Information Structure, Grammar & Strategy in Discourse:
A Dissertation Proposal

Jon Stevens

Abstract

I examine the distribution of de-accenting in English and show how it relates to scrambling in German. I arrive at the hypothesis that what is commonly called Information Structure (IS) manifests in two ways in these languages: as a syntactic feature on saliently Given material, and as a direct interface between discourse and phonology. Different implications of this are considered, and further lines of research are suggested.

As a descriptive term, *Information Structure* (IS) refers to those aspects of an utterance which signal the speaker's assumptions about the hearer's knowledge state. In a variety of languages, different formulations of an utterance correlate with non-truth-conditional meanings which suggest that, as Chafe (1974:112) puts it, "the speaker cannot be ignorant of the fact that the addressee already has certain other things in his consciousness." IS has been partitioned in a number of ways (see Vallduví and Engdahl 1996:510 for a list of formulations), the most popular of which involve some combination of Focus (Chomsky 1971, Vallduví 1990, Rooth 1992, Roberts 1996), Ground (Vallduví 1990), Givenness (Chafe 1974, Schwarzschild 1999, Selkirk 2007, Wagner 2012), and Contrast (Vallduví and Vilkuna 1998, Selkirk 2007, Wagner 2012). Different theories assign different ontological status to these supposed primitives. IS has been conceived of as a structure on discourse itself (Prince 1981b, Roberts 1996, 2011), an information-organizing component of grammar (Vallduví 1990, Vallduví & Engdahl 1996, Eilam 2011), and a set of features in narrow syntax (Rooth 1992, Schwarzschild 1999, Büring 2007, 2008, Selkirk 2007). In striving for a complete theory of what is descriptively called Information Structure, one is confronted with two questions: what are the primitive notions of IS, and what kind of linguistic representation do these primitives instantiate? With these bigger questions in mind, I examine two particular phenomena: the distribution of de-accenting in English and the scrambling possibilities of German. I conclude that in these languages Information Structure is characterized by a syntactically constrained feature of Givenness/Salience and a form of Focus whose distribution is constrained only by pragmatic context. This suggests that what we call Information Structure operates at different levels of linguistic representation. This account makes interesting predictions and raises a number of further research questions which are to be the basis of my dissertation.

Section 1 surveys relevant work in the area, reviewing the notions of Focus, Givenness, and Contrast. I summarize a recent attempt (Wagner 2006, 2012) to analyze these notions as a single phenomenon, an examination of which leads me to claim that Focus and Givenness must in fact be separate. Section 2 develops this argument, showing that IS-based de-accenting in English can result either from salience in discourse, which Schwarzschild and Wagner call Givenness but which might more precisely be called Givenness$_S$ after Prince (1981b), or from not being in Focus. Unlike other accounts, I show that Focus and G-marking are

very different in their syntactic behavior, casting doubt on whether they should be given equal status in grammar. Section 3 further addresses the behavior of the hypothesized G-feature. The current analysis predicts the unavailability of certain scrambling configurations in languages where scrambling is believed to be a form of adjunction. I show evidence from German that bears this out. In Section 4 I turn to Focus, reviewing data which show that Focus, unlike Givenness$_S$, can shift prosodic prominence in almost any syntactic, morphological or phonological environment. I argue that an F-feature is not needed, and I suggest that Focus would be better modeled as a discourse strategy which signals information about the hearer's Expectations. As I review in the concluding section, the hypothesized disparity between Givenness$_S$ and Focus raises interesting questions when we consider their interaction, especially in regards to the possibility of IS-motivated syntactic movement. After offering some tentative ideas and a way forward in investigating these ideas, I end with a timeline for the completion of my dissertation.

1   Previous work

The right-edge prosodic prominence pattern of English is systematically restricted by context. That is, in a default (out-of-the-blue) pragmatic context, prosodic prominence is assigned such that a strong pitch accent falls on the rightmost constituent in an utterance. In certain other contexts, however, an element can become exempt from sentential stress assignment, causing the pitch accent that would otherwise fall on that element to shift leftward. After Ladd (1996) we can call this apparent shift in prominence *de-accenting*.[1] One salient example of this is so-called Question-Answer congruence, illustrated below (primary sentential stress in small caps, de-accented constituent underlined, example pitch track in blue).

(1)   Q: Did anything interesting happen at the party?
       A: Yes. Mary DANCED.

           M   a   r   y   D A N CE D
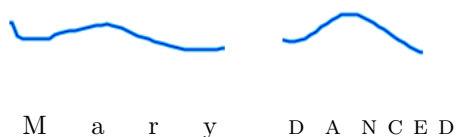
(2)   Q: Who danced at the party?
       A: MARY danced. / #Mary DANCED.

           M   A   R   Y d a n c e d

Here, the question about dancing forces the de-accenting of the verb *danced*. Although de-accenting in this sense is not found in every language, some effect of this pragmatic dimension is found in a variety of languages. In Czech, for example, both prosody and syntactic configuration are affected.

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[1]This may be a misnomer in that it implies some intermediate representation where de-accented elements were once accented. I'm simply using the term to refer pre-theoretically to cases where context disprefers/prohibits accent on something that might otherwise have it.

(1') Q: 'Did anything interesting happen at the party?'

A: Ano. Marija tancovala.
   yes   Mary   danced

(2') Q: 'Who danced at the party?'

A: Tancovala Marija.
   danced   Mary

(Kucerova 2007:6)

Canonical SV word order is violated in (2'); the verb *tancovala* 'danced', which would be de-accented in English, moves across the subject. Similar patterns have been claimed in German scrambling constructions (see e.g. Lenerz 1977), though the picture is quite complicated as we will see in Section 3. For now, we focus on the ability of elements to de-accent in English, which has been said to be a reflex of different hypothesized IS primitives including Focus, Contrastive Focus, and Givenness.

1.1 Focus and Contrast

De-accenting in English is often seen as a way of marking that a constituent is outside of the Focus of a sentence, where the Focus has the effect of filling in some salient open proposition (e.g. 'somebody danced', as in example 2, see Prince 1986). Formally, this has been analyzed in a few different ways. Rooth (1992) posits an F-feature and an accompanying operator, ~. The ~ operator introduces a variable that is co-indexed with some antecedent in the discourse. Only constituents dominated by an F-feature can receive prosodic accent, and the placement of the F-feature determines the form that the discourse antecedent must take in order for the utterance to be felicitous. The accent shift from verb to subject in (2) is licensed by the structure below, where $\tilde{B}_1$ adjoins to S and introduces the requirement that S have a discourse antecedent S' such that S' is an alternative or set of alternatives of the form generated by substituting a variable in for the F-marked element ('x danced', which Rooth calls the Focus semantic value).

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                         D
                        / \
                       /   \
                    S'_1     S
                     |      / \
                     |     /   \
             Who danced?  MARY_F danced   ~B_1
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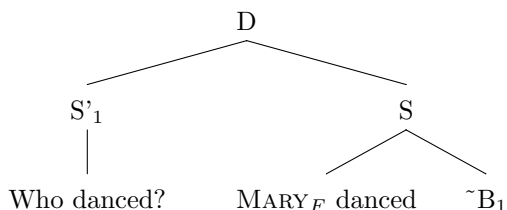
Fig. 1: Narrow Focus on the subject

Question-Answer congruence is explained as the correspondence between the alternatives introduced by the Hamblin semantics of the question ({'Mary danced', 'Bob danced', etc.}, for all party attendees) and the placement of the F-feature.

Alternatively, under the "information packaging" approach of Vallduví (1990), one may view Focus as a primitive object in a separate component of grammar which gives instructions on how to organize the storage of propositional content. This view combines the file card updating semantic framework of Heim (1988) with Prince's (1986) notion of a salient open proposition. Each utterance has a Ground, the open proposition which is suggested by the preceding context, and a Focus which fills in the Ground to complete the meaning of the utterance. The Ground is further divided into a Link and a Tail, where the Link tells the

hearer what or who the sentence is "about", i.e. which file card to update with the new knowledge conveyed by the utterance. Not all sentences must have a Link and a Tail. For example, the answer in (2) is not a fact about a particular entity in the discourse, but rather a general fact about the world. Thus, the sentence lacks a Link. Rather, there is some global file card which contains the knowledge 'x danced at the party' (the Tail), and the IS configuration of the answer instructs the hearer to locate this proposition and replace it with the saturated proposition 'Mary danced', which results from substituting 'Mary' (the Focus) in for the free variable.

A third view of the distinction is oriented toward the communicative goals of interlocutors. Roberts (1996, 2011) adopts the view that discourse is structured into Questions Under Discussion (QUDs), and relevant declarative sentences address or answer QUDs. Under this conception of discourse, what Vallduví calls the Ground of a sentence signals the identity of the QUD, while the Focus of a sentence gives an answer to that QUD. Rather than explaining Question-Answer congruence using alternative sets or open propositions, Roberts takes congruence to be a defining characteristic of Focus.

Whether any of these conceptions of Focus must be distinguished from Contrastive Focus is debatable. Rooth's theory explicitly erases the distinction, and examples of Contrast like the following are easily handled using semantic alternatives.

(3)   John gave MARY a kiss (not Susan).

Here, the ~ operator scopes over the clause *John gave Mary a kiss* and requires a discourse antecedent that corresponds to the sentence's Focus semantic value ('John gave x a kiss'). This requirement is satisfied when the object *Mary* is contrasting with another possible object *Susan*, because the contrast only exists when the context suggests the possibility that John gave Susan a kiss.

Selkirk (2007) claims that the two types of Focus should be differentiated on the grounds that they correspond to different degrees of pitch accent. Under this account, non-contrastive Focus (also called information focus after Kiss 1998) simply represents the default pitch accent, while a Focus of Contrast (FOC) feature is responsible for examples like (3). This is consistent with Vallduví and Vilkuna's (1998) proposal within the information packaging framework that Contrast is an independent dimension of Information Structure (they call it Kontrast). Both Links and Foci can be Contrastive under this view; example (4) below is an instance of can be called a Contrastive Link (or more commonly, a Contrastive Topic)

(4)   Q: What about Mary? Did John kiss her?
        A: MARY, he KISSED.

Though the phonetics of the two types of Focus may differ, it is not clear that they must be treated as categorically different phenomena. I show in Section 4 that Focus and Contrastive Focus pattern together in being much freer in their distribution than the proposed G-feature. For this reason, I take the view for now that Contrastive Focus is a special case of a more general notion of Focus. I return to the question of whether a separate dimension of Contrast is needed at the end of Section 4.

These different formalizations of Focus operate at different levels of description: for Rooth, Focus is a component of narrow syntax; for Vallduví, it is part of a larger linguistic system that interacts with structured knowledge of the world; for Roberts, it is the product of communicative goals held by interlocutors situated within a discourse context. But these accounts all have in common the idea that prominence is assigned

to certain pragmatically privileged elements and that de-accenting is simply the lack of license for accent, whether it be due to the lack of an F-feature, inclusion in the Ground, or being given in the Question Under Discussion. The alternative idea, that de-accenting is due to a feature's presence rather than its absence, is at the core of Givenness, the next Information-structural notion to which we turn.

1.2   Givenness and Salience

Examples like the following from Ladd (1996:175) pose somewhat of a problem for the above Focus-based accounts of accent placement.

(5)   She gave me a German book, but I don't SPEAK German.

What are to be the alternatives here? Under Rooth, we may adjoin ˜ to the VP in which case there must be an alternative of the form $\lambda x.P(x, German)$. That is, there should be some two-place predicate that takes $German$ as its argument. Such an antecedent is not found. Under Vallduví's and Roberts's construals, however, Focus does not necessarily have to correspond to a syntactic constituent. In this case we could say that the Ground or QUD associated with this sentence is $P(German)$, and that the Focus is a one-place predicate $\lambda x.$I don't speak x. This is more reasonable, but not nearly as straightforward as cases of Question-Answer congruence or Contrastive Focus. If QUDs or open propositions are meaningful notions that drive discourse, then we expect some expectation on the part of the hearer that the speaker will address them, and yet cases like (5) are felicitous in contexts with no prior discourse goals or expectations. Consider an example of what I call a conversation starter.

(6)   Context: Pat is reading a book about castles in Germany. Chris walks in, sees Pat, and utters the
       following sentence out of the blue in order to engage Pat.

       I've never BEEN to Germany. Have you?

This is a felicitous way to start a conversation even if Pat is initially unaware of Chris's intent to engage linguistically. Any open proposition or QUD of the form $P(Germany)$ is not part of the discourse—in cases like this the "discourse" consists only of the ever-present QUD, 'what's up?'. Rather, it is simply a matter of what is salient to Chris and Pat as individuals. Going back to Chafe (1974), it is in virtue of the referent of *Germany* being "in the consciousness" of the interlocutors at that moment that the object PP is de-accented.

Beginning with Schwarzschild (1999), formal semanticists have analyzed this phenomenon with a notion called Givenness[2], which is defined below (Schwarzschild 1999:9).

> An utterance U counts as GIVEN iff it has a salient antecedent A and:
> a.   if U is of type e, then A and U corefer
> b.   otherwise: modulo existential type shifting, A entails the existential F-closure of U.

BOX 1: SCHWARZSCHILD'S GIVENNESS

Schwarzschild works within the framework of assigning F-features to elements within which prosodic prominence is assigned, but he posits that F-features are purely phonological and receive no semantic interpretation.

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[2]There are some problems with this term, an issue which I turn to shortly.

Pragmatic context influences accent only in that grammatical constraints exist that make Given nodes resistant to F-marking, placing those nodes outside the domain of accent assignment. A node is Given in the technical sense of Box 1 if it has a salient antecedent in the discourse or if it dominates something that does.

In Ladd's example in (5), we can derive the accent pattern by showing that both the DP *German* and the VP *speak German* are Given under Schwarzschild's technical definition, but that the verb *speak* is not. The result is that only the verb can bear an F-feature. First, *German* is Given in that there is a salient antecedent: the German language is made salient by the preceding context if the book is taken to have been written in German. Under item (a) in Box 1, *German* should not bear an F-feature. It is easy to show that the larger VP cannot receive an F-feature either, under item (b). If the type e semantic object referring to the German language is salient in the context, then so is the proposition that German is the language of the book. The VP is marked as Given if this proposition entails "the existential F-closure" (ExClo) of [[SPEAK$_F$ German]]. This is defined as the result of replacing F-marked nodes with variables and existentially binding them, which here yields $\exists P.P(German)$. Since the entailment holds, the VP is marked as Given. The verb itself, however, does not meet either of the criteria. Under Schwarzschild's constraints on accent placement, the verb bears the strong pitch accent.

In many contexts, Givenness makes the same predictions as purely Focus-based accounts of accenting, and it has been claimed (beginning with Schwarzschild) that Givenness is sufficient to account for Question-Answer congruence. Consider again the simple example (2).

(2) Q: Who danced at the party?
     A: MARY <u>danced</u>. / #Mary DANCED.

The verb *danced* cannot receive an F-mark because it is Given. The question, which is part of the context, suggests the proposition $\exists x.PAST(dance(x))$, which is identical to the existential F-closure of the intransitive VP. The subject, however, is not Given, and thus does not resist F-marking.

This runs into problems, however, in that there are cases in which Given elements must bear sentential stress. Consider the following.

(7)   A waiter is helping a co-worker bring food out to a table of guests. Holding a plate of chicken in one hand and a plate of tofu in the other, the waiter turns to his co-worker and asks, "who ordered what?"
     A: The guy with the HAT ordered the TOFU. / #The guy with the HAT <u>ordered the tofu</u>.

In this case it is necessary to accent both the subject and the object, as both constitute the answer to the multiple wh-question under discussion. Under Schwarzschild, one should be able to de-accent the entire VP *ordered the tofu*, as tofu is salient and the context entails that somebody ordered a plate of it. This is unavailable whether or not the subject is also Given—the set of possible tofu-orderers could be large enough that the individual in question is not particularly salient at the time of utterance.

$$C = \{\phi_1 = \exists x.PAST(order(x, chicken)),$$
$$\phi_2 = \exists x.PAST(order(x, tofu))\}$$

$$C \Rightarrow \phi_2$$
$$\&\quad \phi_2 = \text{ExClo}([[\text{ordered the tofu}]])$$
$$\Updownarrow$$
$$[_{VP} \text{ ordered the tofu }] \text{ is GIVEN}$$

$$\phi_2 \Rightarrow \exists x.\exists y.PAST(order(x,y))(= \phi_3)$$
$$\&\quad \phi_3 = \text{ExClo}([[\text{ordered}]])$$
$$\Updownarrow$$
$$[_V \text{ ordered }] \text{ is GIVEN}$$

$$C \text{ introduces } [[\text{the tofu}]]$$
$$\Updownarrow$$
$$[_{DP} \text{ the tofu }] \text{ is GIVEN}$$

BOX 2: PROMINENCE ON OBJECT NOT PREDICTED

The existential closure (ExClo) of the denotation of the tensed VP is entailed by the (non-linguistic) context, and thus *ordered the tofu* meets the Givenness requirement, as does *the tofu* since it has a salient antecedent of type e. Why, then, does the direct object have prosodic prominence? In this case, a question-answer-based view of Focus more straightforwardly accounts for the observed prosodic contour.

Next I consider the view that both Givenness and semantically interpreted Focus coexist in grammar before turning to an attempt (Wagner 2006, 2012) to unify these notions into a single concise theory of de-accenting in English. But first, a note on terminology is in order. In defining Givenness, Schwarzschild recognized that salience was crucial. The essence of the analysis is that if a constituent's denotation is salient in the discourse context, it will lie outside the domain of accent assignment. This is a stronger requirement than simply being known to the hearer, which the word "Given" might imply. We are not talking about old vs new information, but rather salient vs non-salient denotations. Prince (1981b) points out the problems with using "Givenness", and suggests that the term be avoided. However, the term has become quite common in formal semantics, and is well-defined. In order to be more explicit about what is meant, but without abandoning what has become standard terminology, I will from now on borrow Prince's (1981) subscripted term Givenness$_S$, where the 'S' stands for "salience".

1.3 Coexistence vs Unification

As mentioned in 1.1, Selkirk (2007) proposes a view whereby Focus of Contrast is marked in grammar, but not the Focus found in question-answer pairs. To account for Question-Answer congruence, then, a syntactic G-feature is adopted. By hypothesis, it is the G-feature, and not a constraint on F-marking, that is responsible for de-accenting. Büring (2007) adopts the complementary view that answers to questions to involve F-marking, and that Givenness is a pragmatic license for the absence of F-marking when this absence would not result in a violation of Question-Answer congruence. That is, Givenness can shift accent within a QUD-answering element, but cannot de-accent everything within that element (thus the accent pattern in (7)). The hypothesis formulated in this proposal has elements of both of these views: I claim on the basis of evidence from English and German that there is a syntactic feature associated with Givenness$_S$, but I

also suggest that Focus and Contrastive Focus are two sides of the same coin, since they pattern together in exhibiting behavior that is less constrained than that of the Givenness$_S$ feature. Contra both views, I suggest that neither kind of Focus needs to be marked syntactically. This view, that Focus and Givenness$_S$ coexist at different levels, so to speak, is arrived at by first examining the interaction of de-accenting and Contrast. More specifically, I investigate the claim made by Wagner (2006, 2012) that Givenness$_S$-marking requires a mutually exclusive antecedent for the sister of the de-accented element. In Section 2 I show that this claim is not robust, the reasons for which form the core of my argument for two separate notions. The remainder of this section is devoted to summarizing the hypothesis set forth in Wagner (2012).

Let's begin with what is deemed to be a canonical example of Givenness$_S$ within a narrowly Focused argument NP. Examples like this have been used as a strong case for the existence of Givenness$_S$ as a feature separate from Focus (e.g. De Kuthy and Meurers 2011)

(8)   Q: Mary's rich uncle buys and sells expensive convertibles. He's coming to Mary's wedding. I wonder what he got her as a gift.
       A: He got her [a CHEAP <u>convertible</u>]. / ??He got her [a cheap CONVERTIBLE].

But as Wagner (2012) notes, these examples do not exhibit mere Givenness in the sense of Schwarzschild (1999). Rather, they require a Contrasting antecedent for the prominent element, where Contrast is defined as a relationship of mutual exclusivity.[3]

(9)   Q: Mary's rich uncle buys and sells expensive convertibles. He's coming to Mary's wedding. I wonder what he got her as a gift.
       A: He got her [a blue CONVERTIBLE]. / #He got her [a BLUE <u>convertible</u>].
       (after Wagner 2010:13)

Formally, a constituent $[ab]$ Contrasts with an antecedent $[ab']$ iff the universal closure (UniClo) of $[ab]$ (for all x, $[[ab]](x)$ is true) entails the falsity of the denotation of $[ab']$. Informally, a constituent Contrasts with its antecedent when both elements denote mutually exclusive descriptions. In (8), the antecedent is *expensive convertibles*. We know that cheap convertibles cannot also be expensive convertibles, and under Wagner's analysis this licenses a shift in accent within the NP *cheap convertible*. In the case of *blue convertible*, even though *convertible* is Given in the sense of Schwarzschild, the NP within which the attempted accent shift would take place, *blue convertible*, does not Contrast with an antecedent. Thus, the de-accenting is infelicitous.

Wagner suggests that this unifies the distinct Information-structural notions discussed above. If Givenness$_S$ always requires Contrast, there is no longer a need for separate Focus or Focus of Contrast features. Initial support for the generalizability of the Contrast requirement is found in the following.

(10)   a. Q: I heard that somebody shot Smith, and that he's been recovering in the hospital. Is he OK now?
           A: Actually, something bad happened again. You'll never guess: Someone shot SMITH! / #Someone SHOT <u>Smith</u>!

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[3]Büring (2008) offers an alternative formulation of this idea that uses F-marking instead of G-marking; see Wagner (2012:25-26) for a response. Section 2 argues that examples like (8) are indeed to due to Focus, not Givenness$_S$, but contra Büring I argue that Givenness$_S$ nevertheless has independent status in grammar.

b.   Q: I heard that somebody shot Smith, and that he's been recovering in the hospital. Is he OK now?

        A: Actually, something bad happened again. You'll never guess: Someone STABBED <u>Smith</u>! / #Someone stabbed SMITH!

(after Wagner 2010:5)

The same reasoning is applied to (10) as was applied to the convertible example in (8) and (9), but here the accent is shifting within a VP rather than an NP.

There are two problematic cases which Wagner addresses: 1) when the domain of accent shift is the entire clause (e.g. when shifting from predicate to subject), a weakened definition of Contrast is needed to account for the facts, and 2) objects are required to move to a propositional node at LF. We begin with the former.

(11)   Mary went SWIMMING. After that, JANE <u>went swimming</u>.

There is no mutual exclusivity relation between *Jane* and *Mary*. Jane's swimming does not exclude Mary's swimming. Examples like these lead Wagner to postulate a different analysis for de-accenting predicates: the mutual exclusivity requirement must hold not between a Given constituent and its antecedent, but rather between the application of an Exhaustivity operator to the Given constituent and its antecedent. In other words, the de-accenting of *went swimming* is licensed by the fact that, were Jane the *only* swimmer, this would entail the falsity of the antecedent *Mary went swimming*. This is stated formally below.

$[[Exh]] = \lambda a.\lambda b.\ [[ab]] \ \& \ \forall b' \in C : [[ab']] = 1 \rightarrow ([ab] \Rightarrow [ab'])$

Given a sentence $[ab]$, de-accent a only if there is an antecedent in the discourse $[ab']$ s.t. $Exh(a)(b) \Rightarrow \neg[ab']$

BOX 3: MUTUAL EXCLUSIVITY UNDER EXHAUSTIVITY

It is speculated that perhaps this stipulation is an inadequacy of the formalism used, rather than a deep difference between the two cases (p.23). In Section 2 I show that the difference goes beyond the formalization, which should cast some doubt on a unified theory of IS-based accent shift.

The second problematic case involves the de-accenting of objects without any apparent contrasting antecedent for the VP.

(12)   Smith got away from the scene of the crime in Mary's cheap convertible.

      Q: Then what happened?

      A: The car broke down, and a detective ARRESTED <u>Smith</u>.

There is no mutually exclusive antecedent of the form $\lambda x.P(x, Smith)$. Wagner claims that the de-accenting is licensed because Given objects move at LF yielding a structure like the following.
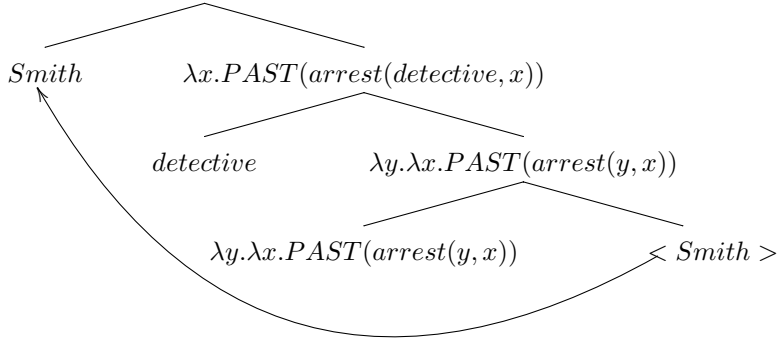
Fig. 2: Movement at LF

Post-movement, the domain of accent shift is now the whole proposition rather than the predicate *arrested Smith*, in which case Wagner hypothesizes that the Contrast requirement is weakened by the Exhaustivity operator (see Box 3). The result is that the direct object can be de-accented as long as there is some antecedent in the discourse of the form $P(Smith)$ whose truth would be excluded if Smith's being arrested were the only thing that happened to Smith. In other words, the salience of some other property of Smith is the only requirement for de-accenting.

We are now ready to turn to the driving question of this proposal: are Givenness$_S$ and Focus necessarily different elements of the linguistic system, and if so, how do they interact? I begin to address this question in the following Section by arguing against Wagner's unified proposal.

2   Argument for separate notions of Givenness$_S$ and Focus

Wagner (2012) posits a single generalization of de-accenting in English: an element is "Given" and thus able to de-accent iff 1) that element has a salient antecedent in the discourse context (i.e. it is Given$_S$) and 2) the lowest node dominating both that element and the target of the resulting accent shift has a mutually exclusive semantic antecedent in the context (i.e. the newly accented element is Contrastive). In the previous Section we reviewed the two caveats to this generalization. First, shifting accent at the propositional level does not require true mutual exclusivity, but rather mutual exclusivity under Exhaustivity (Box 3). Second, movement of objects at LF is necessary for even the weaker condition to hold. In this Section I show that both of these caveats are empirically inadequate, and that the simplest hypothesis takes Givenness$_S$ to be present without creating Contrast. This leads to a re-examination of the data that led to Wagner's proposal in order to determine why Contrast is necessary in some environments and not others. I conclude that the Givenness$_S$ of a constituent must be inherited by any elements which adjoin to it. Thus, the only way to derive a de-accenting pattern that shifts accent onto an adjunct, such as a modifying adjective like in (8), is via Focus (leading to a Contrastive interpretation in such cases).

Let's first address the idea of mutual exclusivity under Exhaustivity, beginning with a technical point. The Exh operator is semantically the same as *only*—$Exh(a)(b)$ is true so long as any statement $[ab']$ that is also true is entailed by $[ab]$. For example, the sentence *only John and Mary went swimming* is true because, modulo domain restriction, any other true statements about who was swimming (i.e. *John went swimming*

and *Mary went swimming*) are entailed by the operand of [[only]]. Now consider example (11) from the first Section.

(11)   Mary went SWIMMING. After that, JANE <u>went swimming</u>.

The application of this operator to a proposition like *Jane went swimming* certainly does exclude the antecedent *Mary went swimming*; however, we can manipulate the example so that the antecedent is entailed by the accent-shifting sentence, in which case mutual exclusivity under Exh no longer holds.

(13)   Mary went SWIMMING. In fact, EVERYBODY <u>went swimming</u>.

If we apply Exh to de-accenting sentence we get a denotation that is true as long as any contextually relevant statement of the form *x went swimming* is entailed by *everybody went swimming*. This condition of course holds for all possible antecedents, and indeed in this context it is true that the antecedent *Mary went swimming* is entailed by the de-accenting sentence. Therefore, applying Exh does not exclude the antecedent.

Is there some other way in which an example like (13) represents Contrast? It is worth considering the possibility of Contrast between events. If the subject *everybody* can be interpreted as a collective Agent of a swimming event, then the two sentences in (13) encode different events with different Agents, in which case the UniClo of an event-based denotation, $\forall e.swim(e)$ & $past(e)$ & $Agent(everybody, e)$, excludes its antecedent without any reference to Exh. However, this is not fully generalizable, as evidenced by the following.

(14)   I don't think the city is safe anymore. My COUSIN <u>lives in the city</u>, and she says it's deteriorating fast.

Though mentioning unsafe conditions in a city makes it salient that there are people who live in that city, allowing Givenness$_S$, there is no specific event or state evoked by the context, and thus no Agent or Experiencer to be excluded by the neo-Davidsonian UniClo of *my cousin lives in the city*. The easiest way to account for these examples is simple Givenness$_S$.

There is another problem with unifying Givenness$_S$, Focus and Contrast: one must posit LF-movement of G-marked objects, and this makes false predictions regarding de-accenting within DPs and islands. Recall example (12) from Section 1.

(12)   Smith got away from the scene of the crime in Mary's cheap convertible.
    Q: Then what happened?
    A: The car broke down, and a detective ARRESTED <u>Smith</u>.

Here, it is said that *Smith* moves to a propositional node at LF, partitioning the semantic structure into the moved object *Smith* and $\lambda x.PAST(arrest(detective, x))$. Wagner gives the following example as support for the LF movement approach, reasoning that DPs should disallow the broader pragmatic license for de-accenting in (12) because there is no propositional node within the DP for the de-accented element to move to.

(15)   You should hire a DJ. #The PRESENCE of a DJ makes a big DIFFERENCE at a party.

The mere salience of DJs in the context is not a sufficient license for accent shift, and thus the example seems not to be parallel to (12). However, there is an issue with this particular case. The noun *presence* is semantically rather empty, and in almost any context meets the criteria of Schwarzschildian Givenness. We expect such a word to resist accent *a priori*. Below is a different example where accent shift within a DP is fine without an explicitly Contrastive antecedent.

(16)   My mother asked if we were moving to the city. I told her that the VIOLENCE in the city is a TURN-OFF.

Here we have a clear case of de-accenting within a DP (*city* would bear some accent if its denotation were not salient), and there is no mutually exclusive antecedent for *violence in the city*. Thus it is not clear that DPs can be used as evidence for LF movement.

It is also possible to de-accent within islands. The following illustrates de-accenting of an element that, were it to move, would violate the Coordinate Structure Constraint (Ross 1967).

(17)   *$[_{PP}$ From which store] did you buy a necklace t_{PP} and a belt from Macy's?

    Oh, you went to Sak's? Yesterday I bought a NECKLACE from Sak's and a BELT from MACY'S.

We could construct similar examples for other island constraints, but Wagner (p.27) points out that other islands have propositional nodes, allowing movement within them rather than out of them, making these cases inconclusive. The felicity of (17) is conclusive, however, given that the PP should not be able to move at all. An *in situ* analysis of this sentence predicts an antecedent of the form $\lambda x.P(x) \ \& \ from(Saks)(x)$ whose existential closure is made false by the UniClo of the first conjunct NP, $\forall x.necklace(x) \ \& \ from(Saks)(x)$. This prediction is not borne out.

Finally, let's take a closer look at examples like (10). These seem on the surface to suggest that some form of Contrast is necessary to shift accent onto the verb.

(10)   a.   Q: I heard that somebody shot Smith, and that he's been recovering in the hospital. Is he OK now?
             A: Actually, something bad happened again. You'll never guess: Someone shot SMITH! / #Someone SHOT Smith!
        b.   Q: I heard that somebody shot Smith, and that he's been recovering in the hospital. Is he OK now?
             A: Actually, something bad happened again. You'll never guess: Someone STABBED Smith! / #Someone stabbed SMITH!
        (after Wagner 2010:15)

In (10a) there is no Contrast because the clause and its antecedent are identical—$\lambda x.\exists y.PAST(stab(y,x))$ is not mutually exclusive with itself. But this identity relation offers independent explanation for the infelicity of de-accenting. In this case, to de-accent would be to shift accent from one Given$_S$ constituent to another Given$_S$ constituent. This is not motivated, and since one cannot de-accent an entire utterance, an entirely

Given$_S$ utterance results in default, right-edge prosody. The following illustrates that in straightforward cases of all-Given utterances, prominence falls in the same place as it would were the utterance entirely new.

(18)   Q: You got a new computer?
         A: Indeed, I got a new COMPUTER.

The true test case is one where the verb is not Given$_S$ and also lacks any Contrastive antecedent. Contra Wagner, felicity in such cases is possible. Recall the phenomenon of de-accenting in conversation starters.

(6)   Context: Pat is reading a book about castles in Germany. Chris walks in, sees Pat, and utters the following sentence out of the blue in order to engage Pat.

         I've never BEEN to Germany. Have you?

(19)   Context: June comes home to find her roommate watching a documentary about Leo Tolstoy. June sits down next to her roommate and utters the following sentence.

         My great-grandfather was FRIENDS with Tolstoy.

(20)   Context: Driving on the interstate, passing a road sign reading "Dayton, OH", a passenger utters the following to the driver.

         I used to LIVE in Dayton.

The evidence against LF-movement, the inconsistent presence of Contrast at the propositional level, and the ability of constituents to de-accent when salient in the non-linguistic context with no prior discourse, when taken together, all point toward a simple Givenness$_S$-based account. However, we cannot ignore the data which led Wagner's generalization.

(21)   Q: Mary's rich uncle buys and sells expensive convertibles. He's coming to Mary's wedding. I wonder what he got her as a gift.
         A: He got her [a CHEAP convertible]. / #He got her [a BLUE convertible].

When does de-accenting create Contrast? We have seen non-Contrastive de-accenting of adjuncts (examples 16 and 17), arguments (12, 19 and 20), and entire predicates (11, 13 and 14). The only environment we have seen so far which requires Contrast is where prominence shifts from a modified NP onto a modifying adjective. That this case is different from the others we have looked at is further illustrated by the following pair.

(22)   a.   Convertibles can be very dangerous, so imagine my horror when Jack felt it necessary to buy his NIECE a convertible.
         b.   #Convertibles can be very dangerous, so imagine my horror when Jack felt it necessary to buy his niece a BLUE convertible.

We can generalize this to include adverbs as well.

(23)   Everybody knows Fred loves to dance. #Just yesterday I saw him in his office WILDLY <u>dancing</u>.

The generalization is that one cannot shift accent onto a modifying adjunct without a mutually exclusive antecedent.[4] This is indicative of two independent factors determining de-accenting: a Givenness$_S$ feature which is syntactically constrained in its distribution, and a notion of Focus which is not. This raises the following question: is Question-Answer congruence due to Givenness$_S$ or Focus? It is immediately clear that Focus is responsible, as Question-Answer congruence can easily shift prominence onto adjuncts.

(24)   Q: What color convertible did you buy?
         A: I bought a BLUE <u>convertible</u>.

(25)   Q: In what manner were you dancing?
         A: I was WILDLY <u>dancing</u>.

In light of this, the table below summarizes the distribution of de-accenting in English.

	Merely Given$_S$	Contrast-creating	Part of QUD
Adjuncts	✓	✓	✓
Arguments	✓	✓	✓
Predicates	✓	✓	✓
Modified NPs	x	✓	✓
Modified VPs	x	✓	✓

TABLE 1: THE DISTRIBUTION OF DE-ACCENTING

We see that mere Givenness$_S$ is restricted in a way that other licenses for de-accenting are not. This leads me to the following hypothesis, for which I will give additional support in Section 3.

- A constituent is de-accented, i.e. invisible to sentential stress assignment, if:

    1. a QUD or Contrast in the discourse makes some other element the Focus of the sentence (a CHEAP <u>convertible</u>), or

    2. the constituent itself is marked with a Givenness$_S$ feature (the VIOLENCE <u>in the city</u>).

- Any structure that adjoins to a Given$_S$ node must inherit its G-feature (#a BLUE <u>convertible</u>)

HYPOTHESIS 1

This rules out (22b) on the grounds that Givenness$_S$, the only IS notion licensed by the context, cannot derive the accent pattern in question. I illustrate this below using the notation of the Tree-Adjoining Grammar (TAG) formalism (Joshi 1985, Kroch and Joshi 1985, Schabes and Schieber 1990, Frank 2002, and many others).

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[4]To drive the point home, consider a variant of (16): #. . . the VIOLENT <u>city</u> is no place to LIVE (due to Tony Kroch).

NP   +   NP   ⇒   NP

convertible   A   NP*   A   NP

blue   blue   convertible

NP_G +   NP   ⇒ NP_G

convertible A_G NP* A_G NP_G

blue   blue   convertible

NP   +   NP   ⇒   NP

convertible A_G NP* A_G NP

blue   blue   convertible

NP_G +   NP   ⇒ NP_G

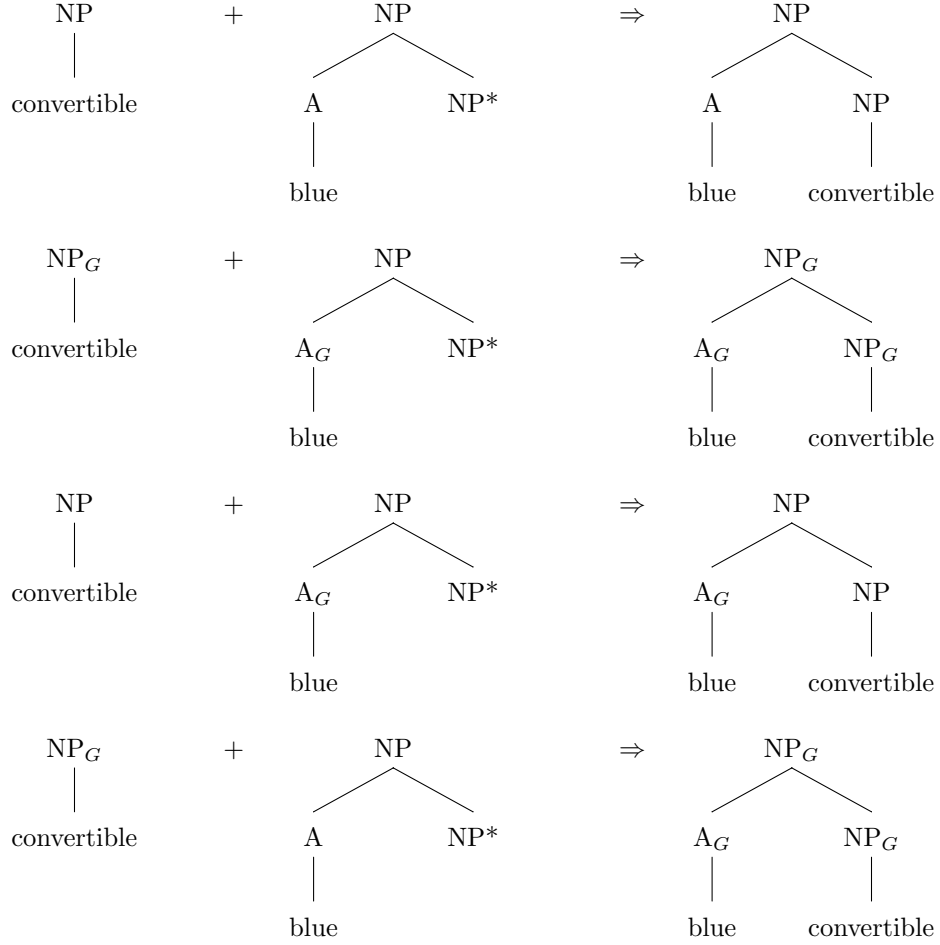convertible   A   NP* A_G NP_G

blue   blue   convertible

FIG. 3: ADJUNCTS INHERIT G-FEATURES

In the next Section I turn to the predictions that this account makes vis-à-vis scrambling in German.

3   Scrambling and G-marking

Scrambling, or the optional short-distance movement of material within the VP domain, is thought to be a form of adjunction (see e.g. Webelhuth 1989, Wallenberg 2011). German is a language which allows scrambling, and effects of Information Structure on scrambling possibilities have been reported, beginning with Lenerz's (1977) observation that scrambling tends not to result in a Focused element preceding a non-Focused element, as seen when comparing the following two examples.

(26)   Q: Wann hast du   das Buch gelesen?
            when   have you the book read
            'When did you read the book?'

       A: Ich habe GESTERN <u>das Buch gelesen</u>. / Ich habe das Buch GESTERN <u>gelesen</u>.
           I   have yesterday <u>the book read</u>   / I   have the book yesterday read
           'I read the book yesterday.'

(27) Q: Was hast du gestern gelesen?
what have you yesterday read
'What did you read yesterday?'

A: Ich habe gestern das BUCH gelesen. / *Ich habe das BUCH gestern gelesen.
I have yesterday the book read / I have the book yesterday read
'I read the book yesterday.'

(Lenerz 1977:20-21)

The first formulation of the answer in (26), *ich habe gestern das Buch gelesen*, represents the unmarked order in that it is grammatical regardless of context factors. The second formulation of the answer in (26) shows the object *das Buch*, which is part of the QUD, scrambling past the Focused adverbial *gestern*. Example (27) shows the asymmetry in question: it is unacceptable in this context to scramble the Focused direct object leftward past the non-Focused, de-accented adverbial.

The following from Abraham (1986:18) shows another effect on scrambling which appears to be independent of IS.

(28) a. Ich habe meinem BRUDER den Brief geschickt. / Ich habe den Brief meinem BRUDER
I have my brother the letter sent / I have the letter my brother
geschickt.
sent.
'I sent my brother the letter'

b. Ich habe meinem BRUDER einen Brief geschickt. / *Ich habe einen Brief meinem BRUDER
I have my brother a letter sent / I have a letter my brother
geschickt.
sent.
'I sent my brother the letter.'

We see here that the indefinite DP *einen Brief* is unable to scramble, even when it is part of the Question Under Discussion. This is indicative of an effect of specificity: scrambling should not result in a non-specific DP preceding a specific one. One reflex of this is that definite DPs tend to precede indefinite DPs independent of any right-edge Focus effects.

(29) Q: Wem hat Hans ein Buch gegeben?
who.dat has Hans a book given
'To whom did Hans give a book?'

A: Ich glaube dass Hans dem SCHÜLER ein Buch gegeben hat. / *Ich glaube dass Hans ein
I believe that Hans the student a book given has / I believe that Hans a
Buch dem SCHÜLER gegeben hat.
book the student given has
'I believe that Hans gave a book to the student.'

(Choi 1996:184-185)

Examples like this show failure of an indefinite DP to scramble. On the other side of the coin, definite DPs appear to be able to scramble solely in virtue of being definite. Fanselow (2012) lays out the case, showing

that definite DPs scramble leftward in cases where there is no IS-based reason to do so, considering the case of idiomatic expressions.

(30) Vielleicht hat er die Flinte zu früh ins   Korn geworfen.
      perhaps   has he the gun   too early into-the corn thrown
      'Perhaps he gave up too early.'

Here, an idiomatic phrase is split up—the direct object *die Flinte* is scrambled out of its canonical position below the adverbial *zu früh*. This does not affect the IS-syntax mapping in any way, and yet this is the most natural word order for this sentence.[5]

   There are other factors influencing scrambling behavior, but the interaction between the three factors discussed here, definiteness, specificity and right-edge Focus effects, is sufficient to generate a testable prediction in regards to Hypothesis 1 from Section 2. Namely, we can construct an example where there is pressure for a definite DP to scramble past an indefinite, non-specific DP independently of IS, and then test whether the availability of this operation is limited by a particular IS effect predicted by the hypothesis

   Recall that under Hypothesis 1, when a constituent adjoins to a Given$_S$ constituent, the adjunct must inherit the G-feature, creating an "all or nothing" effect. We motivated this on the grounds that accent only shifts onto adjuncts when the adjunct is narrowly Focused (either wh-Focused or Contrastively Focused), but it has ramifications for scrambling if scrambling is taken to be adjunction. It should not be possible to scramble a non-G-marked argument such that it adjoins to a G-marked VP remnant. G-marking of the remnant is not itself problematic: the Givenness$_S$ criterion can be met under the common assumption that movement replaces its trace (or lower copy) with a bound variable at LF. In fact, remnant G-marking may be characteristic of so-called Focus movement in English, shown in the following example from Prince (1981a:259).

(31) They just bought a dog. FIDO they named it *t*.

The de-accenting of the remnant *they named it* can in principle be due either to G-marking of that remnant or to narrow Focus on the fronted object *Fido*. Using the restriction on adjunction to Given$_S$-marked nodes, we can show that in this case it is indeed G-marking, and not Focus, that is responsible. In order for *Fido* to be in Focus, there must be some QUD or open proposition in the discourse of the form *they named the dog x*. When this is explicitly introduced into the discourse we see that, predictably, the adjunction restriction does not apply.

(32) Q: What did they name the dog?
      A: They gave it a STUPID name

If (31) is an instantiation of Focus, then we predict the same intonation possibility. However, this is not the case, which suggests that we are dealing with a G-marked remnant.

(33) They just bought a dog. They gave it a stupid NAME. / #They gave it a STUPID name.

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[5]In the absence of the adverb *vielleicht* it is natural to raise the direct object to spec,CP yielding *die Flinte hat er zu früh ins Korn geworfen*. This seems to support the idea that the left periphery of a German sentence is filled via first scrambling past the subject (Frey 2006). Aspects of examples like these are considered in Fanselow and Lenertová (2011).

If a remnant constituent can be marked as Given$_S$ after a non-Given$_S$ element has been moved out of it, then we have a true test of Hypothesis 1: we need to know whether a moved non-Given$_S$ constituent can *adjoin* to its Given$_S$ remnant. Initial evidence bears out the prediction that it can't.

By way of setting up our test, the following example shows a case where the preference for definites to precede non-specific indefinites makes scrambling possible even when the scrambled element is narrowly Focused.

(34)   Q: Was bietet Darth Vader einem Rebellen an?
              what offers Darth Vader a.dat rebel.dat on
              'What is Darth Vader offering to a rebel?'

         A: Ich habe gehört, dass Vader den TODESSTERN einem Rebellen *t* anbietet.
             I   have heard that Vader the Death-Star   a.dat rebel.dat offers
             'I heard that Vader is offering the Death Star to a rebel.'

While this is not the only possible order, it is acceptable in a narrow wh-Focus context with strong accent on *Todesstern* (Florian Schwarz, p.c.), which runs counter to the generalization of Lenerz (1977) illustrated in (27). This is not a problem for Hypothesis 1 because the accent pattern of the answer can be derived via Focus alone, without any G-features in the structure. More importantly, this is a good test case because there is an independent *reason* to scramble. Scrambling is optional, and thus we need to separate out the grammaticality of certain configurations from their felicity. Hypothesis 1 predicts that in a broad Focus construction where the context makes the denotation of *einem Rebellen t anbietet* salient, the answer in (34) should not be possible. This is indeed the case (Florian Schwarz, Beatrice Santorini, p.c.)

(35)   'Word on the street is, Darth Vader has been doing business with the rebels.'

         Q: Was hast du gehört?
             what have you heard

        A: #Ich habe gehört, dass Vader den TODESSTERN einem Rebellen *t* anbietet.
             I   have heard that Vader the Death-Star   a.dat rebel.dat offers
             'I heard that Vader is offering the Death Star to a rebel.'

Compare to an English passive construction conveying a similar meaning.

(36)   Word on the street is, Darth Vader has been doing business with the rebels.

         Q: Really? What have you heard?

         A: I heard that the DEATH STAR was offered to a rebel.

My intuition is that although the passivization is odd in the context, (36) is otherwise an acceptable question-answer pair. The German scrambling analog to this, however, is infelicitous. This is predicted under Hypothesis 1. Since the de-accented remnant is part of the Focus, the only way to felicitously derive the intonation pattern in question would be via G-marking, but the scrambled object *den Todesstern* cannot adjoin to the G-marked remnant without itself being G-marked. In this regard (35) is parallel to (21), where BLUE convertible is ruled out.

The answer in (34) is also felicitous when it is Contrastive, providing yet another parallel between Contrastive Focus and Question-Answer congruence.

(37)   Ich habe gehört, dass Vader den TODESSTERN <u>einem Rebellen *t* anbietet</u> (nicht die AT-ATs).

Considering other possible configurations shows that it is *only* when adjoining Given$_S$ to non-Given$_S$ that the definite-before-indefinite preference must be violated. The following example, where prominence is suppressed on the scrambled object, shows that the converse is acceptable—Given$_S$-marked DPs can scramble and adjoin to non-Given$_S$-marked nodes.

(38)   Ich habe einen Brief geschrieben. Dann habe ich <u>den Brief meinem BRUDER   geschickt</u>.
        I   have a   letter written.   Then have I   the letter my.dat brother.dat sent
        'I wrote a letter. Then, I sent the letter to my brother.'

Sentences like (30) above show that splitting up broad Focus via scrambling is no problem.

(30)   Vielleicht hat er die Flinte zu früh ins   Korn geworfen.
        perhaps   has he the gun   too early into-the corn thrown
        'Perhaps he gave up too early.'

Finally, the following shows that a contrastive interpretation of both the scrambled DP and of an *in situ* DP is fine.

(39)   Vader hat den Todesstern einem Rebellen angeboten. Dann hat Vader die AT-ATs einem
        Vader has the Death-Star a.dat rebel.dat offered.   Then has Vader the AT-ATs a.dat
        KOPFGELDJÄGER angeboten.
        bounty-hunter   offered
        'Vader offered the Death Star to a rebel. Then, he offered the AT-AT units to a bounty hunter.'

The following table summarizes the possibilities.

	Given$_S$	Contrastive	Entire QUD answer	Partial QUD answer
De-accented remnant VP	✓	✓	✓	x
Accent-containing remnant VP	✓	✓	N/A	✓

TABLE 2: POSSIBLE ADJUNCTION SITES FOR A SCRAMBLED DEFINITE DP

This is as expected. Under Hypothesis 1, a definite DP should fail to scramble only in cases where 1) it is accented, 2) the remnant is de-accented, and 3) that accent pattern cannot be due to the scrambled DP being narrowly Focused. Again, this is because in such cases the only other possible license for the accent pattern, a Givenness$_S$ feature on the remnant, is unavailable due to the nature of adjunction. Figure 4 illustrates.
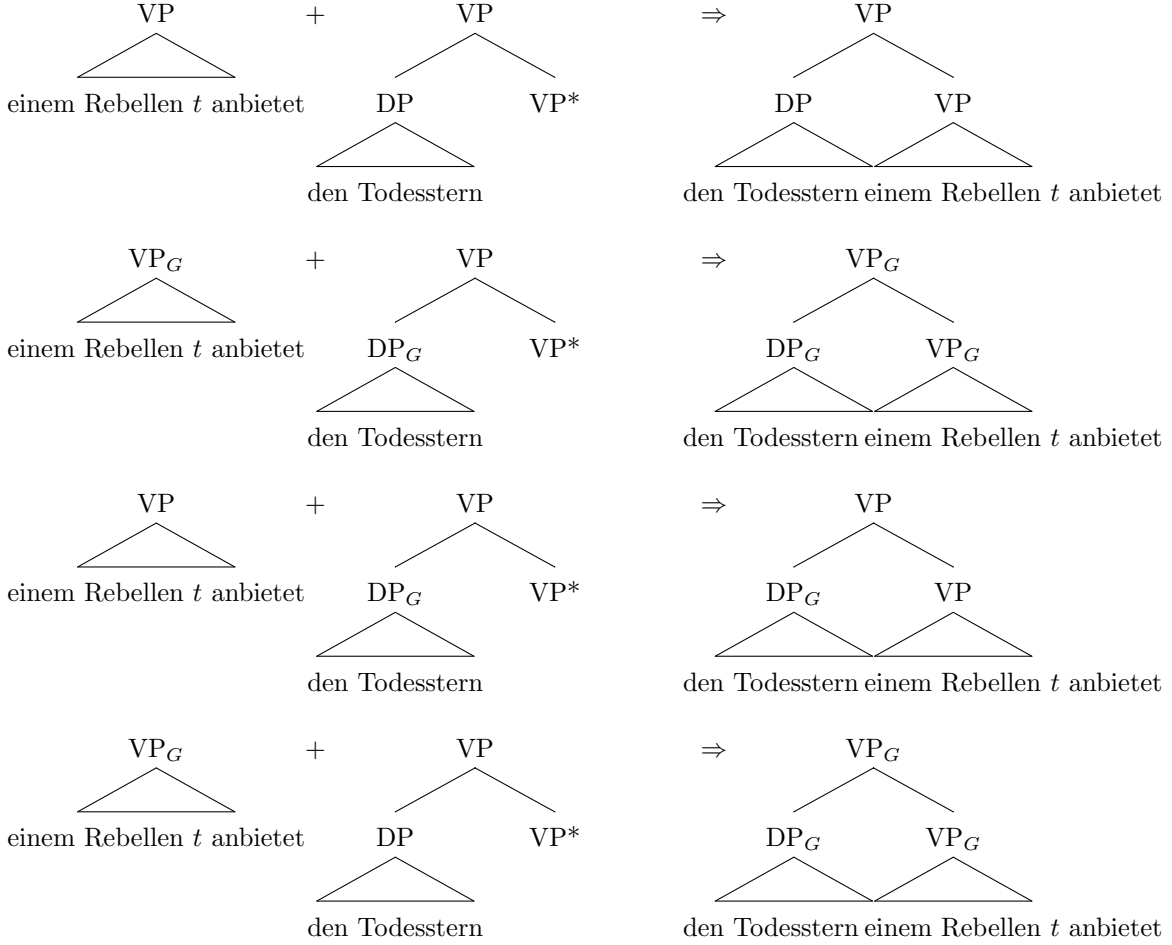
FIG. 4: SCRAMBLED ARGUMENTS INHERIT G-FEATURES

This Section has argued that the possibilities for definiteness-motivated scrambling in German are in line with, and thus serve as support for, the hypothesis formulated in Section 2. That two seemingly disparate phenomena, de-accenting in English and scrambling in German, might be partially governed by the same principle is a promising result. However, there are still many questions to be answered. Firstly, there are likely subtleties beyond what has been addressed regarding when definite DPs can scramble past indefinite DPs. Also, there are other general effects of IS on scrambling. For example, when an accented definite DP scrambles past another definite DP (controlling for definiteness and specificity effects), the result is typically a Contrastive interpretation; instances of Question-Answer congruence disfavor this configuration (Choi 1996, Neeleman & van de Koot 2008). Finally, I have motivated a descriptive account whereby G-features are inherited by adjuncts, which I illustrated using a primitive feature-based TAG formalism, but I have not said much about the mechanics of this, or how this might be instantiated in any mainstream theory of syntax. More work is needed to determine exactly how this syntactic generalization should be formalized and presented. I will address these questions further in Section 5, wherein I outline plans for further research. But first, I wish to lay out a tentative hypothesis regarding Focus, formulated in light of how Focus differs from and interacts with the Givenness$_S$ phenomena thus far discussed.

4   Focus as a discourse phenomenon

To summarize thus far, a closer look at the distribution of de-accenting in English and scrambling in German supports a particular view of what we call Information Structure. Under this view, the correlation between the information status of a linguistic object (i.e. its relation to the hearer's consciousness or knowledge state) and whether it receives prosodic prominence (e.g. in the form of pitch accent) is a composite of two phenomena: one syntactically constrained and related to salience in context (Givenness$_S$) and one less constrained and related to the goals of the speaker and expectations of the hearer (Focus).

That multiple notions of this sort should co-exist is not itself a new idea—Selkirk (2007) posits both G-features and F-features. However, the reasons given in Sections 2 and 3 above for proposing this co-existence are quite different from Selkirk's reasons, and the details of the analyses are not at all the same. As outlined in Section 1, Selkirk proposes an accent-removing Givenness feature to explain Question-Answer congruence in light of her claim that only Contrastive Focus, and not wh-Focus, is marked in language.[6] The current proposal points out that Question-Answer congruence shows the distributional properties of Contrastive Focus and not those of Givenness$_S$, whose existence is motivated by other phenomena (e.g. de-accenting in conversation starters). The syntactic restriction on Givenness$_S$ and its implications for scrambling comprise what is thus far the novel contribution of this proposal. But on the other side of the coin, comparing the implications of the view suggested here with those of Selkirk's view raises several interesting questions about Focus which may lead to novel insights.

- Is there any restriction at all on what can be in Focus?

- Does the inclusion of an F-feature in syntax have any explanatory value?

- Is a separate notion of Contrast required to motivate syntactic movement?

I address these questions in turn, tentatively arriving at a hypothesis about Focus which makes the strong prediction that neither Contrastive Focus nor wh-Focus should directly motivate syntactic movement.

4.1   Distributional asymmetry

First, let's examine the distribution of Focus, and in particular the asymmetry between Focus and Givenness$_S$. Under Hypothesis 1, Givenness$_S$ is inherited by adjuncts. We can show that this is not likely to be the case for Focus, beginning with the following.

(40)   Q: Did you have pizza with onions or a sandwich with onions?
         A: I had [a SANDWICH] with onions.

This only serves to show that the adjoining PP *with onions* does not inherit any prosodic prominence from *sandwich*. It does not show that Focus is not inherited, since the failure to inherit prominence could be due to G-marking.

---

[6]Another motivation of Selkirk's G-feature lies in a particular analysis of so-called second-occurrence Focus, where discourse-old elements associated with *only* can be de-accented. The analysis relies on Rooth's (1992) "weak" theory of Focus interpretation whereby *only* must associate with an F-feature. See Chapter 2.3 of Eilam (2011) for an extended argument that second-occurrence Focus is not, strictly speaking, Focus. I adopt Eilam's view, and for the purposes of this proposal I have nothing more to say about this phenomenon.

(41)   Q: Did you have pizza with onions or a sandwich with onions?
       A: I had [a SANDWICH with onions$_G$].

To distinguish between these possibilities we must ask: is there another property, apart from de-accenting, that can differentiate between Givenness$_S$ and lack of Focus? There is at least one such phenomenon that can be brought to bear on this case: ellipsis. Focus and ellipsis are closely linked (Kim 1997), and Question-Answer pairs often instantiate ellipsis of everything that is not in Focus.

(42)   Q: Did you have pizza with onions or a sandwich with onions?
       A: A sandwich.

Is the Ground for (42) 'I had x' or 'I had x with onions'? Clearly, the answer is taken to be equivalent to *I had a sandwich with onions*, but this seems like it could be a trivial product of Gricean principles, rather than an indication of narrow Focus on *a sandwich*. However, the following gives pause.

(43)   a. Q: Were you eating onions again?
           A: Yes. I had a SANDWICH with onions.
       b. Q: Were you eating onions again?
           A: Yes. #I had a SANDWICH.

Two conditions hold here: 1) the missing PP *with onions* is Given$_S$, and 2) the denotation of the missing PP is easily recoverable via Grice's maxim of Relation. Nonetheless, to leave it out seems quite odd to me. The answer in (43b) seems to imply that onions are a fundamental ingredient in sandwiches, which is of course not the case. Omission of the adjoining PP is licensed when it is part of the QUD but not in a minimally different context where the PP is merely Given$_S$. This suggests that the elided answer in (42) is indeed an example of pronouncing the Focus deleting the Ground. Of course, if *sandwich* is narrowly Focused, and the configuration in (40) implied, then the adjoining PP does not have to inherit Focus. An asymmetry is implied.

   Going beyond this, we see that Focused bound morphemes are possible, but not Given$_S$ bound morphemes.

(44)   My mother thinks I'm out of work, but actually I'm UNDERemployed.

(45)   a. The issue of job creation is particularly important to those who can't FIND work.
       b. The issue of job creation is particularly important to the unEMPLOYED. / #... the UNemployed.

It turns out that (45b) mirrors the "blue convertible" examples from Section 2: there must be a contrasting antecedent for the morpheme *un-*, suggesting that Givenness$_S$ cannot be responsible for shifting the accent within the word. Alternatively, accent shift within a word is possible in cases of Question-Answer congruence, as we have come to expect.

(46)   Q: What's your employment status?
       A: I'm UNemployed.

Another interesting distributional fact about Focus is that it is often assigned to parts of words in order to contrast with or fill in phonological shapes, rather than semantic content (Artstein 2004).

(47)   I said she was EMployed by the army, not DEployed.

(48)   Q: This is a stalag-what?
        A: It's a stalagMITE.
        (Artstein 2004:7)

(49)   I said I like Thai FOOD, not tyPHOONS!

The temptation is to brush these aside as fringe cases of "meta-linguistic" Focus. But what's interesting is that there is no counterpart phenomenon involving Givenness$_S$. There is no meta-linguistic G-marking.

(50)   There are lots of restaurants in town to choose from. We only have two restrictions: I don't want to go anywhere that requires a shirt and TIE, and #my father doesn't LIKE Thai.

Here it is infelicitous to de-accent the salient phonological shape even though, similarly to (43b) above, the utterance is not *a priori* difficult to interpret. After all, any Gricean reasoner should be able to figure out that it is *Thai* that is meant, and not the nonsensical *tie*. Only Focus, and not Givenness$_S$, can apply to parts of adjunction structures, parts of words, and phonological shapes.

I conclude this discussion of Focus/Givenness$_S$ asymmetry with what I consider to be a particularly beautiful example of the versatility of Focus. This example was heard on a TV show singing competition entitled "The Voice". One of the judges, Cee-Lo Green, was describing the competition's high standard for vocal prowess, and he summed up his thoughts on the matter with the following utterance.

(51)   We're looking for THEE voice, not THUH voice.

Here, Cee-Lo is contrasting two possible vowel qualities for the English definite determiner *the*, emphasizing that the most appropriate vowel quality for his utterance is the unreduced long vowel (i:) rather than the reduced schwa, due to his intent to convey the implicatures that go along with stressing the definite determiner in a way that yields the long vowel. When one stresses *the* in this way it has the effect of widening the domain restriction of the definiteness presupposition, implying some sort of global uniqueness. The implicature here is that Cee-Lo and company are looking for the best singer of all, not just a big fish in a small pond.

4.2   Can syntax see Focus?

If Focus and Givenness$_S$ are indeed separate phenomena as I've argued, then they have distributional properties that are summed up in the following table.

	Focus	Givenness$_S$
Argument	✓	✓
Adjunct	✓	✓
Adjoined-to constituent	✓	**x**
Bound morpheme	✓	**x**
Phonological unit	✓	**x**

TABLE 3: FOCUS VS GIVENNESS$_S$

Based on this we can ask: what would an F-feature be a feature of? Momentarily leaving aside the issue of Focus-correlated syntactic movement, a complex matter which is addressed in the next subsection, there is no evidence that Focus is represented in the syntactic derivation of a sentence. I argue this point by defending four premises.

1. That Givenness$_S$ alone is arbitrarily constrained in its distribution suggests a difference in ontological status between Givenness$_S$ and Focus.

2. Example (51) instantiates a case of Focus that is difficult to account for under standard syntactic assumptions.

3. There is a syntax-free account of "meta-linguistic" examples like (51) which, upon first inspection, generalizes to the more straightforward cases.

4. If generalizable, such an account is more descriptively and explanatorily adequate than a syntax-based account in that it covers more cases and is consistent with premise (1).

Premise (1) states that the restrictions on Givenness$_S$ are arbitrary. This is intended to mean that there is nothing about the semantic or phonological interpretation of Givenness$_S$ that explains the distributional difference. It has been demonstrated throughout this proposal that certain accent patterns are derivable via Focus but not via G-marking, and thus there is no purely prosodic prohibition that is responsible for the unavailability of G-marking in these cases. The most adequate semantic interpretation for Givenness$_S$, prior salience of a denotation in discourse (possibly encoded as entailment under existential closure), also fails to predict the unavailability of G-marking. This is unexplained if G-features and F-features belong to the same class of formal objects in Language.

Premise (2) returns to Cee-Lo's utterance in (51)

(51)   We're looking for THEE <u>voice</u>, not THUH <u>voice</u>.
         'We're looking for the globally best voice, not the locally best voice.'

Standard syntactic theory assumes the following architecture of the Language faculty, whereby abstract linguistic structures are assembled at a syntactic level of representation before being split off to be interpreted in parallel by semantic and phonological systems (the process known as "Spell-out" after Chomsky 1995).

```
                          Syntax

        Phonological Form (PF)      Logical Form (LF)
```
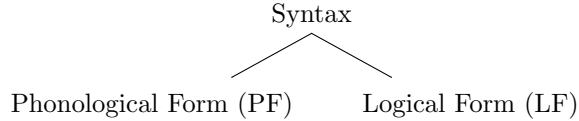
Fig. 5: Standard architecture of Grammar

An Information-structural feature like Focus, having both a phonological and a semantic interpretation, would have to associate with an abstract pre-Spell-out structure, and it is the abstract representation, void of any phonological information, that is interpreted at LF. In light of this, let's consider two possible analyses based on syntactically represented F-features. The first is a straightforward Rooth-style analysis where semantically interpreted lexical items are tagged with an F-feature. The sentence would have the following configuration.

(52)   We're looking for ˜[THE$_F$ voice], not ˜[THE$_F$ voice]

Since the Focus configuration is interpreted separately by the semantic and phonological systems, the two focused instances of *the* cannot encode any phonological features like vowel quality at LF. The result is the two DPs are identical with respect to satisfying the presuppositions of Focus, as is represented above.[7] Such a configuration is ruled out by Rooth (1992:90) on the grounds that an element never serves as an alternative to itself. Motivating this prohibition is trickier than it might seem at first glance, but it is possible. As Rooth points out (p.108), some Focus effects are optional; perhaps (52) is a perfectly interpretable structure, but not one typically chosen in discourse. In this case, meta-linguistic Contrast could supply motivation for what is otherwise pragmatically sub-optimal. I think it's a mistake to assign such an impoverished interpretation to Focus. If one is free to choose configurations like (52) when there is some external reason to do so, then we expect various factors apart from meta-linguistic Contrast to be a factor. For example, we know that speakers tend to avoid clashing prominences wherever possible, often affecting the choice of syntactic construction (see Speyer 2008) and sometimes causing stress shift within lexical items.

(53)   a.   Beans, he likes; rice, he doesn't
        b.   John likes beans; Mary likes rice
        c.   ?Beans, John <u>likes</u>; rice, Mary <u>likes</u>.

(54)   a.   Let's go to New York.
        b.   The New <u>York</u> city nightlife. . .

And yet such considerations are not sufficient to license Focus in the absence of a true alternative.

(55)   #This house won't sell because this <u>house</u> smells.

It's advantageous to maintain the requirement of true alternatives. Therefore, I hold that a better account is one where phonological features contrast to license the Focus.

---

[7]Though one might conjecture to say that there are separate lexical entries for *thee* and *the*, it is not true that *thee* is always used as it is in (51). It is interchangeable with *the* in other circumstances, and is correlated with other non-semantic phenomena like language planning (see Arnold, Tanenhaus, Altmann, and Fagnano 2004).

The second possibility we need to consider is one suggested by Artstein (2004) to account for Focus below the word level, as in (48). Perhaps there are syntactic objects that refer meta-linguistically to their own phonological forms. Imagine a class of syntactic objects $PHON$, where $PHON.p$ denotes some string of phonemes p and whose pronunciation at PF is identical to p. Further, imagine a class SEM where $SEM.s$ denotes a function from an instance of $PHON$ to a semantic denotation of the form $P(s)$. The following configuration would result.

(56)   We're looking for ˜[$PHON.\textsc{thee}_F$ $SEM.\text{voice}$], not ˜[$PHON.\textsc{thuh}_F$ $SEM.\text{voice}$]

Here it is the phonological segments that contrast, and not any denotations in the traditional sense. This is a more reasonable license for the Focus configuration: there are true alternatives in the form of differing $PHON$ objects. There are two problems, however. First, this framework was devised to account for Focused word parts, not for Focused words, and extending it in this way makes for a rather unconstrained theory. For example, while there is a systematically determined relationship between, say, $SEM.\text{stalag}$ and $PHON.\textsc{mite}_F$ in (48)—the combination of the two phonological forms corresponds to a single lexical item with a recoverable denotation—the relationship between $SEM.\text{voice}$ and $PHON.\textsc{thee}_F$ is nebulous. There is no interpretable lexical item *theevoice*, and it's unclear how the output of $[[SEM.\text{voice}]]([[PHON.\textsc{thee}_F]])$ should be determined. The interpretation would be straightforward if $PHON.\textsc{thee}_F$ was identified in the derivation as an instance of the lexical item *the*, but it's unclear how this element could simultaneously refer at LF to the phonetic shape and the lexical identity of the word.

The second problem with (56) is that it predicts meta-linguistic G-marking. There is nothing in the theory to prohibit a G-feature on an instance of $PHON$, resulting in a configuration like the following.

(57)   I don't want to go anywhere that requires me to wear $SEM.\text{a}$ $PHON.\text{/tay/}$, and my father doesn't $SEM.\textsc{like}$ $PHON.\text{/tay/}_G$.

This licenses the infelicitous (50) under a Schwarzschildian interpretation of the G-feature. There is a salient discourse antecedent *tie* whose denotation $PHON.\text{/tay/}$ is co-referential with the de-accented *Thai*. While it is likely that a notion like $PHON$ exists independently above the word level to represent explicit reference to the pronunciation of a word, the impossibility of (50) casts doubt on the reality of SEM.

Once we grant that the Focus is licensed by a combination of semantic and phonological information, we must either account for (51) extra-syntactically or modify the standard architecture of grammar. Not wishing to throw the baby out with the bath water, I opt for the former.

This leads us to premise (3). How should we handle (51)? I suggest a generalization of Roberts (1996, 2011) whereby Focused elements address or introduce Expectations. Like a QUD, an Expectation can encode a communicative goal, but the notion is broader, going beyond communicative goals and extending into the phonological domain. While a QUD introduces the Expectation that the QUD will be answered, I propose that Focus can also be determined by an Expectation about the phonological form of a yet-to-be-uttered element.

What might an expectation look like? I tentatively adopt the following hypothesis and explicate with some examples.

An Expectation is a salient proposition whose potential truth is suggested by the discourse.

An utterance addresses an Expectation if it verifies or falsifies that Expectation.

- A sub-utterance u of utterance U is a Focus iff either

  1. U addresses an existing Expectation E by replacing an element in E with the meaning of u, or

  2. U intends to introduce a novel Expectation whose prior existence would have satisfied (1).

- Domains of prosodic accent are chosen to align with Foci modulo effects of Givenness$_S$-marking.

HYPOTHESIS 2 (TENTATIVE)

Consider two simple cases.

(58)   a.   Q: What color convertible did you buy?
            A: I bought a BLUE convertible
      b.   I USED to have a RED convertible, but NOW I have a BLUE convertible.

In (58a) we are dealing with an explicit QUD. The question saliently suggests the truth of a particular proposition: 'there is some color P such that you bought a P convertible'. This is an Expectation. In this case the Expectation is addressed because the answer entails it, confirming its truth. Moreover, the answer addresses the Expectation in virtue of having replaced an element in the Expectation (the variable P) with the denotation of the Focused element (*blue*).[8] So far, so good.

In (58b) the second conjunct is parallel to the first in its Focus structure, but the first conjunct needn't address any prior Expectation about convertible ownership. This is why I suggest that Focus can serve to introduce Expectations as well as address them. By item (2) in Hypothesis 2, the Focus structure of the first conjunct can be used to introduce the following expectation: 'there is some time-color pair $< t, P >$ such that t is the time of my possessing a P convertible'. That Expectation is then addressed by the second conjunct, where t and P are replaced by *now* and *blue*, respectively, which is why the utterance is felicitous.

This is just one way of doing things, but the general approach has the advantage of allowing phonological information to determine Focus placement. Returning to (51) for the last time ("THEE voice, not THUH voice"), we can derive the accent placement by allowing meta-linguistic propositions to be encoded by a function $UTTER$, where $UTTER(/bla/)$ is true iff the sequence of phonemes /bla/ is uttered in discourse. The first conjunct of (51) is then an analog to the first conjunct of (58b), where the introduced Expectation is the following proposition: $\exists x. UTTER(x + /voys/)$. This Expectation is then verified by the second conjunct, which entails the proposition that results from replacing x with "THUH". This license for Focus is completely determined by Expectations at the pragmatics-phonology interface, and is thus orthogonal to the LF-interpretation and subsequent implicature calculation. This circumvents any problems associated with drawing a contrast between phonological units while still deriving non-meta-linguistic meaning.

The intent of defending premise (3) has not been to formulate a full-on theory of Focus. Rather, my intent has been to show that a general approach along the lines of the Expectations account is a promising way to

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[8]By "replaced P with *blue*" in this case I really mean "replaced the existential quantifier in the Expectation with a lambda and applied the resulting function to *blue*", since otherwise there would be vacuous quantification. I'm using a short hand because I am not too concerned with the formalism at this stage. An account like this might be amenable to a structured meaning approach as in Krifka (2001, 2007).

subsume the various flavors of Focus, including wh-Focus (58a), Contrastive Focus (58b), and phonologically determined Focus (51). I'd also like to point out that it provides an especially intuitive explanation of (8).

(8) Q: Mary's rich uncle buys and sells expensive convertibles. He's coming to Mary's wedding. I wonder what he got her as a gift.
     A: He got her [a CHEAP <u>convertible</u>]. / ??He got her [a cheap CONVERTIBLE].

The de-accenting of *convertible* is only licensed to the extent that the context sets up the Expectation 'Mary's uncle bought her an expensive convertible'. Congruent with Hypothesis 2, this Expectation is addressed by being falsified, and the falsifying proposition is the result of replacing 'expensive' with 'cheap'. Thus, *cheap* is narrowly Focused, and *convertible* is invisible to accent assignment, even though it cannot be marked as Given$_S$.

   To conclude this argument, if it is indeed possible to account for Focus without positing an F-feature in narrow syntax, this is the way to go. Doing so not only allows a unification of various phenomena, but also explains the distributional differences between Focus and Givenness$_S$. Having motivated the G-feature in Sections 2 and 3, we have some idea of what an Information-structural feature should look like. Focus does not fit nicely into the picture. It is not a new idea that Focus is in some way "external" to the combinatoric system underlying language. For example Vallduví (1990) places Focus inside an informational component, which is claimed to be a fourth level of representation apart from narrow syntax, PF and LF. Nothing in my argument requires the addition of a module to the grammar architecture, however. Under my conception, PF is partially determined by syntax and partially determined by discourse-motivated prosodic choices. I suggest something more along the lines of the following.
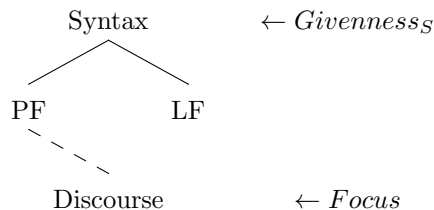
$$\text{Syntax} \qquad \leftarrow Givenness_S$$
$$\text{PF} \qquad \text{LF}$$
$$\text{Discourse} \qquad \leftarrow Focus$$

FIG. 6: INFORMATION STRUCTURE AS GRAMMAR AND DISCOURSE

4.3 But what about movement?

I'd like to end this section by offering some thoughts and speculations on Focus-correlated movement. We have motivated a particular view of Focus, illustrated in Figure 6, that allows no room for Focus-driven syntactic movement in the strictest sense of the word. However, one must distinguish between the possible utterances generated by the grammatical system and the principles that determine the choice from among those possible utterances. Assuming the strongest form of Hypothesis 2, Focus cannot influence the former, but can indeed influence the latter. Until we can rule it out, we should assume this strong hypothesis. An obvious corollary of this is that any apparent instance of Focus-driven movement must have some other formal motivation. There is already research along these lines, though the generalizability of this claim is not obvious.

First let's recall that what is called "Focus movement" after Prince (1981a) need not instantiate the movement of a narrowly Focused element as we've conceived of it here.

(31)   They just bought a dog. [FIDO <u>they named it</u>].

The case of so-called Contrastive topicalization is less clear, as it actually does seem to require narrow Focus in the sense of Hypothesis 2.

(59)   BEANS, we LIKE; MEAT we DON'T.

Along these lines, Selkirk's (2007) account predicts that Focus will motivate movement only when it is Contrastive, but we have motivated a single generalization regarding Focus and thus under Hypothesis 2 even Contrastive Focus should fail to motivate movement directly. It is possible that there is an independent dimension of Contrast, as claimed by Vallduví and Vilkuna (1998), which can drive movement independently of Focus. This is in line with the pattern found in Finnish (Vilkuna 1995), whereby Contrastively interpreted elements occupy a special position at the left edge of a clause. A similar position has been motivated for German as well (Frey 2006).

On the other hand, it is also possible that apparent cases of Contrast-driven movement are motivated by formal features other than Contrast. This has already been suggested for Turkish and English by Horvath (2010) and for German by Fanselow (2012) and Fanselow & Lenertová (2011). Hungarian has a left periphery position associated with Focus. Kiss (1998, 2007) distinguishes the "identificational" Focus that occurs in this position from ordinary "information" Focus which does not motivate movement. Identificational Focus exhaustively identifies a member from a larger set, and overlaps in its distribution with Contrastive Focus, but with a crucial difference. The exhaustivity implication of left-edge Focus in Hungarian is part of the proffered content of a sentence, and affects entailment relationships.

(60)   PETER aludt a   padlón.
        Peter   slept the floor-on
        'It was Peter who slept on the floor.' (Kiss 2007:75)

Unlike Contrastive Focus, Focus on *Peter* entails the negation of 'Peter and somebody else slept on the floor'. In this regard the left-edge Focus position creates a meaning like English *only.* Horvath (2010) analyzes the phenomenon utilizing only a truth-conditional formal feature EXH (not unlike the operator used by Wagner shown in Box 3 in Section 1), without referencing any discourse notions.

In other languages, it is less clear that there is a distinct formal feature motivating apparent Focus movement. Fanselow (2012) and Fanselow & Lenertová (2011) argue that apparent cases of Contrastive Focus movement to the left periphery in German result in a particular prosodic configuration, suggesting a prosodically motivated movement account along the lines of Zubizarreta (1998). Horvath (2010) suggests the same for English Contrastive topicalization. Ideally, if we wish to stick to a strong form of the architecture in Fig. 5, these movements would be motivated neither by prosody nor by Focus. Whether some other license for these various movement operations can be found remains an open question, and a challenging one. It is worth considering the idea that there are very general motivations for movement, but that extraneous movements are typically ruled out by pragmatic factors. This view assumes that the data available to

linguists is a composite of the generative system's output and a mechanism for choosing potentially felicitous utterances from that output.

LEXICON	→	POSSIBLE UTTERANCES	→	POTENTIAL DATA
	Generative		*Rational*	
	grammar		*choice*	

FIG. 7: GENERATION VS CHOICE

I'll end with a quick sketch of what this view might buy us. Suppose that the generative system optionally allows some movements that in no way affect how the sentence is interpreted at the grammatical level. Say, for example, there is a generalized way to get direct objects to a position above spec,TP.
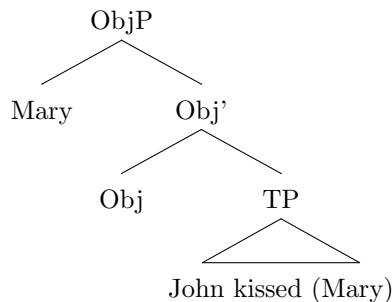
```
            ObjP
          /      \
       Mary      Obj'
               /      \
             Obj       TP
                     /    \
              John kissed (Mary)
```

FIG. 8: OBJECT MOVEMENT

The English speaker's intuition suggests that the structure in Figure 8 is ungrammatical because the following is unacceptable.

(61)   ☺Mary John KISSED.

But by Figure 7, the unacceptability could arise from the fact that in contexts that correlate with the default accent pattern, there is never a *reason* to merge the optional Obj head and force the movement. Suppose, as motivated in Section 3, that this movement could have the effect of merging a non-G-marked object to a G-marked remnant.

```
            ObjP
          /      \
       Fido      Obj'
               /      \
             Obj       TP_G
                     /    \
              they named him (Fido)
```
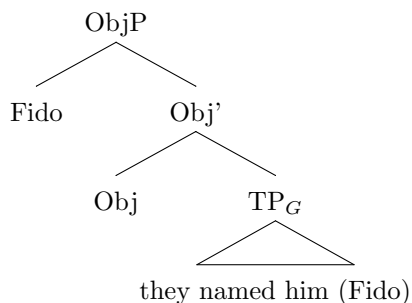
FIG. 9: FIDO MOVEMENT

If there is some preference to maximize G-marking, then we have motivation to introduce extraneous structure into the derivation of our sentence, and it is perhaps this that makes (31) acceptable. A number of factors

are likely responsible for determining when this sort of structure is preferred or ruled out. For example, phonological preferences may be responsible for the deviance of the following.

(62)   They just bought a dog. ??FIDO <u>they decided to name it</u>.

This might be dispreferred on the grounds that it's simply hard to pronounce with so much de-accented material. Yet a third factor might intervene and ameliorate the structure: emphasis.[9]

(63)   They just bought a dog. BARK OBAMA <u>they decided to name it</u>!

I judge this to be an acceptable utterance when there is strong emphatic stress on the ridiculous *Bark Obama*.

This picture is complicated, but I think a Focus-free syntax is tenable. If the hypotheses in this proposal are correct, then we are left with a situation where the IS-syntax interface is determined both directly by a Givenness$_S$ feature and indirectly by pragmatic and phonological preferences guiding structural choices. To conclude with a suggestion, the idea of preferences guiding choices is at the heart of mathematical Game Theory. Recent work (Clark 2011, Parikh 2001, 2010, Sally 2002) has shown that Game Theory can be a useful formal tool for modeling pragmatic behavior. This growing field takes linguistic communication to be a type of coordination game (Schelling 1960, Mehta, Starmer & Sugden 1994), assuming that broader behavioral principles with roots in the fields of biology and economics can be brought to bear on questions of meaning and language use. If the ideas in this section have merit, they might find a home in Game Theoretic pragmatics. This is one potentially useful direction in which the research presented in this proposal might go. The next and final section offers a way forward.

5   The way forward

5.1   Summary and further directions

There are several existing views on how the information status of a linguistic object affects that object's realization in speech and grammar. With regard to prosodic prominence, the view of Rooth (1992) holds that accent is assigned by a semantically interpretable F-feature. The view of Schwarzschild (1999) holds that F-features are not semantically interpreted, but are assigned in accordance with constraints on Givenness. Two hybrid theories have been suggested: one where semantic/pragmatic considerations like Question-Answer congruence can force the presence of an F-feature which is further constrained by Givenness (Büring 2007, 2008), and one along the lines of Schwarzschild (1999) but with an added feature for Contrastive Focus (Selkirk 2007). Roberts (1996, 2011) suggests that Focus presupposes a certain structure for the discourse itself, namely that the Focused element is addressing a Question Under Discussion, while Vallduví (1990) suggests an interface between prosody, syntax and an information-packaging component of grammar, eschewing the notion of F-marking altogether. This proposal has aimed to show that, while these views all have something to offer, there are certain facts that none of them get quite right.

Section 2 argued that a notion of Givenness, which I've chosen to write Givenness$_S$, must exist independently of Focus à la Selkirk (2007) and Büring (2007, 2008), but contra the latter and unnoticed by the former, I demonstrated an interesting syntactic restriction on Givenness$_S$. In Section 3 I showed that this restriction,

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[9]Interestingly, Zimmermann (2008) argues for a link between Contrastive Focus and emphasis.

that Givenness$_S$ must be inherited by adjuncts, makes correct predictions about the Information-structural possibilities for German sentences with scrambled arguments. In Section 4 I compared the distribution of Givenness$_S$ and Focus, which led to a particular view of Focus. The properties of Givenness$_S$ require that it be represented at the syntactic level, and Focus shares none of these properties. In light of this, the notion of an F-feature is not particularly useful, and I argued that the best theory is one where domains of accent assignment are chosen to directly reflect facts about the discourse, without any intermediate syntactic representation. I gave the foundation of a particular theory based on Expectations which subsumes both wh-Focus and Contrast Focus (contra Selkirk 2007) as well as meta-linguistic Focus. Taken together, these proposals make interesting predictions regarding movement possibilities in language. Givenness$_S$ should be able to directly motivate syntactic movement, but not Focus. Whether there evidence to this end is at this point an open question.

The data and hypotheses pursued in this proposal raise many questions. To conclude, I pose some of these questions and suggest methodologies to answer them. I will enumerate the questions and address them in turn.

1. It was pointed out to me (Chris Ahern, p.c.) that the anaphor *one* does not obey the adjunct-inheritance rule given in Section 2. The following variant of (22b) is reasonably acceptable.

   (64)   Convertibles can be very dangerous. So imagine my horror when Jack felt it necessary to buy his niece a BLUE <u>one</u>.

   Pronouns like *one* always resist accent, and they always meet the semantic criteria for Givenness$_S$. It would be nice to say that *one* is lexically supplied with a G-feature. Is this idea compatible with (64)? Are pronouns inherently G-marked? If so, why is (64) possible? If not, what makes them resistant to accent?

2. Aside from the case of anaphors like *one*, are there any other cases where the adjunct restriction is lifted? Is this behavior absolute, as has been suggested here?

3. Is the German scrambling behavior shown in Section 3 completely generalizable? Are there other types of test cases? Could parsed corpora be useful?

4. Having motivated that Focus and Givenness$_S$ are indeed separate phenomena, it is possible that the phonetic reflexes of these notions are not identical. In fact, some examples of Givenness$_S$ whose falling pitch contours are visible on a pitch track have been judged intuitively as "not completely de-accented" (Tony Kroch, p.c.). Is there any systematic difference in the relative pitch levels associated with Givenness$_S$ and lack of Focus? Is "de-accenting" a useful term to describe either?

5. Can a fully realized Expectation theory of Focus be useful? Can this be formalized in such a way that, taken together with a theory of Givenness$_S$, can straightforwardly predict the placement of pitch accents in a small chunk of discourse?

6. Can simple Game-Theoretic models of utterance choice be brought to bear on the question of how IS and syntax interact? Does such a framework easily incorporate the notion of Expectation?

These questions are, as I see it, increasingly difficult to answer, and though a decisive answer to all of them may not be a reasonable expectation, no one of them is beyond the scope of the proposed dissertation. Here are some proposed methods for answering each question.

1. It would help to know more about the way certain classes of words interact with prosody. It is not only pronouns that resist accent, but prepositions as well. In all of the cases addressed in this proposal where a DP within a PP has a salient denotation, it is the entire PP that is de-accented, and not just the DP, as in (6) from Section 1.

   (6)   Context: Pat is reading a book about castles in Germany. Chris walks in, sees Pat, and utters the following sentence out of the blue in order to engage Pat.

           I've never BEEN to Germany. Have you?

   It is not possible to accent the preposition.

   (65)   #I've never been TO Germany.

   There seems to be an independent factor here prohibiting stress on *to*, but it is not a wholesale prohibition on accenting prepositions that are not narrowly Focused, as the following example shows.

   (66)   Chomsky is both a linguist and a political writer, and he is often asked whether there is a common thread BETWEEN those two professions.

   Though this is not 100% natural in my judgment, I heard a sentence like this spoken on a radio broadcast recording, and it did not strike me as particularly odd. An obvious difference here is that *between* has more weight to it—it is an entire metrical foot with a closed second syllable, whereas *to* is a single, open syllable. Whatever allows *between* to bear stress and not *to* may also be responsible for *one*'s apparent violation of the adjunction restriction. There is undoubtedly some literature in metrical phonology that could be brought to bear on this question.

2. I would like to construct a wider variety of test cases for the proposed distribution of G-marking, including right-adjunction structures with PPs and complex adjective phrases as well as adverbs. This is tricky because English prosody puts prominence at the right edge, and thus de-accenting an element that is not at the right edge could be difficult to perceive. It is crucial to find cases with a perceptible pitch accent distinct from the main right-edge prominence. Then, I could suppress that accent and elicit judgments as to its acceptability. Since we are dealing with possibly subtle phonetic effects, a controlled experiment would be more useful than traditional linguistic judgments.

   One potential methodology was suggested to me by Yong-Cheol Lee (p.c., see Lee to appear). It is not too difficult to digitally manipulate the pitch track of a recorded utterance (it can be done in PRAAT), and one can perform such manipulations to suppress naturally occurring pitch accents. The resulting audio files can then be used in an acceptability judgment task, where subjects are asked to rate how natural certain audio clips sound when they are situated within a particular manufactured discourse

context. Such a task could be implemented to determine if native English speakers are ever accepting of Givenness$_S$-marking that fails to be inherited by an adjunct.

3. Judgment tasks may also be brought to bear on the robustness of the scrambling behaviors shown in Section 3. I have no native intuitions myself, and thus judgments from others are always necessary. It would be more rigorous to devise a more formal and controlled judgment task for a greater number of speakers than the two I have consulted thus far. I would not expect any major differences in acceptability between the results of such an experiment and what is reported here, but as is the case with English de-accenting, these contextual phenomena can be rather subtle. As such, they should be investigated as carefully as possible.

   Parsed corpora may be useful here as well. The picture painted in Section 3 would be more convincing if particular correlations could be found between certain scrambling configurations and the types of contexts they occur in. There is at least one parsed corpus of modern German that I know of, the TIGER corpus, and there may be more. Using such a tool I could determine how often and in which contexts Given$_S$ arguments are scrambled. For example, we could compare *in situ* constructions where an indefinite DP precedes a definite DP with scrambled constructions that place the definite first. The data in Section 3 predict that a relatively high proportion of the *in situ* constructions will have non-Given$_S$ definite DPs (this could be approximated by tagging whether the DP occurs in the immediately preceding portion of the text) that are not narrowly Focused (this will be harder to tag, but this has been done before, I believe). A broader range of test cases could be considered, because even if certain scrambling orders are disfavored simply on the grounds that there is no reason to scramble, large-scale corpus data may still show statistically significant effects.

4. If the design of the audio acceptability judgment experiment described in the answer to question (2) is successful, a minimally extended follow-up experiment could determine whether there are any differences between Givenness$_S$ and Focus in terms of pitch realization. I have an intuition that Given$_S$ constituents are not "de-accented" in exactly the same way as elements that are outside Focus. I would not be surprised to find that instances of Givenness$_S$ instantiate a shallower drop-off in pitch when compared to Focus. One could elicit acceptability ratings of sentences with either narrow Foci or G-marked constituents, where some stimuli fully accent the G-marked or non-Focused elements, some completely de-accent them, and a third group exhibits "half de-accenting". This could provide yet another way of differentiating these two phenomena.

5. One ambitious test of the ideas underlying this proposal would be to take a small chunk of written discourse, armed with some common sense operationalizations of the theoretical notions of salience and Expectation, and superimpose a prosodic structure. Then, we could see whether this correlates with the most natural pattern of pitch prominence, as judged by native speakers of English. To formalize these things at an algorithmic level may not be a practical goal, but it is a goal that I have in the back of my mind when studying these matters. To that end, I would like to further pursue the role of Expectations in determining Focus. It seems to me that some reasonably simple extensions of the formalizations of Roberts (1996) could account for a wide range of facts in a rigorous way. Even if it is not the central issue of the dissertation, some small steps in this direction would be quite satisfying.

6. In Stevens (2012) I suggested a way in which Game Theoretic pragmatics could be used to model Information Structure. I haven't presented that account here because I have since obtained a fuller picture of the facts which suggests that analysis to be somewhat naïve. However, I remain convinced that Game Theory is a potentially useful tool, and two particular ideas suggested in this proposal seem to scream out for it. First is the idea that some syntactic movements are completely optional from the perspective of the grammatical system, but that there are principles of rational choice which relegate those constructions to particular IS contexts. While a broad survey of the types of IS-related movements available in language is beyond the scope of the proposed dissertation, a deeper look at German is possible. A variety of movement phenomena are known, not limited to the scrambling possibilities written about in this proposal. A deeper look at the work of Frey (2006) and many others, including Caitlin Light's upcoming dissertation, may allow me to propose a small set of syntactic preferences which could be encoded in a Game Theoretic model of utterance choice. If focused on a small set of phenomena in a particular language, I think this is a reasonable goal. Finally, the notion of Expectation suggested in Section 4 seems at first glance to be a reflection of the Game-theoretic concept of Utility. Coordination games crucially depend on expectations of some form, and IS could perhaps be seen as a way of facilitating coordination. Also, the idea of expecting or being surprised by something evokes the concept of Entropy which has been brought to bear on questions in Game-theoretic pragmatics before (van Rooy 2004). I don't yet know if such a concept is relevant, but if it is, it would have the rather poetic effect of bringing together the study of Information Structure with concepts from Information Theory.

The intent of this proposal has been threefold: 1) to show concrete results of initial research into the nature of Information Structure, 2) to suggest methods of further testing the validity of those results, and 3) to leave the path forward open enough to ensure that whichever directions I am led in, the resulting dissertation will be of interest to the field. I hope I have succeeded.

5.2 Timeline

By the end of Spring semester 2012 I intend to have followed up on any immediate concerns of the committee, to have read any additional suggested literature, and to have worked out designs for any experiments I decide are appropriate. Summer 2012 will be devoted to assembling the deepest literature review possible, not just on Information-structural topics, but also on movement in the German middle-field/pre-field as well as potential Game-theoretic applications to language. By the end of the Summer I also hope to have conducted any judgement tasks or other simple experiments. September 2012 will be the time to focus and outline the substantive parts of the dissertation. By Halloween I should have the first chapter written with a clear outline of the rest, including any experimental results and analysis. By January 2013 I plan to be regularly submitting chapters to members of my committee. This puts me on track for a completion date roughly one year from the defense of this proposal (March 15), allowing me to graduate in June.

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