carrying this feature will be moved, and movement across higher elements is possible. This explains why object fronting is more restricted; the details of the restrictions depend on what the relevant feature is assumed to be.

In Fanselow (2002), it is assumed that the lower functional projection in the left periphery (SpecFinP), which is targeted by minimal fronting, is an A-position, whereas the higher functional projection (SpecCP), which is targeted by non-minimal fronting, is an \bar{A} -position. Only operators are assumed to be able to land in an \bar{A} -position, so the crucial property deciding whether an object can be fronted is operator status. Wh, topic, and focus features are assumed to be operators, in the sense that they involve binding of a variable⁵.

In Fanselow (2004), the distinction between A-movement and operator-related movement is preserved, but the idea that semantic operator properties play a role for what exactly is fronted is discarded; rather, morphological / prosodic *marking* of the operator is assumed to be crucial: in the case of wh-movement, the part of the wh-constituent carrying wh-morphology is the one that is attracted, and in the case of focus/topic movement, it is the part carrying the relevant accent (in both cases, more material can be pied-piped).

In Müller’s (2004) system, a feature or feature bundle Σ is assumed to trigger object movement to SpecvP⁶, which is a precondition for appearing in the prefield. Müller assumes that it is the same feature bundle that is responsible for scrambling within the middle field; if the vP is not moved to the initial position (which would result in V2 order), but left in situ (e.g. in a verb-final embedded clause), movement to SpecVP is also the mechanism used for reordering the arguments and adverbs, i.e. scrambling. Thus, within Müller’s system, it is not possible to specify conditions on prefield elements independently of conditions on scrambling. It follows that an element is predicted to be able to occur in the prefield iff it is able to occur as the highest element in the middle field. Frey (2004: 35–37) provides arguments that this prediction is not borne out; e.g., focused objects can easily occur in the prefield, but cannot be scrambled within the middle field.

Frey’s (2004) analysis is similar to Fanselow (2002) in that the lower functional projection in the left periphery is assumed to be filled by A-movement, and the higher one is assumed to

⁵In the syntactic literature, two types of operators that can show different syntactic behavior are sometimes distinguished: quantificational operators (e.g., wh and focus), which show weak cross-over effects when moved, and non-quantificational/“anaphoric” operators like the phonologically null operator that is assumed to be involved in topic movement; see Lasnik and Stowell (1991) and Rizzi (1997: ch. 5) for a more detailed definition and discussion of the *operator* notion.

⁶A more detailed characterization of this scrambling-triggering feature is provided in Müller (1999). There, Müller proposes to formalize this “scrambling criterion” in form of a complex Optimality Theoretical constraint consisting of a range of separate linearization preferences concerning e.g. animacy and definiteness. Müller proposes that a sentence involving scrambling is grammatical if it is optimal when *some* sub-constraint is considered, and “unmarked” if it is optimal when *all* sub-constraints are taken into account.

be filled by \bar{A} -movement. However, operator-status is not considered to be the crucial property that determines which elements can undergo \bar{A} -movement to the higher projection; rather, it is limited to elements with an exhaustive interpretation, in the sense that the sentence would not be true if the fronted element was replaced by an alternative. In Frey (2010), the restriction is weakened: an element does not have to be exhaustive in order to undergo \bar{A} -movement to the higher projection, it can also be “emphasized”, where “emphasized” means that it is the highest element on a salient scale.

Frey’s proposals are different from the other proposals in that they make more fine-grained distinctions within the set of sentences containing a fronted narrow focus. This type of sentence is predicted to be generally grammatical by the other proposals; according to Frey’s proposal, focus alone is not enough to license \bar{A} -movement to the prefield.

Frey (2010) is not the first one to propose that the prefield position is linked to an emphatic interpretation. In fact, this assumption is already discussed in Drach (1939). Drach cites the following claim from a textbook: if the subject follows the verb and some other element other than the subject is in initial position, then this initial element is associated with emphasis.⁷ Drach criticizes that two different notions are conflated in that claim and proposes to differentiate between *Denkwichtigkeit* (roughly: ‘mental importance’) and *Affektbeladung* (‘affect-ladenness’). Drach argues that the former concept is signaled by an intonational peak and can occur in any position in the sentence; only the latter concept tends to be associated with the prefield position (Drach 1939: p. 26–27). If *Denkwichtigkeit* is taken to correspond more or less to the notion of *focus* (which is indicated by Drach’s claim that it is signalled by an intonational peak—a property that is typically attributed to the notion of focus in current work), and *Affektbeladung* to what Frey calls *emphasis*, then Drach’s description is quite similar to Frey’s approach: they both argue that the focus/importance is not the crucial requirement for fronting an element that is not the subject; the fronted element is associated with an additional property. How Frey defines the notion of emphasis, and to what extent it is similar to Drach’s earlier description will be discussed in more detail below.

Although the idea to link the prefield position to emphasis is not new, to the best of my knowledge, Frey’s (2010) account is the only one that tries to implement this link directly in a modern syntactic framework. In the remainder of this part of the thesis, I will review the proposal in more detail and point out problems that I see with the implementation.

2.2 Encoding emphasis in the syntax: a closer look at Frey (2010)

2.2.1 Evidence against previous accounts

Frey (2010) claims that previous accounts of the German prefield are not able to capture all relevant generalizations about prefield movement. Fanselow’s (2002, 2004) proposals are

⁷Original quotation: “Bei verkehrter Wortstellung (Inversion) geht das Verb dem Subjekt unmittelbar voran. Sie wird angewandt, falls irgendein anderes Wort den Satz einleitet, dies einleitende Wort ist dann mit Emphase beladen (emphasized).” (Drach 1939: p. 26)

argued to be too permissive in that they predict that all narrowly focused elements should be able to undergo movement to the prefield, which is not the case. Frey’s own previous proposal (Frey 2004) is argued to be too inflexible, because it predicts that non-minimal prefield movement should invariably come with an exhaustive effect, but in fact various different interpretative effects are possible, depending on the context.

The example in (12) (from Frey 2010: 1421) is presented as evidence for the claim that Fanselow’s (2002, 2004) theories overgenerate. Although the locative PP *in einem Tal* ‘in a valley’ is narrowly focused (it corresponds to the short answer to the question), it is not felicitous to move it to the prefield according to the judgment provided by Frey.

- (12) Wo liegt eigentlich Stuttgart? ‘*Where is Stuttgart situated?*’
- a. Stuttgart liegt in einem Tal.
Stuttgart is.situated in a valley
‘*Stuttgart is situated in a valley.*’
 - b. #In einem Tal liegt Stuttgart.

This acceptability contrast does not follow from Fanselow (2002, 2004), who predicts that fronting of narrowly focused elements should always be possible (at least if nothing else is added).

That Frey’s (2004) previously proposed exhaustivity requirement is too inflexible is shown by (13) and (14) (from Frey 2010: 1422). Although both answers are exhaustive (if a team won, none of the alternatives of the form ‘They lost’ or ‘They played to a draw’ is true), there is an acceptability difference: fronting the participle is felicitous in (13), but not in (14), and the reported intuition is that this has to do with whether the respective teams were expected to win or to lose (note that Bayern München is a team that was expected to win, and Hansa Rostock was rather expected to lose). Frey interprets this as evidence that the interpretative effect that arises from non-minimal prefield movement is influenced by the context.

- (13) Wie hat Bayern München gespielt? ‘*How did Bayern München play?*’
- a. Bayern München hat gewonnen.
Bayern München has won.
‘*Bayern München won.*’
 - b. Gewonnen hat Bayern München.
- (14) Wie hat Hansa Rostock gespielt? ‘*How did Hansa Rostock play?*’
- a. Hansa Rostock hat gewonnen.
Hansa Rostock has won.
‘*Hansa Rostock won.*’
 - b. #Gewonnen hat Hansa Rostock.

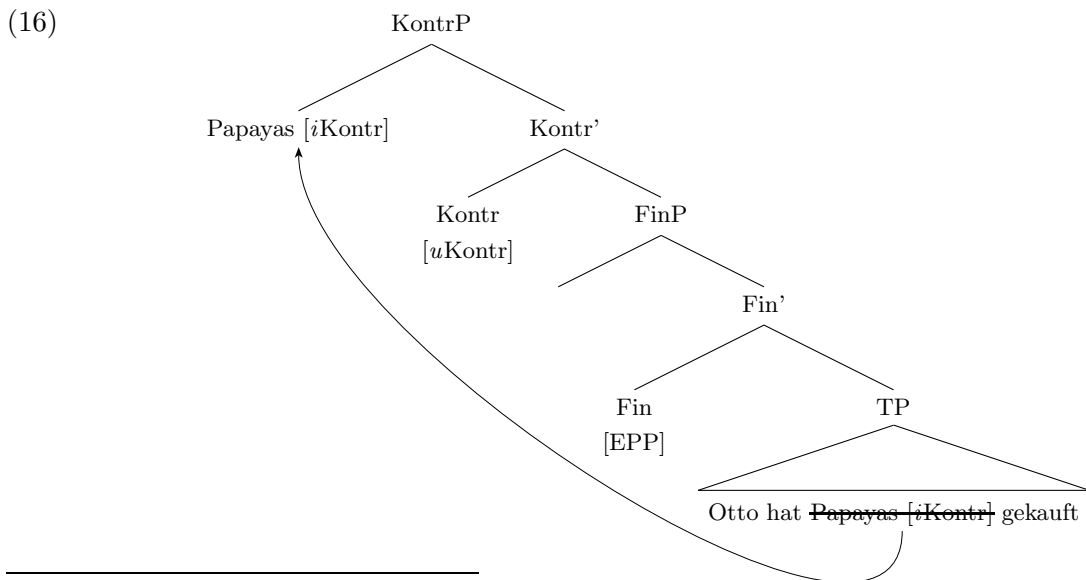
2.2.2 New proposal: syntactic exhaustivity/emphasis marking

In Frey’s previous work, the requirement that non-minimally fronted elements must be exhaustive (“contrastive”, in Frey’s terminology) was formulated as follows (from Frey 2004: 17):

- (15) If an expression α in a sentence S is contrastively interpreted, a set M of expressions which are comparable to α becomes part of the interpretation process of S . M denotes the set of alternatives to the referent of α .

The utterance of a declarative clause S containing a contrastively interpreted expression α has the implicature that S is not true if α is replaced by any $x \in M, x \neq \alpha$.

As already discussed in section 2.1.4, the requirement is formally implemented by assuming a designated functional projection in the left periphery, headed by the functional element *Kontr*. If present, this uninterpretable feature needs to be checked by a contrastive element, and in addition, *Kontr* carries an EPP feature, meaning that the contrastive element has to move to the specifier of *KontrP* overtly. Contrast is thus considered a formal feature (it plays an active role in the syntactic derivation), which at the same time has a semantic/pragmatic⁸ interpretation, similar to features like number or tense. Recall that this type of movement is called *Genuine \bar{A} -movement* in Frey’s terminology and can attract any contrastive element, whereas *Formal Movement* to the specifier of *FinP* can only target the highest element in the middlefield. In contrast to *Formal Movement*, *Genuine \bar{A} -movement* requires the fronted element to be stressed and it can cross clause-boundaries. An instance of *Genuine \bar{A} -movement* is illustrated in (16) (leaving aside verb movement and projections that are irrelevant for this discussion).



⁸In what follows, I will sometimes use the term ‘semantic’ in the broader sense of ‘relevant for interpretation’, i.e., as an abbreviation for ‘semantic or pragmatic’.

Frey (2010) adopts the distinction between the two movement operations, but he changes the semantic notion that is taken to be correlated with *Genuine \bar{A} -movement* and the form in which it enters the derivation. It is now assumed that *Genuine \bar{A} -movement* always comes with a certain conventional implicature. According to Potts (2007), conventional implicatures differ from conversational implicatures in that they do not arise via pragmatic reasoning, but “by virtue of the meaning of the words” that the speaker chooses; they are a part of a lexical element’s conventional meaning. The conventional implicature that is linked to *Genuine \bar{A} -movement* is formulated as follows (Frey 2010: 1423):

- (17) Let S be a declarative sentence involving \bar{A} -movement of a constituent α containing a stressed subconstituent β . A set M denoting salient referents becomes part of the interpretation process, $|M| \geq 2$. M contains α and expressions denoting alternatives to the referent of α , varying in the denotation of β . S is associated with the CI in (18).
- (18) CI: The speaker expresses that α is ranked highest in a partial ordering which holds among the elements of M pertaining to S and which contains one element which is highest.

The kind of ranking depends on the context of the sentence. In the soccer example in (13) a ranking according to expectations is highly salient: ‘Bayern München won’ conforms more to the expectations than ‘Bayern München lost’ or ‘Bayern München played to a draw’. In other contexts, other types of scales can be salient. Frey (2010) proposes that the many examples with an exhaustive interpretative effect that were discussed in Frey (2004) can be captured by the same mechanism. The idea is that the scale which can always be employed by default is one that is ordered “according to the truth value” (Frey 2010: 1425), i.e. a scale on which the (only) sentence that renders the sentence true is ranked highest, and all other sentences in which the fronted constituent is replaced by an alternative are on the same lower rank because they render the sentence false. A different scale can become the relevant one either because it is highly salient, as in (18), or because an exhaustive interpretation is not available, as in (19) (from Frey 2010: 1424). There, the exhaustive interpretation is not compatible with the context (because it is explicitly denied by the following sentence), and a different effect arises in (19b), in which the object *Fleisch* ‘meat’ is fronted: it seems that the speaker wants to express that buying meat is more remarkable in some way than buying other things. This effect does not arise in (19a).

- (19) Was hat Otto heute auf dem Markt gekauft?
‘What did Otto buy on the market today?’
- a. Otto hat Fleisch gekauft, und drei Pfund Bananen.
Otto has meat bought and three pounds bananas
‘Otto bought meat and three pounds of bananas.’

- b. Fleisch hat Otto gekauft, und drei Pfund Bananen.

Frey reports that a focused object can be realized felicitously both in and ex situ in most contexts; they will only differ in whether the conventional implicature arises or not, but they will both be acceptable. However, if a ranking is explicitly introduced in the context, the ex situ answer is preferred. Frey presents three types of contexts in which this is the case. The first type of context is illustrated in (20) (from Frey 2010: 1424): here, a ranking is introduced explicitly in the context, as the first speaker asks for something that is ranked high on a scale by using the modifier *Besonderes* ‘extraordinary’. The answer in (20b) “fits smoothly into the context” (Frey 2010: 1424), because the high position of the object *Papayas* ‘papayas’ is marked grammatically by Genuine \bar{A} -movement.

- (20) Was hat Otto dieses Mal Besonderes auf dem Markt gekauft?
 ‘What extraordinary thing did Otto buy on the market this time?’
- a. Er hat dieses Mal Papayas gekauft.
 He has this time papayas bought
 ‘He bought papayas this time.’
 - b. Papayas hat er dieses Mal gekauft.

The second type of context in which fronting the object is the preferred option according to Frey are selection questions as in (21) (from Frey 2010: 1425). The idea is that here a scale ordered according to truth value, which Frey assumes to underlie an exhaustive interpretation, is made explicit, because the speaker asks the addressee to choose only one of the alternatives.

- (21) Was möchte Paul? Ein Eis oder einen Kuchen?
 ‘What does Paul want? Ice cream or a cake?’
- a. Paul möchte einen Kuchen.
 Paul wants a cake
 ‘Paul wants a cake.’
 - b. Einen Kuchen möchte Paul.

The third type of context is correction, as illustrated in (22) (from Frey 2010: 1430). Frey reports the intuition that the subject-initial reaction in (22a) cannot express correction (at least if it is stressed “in a standard way”), whereas (22b) can. The reasoning is that there is only one salient alternative to *Kleid* ‘dress’ here, namely *Hose* ‘trousers’. The fronted object indicates an exhaustive interpretation, i.e. it is true that Maria bought a dress, and false that she bought trousers, which amounts to correcting the first speaker’s statement. Since exhaustivity is not encoded syntactically in (22a), it cannot have a corrective meaning, unless it is marked otherwise (by adding *nein* ‘no’ at the beginning of the sentence, or by prosodic means).

- (22) Maria hat eine Hose gekauft. ‘Maria bought trousers.’

- a. #Maria hat ein Kleid gekauft.
 Maria has a dress bought
 ‘*Maria bought a dress.*’
- b. Ein Kleid hat Maria gekauft.

In order to illustrate that different scales can be relevant for interpreting Genuine \bar{A} -movement, Frey (2010: 1426) provides the following example, showing that a highly expected element as in (23b) can undergo Genuine \bar{A} -movement, but also a highly unexpected element as in (23d).

- (23) Was hast du heute Nacht gemacht? ‘*What did you do last night?*’
- a. Ich habe geschlafen.
 I have slept
 ‘*I slept.*’
 - b. Geschlafen habe ich.
 - c. Ich war auf einer Berlinale-Party.
 I was at a Berlinale.party
 ‘*I was at a Berlinale party.*’
 - d. Auf einer Berlinale-Party war ich.

That the exhaustive/scalar meaning component is indeed a conventional implicature is supported by some tests that Frey applies following Potts (2007). In contrast to conversational implicatures, conventional implicatures are not cancellable. Frey (2010: 1426) claims that it is infelicitous to follow up an utterance involving Genuine \bar{A} -movement by the continuation *... aber das ist ja nicht weiter erwähnenswert* ‘... but this is not worth noting’, which is supposed to indicate that denying the high ranking expressed by the movement operation leads to inconsistency. Furthermore, in contrast to presuppositions, conventional implicatures are subject to an “anti-backgrounding” requirement (Frey 2010: 1427), meaning that the content of the implicature cannot have been overtly expressed in the preceding context. Frey claims that e.g. the soccer example involving fronting in (13) becomes infelicitous if the expectation that the implicature expresses is previously stated overtly.

2.3 (Potential) problems with Frey’s (2010) analysis

2.3.1 Is emphasis a linguistic notion at all?

A potential counterargument against Frey’s (2010) analysis could be that the notion of emphasis should not be part of a linguistic model at all. In recent linguistic articles, it seems to be a standard assumption that emphasis is per se a *paralinguistic* notion. For example, Hartmann (2008: 2) in her cross-linguistic study on the expression of contrasts concludes that “contrastive focus may be realized with more emphasis, which clearly is a paralinguistic notion”, and Downing and Pompino-Marschall (2013: 25) argue that the alleged focus prosody found in earlier studies on Chichewa should be reanalyzed as “paralinguistic emphasis prosody”. In both these examples, the authors follow Ladd (2008) in defining paralinguistic phenomena as

gradient and optional, as opposed to linguistic phenomena that are realized categorically and obligatorily.

However, this definition is not without problems. When we look at the earlier literature, we find a controversial debate whether the term *paralinguistic* is a useful one and how it should be defined. The term was coined by Trager (1958), who proposed an enriched transcription system in order to capture properties of spoken language for which there had been no annotation standard before. For him, all kinds of vocalizations to which no phonological, semantic, and morphological structure (in other words, no “sound, shape, and sense”, Trager 1958: 275) can be assigned by the typical tools used for linguistic analysis, fall into the category of *paralanguage*. This comprises a wide range of utterances, including expressions of hesitation, laughing, or yawning. For Trager, also voice qualities like pitch height, intensity, and duration (irrespective of whether they are caused by biological features or by the speakers’ mood, or whether they are consciously controlled) are paralinguistic features.

Crystal (1974) criticizes this view, because it is based on an *ex negativo* definition, and the result is a very heterogeneous class of vocalizations and voicing properties. Crystal (1974: 170–273) provides a comprehensive review of how the term was used since Trager introduced it into the field, and he lists no less than seven types of definition that he observed to be employed by different researchers, differing in which factors are considered to be relevant in distinguishing linguistic from paralinguistic phenomena. According to Crystal, the most wide-spread and useful use of *paralanguage* is one that restricts it to human, vocal, non-segmental phenomena which are controlled by the speaker, but non-phonemic. He argues that subsuming both human and animal communication under one label would result in a set of features that would be too diverse to gain anything from such a categorization, and the same holds for controlled versus physiologically conditioned aspects. According to the proposed definition, suprasegmental modifications in pitch height, intensity, and duration are considered as paralinguistic, unless they are physiologically caused (and thus not controllable), or they are phonemic, i.e. they are categorically related to a specific meaning or function.

Yet, Crystal (1974: 279–281) is skeptical even about this definition because of the unclear notion of ‘phonemic’ suprasegmental features. In his view, there is no reason to think that the categorical nature of (segmental) phonemes and morphemes should be a prerequisite for considering something as a proper part of the linguistic system. If some prosodic property can be shown to be correlated with a specific interpretative effect under experimental conditions, this is a part of the language system, no matter whether the property is realized in a gradient or in a categorical way.

I follow Crystal in considering any notion that effectively describes a systematical relation between linguistic form and meaning as a linguistic notion. As argued in detail by Myers (2000), this does not amount to neglecting the important difference between between categorical and gradient gradient patterns. In the second part of the thesis, I will review some of the evidence for the view that there is such a systematic and reliable relation between prosodic

realization and an emphatic interpretation. I think that in view of this evidence, emphasis should be considered a linguistic notion, and thus there is no reason to exclude it a priori from being part of a linguistic model. However, the gradient nature of the notion might make it difficult to implement it in certain parts of the grammar, in particular within the syntax, as will be argued below in more detail.

2.3.2 Empirical problem with the exhaustivity requirement: contrastive topics

One of the problems that I see with Frey’s (2010) proposal is that exhaustivity is assumed to be the default interpretative correlate Genuine \bar{A} -movement, and this is a problem that is imported from earlier work. In Frey (2004), it is claimed that “contrast” is a necessary condition for Genuine \bar{A} -movement, and according to the definition provided there (quoted above in (15)), an element is “contrastive” if two conditions are satisfied: (i) there are salient alternatives to the element, and (ii) the sentence containing the element would not be true if the element was replaced by one of the alternatives. I will refer to the first property as salience of alternatives and to the second property as the exhaustivity requirement. In Frey (2004), it is proposed that the combination of the two properties is what triggers \bar{A} -bar-movement. This is intended to capture that contrastive, but not non-contrastive foci can undergo \bar{A} -bar-movement, and that contrastive, but not aboutness topics can undergo \bar{A} -bar-movement. This is problematic conceptually: it has been argued by Repp (2010) that exclusion of alternatives is a relevant property for distinguishing focus from contrastive (i.e., corrective and exhaustive) focus, but not for distinguishing topic from contrastive topic, and thus, an exhaustivity requirement cannot be part of a consistent definition of contrast. I want to argue that there are examples showing that the exhaustivity requirement indeed cannot hold for contrastive topics in the case of German prefield movement. To the best of my knowledge, contrastive topics can always be moved to the prefield (also across clause boundaries). The exhaustive property that they apparently have in common with fronted foci in my view is based on a misleading example (from Frey 2004: 17):

- (24) Da wir gerade von den Halbfinalspielen sprechen...
‘Since we are talking about the semifinals...’
 Das /ERSTE Halbfinale denke ich, dass sich JEDER\ Fußballfan anschauen
 the first semifinal think I that REFL every soccer.fan watch
 wird.
 will
‘I think that every soccer fan will watch the first semifinal.’

Since only \bar{A} -bar-movement, but not Formal Movement is able to cross clause boundaries Frey’s system, it is ensured that the fronted object did not arrive there via topic movement within the middlefield followed by Formal Movement. So if this utterance is read as a contrastive topic-focus construction, with a rising accent on the fronted object and a falling accent on *jeder* ‘every’ (as indicated in (24); accent marking added by me), it should conform to the

exhaustivity requirement, i.e., it should follow from the sentence that replacing the fronted object by a salient alternative (which would be the second semifinal) would lead to a false statement; Frey reports the intuition that this is indeed the case for (24), and not the case for a version of the sentence without long movement. I agree that the interpretation that the speaker wants to say that the other semifinal will not be watched by everybody is salient in (24), but a look at other examples suggests that this might be an exceptional case. Consider (25a):

- (25) Weißt du, was mit den Desserts ist?
‘Do you know what happened to the desserts?’
- a. Den /EISBECHER denke ich, dass MARIA\ gegessen hat.
the ice.cream think I that Maria eaten has
 - b. Ich denke, dass den /EISBECHER MARIA\ gegessen hat.
 - c. Den EISBECHER\ denke ich, dass Maria gegessen hat.
‘I think that Maria ate the ice cream.’

(25a) does not imply that Maria did not eat any other things besides the ice cream according to my intuition; it is for example fully consistent with the continuation ‘But I have no idea who ate the cake and the muffins; it might also have been Maria’. For me, there is no interpretative difference between (25a), where the object must have undergone Genuine \bar{A} -movement, and (25b), where it has not. In my view, the only thing that the speaker conventionally indicates by using a contrastive topic intonation in (25a) and (25b) is that there are other relevant questions about other desserts; or more technically, that other questions of the form ‘Who ate X?’ (X being alternatives to the ice cream) are part of discourse strategy (see Büring 2003 for a formal analysis of this meaning component of contrastive topic marking); so according to my intuition, the first part of Frey’s contrast definition is fulfilled here (there are salient alternatives), but the second (exhaustive) part is not. (26c) on the other hand, with a fronted focus, an exhaustive interpretation is indeed highly salient.

I think that in (24), the exhaustive interpretation is due to the nature of the salient alternative sets: the only salient alternative to ‘the first semifinal’ is ‘the second semifinal’, and the only possible alternatives to the quantifier ‘every’ are other quantifiers like ‘some’, ‘all’, ‘no’, which all entail ‘not every’. The contrastive topic intonation indicates that other questions of the form ‘Who will watch X?’ (where X are alternatives to the contrastive topic, i.e. to the first semifinal) are relevant, and here the only possible question of that form is ‘Who will watch the second semifinal?’. It is thus very plausible that by explicitly pointing to this question via a contrastive topic intonation, the speaker wants to convey that one of the other quantifiers should be used in the answer to this other question, and that it is thus not everybody who will watch the other game. Crucially, according to my intuition the implicature also arises for a contrastive topic that has not undergone Genuine \bar{A} -movement, as in (26a); and even in the long-distance case in (26b), it is a cancellable implicature for me: (26d) is a felicitous continuation to both (26a) and (26b). What is more, I think the

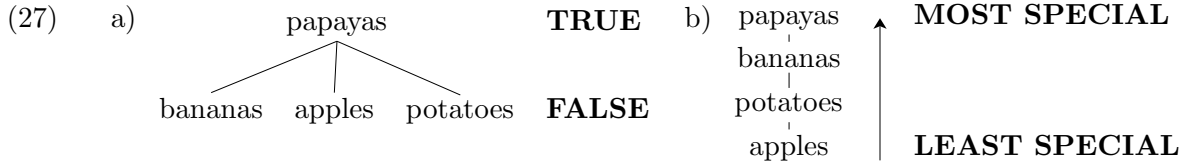
implicature even arises in this context (maybe to a lesser degree) if a canonical word order and default intonation is used, as in (26c).

- (26) Wie werden wohl die Einschaltquoten bei den Halbfinalspielen sein?
‘I wonder how many people will watch the semifinals?’
- a. — Ich denke, dass das /ERSTE Halbfinale sich JEDER\ Fußballfan anschauen wird...
‘I think that every soccer fan will watch the first semifinal...’
 - b. — Das /ERSTE Halbfinale denke ich, dass sich JEDER\ Fußballfan anschauen wird...
 - c. — Ich denke, dass sich jeder Fußballfan das erste Halbfinalspiel anschauen wird.
 - d. ...Über das zweite Spiel kann ich dir nichts sagen, wer spielt da nochmal?
‘...I cannot tell you anything about the second game, who is playing again?’

So in my view, Frey’s (2004) claim that Genuine \bar{A} -movement is always related to exhaustivity is not empirically warranted—the examples above suggest that exhaustivity cannot be a necessary requirement for \bar{A} -movement of contrastive topics. These considerations are relevant for assessing Frey (2010), too. Although the requirement for \bar{A} -movement is weakened in that exhaustivity *or* emphasis are assumed to license it, it is claimed that an exhaustive interpretation is the *default* interpretative correlate of \bar{A} -movement in the absence of another salient scale on which the alternatives could be ordered. I think that this description is correct for fronted foci (and it was confirmed experimentally by Skopeteas & Fanselow’s 2011 study, which will be discussed in more detail in section 2.4); however, for contrastive topics, I cannot detect any difference with respect to exhaustivity—or in fact any other interpretative property—between a contrastive topic that has undergone \bar{A} -movement and one that has not.

2.3.3 Problems with the unified analysis of exhaustivity and emphasis

I see some complications with Frey’s (2010) attempt to formalize exhaustivity and emphasis using the same mechanism. Whereas exhaustivity can be conceptualized in a binary way (an element is either the only element that makes the sentence true or not), the notion of emphasis used by Frey (2010) is inherently gradient. This becomes clearer when the formal model is illustrated schematically. The figures in (27) illustrate that two different kinds of scales are used in Frey’s model. For the exhaustive (default) interpretation, it is assumed that the speaker expresses that the fronted element is the only element such that it makes the sentence true, whereas all others—when inserted in the same position—would make the sentence false. This means that the set of alternatives is divided in a binary way. Conceptualizing this as a scale amounts to saying that the scale consists only of two end-points with no range in between. For any of the other possible interpretations (e.g. as highly remarkable, expected, unexpected...), it is usually possible to order the elements in the alternative set along a real, gradient scale with more than two ranks.



Formulating the same condition on both scales, as Frey suggests, leads to formal problems. According to Frey’s formulation of the conventional implicature, a speaker who uses Genuine \bar{A} -movement expresses that there is a salient scale that contains a single highest element, and this highest element is the denotation of the fronted element. However, it seems unlikely to me that this strong requirement really needs to hold for scales of the type in (27b). That would mean that it should be unacceptable to front an object if there is any salient alternative to it that is as high or higher on the relevant scale. For example, (28) should be out:

- (28) Peter hatte doch überlegt, ob er sich trauen soll, zu der Dinnerparty Shorts oder einen Rock anzuziehen, oder ob er doch in Jacket und Anzughose geht. Was hat er gemacht?
‘Peter was considering whether he should dare to wear shorts or a skirt to the dinner party, or whether he would go in a jacket and trousers after all. What did he do?’
 Shorts hat Peter getragen, und dazu ein Jacket!
 shorts has Peter worn and with.them a jacket
‘Peter wore shorts, and in addition a jacket!’

However, I think that fronting the object is perfectly acceptable here, although the shorts are only one of the most remarkable pieces of clothes that he could wear; this seems to be enough to license the fronting (exhaustivity cannot be the motivation here, as it is explicitly denied in the follow-up sentence). On the other hand, if the requirement was altered in order to capture this, e.g. by requiring that the fronted element denotes something that is relatively high on the scale, or among the highest ones, it would not be straight-forward to apply this requirement to a binary division of alternatives as in (27a).

There is a further problem which speaks against Frey’s unified analysis of exhaustive and emphatic interpretations. To define the exclusion of alternatives formally, the notion of *logical strength* is needed (cf. e.g. Beaver and Clark’s 2008 analysis of the exclusive particle ‘only’). Frey does not consider it in his formalization: he requires *all* sentences in which the relevant element is replaced by an alternative to be false. If the analysis is to capture not only sets of alternatives containing atomic entities, but also hypernyms and conjuncts, the condition must be stated differently; otherwise, an exhaustive interpretation of (29a) would imply that (29b) is false, which is an undesired result.

- (29) a. Papayas und Mangos hat Otto heute gekauft.
 papayas and mangoes has Otto today bought
‘Otto bought papayas and mangoes today.’
 b. Papayas hat Otto heute gekauft.

‘Otto bought papayas today.’

Thus, to capture the exhaustivity requirement correctly, only logically stronger alternatives should be excluded. However, changing the definition in such a way creates a problem for the other type of scale. According to Frey, the scale can express any ordering, e.g. expectedness or unexpectedness, depending on the context. If the scale can be reversed in that way, the definition of the implicature would also need to be reversed: if (29a) is expected, then (29b) is also expected, so in that case, logically stronger alternatives should be excluded, just like in the case of an exhaustive interpretation. But if (29a) is unexpected, (29b) is not necessarily unexpected, so the implicature cannot be stated in the same way for both scales.

Another problem stems from the fact that Frey leaves it entirely open what type of scale can be employed for the emphatic interpretation. In principle, if some scale S can be the relevant one in one context, then the reversed scale S' could be relevant in some other context. This makes it difficult to derive testable predictions; in fact, the validity of some of the tests that are employed in Frey (2010) are corrupted by this permissive definition. For example, the soccer examples presented above as (13) and (14) and repeated below, remain basically unexplained—if the relevant scale can be one ordered according to expectedness and unexpectedness, it is unclear why (31b) should be any worse than (30b).

(30) Wie hat Bayern München gespielt? *‘How did Bayern München play?’*

- a. Bayern München hat gewonnen.
Bayern München has won.
‘Bayern München won.’
- b. Gewonnen hat Bayern München.

(31) Wie hat Hansa Rostock gespielt? *‘How did Hansa Rostock play?’*

- a. Hansa Rostock hat gewonnen.
Hansa Rostock has won.
‘Hansa Rostock won.’
- b. #Gewonnen hat Hansa Rostock.

Furthermore, it also calls into question one of the tests that Frey applies in order to show that the effect is a conventional implicature. In order to show that the implicature is not cancellable, he presents the following example (from Frey 2010: 1426). (32b) is claimed to be an unacceptable continuation of (32a); however, if the scale could really involve any ordering factor, then it is unclear why the fronted element *grün* ‘green’ could not be for example the most expected or most unremarkable among the alternatives here, which would make the continuation coherent.

(32) Wie hat Maria ihre Tür gestrichen? *‘How did Maria paint her door?’*

- a. Grün hat Maria ihre Tür gestrichen...
Green has Maria her door painted

‘Maria painted her door green...’

b. #...aber das ist ja nicht weiter erwähnenswert.

‘...but this is not worth noting.’

In sum, the mentioned problems suggest that Frey’s formalization of the interpretative effect is both too specific and too weak in some respect: the proposed specific unified treatment of the exhaustive and emphatic effect does not seem to work out technically; and the characterization of the emphatic effect is too permissive with respect to the scale that can be employed.

2.3.4 Status as a conventional implicature

Frey proposes that the interpretative effect has the status of a conventional implicature. In Potts’ (2007, 2012) work on conventional implicatures, there is one phenomenon that is particularly reminiscent of Frey’s description of fronting in German, namely expressives like ‘damn’. Potts considers sentences like the following and observes that (33a) expresses something that (33b) does not.

- (33) a. The damn dog is on the couch.
b. The dog is on the couch.

Potts reasons that this meaning component is best described in terms of “use conditions” rather than in the format of “traditional semantics” (Potts 2012: section 3.2). He presents the results of a corpus study on a set of user reviews. The main finding is that expressives are used mainly in reviews of users who decided to give an extremely high or extremely low rating to the reviewed product, and they are virtually absent in reviews accompanied by a mediocre rating. Potts concludes from this that ‘damn’ is a “signal of emotionality”, and it correlates reliably with “the speaker’s being in a heightened emotional state (or wishing to create that impression)”. I think this description is very similar to what Frey (2010) intends to say about the difference between sentences like (34a) and (34b): in (34a), the speaker is expressing something in addition by choosing a specific construction.

- (34) a. Papayas hat Otto heute gekauft.
papayas has Otto today bought
‘Otto bought papayas today.’
b. Otto hat heute Papayas gekauft.

In contrast to Potts, Frey tries to give a relatively formal semantic/pragmatic description; its problems were discussed in the previous subsection. In my view, staying closer to Potts’ use conditions would be beneficial: instead of the formal description of the implicature in terms of scales, one could say that Genuine \bar{A} -movement correlates with the speaker’s wish to express that there is something remarkable about the fronted element, and to direct the listener’s attention to it. It might seem that giving up the concise semantic formalization that Frey proposed would weaken the theory. However, in view of the problems with the formal

definition pointed out above, it seems inevitable to employ a more “subjective” definition, i.e. one that makes reference to the speaker’s emotions and intentions⁹; specifically, the speaker’s intention to highlight something. In my view, this intention is the core component that is missing in Frey’s definition—merely requiring that an element is the highest one on *any* scale could include being most expected, boring, or unremarkable. If the definition included the intention of highlighting, the fronted element could still be a highly expected one, but only if the speaker finds that noteworthy, e.g. because they are annoyed by the question (which is an effect that indeed arises in Frey’s ‘What did you do last night? — I slept.’ example, I think).

In contrast to an expressive, however, the additional meaning is not brought about by any lexical item in the sentence, but rather by a certain syntactic construction. It is thus not clear to me how it is compatible with the properties of conventional implicatures which Potts proposes, and which Frey (2010: 1423) cites and adopts:

- (35) *Central properties of conventional implicatures according to Potts (2007: section 1), following Grice (1975: 44–45):*
- a. CIs are part of the conventional (lexical) meaning of words.
 - b. CIs are commitments, and thus give rise to entailments.
 - c. These commitments are made by the speaker of the utterance “by virtue of the meaning of” the words he chooses.
 - d. CIs are logically and compositionally independent of what is “said (in the favored sense)”, i.e., the at-issue entailments.

Properties (a) and (c) explicitly make reference the meaning of words, and I do not see how this applies to a word order variant or construction—unless the empty category triggering the movement in Frey’s analysis is considered to fall under this definition. In principle, this is not a large problem; it is conceivable that the properties above should be adjusted such that they could include constructions, if there are reason to assume that these can also trigger conventional implicatures. However, in the absence of lexical triggers, it is more difficult to differentiate between a conventional and a conversational implicature. In contrast to conventional implicatures, conversational ones arise due to pragmatic reasoning based on conversational maxims (Grice 1975). The general idea is that a participant in a conversation assumes that the interlocutor follows certain conversational rules serving successful communication; and if one of the maxims is violated, this will be taken as a deliberate act with the goal to convey some additional meaning. Among others, Grice proposes that there is a general manner maxim, concerning how the speaker chooses to phrase a sentence. They all fall under the supermaxim “Be perspicuous” and for example involve the following concrete rules:

⁹Emotion and intention are also the key criteria that Drach (1939: 26–27) assumes to be linked to the prefield position: as mentioned above, he speaks about *Affektbeladung* ‘affect-ladenness’, which he paraphrases as *Gefühl- und Willensladung* ‘ladenness with emotion and will’. This aspect is missing in Frey’s account, so it is not fully parallel to Drach’s description.

- (36) *Conversational maxims of manner according to Grice (1975: 46)*
- a. Avoid obscurity of expression.
 - b. Avoid ambiguity.
 - c. Be brief.
 - d. Be orderly.

By uttering a sentence involving Genuine \bar{A} -movement, a speaker deviates from the most common sentence structure, which would be a subject- or adverb-initial clause. In this sense, it can be argued that a manner maxim is violated—the speaker deliberately chooses an uncommon, infrequent way to utter the proposition. Non-subject initial sentences are also known to be harder to parse and to acquire (see Weskott et al. 2011 for an overview of experimental studies), which further supports the view that they can be seen as less “perspicuous”. The interpretative effect described by Frey (2010) could thus stem from pragmatic reasoning rather than being conventionally encoded: when encountering a non-subject initial sentence, one might wonder why the speaker chose a less straight-forward way to utter it, and I think the conclusion is not far-fetched that the speaker wanted to convey some additional meaning concerning the element that was preposed instead of the subject. An approach along these lines is proposed by Skopeteas & Fanselow (2011), which will be discussed in more detail in section 2.4

In order to decide between the two outlined possibilities, tests can be applied. As discussed in the previous subsection, Frey (2010: 1426) applies one of the tests: conversational implicatures are cancellable, conventional ones are not. I argued above that the way Frey applies the test is not fully coherent with his definition of the conventional implicature; but let us assume it included that the speakers finds the fronted element remarkable in some way, and reconsider the example (repeated below in (37)) in comparison to a parallel example involving a clear case of a conventional implicature, the expressive ‘damn’. I think that the degradedness that Frey reports for the continuation in (37b) is clearly much weaker than (38b). In the latter case, my intuition is that the speaker is contradicting herself or being ironic; this impression does not emerge for (37).

- (37) Wie hat Maria ihre Tür gestrichen? *‘How did Maria paint her door?’*
- a. Grün hat Maria ihre Tür gestrichen...
Green has Maria her door painted
‘Maria painted her door green...’
 - b. #...aber das ist ja nicht weiter erwähnenswert.
‘...but this is not worth noting.’
- (38) *Where is the dog?*
- a. The damn dog is on the couch...
 - b. #...and I do not have any special feelings concerning that dog.

What is more, I think that (37b) can even be fully coherent with the preceding utterance—depending on intonation. I will elaborate on that idea further in the second part of the thesis. In sum, I conclude that although I see parallels between the phenomenon discussed in Frey (2010) and standard cases of conventional implicatures, there is not enough support to favor of this analysis over one in terms of conversational principles.

2.3.5 The role of the stress requirement

Frey’s (2010: 1423) definition of the conventional implicature begins with the sentence “Let S be a declarative sentence involving \bar{A} -movement of a constituent α containing a stressed subconstituent β .” I see several problems with the way in which a relation to stress is established here. The first problem is that it is not made entirely clear what is meant by “stress” in phonological terms. On p. 1418, Frey indicates that the requirement is to be “stressed beyond the word accents”. However, typically several levels of prosodic prominence are assumed above the level of word accents; see e.g. Féry (2011) for a system distinguishing between prominence at the level of (potentially recursive) phonological phrases and intonational phrases for German. Examples like (39) (from Frey: 1418) indicate that Frey probably means that an \bar{A} -moved element must be the most prominent one at the level of the intonation phrase, which would correspond to the whole utterance in this example; this is suggested by the fact that *GRÜN* is the only word set in capital letters, which could indicate that it has to be more prominent than any other element in the utterance.

- (39) Die Tür braucht eine neue Farbe.
 a. *Grün will sie Maria streichen.
 b. GRÜN will sie Maria streichen.

It would help to make the claim more specific in this respect in order to make the predictions and the relation to other approaches clearer, both to those making reference to accentuation (Fanselow 2004, Fanselow & Lenertová 2011), and those that restrict prefield movement to certain information-structural categories (Fanselow 2002). For example, (39a) would be excluded under Fanselow’s (2002) approach as *grün* is neither focused nor topical; under Fanselow & Lenertová’s (2011) approach, it would only be excluded if both *grün* and *Maria* carry phrasal accents, as accented categories are assumed not to be able to cross each other. Sharpening the notion of “stress” would help to see to what extent the predictions of Frey’s (2010) model overlap with these other approaches.

The second problem is the relation between the prosodic stress requirement and the interpretative exhaustivity/emphasis requirement. Frey makes the claim that contrast/emphasis is systematically encoded syntactically in German, whereas the relation between contrast/emphasis and prosody is not as clear:

“The question whether the notion of contrast is necessary for the description of a given language is easy to answer if the language employs some formal marking

which functions to indicate a contrastive interpretation of a certain item. Formal markings can be achieved by prosodic, morphological or syntactic means. It is beyond dispute that in German, the language considered in this paper, contrastiveness is not marked morphologically. [...] [T]he correlation between the shape of the accent and the information-structural status of the accented constituent is not strong [...] So the question arises whether German makes use of any syntactic means that unambiguously designate an item as to be contrastively interpreted. In the following, I want to argue that, in fact, there exists at least one operation whose interpretative effect seems to call for a description in terms of contrastivity.” (Frey 2010: 1416–1417)

This suggests that the interpretative and prosodic effect of Genuine \bar{A} -movement (emphasis / prosodic prominence) happen to co-occur, but are not causally related. Thus, two unrelated stipulations are made, although there is evidence that the two properties are systematically related, some of which Frey mentions on p. 1416, but assesses as not conclusive; further evidence will be reviewed in the second part of the thesis in some detail. In my view, the right analytical components are present in Frey’s (2010) analysis (prosody and interpretation), but not making use of the relation between them in the analysis amounts to a loss with respect to parsimony and explanatory adequacy.

A further problem is that it is not specified how the stress requirement is implemented in the grammar—is it active during the derivation? In the next subsection, I will consider whether an implementation in terms of a formal feature would work technically.

2.3.6 Syntactic implementability

Frey (2010) focuses on the specifics of the pragmatic effect induced by Genuine \bar{A} -movement, leaving open the question how exactly it is anchored in the syntax. Rather than implementing the interpretative effect as a direct condition for movement in form of a formal feature as in Frey (2004), we now find the formulation “Let S be a declarative sentence involving \bar{A} -movement of a constituent α . [...] A set M denoting salient referents becomes part of the interpretation process...”. The interpretative effect is crucially formulated from a perspective in which a sentence containing \bar{A} -movement already exists. How the Genuine \bar{A} -movement exactly happens, what is its syntactic trigger, and how it is restricted is left open; we only learn that *if* a speaker has chosen to use a structure involving Genuine \bar{A} -movement, a certain interpretative effect arises.

The only explicit statement about the syntactic structure is found in a footnote, and it indicates that a similar multiple-layered structure of the left periphery is assumed as the one proposed in Frey (2004): “I assume that the CI is associated with the (empty) head of the functional projection whose Spec is targeted by \bar{A} -movement.” (Frey 2010: footnote 7 on p. 1423). In another footnote (footnote 3 on p. 1418), it is stated that Formal Movement (the minimal movement type) is assumed to be triggered by an EPP feature and restricted by a minimality

condition (“Attract Closest”). These assumptions suggest that a Minimalist feature-checking system is generally still assumed; for concreteness, I will presume that it is the system described in Chomsky (2000, 2001). In this system, an *uninterpretable/unvalued* feature (a *probe*) introduced into the derivation triggers a search for a matching *interpretable/valued* feature in its c-command domain. When a matching feature is found, an *Agree* relation is established, and the uninterpretable feature can be deleted, saving the derivation from crashing at the interfaces. Overt movement only happens when the probing feature is associated with an EPP property. It is not made explicit neither in Frey (2004) nor in Frey (2010) that it is exactly this system that is assumed, but the used terminology implies so (Frey speaks about features with/without EPP properties rather than weak/strong features as in the system proposed in Chomsky 1995). Within this system, Genuine \bar{A} -movement also needs to be triggered by feature checking, but it is not made explicit what feature it is that triggers it.

At first sight, a certain duplication seems to be involved: a formal feature is still needed to distinguish between Formal Movement and Genuine \bar{A} -movement syntactically (otherwise these two operations would work in the same way), and then there is the conventional implicature, which is assumed to be associated with the head of the functional projection targeted by Genuine \bar{A} -movement, suggesting that it is some kind of semantic feature of that head. The question arises how the movement-triggering feature and the semantic feature are related. I would like to discuss the following three possibilities: (i) the feature that triggers the movement is identical to the interpretative CI feature, (ii) the movement is triggered by a completely unspecific feature, and (iii) the movement is triggered by a specific feature, which is however distinct from the one that is interpreted. I am going to argue that the first and the third possibility are in principle implementable. The third possibility seems to be preferable to me, because it allows to include the stress requirement whose unclear status in the model was discussed in the previous subsection.

Option (i) would amount to assuming that there is in fact only one kind of feature involved, namely an emphasis feature (in Frey’s 2010 sense of being the highest element on a scale). Spelled out concretely, this would mean that a lexical item can enter the numeration with an optional emphasis feature (see Chomsky 1995: 231 for the distinction between intrinsic and optional lexical features; in short, intrinsic features are those that a specific lexical item always has, e.g. the gender feature of a noun; optional feature are those that are variant, e.g. the number feature of a noun). At some point in the derivation, the relevant left-peripheral head is merged, which is associated with an uninterpretable version of the emphasis feature that needs to be checked by the lexical item. The uninterpretable feature has to have an EPP property in order to trigger movement of this item. An *Agree* relation is established between the left-peripheral head with the uninterpretable feature and the lexical item with the emphasis feature, the uninterpretable feature is deleted, and the lexical item is moved to the specifier of the head. If the movement-triggering, uninterpretable feature, and the semantic CI feature are to be identical, the following problem arises (which is already evident from the

terminology): if the system of uninterpretable and interpretable features is taken seriously, then the idea is that the movement-triggering feature (in our case, the left-peripheral emphasis feature) is literally not interpretable at the semantic interface, thus, it has to be deleted in the course of the derivation. Thus, there is strictly speaking no way in which the feature that triggers the movement can at the same time be responsible for the interpretative effect.

The situation is comparable to *wh*-questions with a fronted *wh*-constituent. A similar problem arises there if *wh*-movement is modeled via an uninterpretable feature in the left periphery and an interpretable feature on the *wh*-element. Since the left-peripheral uninterpretable feature by definition cannot enter the semantic computation, an additional feature has to be posited to mark the sentence as an interrogative. According to Pesetsky & Torrego (2007), within the system described in Chomsky (2000, 2001) it is necessary to differentiate between the trigger of *wh*-movement and its semantic effect: an uninterpretable *wh*-feature Agrees with the *wh*-element and triggers its movement, whereas the interrogative semantics stems from an additional *Q* feature. Pesetsky & Torrego problematize this duplication. They propose that interpretability and triggering of movement should be kept apart. Within their system, a feature can be interpretable and still trigger movement. The idea is that a feature must have a semantic interpretation in some syntactic location. The Agree operation unifies two features; and if one of the instances is uninterpretable in its own syntactic position, it becomes licensed if the other one is interpretable in its position. In particular, according to their analysis, a left-peripheral question feature has a semantic interpretation in its position (it brings about an interrogative interpretation at the propositional level), and can trigger the movement of a *wh*-element, which is assumed to bear an uninterpretable question feature and thus needs to be unified with the left-peripheral feature via an Agree relation. An analogous analysis could be adopted for the emphasis feature, enabling it to trigger the movement of an element with a matching uninterpretable feature and to convey the CI interpretation at the same time. In Pesetsky & Torrego's system, it is equally possible that the element undergoing movement carries the interpretable feature and the higher one an uninterpretable one, or the other way around, as the motivation for an Agree operation is present in both cases. As for the emphasis feature, I think it would be more plausible that the left-peripheral feature is the one that is interpreted. Recall that the implicature is that the sentence is ranked highest among a set of *sentences* resulting from replacing the fronted constituent by alternatives; this is a meaning component that has to enter the semantic computation at the *propositional* level, and it is difficult to see how this would be possible if it was encoded in a feature directly associated with a lexical item or a constituent.

The second possibility would be to assume that the triggering feature is completely un-specific, i.e. it can attract any category, not just ones that fulfill a specific requirement. The freely fronted category would then receive the emphatic interpretation. However, the system proposed by Frey crucially relies on the distinction between minimal and non-minimal movement. If this distinction is not to be given up, and both types of movement are triggered

by an EPP feature that is not specified further, one would need to find a different way to ensure that Formal Movement can only attract the closest element, whereas \bar{A} -movement can attract any element. A minimality requirement, or more generally, an economy requirement favoring shorter derivations, however, is a general principle of the computational system, and if it assumed, it would necessarily need to apply to all movement operations.

Finally, the third logical option would be to assume that the movement-triggering feature is distinct from the semantic feature. This would result in a system similar to Chomsky’s (2000, 2001) account of wh-movement mentioned above: there would be two features on the same left-peripheral head. With respect to wh-movement, this enables the option to differentiate between formal features (wh-morphology) triggering the movement and semantic effects (interrogative) arising for the interpretation of the sentence if the head is present. The same could be done for Frey’s emphasis fronting, and it would help to solve the technical problem mentioned in the previous subsection. Frey says that the CI arises for declarative sentences involving an \bar{A} -moved constituent which is stressed. It is unclear how the phonological prominence requirement could be formulated if one of the first two implementations is employed. If, however, the movement-triggering feature and the CI are dissociated, the former could express such a formal requirement. As a consequence, only stressed constituents could be fronted by Genuine \bar{A} -movement, and then the CI would apply to them. This implementation would be reminiscent of Fanselow (2004), who assumes that what is fronted to the prefield is determined by formal (morphological/phonological) rather than semantic properties. It would amount to a deviation from Frey’s (2010) proposal to the extent that a certain systematic relation between the phonological property of being prosodically prominent and the interpretative property of being emphasized would be introduced in that they would be two features (a formal and a semantic one) of the same head.

There is one problem that arises for all conceivable implementations of an emphasis feature that is active in the syntactic derivation, and it concerns optionality. In all examples discussed by Frey (2010), fronting the exhaustive/emphatic element is at most the preferred option—the in situ version is never completely unacceptable (maybe with the exception of correction without a negating particle). Within a Minimalist framework, this would need to be modeled by assuming that the relevant feature is inserted into the derivation *optionally*. If it is inserted, it triggers the fronting operation. The question then is whether an exhaustive/emphatic interpretation can also be achieved without that feature being present. If not, then fronting exhaustive/emphatic elements should be obligatory. If yes, then the fronting should never happen: economy conditions banning derivations with superfluous movement steps or superfluous symbols (which are not necessary for convergence at the interfaces) are core assumptions of the Minimalist program (Chomsky 1995: ch. 2)¹⁰, and if a convergent

¹⁰In more recent work, a different view is becoming more prevalent, namely that syntactic movement is a free operation, which does not have to be stipulated, in contrary, it “can only be blocked by stipulation” (Chomsky 2008: 140–141); however, Frey’s (2010) system must involve a minimality/economy condition in view of the way Formal Movement is characterized.

derivation not involving Genuine \bar{A} -movement and emphasis features is available for a set of lexical items, it will always be preferred. If the phenomenon really involved syntactic feature-checking, we would thus rather expect a categorical behavior of sentences involving an exhaustive/emphatic element—they should be fronted either always or never—rather than the rather subtle and gradient patterns that is observed in the most part of the data (see also Fanselow & Lenertová 2011: section 2.2 and Broekhuis 2008: 28 for related discussion of optional movement).

I think that out of the three options that were considered, the third one is the preferable one, as it allows to incorporate the stress requirement, which otherwise would need to be stipulated as a side effect; but all options encounter the optionality problem. In the second part of the thesis, I will present an alternative account that also incorporates prosody—in fact, it ascribes it the major role in the discussed phenomenon—and which does not involve, I believe, the empirical and conceptual problems discussed here and in the previous sections.

2.4 Alternative proposals for encoding a syntax-emphasis relation

There are some other approaches, in which a relation between syntactic fronting and emphasis or similar interpretative effects is established, but without implementing it in narrow syntax. One example for such an approach is Skopeteas & Fanselow's (2011) account of left-peripheral movement. They present a set of cross-linguistic experiments that show that in some languages, including German, left-peripheral movement of focused objects is typically associated with an exhaustive interpretation—unless the fronted element has another special interpretative property. In particular, exhaustivity vanishes if the fronted constituent is unpredictable in the given context. The authors interpret this result as evidence in favor of the view that exhaustivity is not encoded as an effect of fronting within the syntax, because this would lead to the expectation that it should be an invariable, context-independent effect. Instead, they propose that “the connection is established only indirectly, e.g., as a consequence of a general rule that a marked structure just draws the attention of the addressee to a deviation from the canonical structure” (Skopeteas & Fanselow 2011: section 1). In other words, if a listener or reader encounters a marked structure, they will assume that the speaker had at least one reason to choose this structure; if such a reason is evident e.g. by the fronted element being unpredictable, no additional motivation needs to be accommodated. If, however, there is nothing unusual about the fronted element, the hearer will assume that the speaker wanted to express exhaustivity. This approach is similar to an account in terms of a conversational implicature, as suggested in section 2.3.4 above: the interpretative effect is attributed to pragmatic reasoning of the listener, whose interpretation of an utterance is influenced by the consideration what meaning the speaker probably wanted to convey by using an unusual form.

A similar view is expressed by Hartmann (2008), who discussed cross-linguistic data concerning focus realization. She comes to the conclusion that left-peripheral movement of fo-

cused constituents is a means of expressing increased emphasis (in intonation languages, an alternative means is increasing the prosodic prominence), and a speaker's choice to do so depends on "the urge to express unexpected discourse moves" (Hartmann 2008, section 6). Thus, she shares Skopeteas & Fanselow's (2011) opinion that a relation between emphasis and syntax arises at the level of pragmatics.

Hartmann draws a connection between her approach and Gussenhovens (2004: section 5.7) "Effort Code", which he sees as a universal, extra-grammatical principle of perception. The main idea is that increased effort in speech production signals a speaker's increased interest in getting the message across. Gussenhoven mainly speaks about pitch range in this connection: "Increases in the effort expended on speech production will lead to greater articulatory precision [...], including a wider excursion of the pitch movement. Speakers exploit this fact by using pitch-span variation to signal meanings that can be derived from the expenditure of effort" (p. 85). It is less clear whether it applies to syntactic alteration: it is plausible that moving an element to the initial position could be used to ensure that this element is perceived properly by the listener; however, syntactic movement is not associated with more "effort" in the physical sense that Gussenhoven has in mind here.

Another idea that is in a sense related, but expressed in grammar-internal terms, is that optional operations have to be motivated by an effect on interpretation, as proposed for example by Neeleman & Reinhart (1998). They argue that operations that apply optionally within the syntactic or prosodic systems, like QR-movement or stress shift, must satisfy a general economy condition; i.e., they must only apply if this has an effect at the interpretatory interface. Under the view that non-minimal prefield fronting is an operation that does not have a specific syntactic trigger and can apply optionally during the derivation, it would follow that this movement must be licensed by an interpretative effect at the interface, and that is why the impression arises that the speaker wanted to convey an additional meaning.

Skopeteas & Fanselow's and Hartmann's approaches have in common that they are able to express a connection between emphasis and word order, but on a different level than it is done in Frey's proposal: the interpretative effect is not encoded directly in the syntax, but arises at the interface level, at the earliest, if an underlying principle like Neeleman & Reinhart's economy condition is assumed, or, if one follows Skopeteas & Fanselow's formulation more closely, at the level of pragmatic reasoning about the speaker's intentions. I think that establishing a connection between emphasis and word order at such a higher level helps to avoid most of the problems of a narrow syntactic implementation discussed in the previous section: instead of providing a semantic formalization of the implicature's content, the pragmatic approaches rely on the speaker's reasons to choose an unusual structure, so the specific problems concerning unifying exhaustive and emphatic effects do not arise. Establishing the connection at a conversational/pragmatic level rather than at a conventional/syntactic level averts the problem that the effect seems to be less strong and stable in comparison to typical representatives of conventional implicatures. Finally, the problems related to syntactic im-

plementability do not arise. One problem is not solved straight-forwardly by the alternative approach: it concerns my observation that fronted contrastive topics do not seem to differ interpretation-wise from sentence-internal ones; if this observation can be confirmed, it would require to postulate that the exhaustive/emphatic effect is limited to fronted foci, which does not follow directly from an analysis in terms of pragmatic reasoning.

2.5 Interim summary

In the first part of the thesis, I reviewed the various syntactic approaches to German prefield movement, with special attention to Frey's (2010) proposal according to which non-minimal movement to the prefield is accompanied by an exhaustive or emphatic interpretation. Frey implements the effect in form of a conventional implicature associated with a specific left-peripheral head that is assumed to be targeted by that type of movement. I have tried to show that there are several problems concerning empirical coverage, the unified analysis for exhaustivity and emphasis, the status as a conventional implicature, the role of the prosodic requirement, and syntactic implementability. I reviewed alternative solutions that were proposed in the literature, in which the link between word order and emphasis is established at a higher level, in terms of a pragmatic inference that arises because a marked structure was used. I argued that this type of approach is preferable, as most of the mentioned problems do not arise for them.

3 Empirical part: should emphasis be represented in syntax?

3.1 New proposal: emphasis and syntax interact only indirectly

3.1.1 Motivation

In the first part of the thesis, I concluded that a relation between emphasis and syntax can in principle be established, but it is less problematic to implement this relation at a relatively high/late level in the linguistic model in the form of a pragmatic inference rather than in the form of a syntactic entity. In this part of the thesis, I want to put forward the question whether establishing this relation is necessary from an empirical point of view. The motivation for this question comes from the fact that emphasis plays another well-known role in the grammar: it influences prosody in a systematic way (evidence for this relation will be reviewed below). Prosody, in turn, is known to interact with syntax. An indirect relation between syntax and emphasis thus arises simply as a result of these independently needed and motivated connections. In my view, it is thus worth questioning the necessity of postulating a direct connection between syntax and emphasis in addition. The core idea is that if the observations in which syntax and emphasis seem to interact can be reduced to an indirect effect mediated via prosody, a more parsimonious model could be adopted.¹¹

¹¹The possibility of an indirect prosodic explanation of the interpretative effects is noted by Skopeteas & Fanselow (2011: footnote 10), but not investigated further: "The syntactic operation may coincide with

3.1.2 Relation between prosody and emphasis

The observation that emphasis has intonational correlates is wide-spread in the prosodic literature. Following Ladd’s (1983) overview of this issue, two main types of approaches can be distinguished. In contour-based approaches (e.g., Thorsen 1979), over-all intonational shapes spanning the whole utterance are taken to be the basic units of intonation and to correlate with specific sentence types like declarative or interrogative. Further potentially pitch-affecting factors like emphasis are assumed to correspond to an independent kind of contour, which then interacts with the general grammatically determined contour of the utterance, leading to certain changes of the shape.

A very different kind of approach was proposed by Pierrehumbert (1980), who assumes that the basic units of intonation are not over-all contours, but smaller phonological units: low tones (L) and high tones (H) and combinations thereof. The assumption is that an utterance-spanning intonational shape emerges from a sequence of Hs and Ls, and linguistic meanings should be attributed more locally to these units and the way they are aligned with the utterance’s syllables rather than to the global contour. Pierrehumbert (1980) does not consider emphasis as a phonologically relevant factor, and consequently, there is no unit in her inventory that corresponds to an emphatic accent. In her analysis, a high nuclear pitch accent (i.e. the last high tonal accent in an utterance) can be produced with varying height in relation to the preceding accents, and “what controls this variation is something like ‘amount of emphasis’ ”; describing this factor in more detail is a “task to pragmaticists and semanticists” (Pierrehumbert 1980: 39). In Pierrehumbert’s phonological system, such an accent is always transcribed as H* (a high pitch accent) if it is as least as high as the preceding accents, and there is no possibility to express how high it is exactly.

Ladd (1983) criticizes this point in Pierrehumbert’s system—in his view, a raised peak carries a specific linguistic meaning, and it should thus be possible to represent it in the phonological system. He proposes to enhance Pierrehumbert’s inventory by introducing second-order properties to the phonological units, one of them being the feature *raised peak*. This allows to maintain the insights of Pierrehumbert’s analysis (it is for example still possible to capture the similarity of two utterances with a high pitch accent—they would both involve a H* accent) while allowing to represent also gradient differences (a H* that is extraordinarily high with respect to preceding accents would be annotated with a raised peak feature). Ladd illustrates the influence of accent height on the meaning of an utterance with the example shown in Fig. 1: if the accent on ‘do’ is raised in relation to the preceding accent on ‘won’t’, an interpretative effect of surprise or irritation arises.

A more global effect of emphasis was confirmed experimentally for English by Liberman & Pierrehumbert (1984). They had participants produce the utterance “Anna came with

prosodic properties, in particular with the fact that focus-fronting results in the placement of the focus to the maximally prominent position in the prosodic structure [...] However, [...] we restrict our discussion to the properties of syntactic markedness.”

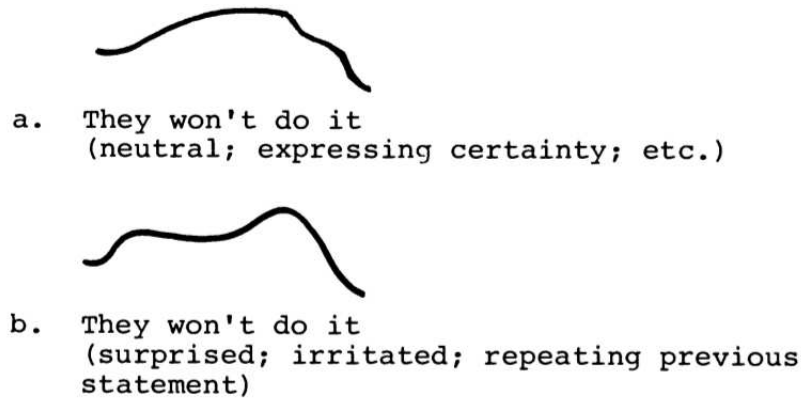


Figure 1: Similar contours, differing in the realization of the peak (from Ladd 1983: 736)

Manny” in two conditions: narrow focus on Anna and narrow focus on Manny. The participants were instructed to produce the utterance several times with an increasing degree of emphasis. Emphasis affected the global pitch significantly, whereas the relation between the accents in the utterance stayed constant.

As for German, prosodic correlates of emphasis were studied most extensively by Kohler and colleagues. For example, Kohler & Niebuhr (2007) elicited emphatic utterances by setting up short contexts that triggered an emphatic reading. They distinguish between *positive emphasis* (as in expressions of pleasure) and *negative emphasis* (as in expressions of dislike) and report that both affect pitch, intensity, and duration of the target utterances. Whereas positive emphasis lengthens the nucleus of the accented syllable and comes with a high pitch, negative emphasis shortens the nucleus and comes with a low pitch (Kohler & Niebuhr 2007: section 5). Kohler (1991) investigates how emphasis relates to peak alignment (i.e. the position of the accent peak in relation to the stressed syllable) and finds a systematic negative correlation of emphasis and early accent peaks; this will be discussed in more detail later in section 3.3.1.

To sum up, it is a well-established finding that emphasis correlates systematically with prosodic factors in English and German. If these factors can be shown to interact with syntactic reordering, the emphatic effect of prefield movement might be reduced fully or in part to the syntax-prosody relation.

3.1.3 Benefits of the proposal

If such a reduction is possible, this would come with the advantage that two very similar phenomena could be unified. As discussed in the first part of the thesis, prefield movement in German can be associated with a range of interpretative effects; Frey (2010) proposed a unifying definition of the effect in terms of being the highest element on a scale, but even this quite broad characterization was argued to be not flexible enough. Moreover, it fails to make reference to the speaker’s intentions—it seems that a better generalization is that the

speakers wants to convey that they find something noteworthy by choosing to front something else than the subject or an adverb. This generalization is very similar to characterizations of the use conditions of prosodically prominent pitch accents as proposed for example in Ladd's and Bolinger's work. Kadmon (2001) summarizes their approaches (specifically, Ladd 1980, 1990 and Bolinger 1986) in the following way that makes the parallels particularly clear:

“Ladd does not attempt to decide whether a pitch accent means ‘new’ or ‘unexpected’ or ‘highlighted’ or something else. I believe that this is as it should be. Allowing flexibility in the interpretation of pitch accent placement is very much in the spirit of Bolinger's work, over many years, on the role(s) of prosodic prominences. [...] Certainly, pitch accents regularly signal that the referent of a given constituent is ‘new’ or ‘unexpected’ or ‘non-salient’ in the context. [...] But pitch accents may also signal something else—for instance, that the speaker attaches special importance to a given constituent or wishes to highlight it.” (Kadmon 2001: 273–274)

The line of reasoning that I want to defend here is that if the interpretative effect of prosodically prominent pitch accents can be characterized in a very similar way as the effect of non-minimal prefield fronting in German, and if the fronting operations can be shown to make the pitch accent on the fronted element more prominent, then it could be the very same principle that explains both phenomena (prosodic prominence → emphasis). This would eliminate the need for two separate similar principles (prosodic prominence → emphasis; special syntactic construction → emphasis).

Moreover, emphasis is an inherently gradient notion, whereas the distinction between an in situ and a fronted constituent is a binary one. I argued above that this leads to certain problems: it is difficult to find a coherent way to “binarize” the emphasis definition (it was shown that requiring the fronted element to denote the single highest element on a scale leads to problematic predictions), and it is difficult to implement gradience and optionality in terms of syntactically active features. Prosodic prominence of pitch accents, on the other hand, is also gradient. Thus, under a prosodic approach, two gradient notions can be coherently related to each other.

3.1.4 Scope of the proposal

My claims are limited to foci. For this category, it is uncontroversial that they can move to the prefield—all theories discussed here provide some mechanism that in principle allows to front foci. In contrast, the theories do not agree in their predictions for given elements. In most accounts, non-topical and non-focal given material is assumed to not be able to undergo non-minimal movement to the prefield (they lack operator status that is required in Fanselow 2002, 2004; they are not the prosodically most prominent element, which is required in Frey's account); according to Fanselow & Lenertová (2011), on the other hand, nothing prohibits

unaccented elements from moving to the prefield. I will exclude unaccented, given elements from the discussion here, because I think that there is not enough empirical data concerning their ability to occur in the prefield. Moreover, the indirect prosodic approach that I propose does not make predictions for unaccented elements, as the presented evidence for the influence of emphasis on prosody concerns pitch accented elements.

As far as contrastive topics are concerned, I think that an indirect, prosody-based account could actually help to get a handle on the problem that the interpretative effects seem to arise only for fronted foci, but not for fronted contrastive topics. The effects of prosody are typically discussed for falling accents associated with new/focal material—for example, Ladd’s (1983) ‘raised peak’ was conceptualized as a secondary property of the H* accent, which is a type of accent that is typically associated with new/focal material in German, not with contrastive topics—the latter are rather typically associated with a rising accent, which would be represented as L*H in this system, followed by a high plateau and then a fall on the focused constituent (“hat contour”, cf. Féry 1993, ch. 4.3). Interpretative effects of differences in the exact realization of the accent have been described by Jacobs (1997). He suggested that it matters how deep the pitch minimum of the low accent is: only if it falls to an especially deep level before the rise, the expectation of a contrastive continuation arises; if it is merely a rise without a preceding fall, no continuation is necessary (p. 98–100). This is a completely different effect than what has been found for increased prominence of falling accents. Consequently, if the prosodic proposal is on the right track, it could be argued that prefield movement increases the prosodic prominence of the fronted element, but increased prominence of falling accents is associated with different interpretative effects than increased prominence of rising accents, which would explain why foci behave differently from contrastive topics. Alternatively, under an analysis in terms of prosody, there could be another explanation for the different behavior: if we adopt Skopeteas & Fanselow’s (2011) idea that using a marked structure requires at least one motivation, then the lack of an interpretative effect of fronted contrastive topic objects could be due to the presence of an independent motivation, namely the requirement that a contrastive topic needs to precede the focus in order to form a hat contour. If the contrastive topic is the object and the focus is the subject, as in the examples discussed in section 2.3.2, this requirement would motivate movement. However, this potential benefit of the proposal concerning the distinction between contrastive topics from foci is only hypothetical so far, and it remains to be tested whether fronted contrastive topics really lack the interpretative effects arising from focus fronting; thus, I will also not discuss this category here and leave these question for future research.

A further limitation in scope is that I will only be concerned with direct objects in the experiments. If it can be shown that the emphatic effect arises indirectly via prosody for focused objects, this would suggest that object initial sentences are not marked, striking, or infrequent enough to trigger a conversational implicature based on Grice’s maxim of manner. This would not exclude the possibility that fronting of other categories could trigger a directly

syntax-based implicature.

Finally, I only tested for emphasis, but not for exhaustivity in the experiments that I will present in the following sections; therefore, it remains an open question whether the prosodic approach can also account for the exhaustivity effect of object fronting.

3.1.5 Hypotheses and outline

The two competing ideas could be schematized as follows:

(40) **Direct relation:** word order ↔ emphasis

A focused object is fronted.

→ The change in word order causes increased emphasis.

(41) **Indirect relation:** word order ↔ prosody ↔ emphasis

A focused object is fronted.

→ This is typically accompanied by changes in the prosodic realization, because initial foci are realized differently than sentence-internal ones.

→ The prosodic changes cause increased emphasis.

If the indirect relation holds, a difference in average perceived emphasis should be found between OVS and SVO order when the materials are presented in written form—in that case, the prosody can be assigned freely and will (by assumption) involve increased emphasis-related prosodic features on the object in most cases; if, on the other hand, the materials are presented auditorily in such a way that the prosodic realization of the object is as similar as possible in both word order variants, no difference in perceived emphasis should be found. This line of thought can be broken down into the following three hypotheses:

1. When native speakers of German read an OVS sentence with narrow object focus, the object is perceived as more emphatic than in the corresponding SVO sentence.
2. When native speakers of German read an OVS sentence with narrow object focus, the object is typically realized with more emphasis-supporting prosodic features than in the typical prosodic realization of the corresponding SVO sentence.
3. When native speakers of German perceive an OVS sentence with narrow object focus and the corresponding SVO sentence in which the realization is identical with respect to emphasis-related prosodic features, the object is perceived as equally emphatic in both sentence types.

The main prosodic features that I assume to be related to emphasis and that will be investigated here are pitch height, peak alignment, and relative metrical prominence.

Hypothesis one is basically a re-formulation of Frey's (2010) observation, except that the claim that focused object fronting is emphatic is restricted to sentences in written form.

Hypothesis two is a necessary prerequisite for the depicted indirect relation idea to make sense: only if an initial focused object differs in emphasis-relevant prosodic properties from a sentence-internal focused object, there is a point in trying to disentangle prosodic from syntactic effects. The third hypothesis is the crucial test case for which two different ideas make different predictions: if word order is related directly to emphasis, we should see an effect in the absence of prosodic difference.

In the following sections, I will present a series of experiments, which were designed to test the hypotheses described above. Here is an overview of the experiments and the line of argumentation that I will pursue:

In order to test hypothesis 1, I conducted a study with written materials, in which participants were asked to choose a fitting context for SVO/OVS sentences with narrow object focus. This forced choice task is based on one of the examples given in Frey (2010) and is intended to reveal as how emphatic the object is interpreted. The results indicate that there is indeed a significant preference for a more emphatic interpretation in OVS word order: the context that I assume to support an emphatic interpretation was chosen for 17.3% of the SVO sentences and 28.5% of the OVS sentences.

Hypothesis 2 was investigated in a production study. 10 participants read out SVO/OVS sentences. The results show that initial foci typically show a higher pitch and a later peak than postverbal ones; these two properties are known to be related to emphasis. Also, most postverbal foci co-occur with prenuclear accents, potentially reducing their perceived prominence, whereas initial foci usually carry the only pitch accent in the utterance due to post-focal compression. However, there is considerable intra- and inter-speaker variability.

A perception study was designed to test hypothesis 3. The same sentences and the same forced choice method as in the written study was used. However, auditory materials were created. For this, an SVO version of each item was recorded twice: once with a highly emphatic pitch accent on the object (high pitch maximum, late peak) and once with a non-emphatic pitch accent (low pitch maximum, early peak). Then, an OVS version of the sentence was recorded, and the object was cut out of the signal. It was replaced by the object from one of the SVO versions, using the splicing technique. This resulted in four versions of the same sentence: one SVO version with an emphatic pitch accent on the object, one OVS version with a phonetically exactly identical realization of the object, and analogously, SVO and OVS versions with an identical non-emphatic pitch accent on the object. The accent pattern of the remaining part of the sentence was held constant by deaccenting the subject and the verb not only in postnuclear, but also in prenuclear position. This accent pattern was not prevalent but attested in the data of the production study; the same holds for early peaks in initial position and late peaks in postverbal position. The results show a significant influence of accent type (emphatic vs. non-emphatic), no effect of word order, and no interaction.

I take this as evidence that to a considerable part it is the prosodically special status of fronted focused objects that leads to a more emphatic interpretation.

3.2 Testing hypothesis 1: written study

3.2.1 Introduction and background

The goal of experiment 1 was to test Frey's (2010) observation that focused objects in the prefield are perceived as more emphatic than in situ in a controlled experimental study. The experiment is based on Frey's papaya example, which is repeated here again as (42):

(42) *from Frey (2010: 1424):*

Was hat Otto dieses Mal Besonderes auf dem Markt gekauft?

'What extraordinary thing did Otto buy on the market this time?'

a. Papayas hat er dieses Mal gekauft.

papayas has he this time bought
'He bought papayas this time.'

b. Er hat dieses Mal Papayas gekauft.

As discussed in section 2.2, according to Frey (2010) (42a) with OVS word order fits more smoothly into the context, because the special status of the object that is introduced in the question is also expressed in the answer by the fronting operation. For the purpose of this study, I interpret this statement as a biconditional; i.e., I assume that if emphasis on an element is expressed in the answer, the prediction is that it also fits better into a context in which the emphasis is also expressed than into a context in which this is not the case. Applied to the concrete example, it means that if the informants had to choose between two contexts for (42a), the prediction would be that they would choose a context containing a word like 'extraordinary' than a context without such a word. Turning the prediction this way, it is possible to construct a forced-choice test with word order (SVO vs. OVS) as the independent variable and the degree of emphasis as the dependent variable, operationalized as the proportion of cases in which the context expressing emphasis was chosen.

3.2.2 Participants and procedure

20 students took part in the experiment for course credit and/or participation in a lottery. They filled in an online-questionnaire that was set up using the *OnExp* software (Onea & Syring 2011, <http://onexp.textstrukturen.uni-goettingen.de>). They were instructed to read the target sentence and imagine it was uttered as an answer to one of the two provided contexts, and to choose in which context the answer would be more felicitous. In case the answer fit equally well into both contexts, they were instructed to choose one of them freely. Each item was presented on a separate page, and the participant had to click on a button to proceed to the next one. Each participant saw 16 experimental items in randomized order intermixed with 16 fillers. Which of the contexts appeared to the left and to the right, respectively, was also randomized. Completing the questionnaire took around 10 minutes.

3.2.3 Materials

16 items were constructed. They all involved two context questions between which the participants had to choose: one of the questions contained one word out of the set {*Besonderes* ‘special’, *Außergewöhnliches* ‘extraordinary’, *Bemerkenswertes* ‘remarkable’, *Erstaunliches* ‘astonishing’} as a modifier of the object, whereas the other question did not. All answers contained a proper name as the subject, an indefinite DP as the object, a perfect tense auxiliary and a participle verb. They were constructed in two conditions: SVO vs. OVS word order. In half of the items, the object was a bare plural and in the other half it was singular with an indefinite determiner. Since the same materials were used in the auditory perception study that will be described in section 3.3, objects with sonorant phonemes were preferred. An example item in a format similar to what the participants saw on the screen is given in (43); a full list of the 16 answers can be found in the following results section.

- (43) a. *Condition a: SVO order*
- Was hat Lena gekauft? Was hat Lena Besonderes gekauft?
- Lena hat Bananen gekauft.
- b. *Condition b: OVS order*
- Was hat Lena gekauft? Was hat Lena Besonderes gekauft?
- Bananen hat Lena gekauft.

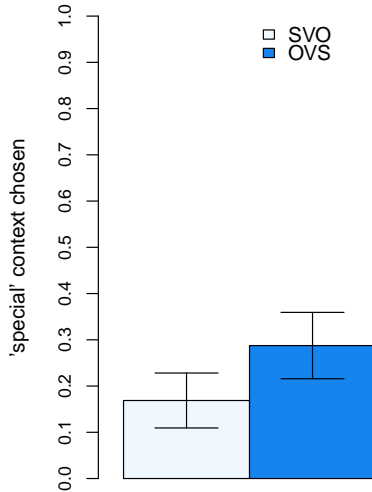
In addition, 16 fillers were created. They had the same structure, but they involved different modifiers most of which I do not assume to be related to emphasis, e.g. “warm” or “new”. Each of them was constructed in only one of the conditions, i.e. either in SVO or OVS order. An example is shown in (44); a full list can be found in the results section.

- (44) a. *Filler:*
- Was hat Karl mitgebracht? Was hat Karl Neues mitgebracht?
- Karl hat ein Brettspiel mitgebracht.

3.2.4 Results

The results are illustrated in Fig. 2 and summarized in Tab. 3. According to a logistic regression model, which was fit using the *glm* function in *R*, there was a significant main effect of the factor WORD ORDER ($z = 2.69$, $p = 0.01$): the context containing a word like ‘extraordinary’, ‘special’, etc. (‘special context’ for short) was chosen more often in the case of OVS sentences than SVO sentences. In Table 4, the results are shown for each item separately. In ten out of sixteen items, the special context was chosen more often, two items show equal proportions, and in four items, the preference was reversed.

The results of the filler items are summarized in Tab. 5.



	SVO	OVS
'special' context chosen	16.88%	28.75%

Figure 2: Plot of the results of the written study with 95% confidence intervals

Table 3: Summary of the results of the written study

3.2.5 Discussion

The results support the observation reported in Frey (2010): participants indeed tend to find a context in which an object is expressed to denote something special as fitting better to an answer in which this object is fronted. Following Frey’s (2010) reasoning, this indicates that object fronting expresses emphasis.

It is also interesting to have a look at the results for the filler items. They are summarized in Table 5. To some extent, they can reveal a bit more about how the participants went about the task. In my view, the pattern can be interpreted this way: the participants tended to choose the context containing a modifier in two cases: if the property denoted by the modifier is very common or even inherent to the object, or if it follows from something mentioned in the dialog that the object has the property. Filler items 9–11 are examples of the first case: slippers are usually cozy, fur coats are usually warm, and tailcoats are usually fancy. In all three cases, the context containing the modifier was chosen by more than 50% of the participants. The only other filler item with such a high result is item 8, and I think it is an example of the second case: a dancing course is not necessarily/usually new, but it logically follows from the verb *ausprobieren* ‘try out’ that it is new to Paula. All other items with relatively high ratings (above 30%–50%) can be subsumed under one of these cases, too, I believe: in items 2, 4, 6, and 7, the verb is related to the property in some way (the outcome of the activity denoted by *basteln* ‘to make/tinker’ is usually something nice, similarly for knitting; something that is ‘demonstrated’ is typically a finding or invention and therefore new; and something that is ordered is also typically new) and in items 15 and 16, the property commonly holds of the object. In the items that got lower ratings, namely items 1, 3, 5, 12,

#	item	translation	SVO	OVS
1	Lena hat Bananen gekauft.	‘Lena bought bananas.’	0%	30%
2	Uli hat Maronen gekocht.	‘Uli cooked chestnuts.’	50%	50%
3	Manuel hat Lilien verschenkt.	‘Manuel gave away lillies.’	20%	50%
4	Nora hat Gorillas gesehen.	‘Nora saw gorillas.’	30%	20%
5	Bodo hat Lollis bekommen.	‘Bodo got lollipops.’	0%	20%
6	Mona hat Lamas gezeichnet.	‘Mona drew lamas.’	10%	20%
7	Laura hat Gemüse bestellt.	‘Laura ordered vegetables.’	0%	30%
8	David hat Löwen gemalt.	‘David painted lions.’	10%	30%
9	Tamara hat ein Lineal ersteigert.	‘Tamara purchased a ruler.’	10%	50%
10	Georg hat eine Garnele gegessen.	‘Georg ate a prawn.’	60%	20%
11	Julia hat eine Limonade getrunken.	‘Julia drank a lemonade.’	0%	30%
12	Mario hat eine Angel verkauft.	‘Mario sold a fishing rod.’	20%	0%
13	Paul hat eine Eule beobachtet.	‘Paul observed an owl.’	20%	60%
14	Anna hat einen Magneten gefunden.	‘Anna found a magnet.’	20%	20%
15	Lars hat eine Lampe gewonnen.	‘Lars won a lamp.’	10%	30%
16	Isabell hat eine Melone geholt.	‘Isabell fetched a melon.’	10%	0%

Table 4: Results of experiment 1 by items; percentage values show the proportion of cases in which the special context was chosen

13, and 14, nothing indicates whether the property holds of the object or not; e.g., sandals can be expensive or not.

In sum, I think that what the participants did in response to the task can be described as follows: only if there was any hint that the object DP had the property denoted by the modifier in one of the questions, either based on world knowledge or on the meaning of other elements in the dialog, they tended to choose the question containing the modifier. This is a desirable finding in view of the goal of the experiment. We can see the influence of the world knowledge factor in the experimental items as well: object DPs that denote something more valuable or rare (e.g. ‘a prawn’) made it generally more likely that the special context was chosen than DPs denoting more ordinary things (e.g. ‘bananas’). However, since this factor was constant in both conditions in the experiment, it cannot explain the difference found between SVO and OVS order. If the participants behaved similarly with respect to the filler and experimental items, one could conclude that the observed difference is a result of the second case in which participants tended to choose the modified question: something else in the sentence indicates that the object has the property denoted by the modifier; and since the only difference between the conditions was whether it was SVO or OVS, in my view it is a plausible conclusion that in some way, the word order was considered to indicate that the object is special, extraordinary, etc.

An alternative strategy that the participants might have employed could be the tendency to choose the modified context whenever the answer was in OVS order. The data indeed show a slight trend in that direction: the modified context question was chosen for 35.6% of the filler items with OVS order and for 30.8% of those with SVO order. This difference was not

#	item	translation	order	result
1	Was hat Lisa (Nettes) genäht? Lisa hat eine Weste genäht.	‘What (nice thing) did Lisa sew?’ ‘Lena sewed a vest.’	SVO	20%
2	Was hat Thomas (Nettes) gebastelt? Einen Behälter hat Thomas gebastelt.	‘What (nice thing) did Thomas make?’ ‘Thomas made a container.’	OVS	35%
3	Was hat Nina (Nettes) getöpft? Nina hat einen Krug getöpft.	‘What (nice thing) did Nina craft?’ ‘Nina crafted a jar.’	SVO	5%
4	Was hat Hannes (Nettes) gestrickt? Eine Mütze hat Hannes gestrickt.	‘What (nice thing) did Hannes knit?’ ‘Hannes knitted a cap.’	OVS	35%
5	Was hat Karl (Neues) mitgebracht? Karl hat ein Brettspiel mitgebracht.	‘What (new thing) did Karl bring?’ ‘Karl brought a board game.’	SVO	21%
6	Was hat Tina (Neues) vorgeführt? Ein Chatprogramm hat Tina vorgeführt.	‘What (new thing) did Tina demonstrate?’ ‘Tina demonstrated a chat program.’	OVS	45%
7	Was hat Nils (Neues) angefordert? Nils hat Kopfhörer angefordert.	‘What (new thing) did Nils order?’ ‘Nils ordered headphones.’	SVO	30%
8	Was hat Paula (Neues) ausprobiert? Einen Tanzkurs hat Paula ausprobiert.	‘What (new thing) did Paula try?’ ‘Paula tried a dancing course.’	OVS	65%
9	Was hat Martin (Warmes) im Schrank? Martin hat einen Pelzmantel im Schrank.	‘What (warm thing) does Martin have in his closet?’ ‘Martin has a fur coat in his closet.’	SVO	55%
10	Was hat Elke (Gemütliches) im Schrank? Pantoffeln hat Elke im Schrank.	‘What (cozy thing) does Elke have...?’ ‘Elke has slippers in her closet.’	OVS	60%
11	Was hat Robert (Schickes) im Schrank? Robert hat einen Frack im Schrank.	‘What (fancy thing) does Robert have...?’ ‘Robert has a tailcoat in this closet.’	SVO	60%
12	Was hat Olga (Teures) im Schrank? Sandalen hat Olga im Schrank.	‘What (expensive thing) does Olga have...?’ ‘Olga has sandals in her closet.’	OVS	5%
13	Was hat Berta (Langweiliges) gelesen? Berta hat ein Gedicht gelesen.	‘What (boring thing) did Berta read out?’ ‘Berta read out a poem.’	SVO	10%
14	Was hat Klaus (Uninteressantes) im Kino gesehen? Einen Horrorfilm hat Klaus im Kino gesehen.	‘What (uninteresting thing) did Klaus see in the cinema?’ ‘Klaus saw a horror movie in the cinema.’	OVS	5%
15	Was hat Emma (Witziges) erwähnt? Emma hat ein Internetvideo erwähnt.	‘What (funny thing) did Emma mention?’ ‘Emma mentioned an internet video.’	SVO	45%
16	Was hat Felix (Ruhiges) aufgelegt? Eine Jazzplatte hat Felix aufgelegt.	‘What (calm) thing did Felix put on?’ ‘Felix put on a jazz record.’	OVS	35%

Table 5: Results of the fillers from experiment 1 by items; percentage values show the proportion of cases in which the context containing a modifier was chosen

significant ($z = 0.43$, $p = 0.67$), but this could be investigated in more detail with a more systematically manipulated set of items.

3.3 Testing hypothesis 2: production study¹²

3.3.1 Introduction and background

The first goal of the production study was to find out whether there are prosodic differences in the realization of focused objects in initial and in sentence internal position that might influence as how emphatic they are perceived. The second goal was to show that although there is a typical realization for each word order, there is also variation. This is important for the perception study that will be presented in the next section. There, SVO/OVS sentences were created in which the object was phonetically identical. It is thus important to show that initial and sentence-internal objects *can* be realized similarly, although this is less frequent, in order to ensure that the materials did not involve unnatural realizations. Furthermore, the collected data was such that it also allowed to check whether any prosodic differences between subject- and object-initial sentences can be found that would support syntactic models in which they are assumed to be structurally different.

One of the prosodic properties that I wanted to investigate in the production study was pitch scaling. It is a property that is both known to be related to emphasis and that is very likely to differ between the two word orders. As discussed in section 3.1.2, Liberman & Pierrehumbert (1984) showed that increased emphasis is realized by increased pitch height; Kohler & Niebuhr (2007) observe the same for German. At the same time, pitch height is a property in which a sentence-internal object is very likely to differ from an initial object, simply due to declination, i.e., the advancing decrease in pitch height that always occurs during the course of an utterance. Féry & Kügler (2008) have shown that a pitch accent on the linearly first argument in the German midfield is produced with a higher pitch than a pitch accent on the second argument, and this one is in turn produced higher than a pitch accent on the third argument (irrespective of which of them is the subject, direct object, and indirect object). Therefore, pitch height is an ambivalent feature for the goals of this study: on the one hand, it is a top candidate for a prosodic property that might mediate between word order and emphasis in the way envisioned above: fronting a focused object will typically increase the maximal pitch height of its pitch accent, and this might play a role for the degree of emphasis with which it is perceived. On the other hand, declination makes elements in different syntactic positions difficult to compare with respect to pitch height. As Pierrehumbert (1979) has shown, when there are two pitch accents within one utterance with an objectively identical maximal fundamental frequency, the second one is perceived as about 10 Hz higher than the first one. This is due to the phenomenon that listeners normalize for expected declination. For this reason, only limited conclusions can be drawn if it is found that

¹²I am grateful to Nele Salvete and Susanne Genzel for very helpful discussion and crucial support in designing the study, and to Sarah Pötzl for help with the recordings.

initial objects have a higher pitch than sentence-internal ones. Nevertheless, maximal pitch height will be reported for the production data. First, this will allow to quantify the difference and to assess how plausible it is that the difference is evened out perceptually. Second, it will allow to find out whether there are cases in which the object is produced equally high in both positions, which would validate using materials with equal height in the perception study.

Another property that will be investigated is the alignment of the pitch peak. Foci are mostly realized with falling accents in German; however, at which position in relation to the stressed syllable the pitch maximum occurs varies. Based on perception experiments, Kohler (1991) proposed to categorize them into three groups: early fall, medial fall, and late fall. One of the example utterances that Kohler tested is *Sie hat ja gelogen* ‘She has lied’. Several versions of the utterance were created, differing in whether the pitch maximum preceded the stressed syllable *lo* in *gelogen* (early peak), or was located within the stressed syllable (medial peak), or far to the right within the stressed syllable or in the following syllable (late peak). Participants had to judge whether the utterance fit into the context that it was embedded in. In the first context, ‘Once a liar, always a liar. This also applies to Tina. ...’, the target sentence restates a fact that is already inferable from the preceding context and serves to finalize the argument. In the second contrast, ‘Now I understand. ...’, the target sentence provides new information. In the second context, ‘Oh! ...’, an emphatic status of the target sentence is implied by the exclamation. The results (Kohler 1991: 131) are summarized in (45).

		‘Once a liar, ...’	‘Now I understand. ...’	‘Oh! ...’
		inferable	new	new + emphatic
(45)	early peak	87.5%	27.3%	8.0%
	medial peak	26.1%	70.5%	72.7%
	late peak	13.6%	67.0%	76.1%

According to Kohler (1991: 163), the results show that it is not primarily emphasis that the peak position is correlated with, but rather the “established/new” dimension, as there is a clear distinction between the early peak and the other two, but not so much between the medial and the late peak. However, it is important to note for the purpose of the current study that something can be concluded about the relation between emphasis and peak alignment, too: an early peak seems to be incompatible with an emphatic interpretation. Ambrazaitis (2009: section 3.2.3) presents a comprehensive overview of similar categorizations: comparable three-level distinctions for the falling pitch accent in German have been proposed by Niebuhr (2007) (“GIVEN”, “NEW”, “UNEXPECTED”) and by Kohler (2006) (“finality”, “openness”, “unexpectedness”). Below, it will be investigated whether sentence-initial and -internal objects differ in peak alignment.

The third property that will be investigated is the relation between the accentuation of the object and accentuation of the other constituents. I will refer to this property as relative

prominence. A special property of initial narrow foci is that unless there is another focus in the sentence, all following material will usually be deaccented, because the focus is required to carry the nuclear accent, i.e. the last pitch accent of the sentence. In contrast, a non-initial focus can be preceded by prenuclear accents. I conjecture that this might have consequences for perceived emphasis for potentially two reasons. First, although the two patterns have the same metrical prominence relations at the level of the intonation phrase (the object carries the most prominent accent), they differ at the level of the phonological phrase: with an initial object, there is only one phrasal accent in the utterance, whereas there can be several phrasal accents when the focus is non-initial. Prominence relations at this intermediate level might be related to perceived emphasis. Second, Féry (2010) showed that pitch scaling is a relative rather than an absolute phenomenon. Her results show that in utterances with a single pitch accent, information structural properties of the accented element do not affect its pitch height. In contrast, Féry & Kügler (2008) found that in utterances with several pitch accents, a narrow focus on one of the constituents raises the height of its pitch accent in comparison to a situation where it is merely new, and givenness lowers pitch height. Féry (2010) concludes that information structure influences how high a constituent's pitch accent is in relation to other accents within the same utterance, if there are any other accents; otherwise, pitch height remains unaffected. It is possible that the same holds for emphasis. This would mean that a focus-initial utterance could be realized with the same pitch height to express any degree of emphasis, whereas the pitch height of a sentence-internal object relative to the prenuclear accents would be expected to vary systematically as a function of emphasis.

3.3.2 Participants and procedure

Seven female and three male native speakers of German from the Berlin/Brandenburg area took part in the experiment. They were paid for their time. During the experiment, the participant was situated in a soundproof booth. A laptop was located outside the booth in such a way that the participant could see the screen, and they could control it via a mouse in the booth. The experimenter was outside the booth, but she was able to listen to the participant via headphones, and she was available for questions during the whole procedure. Before the experiment started, the participant read the instructions and went through two examples. If there were no open questions, the experiment started. At the beginning of each trial, a button labeled *Frage anhören* 'listen to the question' appeared on the screen. After clicking on it, the participant heard this item's context question via headphones. After a complete playback of the audio file, another button appeared in the center of the screen, containing the target sentence. The participant read it out. They were allowed to listen to the question again as many times as they wanted, and they could also repeat the target sentence until they were satisfied with it as an answer to the context question. When they clicked on a button labeled *weiter* 'resume', the next trial started. In sum, there were 106 trials, including the 90 items from this experiment as well as 16 items for an unrelated experiment.

The stimuli were presented in four blocks. Within the first block, each experimental item in each condition occurred once, in randomized order. In the second and third block, this was repeated. The fourth block only contained some of the unrelated items that I did not want to affect the rest of the experiment. All in all, the participants saw each item in each condition three times. The whole session was recorded using a directional microphone in the acoustics lab of the Linguistics Department at the University of Potsdam, using the software Audacity. The context sentences had been recorded before by a female student that is trained in phonetics and a native speaker of German.

3.3.3 Materials

The factors POSITION (initial vs. final), PART OF SPEECH (subject vs. object), and TYPE OF FOCUS (corrective focus vs. information focus) were manipulated in the production study, resulting in a $2 \times 2 \times 2$ design, i.e. eight conditions. Each item consisted of a question and an answer. The question was pre-recorded and served as a context for the answer, which was the target sentence that the participants were asked to read out. Across all conditions, the focused constituent was the same masculine singular DP (marked in gray in the examples below), differing only in case morphology between the object and subject condition. Three lexicalizations were constructed. One of them is given as an example in (46).

- (46) a. **Non-contrastive subject focus:** Die Eulen werden gerade von einem der anderen Tiere porträtiert. Wer ist es, der die Eulen malt?
‘The owls are being portrayed by one of the other animals. Who is it that paints the owls?’
- SVO** Der Reiher malt die Eulen.
 the.NOM heron.NOM paint.3.SG the owls
- OVS** Die Eulen malt der Reiher.
 the owls paint.3.SG the.NOM heron.NOM
‘The heron is painting the owls.’
- b. **Non-contrastive object focus:** Die Eulen porträtieren gerade eins der anderen Tiere. Wer ist es, den die Eulen malen?
‘The owls are portraying one of the other animals. Who is it that the owls are painting?’
- SVO** Die Eulen malen den Reiher.
 the owls paint.3.PL the.ACC heron.ACC
- OVS** Den Reiher malen die Eulen.
 the.ACC heron.ACC paint.3.PL the owls
‘The owls are painting the heron.’
- c. **Contrastive subject focus:** Die Eulen werden gerade von einem der anderen Tiere porträtiert. Ist es der Kranich, der die Eulen malt?

‘The owls are being portrayed by one of the other animals. Is it the crane that paints the owls?’

SVONein, **der** **Reiher** malt die Eulen.
no the.NOM heron.NOM paint.3.SG the owls

OVSNein, die Eulen malt **der** **Reiher**.
no the owls paint.3.SG the.NOM heron.NOM
‘No, the heron is painting the owls.’

- d. **Contrastive object focus:** Die Eulen porträtieren gerade eins der anderen Tiere. Ist es der Kranich, den die Eulen malen?

‘The owls are portraying one of the other animals. Is it the crane that the owls are painting?’

SVONein, die Eulen malen **den** **Reiher**.
no the owls paint.3.PL the.ACC heron.ACC

OVS**Den** **Reiher** malen die Eulen.
no the.ACC heron.ACC paint.3.PL the owls
‘The owls are painting the heron.’

- e. **Subject CT:** Der Reiher porträtiert gerade jemanden, und der Kranich auch. Wer ist es, den der Kranich malt?

‘The heron is portraying somebody, and the crane is, too. Who is it that the crane is painting?’

SVOWeiß nicht. **Der** **Reiher** malt die Eulen.
know.1.SG not the.NOM heron.NOM paint.3.SG the owls
‘I don’t know. The heron is painting the owls.’

- f. **Object CT:** Der Reiher wird gerade porträtiert, und der Kranich auch. Wer ist es, der den Kranich malt?

‘The heron is being portrayed by somebody, and the crane is, too. Who is it that is painting the crane?’

OVSWeiß nicht. **Den** **Reiher** malen die Eulen.
know.1.SG not the.ACC heron.ACC paint.3.PL the owls
‘I don’t know. The owls are painting the heron.’

There were two additional conditions involving a contrastive topic, but they are not directly relevant for the hypotheses addressed in this thesis and will thus not be discussed here in detail; for results and discussion of that part of the experiment, see Wierzba (2014).

The contrastive conditions were included because contrastive focus can be considered a special case of emphasis (see e.g. Hartmann 2008 for this view), or at least as related to emphasis, and it has been shown to have similar prosodic effects (see e.g. Kügler & Gollrad 2011 for evidence that contrastive foci are realized with a higher pitch peak than non-contrastive ones). This makes it possible to compare whether the prosodic features in which a postverbal object differs from an initial one are the same that are used to express a higher degree of

emphasis.

3.3.4 Analysis procedure

In sum, 720 recorded sentences were analyzed (8 condition \times 3 items \times 3 repetitions \times 10 participants) using the software Praat. They were manually segmented into constituents (subject, verb, object) and labeled by listening and examining the spectrogram. Pitch accents were annotated manually. It was annotated whether a constituent was accented, and whether more than one accent within a sentence was perceived as a focus accent. No further categorization of the accents was done. In order to determine the height and position of pitch peaks, I wrote a Praat script that performed the following steps for each labeled interval: (i) Praat's smoothing algorithm was applied to reduce microprosodic and other interferences, (ii) the pitch maximum within the interval was calculated, (iii) if it was clear that the automatically detected maximum was due to an error (e.g., an octave jump), an alternative interval that was more likely to contain the real maximum could be provided manually by the user, (iv) the position of the automatically and manually determined pitch maxima was stored.

The pitch peak alignment was calculated relative to the whole focused constituent. For this, the difference in seconds between the beginning of the constituent's interval and the determined pitch maximum was divided by the length of the whole interval, resulting in a value between 0 (= the highest pitch within the constituent was found at its left edge) and 1 (= the highest pitch was found at the right edge).

Sentences that did not fulfill the following two requirements were removed from further analysis:

- (47) a. The focused constituent carried the nuclear, i.e. last pitch accent.
- b. The sentence was not realized with a multiple focus structure, i.e. with two similarly prominent, falling accents.

71 data points were excluded due to requirement (47a) and 9 due to requirement (47b). In sum, the excluded part of the data constituted 11.11% of the 720 data points. In all remaining utterances, the (only) nuclear pitch accent fell on the narrowly focused constituent, allowing for a consistent pooled analysis.

3.3.5 Results

The maximal pitch height data showed a non-normal, bimodal distribution with two peaks due to the F_0 difference between male and female speakers; therefore, the data from female and male subjects was analyzed separately. The maximal pitch height for each constituent averaged over female all participants is shown in Fig. 3, and for the male participants in Fig. 4. The conditions with a focused object are represented by red lines, and the conditions with a focused subject by blue lines. Solid lines stand for a focus-initial structure, dashed lines for a focus-final one. Separate illustrations for each subject can be found in the appendix.

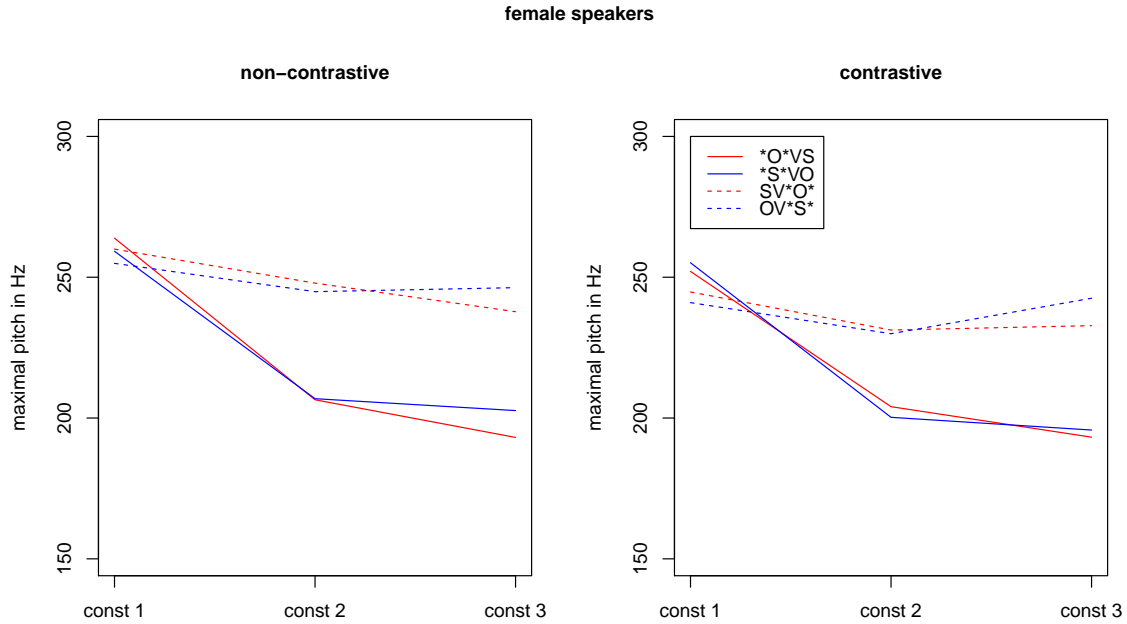


Figure 3: Maximal pitch height on each constituent, averaged over all female subjects

First, the pitch height of the focused constituents was analyzed using a linear mixed model with random intercepts for subjects and items. Within the data of the female speakers, the factors FOCUS TYPE, PART OF SPEECH, and POSITION all had a significant main effect: contrastive foci were on average realized with a lower pitch peak than non-contrastive ones ($t = 3.0$, $p = 0.003$), objects had a lower pitch peak than subjects ($t = 2.8$, $p = 0.006$), and utterance-final constituents had a lower pitch peak than in initial position ($t = 11.3$, $p < 0.001$). In addition, POSITION interacted significantly with PART OF SPEECH: in final position, subjects were higher than objects, whereas in initial position, objects tended to reach a higher pitch. None of the other main effects and interactions reached a significant level. Within the data of the male speakers, only the main effect of POSITION reached a significant level: pitch peaks were lower in final than in initial position ($t = 6.1$, $p < 0.001$).

Another model was run to find out whether FOCUS TYPE affected prenuclear pitch accents in focus-final sentences (beyond the general lowering affect that was previously found). A significant interaction between FOCUS TYPE and the status of the constituent (prenuclear and non-focused vs. nuclear and focused) was found ($t = 4.3$, $p < 0.001$ for the male speakers; $t = 3.1$, $p = 0.002$ for the female speakers): prenuclear pitch accents had a lower peak when the sentence-final focus was contrastive than when it was non-contrastive, and this difference was significantly more pronounced than the general lowering effect of contrastiveness that was also observed for focused constituents.

Fig. 5 shows the peak position within focused objects for each subject. The further to the right a data point appears, the later the pitch maximum occurred within the constituent. Filled circles represent initial foci and empty circles final foci. The left plot shows the non-

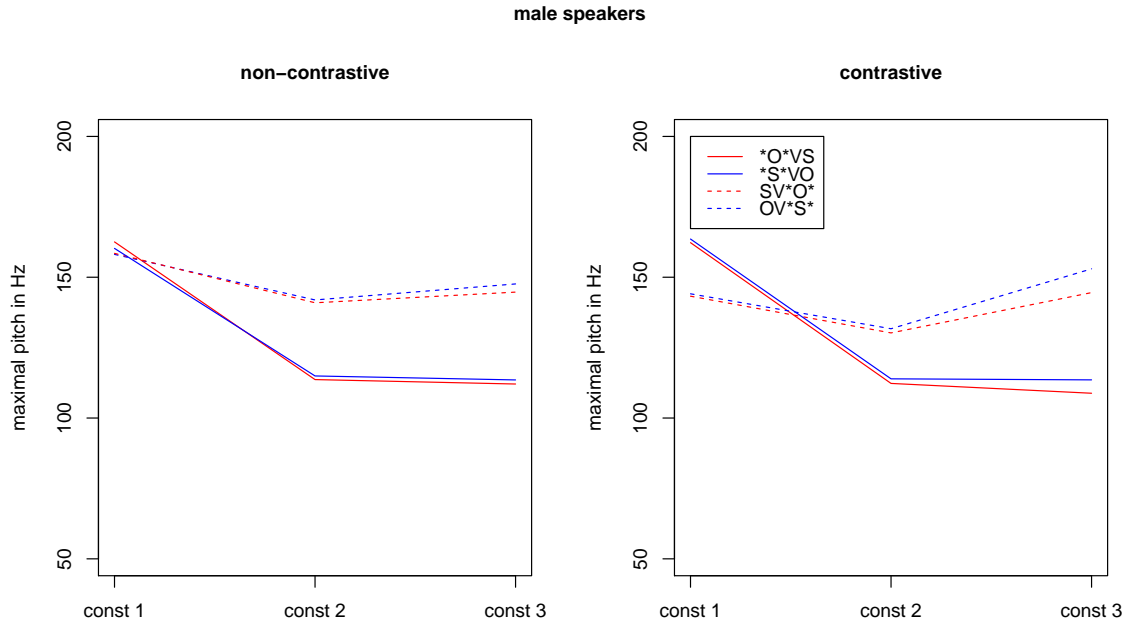


Figure 4: Maximal pitch height on each constituent, averaged over all male subjects

	initial focus	post-verbal focus
focused object, non-contrastive	0.67	0.28
focused subject, non-contrastive	0.63	0.22
focused object, contrastive	0.62	0.32
focused subject, contrastive	0.61	0.30

Table 6: Relative position of the pitch peak within the focused constituent (summary)

contrastive conditions, the right plot shows the contrastive ones. In Fig. 6, the same is shown for focused subjects. The mean values are presented in Table 6. The factors POSITION and PARTOFSPEECH had a significant main effect: the pitch peak occurred later in initial than in final position ($t = 21.8$, $p < 0.001$), and later within objects than within subjects ($t = 3.0$, $p = 0.003$). None of the other main or interaction effects reached a significant level.

3.3.6 Discussion

The results show that maximal pitch height of a focused constituents is lower in post-verbal than in initial position. As discussed in section 3.3.1, this is expected due to general downtrends, and it is possible that it does not play a role for the degree of perceived emphasis, because listeners normalize for these downtrends; thus, the importance of this property should not be overstated. Another expectation connected to pitch height was that contrastive focus accents should be realized with a higher pitch than non-contrastive ones; however, a trend in the other direction was found, which contradicts previous findings as reported e.g. in Kügler & Gollrad’s (2011) study. The explanation for this discrepancy probably lies in a charac-

focused object

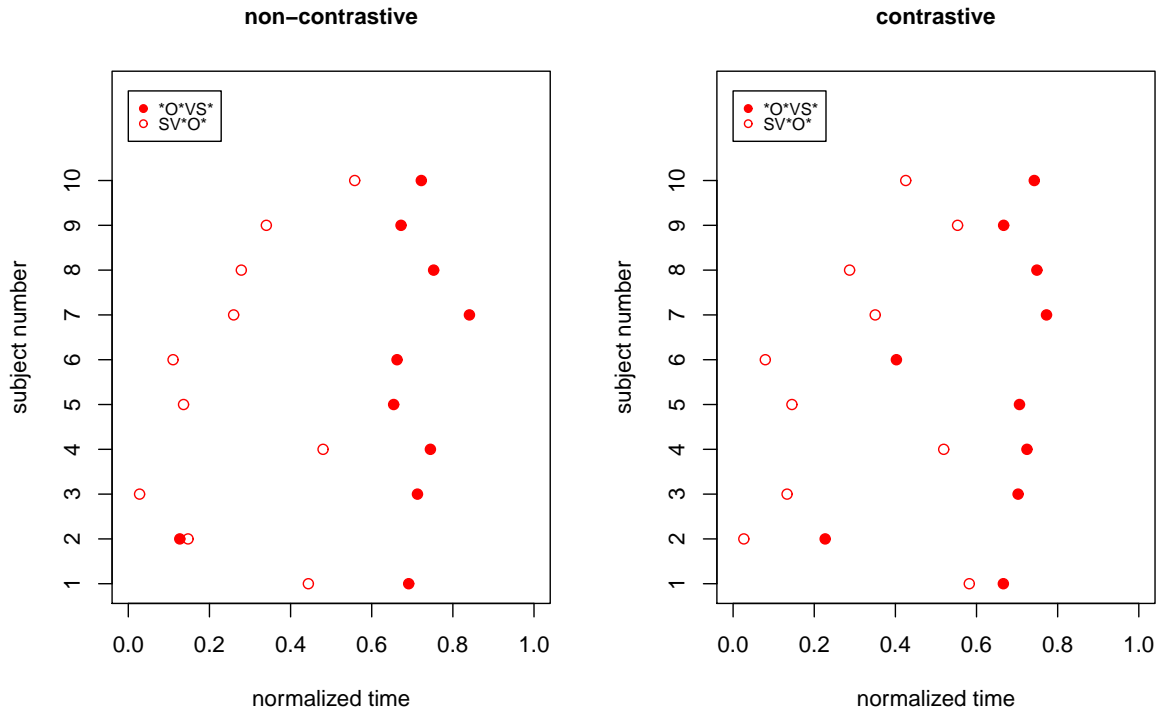


Figure 5: Relative position of the pitch peak within the focused constituent (object)

teristic of the items that were used: target sentence with a contrastive focus were preceded by an additional word, namely *nein* ‘no’. The beginning of contrastive target sentences was probably decreased in pitch because it was not the beginning of the utterance.

As for peak alignment, a clear difference was found between initial and post-verbal foci: within an initial focus, the pitch peak tends to occur late (in the second half of the constituent), whereas in post-verbal position, the pitch peak usually occurs early; this indicates that often, it occurs in the syllable preceding the stressed one (it was always the second syllable that was stressed), or even earlier—in many cases, the highest pitch was found at the very beginning of the constituent, so that the peak of the accent must have occurred on the preceding word (the verb). This difference comes about because post-verbal foci are typically preceded by prenuclear, rising accents, and the last rising accent and the falling focus accent are usually merged into one pitch peak, as it can be seen in Figure 7. This does not happen in initial position. In the case of peak alignment, it is more difficult to see how listeners might normalize for this effect than in the case of pitch height, and I thus consider peak alignment as a plausible candidate for a prosodic property that mediates between syntactic position and emphatic interpretation.

The data shows furthermore that the lowering of prenuclear pitch accents is actively used to express contrastivity of a sentence-final focus; sentences with an initial focus, on the other

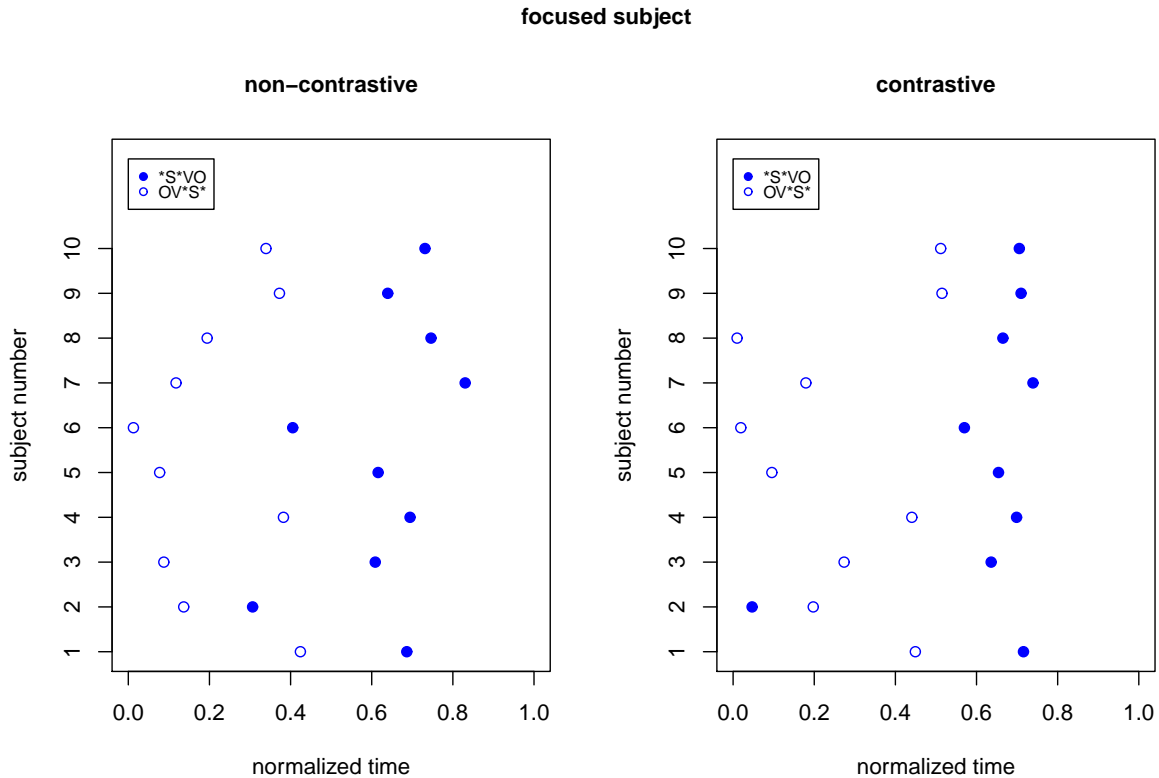


Figure 6: Relative position of the pitch peak within the focused constituent (subject)

hand, remain practically unaffected by the type of focus. This supports Féry’s (2010) idea that pitch scaling is a relative phenomenon: only if there are other accents in the sentence, the relation between them is affected by contrast/increased emphasis; if the focus carries the only pitch accent, nothing changes. In my view, this observation makes it plausible that relative prosodic prominence in comparison to other constituents is a factor that plays a role for the more emphatic interpretation of prefield objects: in initial position, the following material is necessarily deaccented; this allows the accent on the object to express any degree of emphasis. A sentence with a post-verbal focused objects will typically be read with prenuclear accents on the subject and the verb, as the production study has shown, and unless the prenuclear accents are actively lowered or compressed, this restricts the interpretative possibilities of the object—in this position, it is not automatically compatible with any degree of emphasis.

The second goal of the study was to make sure that the patterns used in the perception study occur naturally, even though they might not be the typical realization. In the perception study, which will be presented in the next section, objects that were exactly equal in peak height and alignment were used in initial and post-verbal position. The production data shows that there are speakers who produce post-verbal foci with an equally high or even higher pitch peak as initial ones, e.g. subject 6 and 9 (see Figures 14 and 17 in the appendix). There are also speakers who produce initial foci with a similarly early or even earlier peak

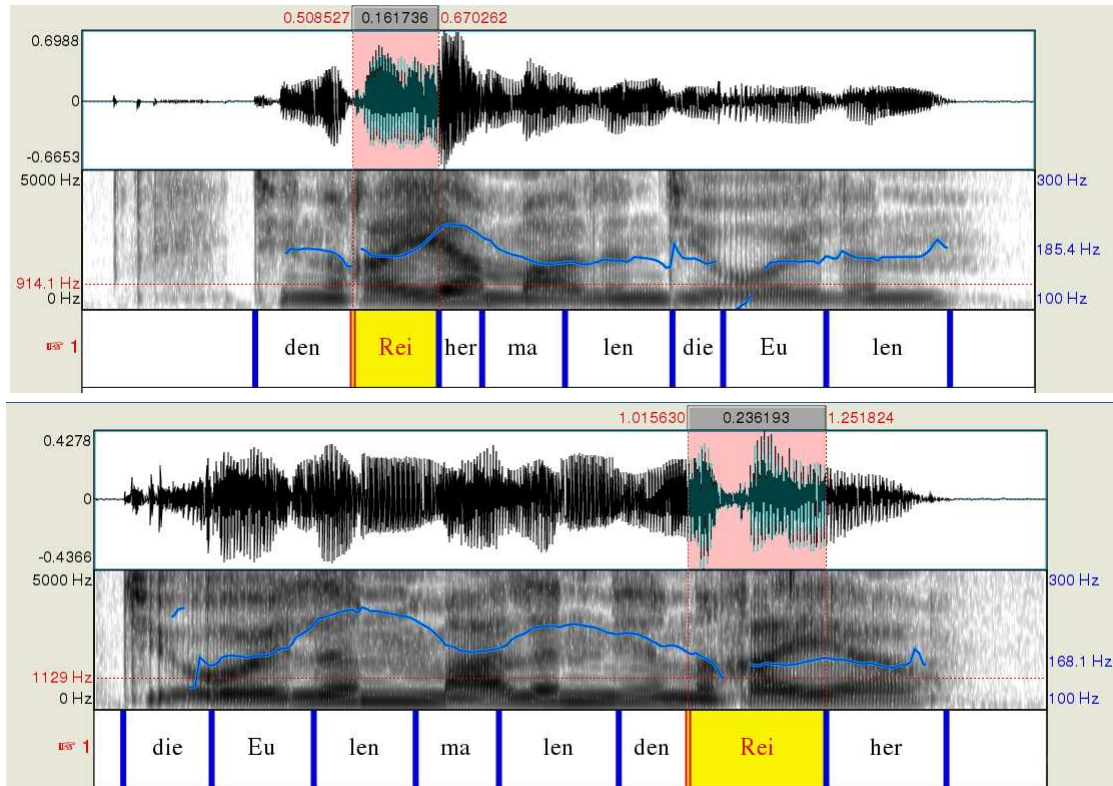


Figure 7: An example of a sentence-initial realization of a focused object with a late peak, and a sentence-final realization with an early peak

than post-verbal ones, e.g. subject 2, as can be verified in Figures 5 and 6, or with similarly late peaks, as e.g. subject 10 tends to do. I conclude that the patterns used in the perception study (which will be presented in the next section) can be considered atypical, but they are naturally occurring.

An additional aim was to test whether subjects and objects behave differently. If an asymmetrical behavior in the initial position was found, this could be taken as empirical evidence that could decide between the types of syntactic approach to the prefield discussed in section 2.1.3. It has been proposed that a syntactically higher left-peripheral position correlates with a stronger prosodic boundary (Féry 2011: 1908–1910), and thus a prosodic difference could point towards an asymmetrical syntactic analysis. However, no significant differences were found in initial position. A more detailed comparison of the subject and object data from the production study can be found in Wierzba (2014).

3.4 Testing hypothesis 3: perception study¹³

3.4.1 Introduction and background

So far, it has been established that narrowly focused objects indeed seem to be perceived as more emphatic when they are fronted, if the materials are presented in written form. It was also shown that even if we leave aside pitch height, the prosodic realization of an OVS sentence with a focused object typically differs from the corresponding SVO sentences in at least one property that has been shown to be related to emphasis, namely peak alignment, and a property that I conjecture to be related to emphasis, namely the presence/absence of accents on the remaining constituents.

The crucial question that can be asked now is whether these prosodic differences rather than the word order difference itself are the real cause of the interpretative difference; in other words, whether there is a causal relation between prosody and emphasis, or between word order and emphasis, or both. For this, I conducted a perception study, using the same sentences as in the written study, but in auditory form. This way, the potentially confounding prosodic differences could be minimized by controlling the prosodic realization as far as possible. Thus, the respective contributions of word order and prosody to the observed effect can be disentangled.

3.4.2 Participants and procedure

20 native speakers of German took part in the study for course credit or payment. The same forced-choice task was used as in the written study with the difference that the materials were recorded and presented auditorily (as described in the following section) using the Praat software. In each trial, one of the items was played. After the audio file stopped, two different contexts appeared on the screen, one below the other. As in the written study, both contexts were object questions, but one of them contained a modifier. The participants were instructed to choose in which context the answer that they had heard would be more felicitous, taking into account both what was uttered and how it was uttered. In case the answer fit equally well into both contexts, they were instructed to choose one of them freely. It was possible to listen to the recording more than once. After choosing a context, the participant clicked on the “proceed” button, and the next audio file was played. Each participant saw 16 experimental items in randomized order intermixed with 16 fillers. Which of the contexts appeared on the top and to the bottom was also randomized. Completing the questionnaire took around 15 minutes.

3.4.3 Materials

The same 16 items and 16 fillers as in the written study were used, but in auditory form. In contrast to the written study, each item was constructed in four rather than two conditions.

¹³I am grateful to Verena Ehrenberg for help with conducting the perception study.

In addition to the factor word order (SVO vs. OVS), the factor accent was manipulated. Each item in each word order was created in two versions, differing in the properties of the accent that was put on the object. In both versions, the object received a falling pitch accent. But in one version of the accent, the pitch peak was higher and later than in the second version. I will refer to the first version as the ‘high accent’ and to the second version as the ‘low accent’; however, this is not intended to take a stand with respect to the question whether they should be represented as different accent types in the phonological analysis, e.g. H vs. L in an auto-segmental phonological framework like Pierrehumbert’s (1980). The four versions of each item were created in the following steps using Praat:

1. I recorded two utterances: the sentence in SVO and OVS order, with a ‘high accent’ on the object.
2. I selected and copied the phonetic signal corresponding to the object in the SVO recording.
3. I deleted the phonological signal corresponding to the object in the OVS recording.
4. I inserted the copied phonetic object into the empty position in the OVS sentence.
5. I repeated steps 1–4 producing a ‘low accent’ on the object.

As a result, for each SVO version of an item, there was an OVS version in which the phonetic realization of the object was exactly identical. In addition, the subject and the verb were pronounced without pitch accents both in prefocal and postfocal position. The mean difference in maximal pitch height and peak alignment between the two accent types is summarized in Table 7.

	‘high accent’	‘low accent’
maximal pitch height	325 Hz	242 Hz
relative peak position	0.24	0.67

Table 7: Mean phonetic differences between the two levels of the factor ‘accent’

The quality of the materials was evaluated in a post-hoc online study, using the OnExp software (<http://onexp.textstrukturen.uni-goettingen.de/>). 17 further participants were recruited. On each page of the questionnaire, two stimuli from the item set were presented: a non-manipulated one in SVO order, and the corresponding sliced OVS version. Each participant saw each item either in the emphatic or non-emphatic accent condition. They were instructed to listen to both presented stimuli via headphones and to perform two tasks: first, they were asked to rate the naturalness of each stimulus; second, they were asked to decide in which of the recordings the object was realized with a higher pitch. This latter task was included in order to address a potential objection to the design: the fundamental frequency of the object in the SVO and OVS version was phonetically identical (since the acoustic signal

was copied), but it is not warranted that it was perceptually equal. As mentioned above, Pierrehumbert (1979) has shown that when there are two pitch accents within one utterance with an objectively identical maximal height, the second one is perceived as higher than the first one. This is due to the phenomenon that listeners normalize for expected declination (i.e., the advancing decrease in pitch height that always occurs during the course of an utterance). It is thus possible that the pitch accent on the object was subjectively perceived as higher in postverbal than in initial position, spoiling the intended prosodic similarity across the two word orders. To make sure that the participants really listened to the materials and were able to perform the task, the 16 filler items were included in two versions: the original recording that was also used in the perception study, and a manipulated version in which the pitch of the object was changed by around 50 Hz using the Praat pitch manipulation tool. A pitch difference of this size should be perceived irrespective of the position in the sentence. Participants that decided correctly in less than 12 out of the 16 filler items were excluded from the analysis; this concerned one participant.

The post-hoc study revealed that OVS versions of the items that were created by the splicing technique were judged as less natural than the non-manipulated SVO version: the OVS versions received a mean rating of 5.29 on a 7-point scale, the SVO versions one of 4.86. This difference is significant according to a linear mixed effects model with random intercepts ($t = 3.74$, $p < 0.001$). In 40.6% of the decisions concerning the height of the pitch accent on the object, participants said that the accent sounded higher in the OVS version than in the SVO version of the item; in 55.9% of cases, they said it sounded higher in the SVO version.¹⁴ The difference was slightly more pronounced in the items with a high accent (39.1% vs. 57.8%) than in those with a low accent (42.2% vs. 53.9%). As for the filler items, the mean rating for those versions in which the pitch was manipulated technically was 5.41, and it was 5.29 for the non-manipulated ones. This difference was not significant ($t = 1.10$, $p = 0.27$).

3.4.4 Results

The results of the auditory perception study are illustrated in Figure 8 and summarized in Table 8.

According to a logistic regression model, there was a significant main effect of accent ($z = 8.17$, $p < 0.001$), no significant main effect of order ($z = 1.09$, $p = 0.28$), and no significant interaction ($z = 1.45$, $p = 0.15$).

¹⁴The percentages do not add up to 100 for the following reason: although participants were instructed to always choose one of the options, even if they perceived both accents as equally high, it was technically possible to not answer the question. Nine out of the 256 data points (16 decisions for 16 items) are missing due to that reason.

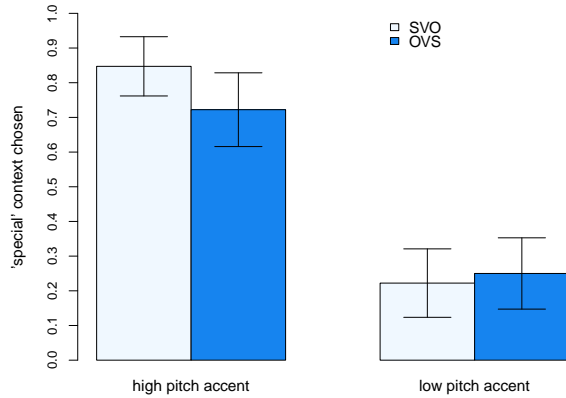


Figure 8: Plot of the results of the perception study with 95% confidence intervals

	SVO	OVS
high accent	84.7%	72.2%
low accent	22.2%	25.0%

Table 8: Summary of the results of the perception study

3.4.5 Discussion

The results show that the prosodic realization of the object has a large effect on the results. The prosodic features in which the ‘high accent’ and ‘low accent’ conditions differed were pitch height and alignment. Typical SVO and OVS realizations of a sentence were shown to differ in these properties in the production study. The results of the perception study thus support the idea that the prosodic differences between SVO and OVS realizations do play a role for perceived emphasis. The size of the difference in peak position between the two levels of the ‘accent’ factor used in the perception study was comparable to the difference found between typical SVO and OVS realizations in the production study. However, the size of the difference in pitch height was much larger between the two levels here (more than 80 Hz) than the difference that was found for typical SVO/OVS realizations in the production study. The fact that pitch peak height and position (features that are known to be correlated with emphasis) strongly affected the results can be taken as an indication that the test is indeed suitable for detecting emphasis. No significant word order effect was found, but the reason for a null-result can always potentially lie in insufficient statistical power (note that the power in the perception study was lower than in the written study, because there were more conditions, but the same number of participants). However, interestingly, within the sentences with a ‘high accent’, the trend even goes in the opposite direction than in the written study. This poses the question whether some other factor was at play, causing this difference of 11.5% between SVO and OVS order (recall that the difference in the other direction in the written study was of comparable size numerically). An important confound here might be declination. As it was mentioned above in connection with the post-hoc quality check of the materials, listeners normalize for expected declination, so that later pitch accents tend to be perceived as higher than early ones. In this case it could mean that the (objectively identical) pitch accent on the object might have been perceived as higher in postverbal than in initial position, leading to an increase in ‘special contexts’ that were chosen in the SVO

condition. This might have acted against and masked a potential directly word order related advantage for the OVS condition. The post-hoc study to test the materials exactly for this problem revealed no significant preference for which of the accents was perceived as higher, but there was a consistent trend both for ‘high accent’ and ‘low accent’ item versions. The fact that the trend is numerically less pronounced for objects with a ‘low accent’ then matches the observation that there is almost no difference between SVO and OVS order with a ‘low accent’ in the perception study, and these two observations could receive a common explanation: the declination normalization was shown by Pierrehumbert (1979) to be a relative effect, i.e. the pitch excursion of a later pitch accent is perceptually increased proportionally. The pitch excursion was much lower in the ‘low accent’ condition; thus, if declination normalization was indeed at play, it would be expected to have a smaller effect there than in the ‘high accent’ condition. Another point that possibly limits the generalizability of the results is that the spliced materials were judged as significantly less acceptable in the post-hoc study, although the difference was numerically rather small (less than 0.5 on a 7-point scale).

In sum, the results showed a highly significant effect of pitch peak height and alignment, and no significant effect of word order. On the one hand, the absence of a word order effect should not be overrated: as discussed above, declination normalization might have been a confounding factor working against the word order effect. On the other hand, the large effect of prosody that was found should not be underrated: it shows that prosodic differences such as an early/late peak position, which happen to also hold between postverbal and initial realizations of focused objects, heavily influence the results of tests that are intended to reveal differences in the degree of emphasis. Thus, whenever the relation between linear order and emphatic interpretation is investigated, prosody should be taken into account as an important factor.

4 Conclusions and outlook

In the first part of the thesis, I argued that establishing a relation between the syntactic position and emphasis directly within the syntactic component of the grammatical model, as proposed in Frey (2010), comes with a range of problems. Some of them are rather specific issues with Frey’s concrete implementation, e.g. concerning the unified treatment of exhaustivity and emphasis, which I argued to be not fully consistent. However, there is also a major problem that as far as I see would apply to any analysis in terms of a feature that is active in syntax: it is unclear how the optionality of Genuine \bar{A} -movement can be modeled if it is assumed that feature checking is involved—this should lead to a categorical behavior of exhaustive/emphatic elements in that they should always move or always stay in situ. I argued that alternative approaches which approach the effect in terms of a pragmatic implicature are more suitable for the phenomenon.

In the second part of the thesis, I suggested to go one step further and to try to dispose of

a principle connecting syntax directly to emphasis even at the pragmatic level, and to instead explore the possibility that the relation is established indirectly via prosody—at least in the case of focused objects. In my view, it is plausible that such an indirect connection is at work, as prosody is known to interact with emphasis, and syntactic movement is likely to influence the prosodic features of an element. I argued that this proposal would come with two main benefits: first, the similar interpretative effects of increased prominence on focal accents and syntactic focus fronting could be reduced to one and the same principle. Second, a relation of a gradient meaning component like emphasis to a gradient property of form like prosodic prominence can be implemented in a more coherent way than to a dichotomous formal distinction like fronting versus staying in situ.

This idea was tested in three studies. The first study confirmed that the emphatic effect reported in Frey (2010) indeed occurs when the materials are presented in written form. In the second experiment, a production study, I investigated in what respects fronted focused objects differ from in situ ones. Fronted foci showed increased pitch height, later peak alignment, and consistent post-focal deaccentuation of the other elements (whereas the other elements in the sentence were almost always accented when they preceded the focus). It is attested that the realization of a pitch accent influences as how emphatic it is perceived, which provides the basis for the indirect connection syntax—prosody—emphasis. Whether the interpretative effects associated with fronted focused objects can be reduced to this indirect relation was investigated in the third experiment, a perception study. The prosodic factors were held maximally constant by copying the acoustic signal of the object from sentence-internal to initial position. Two different accent types were tested (high, late peak vs. low, early peak). The results showed a large effect of accent type and no effect of word order, suggesting that the effect found in the written experiment might indeed have come about due to differences in the prosody that was implicitly assigned to the sentences by the participants, and that it is crucial to take prosodic factors into account when comparing interpretative effects across different word orders.

Some questions remain open. As for the experimental methodology, one thing that could be improved about the written and auditory judgment studies would be to use a test that manipulates emphasis in a more straight-forward way, paying more attention to the intentional and emotional state of the speaker, which was highlighted as an important characteristic of emphasis in the thesis. This could be achieved by embedding the target sentences in more elaborate dialogs making the aims and emotions of the speaker clearer. Also, it would be interesting to use a similar methodology to find out whether the exhaustivity effect can be subsumed under the same prosodic analysis as emphasis, i.e., whether exhaustivity is also systematically related to prosodic features of pitch accents, and whether the exhaustivity difference between SVO and OVS sentences can be reduced to that factor.

Another crucial issue concerns the potential confounding factor of declination that could have influenced the results of the perception study: an effect of word order might have been

actually present, but masked by the perceptual mechanism of normalizing for an expected downtrend in the pitch contour. A way to get around this confound in future work could be to compare only elements that are in the same position, namely sentence-initial focused subjects to sentence-initial focused objects. In the production study, no prosodic difference was found between these groups of elements, and it would be interesting to see what would happen in written and auditory perception studies with such items (which are syntactically different according to asymmetrical prefield approaches, or differ in something like markedness according to syntax-related pragmatic accounts of the interpretative difference like Skopeteas & Fanselow 2011). The design would need to be such that it would involve elements that are equally plausible in object and subject position, similar to the items that were used in the production study (*Der Reiher malt die Eulen* ‘The heron is painting the owls’ vs. *Den Reiher malen die Eulen* ‘The owls are painting the heron’). In comparison to the prevalent practice in the literature—studying the interpretative effects of fronting by comparing sentences in which the same element is fronted / in situ—this alternative method could help to avoid the interfering prosodic factor and to test for the purely syntactic effect in a more reliable way. The prosodic approach would predict that focused objects in the prefield should show a comparable degree of emphasis like focused subjects in the prefield, whereas an approach based on syntactic asymmetry or markedness would predict that fronted focused objects should be more emphatic.

A related possibility would be to compare sentences like the ones that I investigated here to a different type of object-initial sentences. In Frey’s work, it is assumed that pronouns following the finite verb are “overlooked” by the minimality condition, i.e., a direct object can undergo Formal Movement across a pronoun (Frey 2004: endnote 5)—this would predict that a sentence like *Papayas hat er gegessen* ‘He ate papayas’ would lack the exhaustive/emphatic implicature. Interestingly, the prosodic approach would make similar predictions for that case: if only the object carries a pitch accent in an utterance, there would be no difference between the SVO and OVS version with respect to relative prominence, and the difference in peak position would probably not arise, either (as there would be no prenuclear accent in the SVO version if only a pronominal subject and an auxiliary precede the object, or at least I would not expect a very pronounced prenuclear pitch excursion that would influence the nuclear accent). However, if a finite verb that is more likely to carry a pitch accent was involved, the prosodic approach would predict a difference, so this would be a further way to distinguish between the approaches without making comparisons across syntactic positions.

Another limitation of the study is that it was mostly restricted to narrowly focused elements. I hypothesized based on some preliminary observations that fronting of contrastive topics is not associated with the same interpretative effects, which could be captured under the prosodic account by assuming that the effect is linked specifically to increased prominence of focal accents, but it remains to be tested in more detail whether the observation can be confirmed. Likewise, I did not touch on given and (non-contrastive) topical material, which

could be an interesting extension for future work.

Furthermore, I only tested direct objects in my study. It would be desirable to extend the study to other types of constituents, in particular ones that have a lower base position and that occur in the prefield more rarely than objects, e.g. predicative adjectives as in Frey's (2010: 1426) example *Grün hat sie ihr Tür gestrichen* 'She painted her door green', or a participle. Even if it is correct that no principle linking marked word orders to an emphatic effect is at play with respect to direct objects, it could still be active for other categories—it is conceivable that direct objects are just not marked or unusual enough for this principle to apply to them, either in the sense that they can undergo the same movement operation like subjects/adverbs, or in the sense that they are not infrequent and attention-attracting enough to trigger a conversational implicature. Thus, further research is needed to decide to what extent the findings reported here for narrowly focused objects are generalizable to objects with other information-structural properties and to other types of constituents.

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Appendix: additional plots from the production study (pitch height by subject)

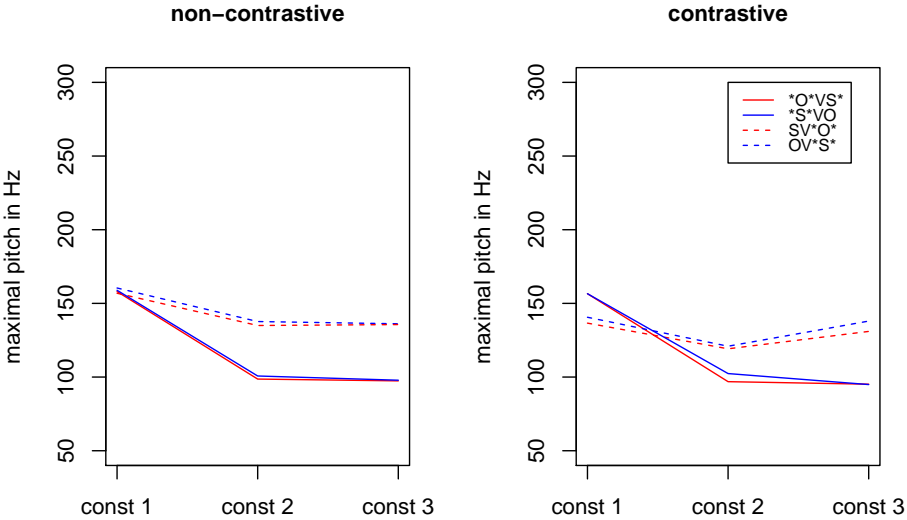


Figure 9: Maximal pitch height on each constituent, subject 1

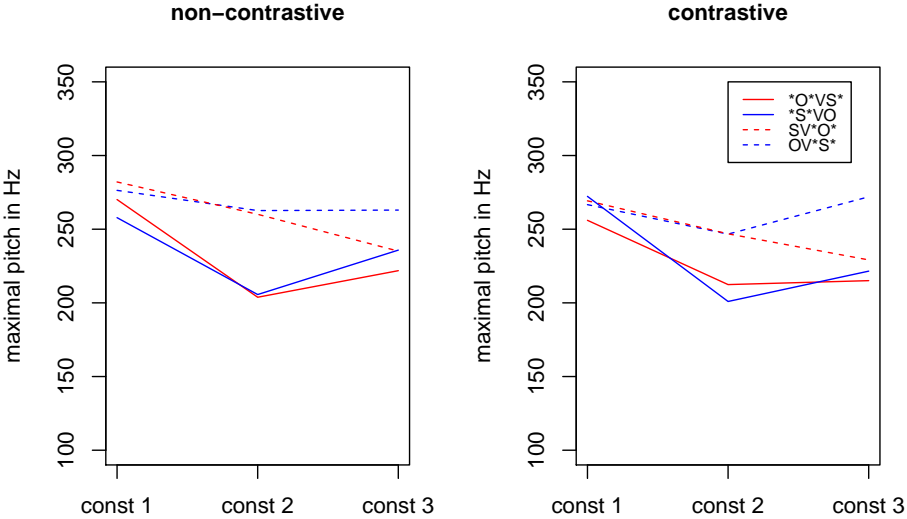


Figure 10: Maximal pitch height on each constituent, subject 2

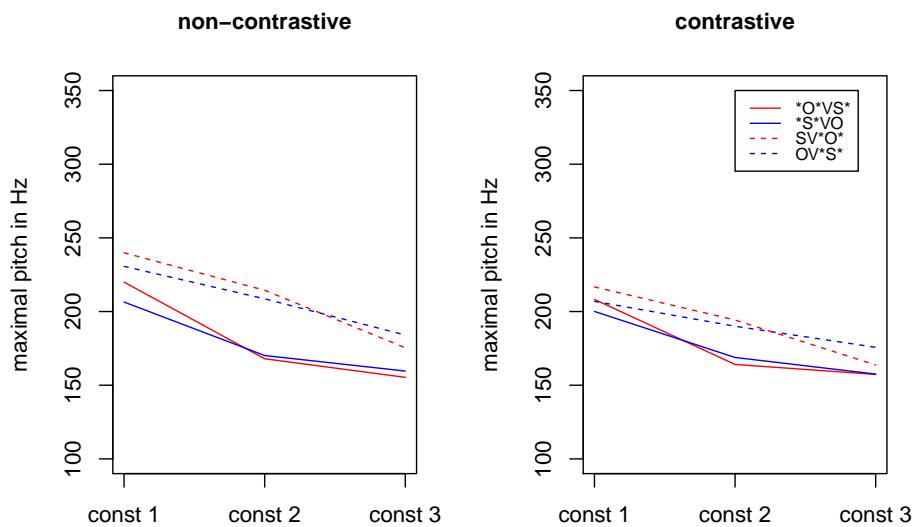


Figure 11: Maximal pitch height on each constituent, subject 3

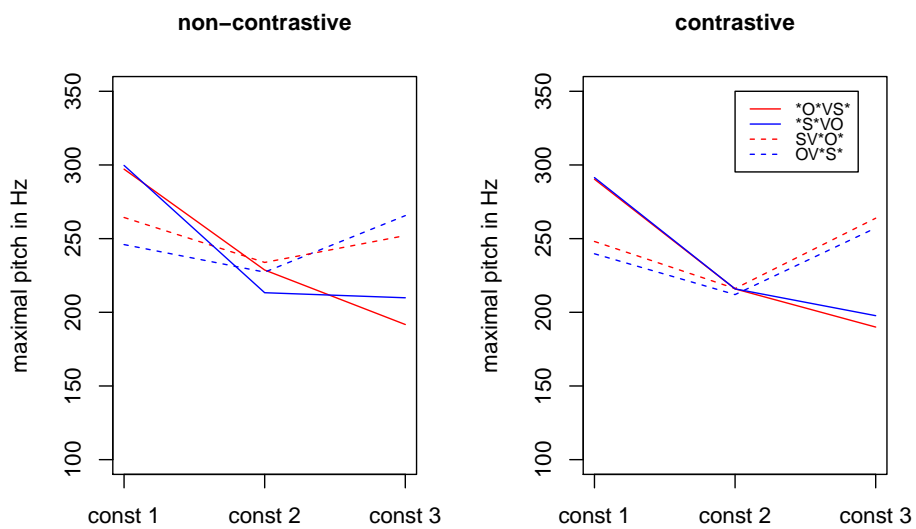


Figure 12: Maximal pitch height on each constituent, subject 4

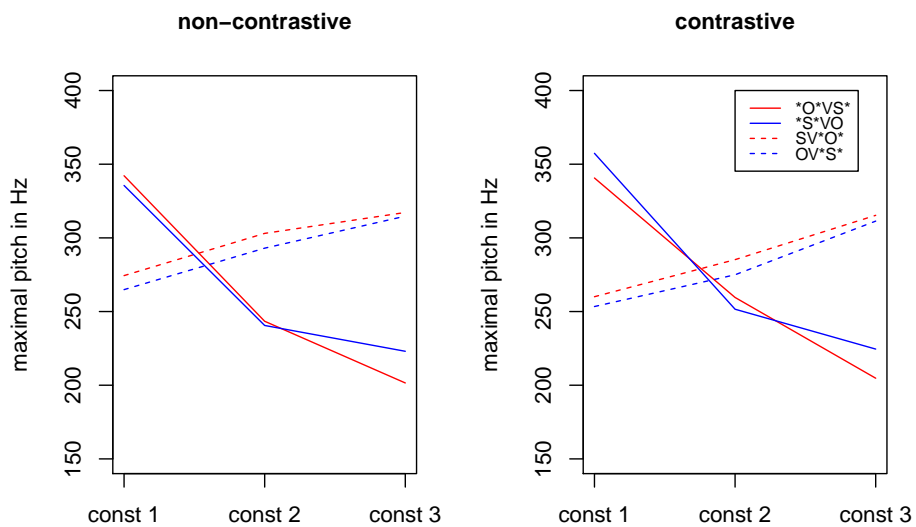


Figure 13: Maximal pitch height on each constituent, subject 5

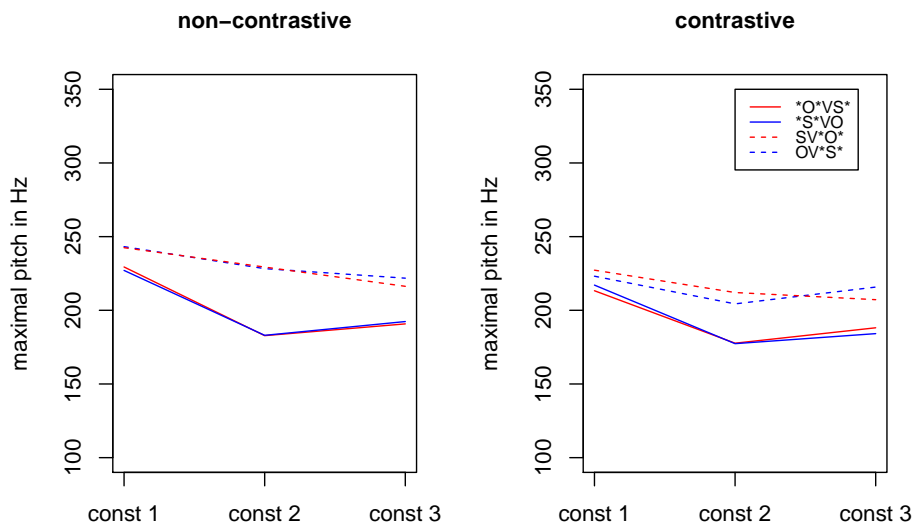


Figure 14: Maximal pitch height on each constituent, subject 6

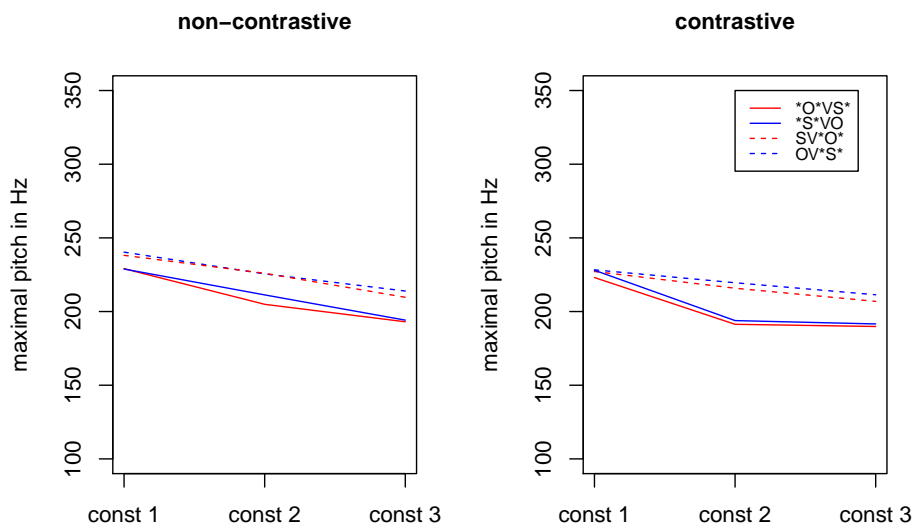


Figure 15: Maximal pitch height on each constituent, subject 7

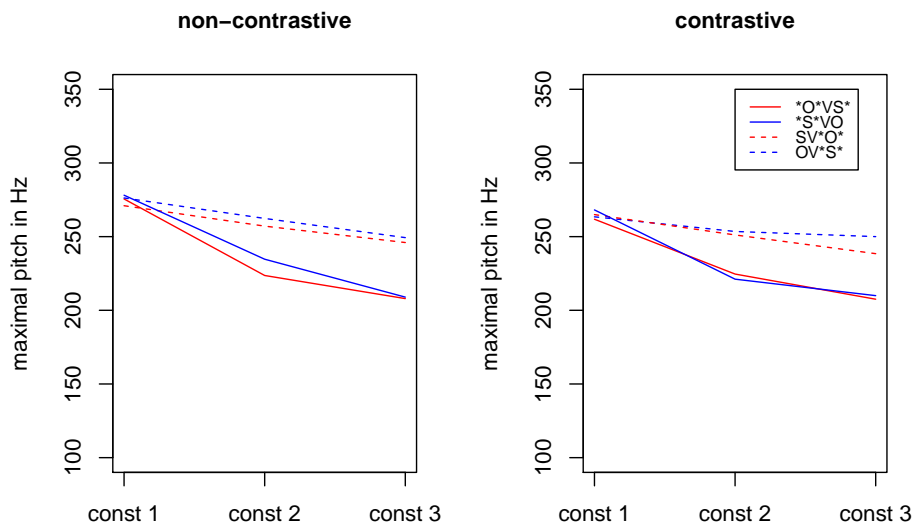


Figure 16: Maximal pitch height on each constituent, subject 8

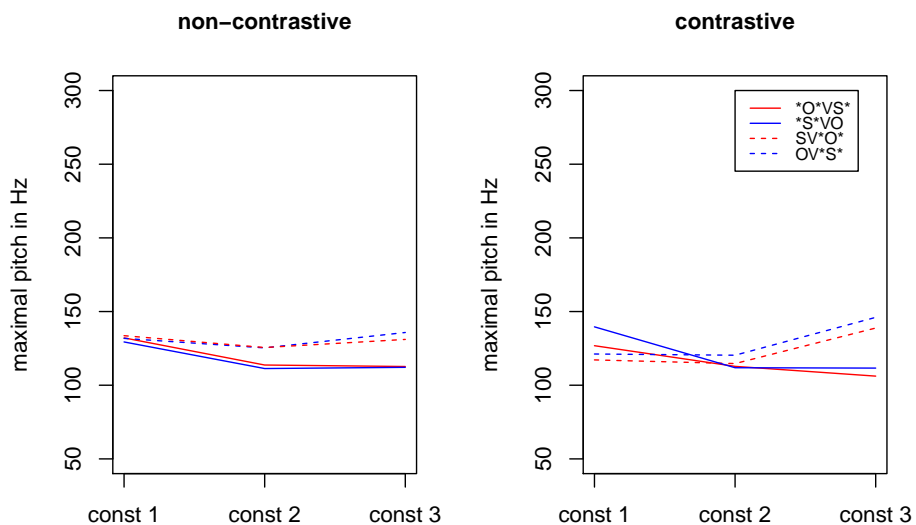


Figure 17: Maximal pitch height on each constituent, subject 9

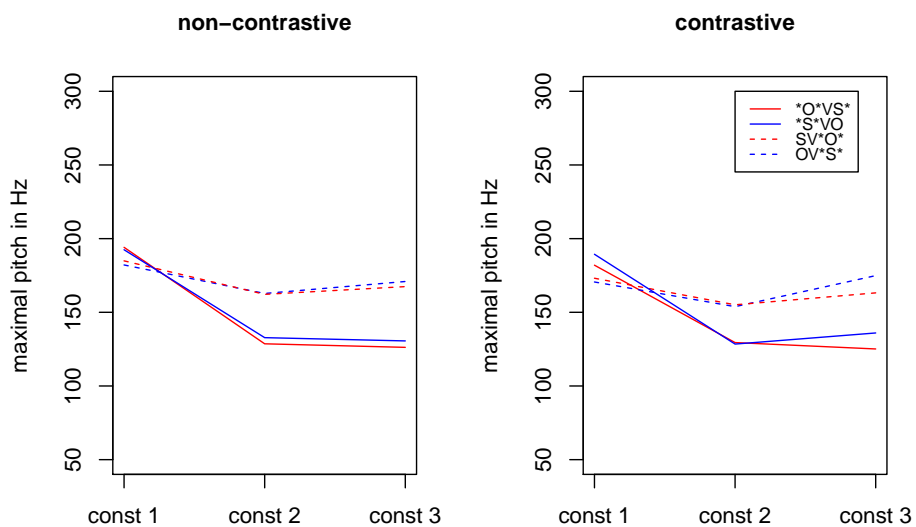


Figure 18: Maximal pitch height on each constituent, subject 10

Zusammenfassung in deutscher Sprache

Diese Arbeit setzt sich mit objekt-initialien deutschen Sätzen im Hinblick auf die Frage auseinander, ob das vorangestellte Objekt eine emphatische Interpretation erhält. Eine solche Analyse wurde von Frey (2010) vorgeschlagen, der annimmt, dass die Interpretation durch eine konventionelle Implikatur bedingt wird, die mit einem syntaktischen Merkmal in der linken Satzperipherie verbunden ist. Im ersten Teil der Arbeit diskutiere ich konzeptuelle Probleme, die ich mit dieser Analyse sehe. Unter anderem zeige ich auf, dass die einheitliche Analyse für exhaustive und emphatische Lesarten, die Frey vorschlägt, zu formalen Komplikationen führt, und dass die Vorhersagen nicht für alle Arten von vorangestellten Objekten zutreffen. Zudem ist es schwierig, einen optionalen Vorgang wie die Objektvoranstellung durch einen rein syntaktischen Mechanismus zu erfassen.

Im zweiten Teil der Arbeit schlage ich eine alternative Erklärung für Freys Beobachtungen vor, die darin besteht, dass der emphatische Effekt zumindest im Fall von fokussierten vorangestellten Objekten prosodisch bedingt wird. Die Grundidee ist, dass der Akzent, den ein fokussiertes Objekt trägt, durch die Voranstellung prosodisch hervorgehoben wird. Diese prosodische Änderung könnte wiederum die Bedeutungsänderung verursachen. Um diese Hypothese zu prüfen, habe ich drei Studien durchgeführt. Die erste Studie zeigt, dass der emphatische Effekt experimentell nachgewiesen werden kann, wenn schriftliche Testsätze verwendet werden. In der zweiten Studie haben Versuchspersonen subjekt- und objektinitiale Sätze vorgelesen. Die Ergebnisse zeigen, dass sich vorangestellte Objekte von satzinternen Objekten in mehreren prosodischen Eigenschaften unterscheiden, die für den emphatischen Effekt verantwortlich sein könnten: Sie werden typischerweise mit höherer Frequenz und einem späteren Frequenzmaximum realisiert; außerdem führt die Voranstellung des Fokus dazu, dass die anderen Konstituenten deakzentuiert werden, was die Prominenzverhältnisse im Satz ändert. Für die dritte Studie habe ich auditive Testsätze erstellt, in denen die prosodischen Eigenschaften des Objekts kontrolliert wurden, um den Einfluss der Prosodie vom Einfluss der Wortfolge trennen zu können. Dazu wurde das akustische Signal des satzinternen Objekts kopiert und in die satzinitiale Position kopiert. Der Wortfolge-Effekt, der in der schriftlichen Version des Experiments gefunden wurde, trat in der auditiven Variante nicht auf, in der das Objekt in beiden Positionen phonetisch identisch war.

Insgesamt argumentiere ich in der Arbeit dafür, den emphatischen Effekt, der bei der Voranstellung von fokussierten Objekten auftritt, als prosodisch und nicht direkt syntaktisch verursacht anzusehen. Auf diese Weise wird ein gradueller Unterschied in der Bedeutung mit einem graduellen Unterschied in der Form in Verbindung gesetzt, wodurch die konzeptuellen Schwierigkeiten vermieden werden können, die bei der Verknüpfung mit einer kategorischen syntaktischen Entscheidung (ob Voranstellung stattfindet oder nicht) entstehen.

Selbstständigkeitserklärung

Hiermit versichere ich, dass ich die vorliegende Arbeit selbstständig und ohne Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe. Alle Stellen, die wörtlich oder sinngemäß aus veröffentlichten oder nicht veröffentlichten Schriften entnommen sind, sind als solche kenntlich gemacht.

Die Arbeit wurde in gleicher oder ähnlicher Form noch nicht als Prüfungsleistung eingereicht.

Die elektronische Fassung der Arbeit stimmt mit der gedruckten Version überein.

Ort, Datum

Unterschrift