Deconstructing Information Structure

Angelika Kratzer & Elisabeth Selkirk

University of Massachusetts Amherst & University College London*

To the memory of Michael Rochemont

Abstract

The paper argues that the core of what is traditionally referred to as 'Information Structure' can be deconstructed into bona fide morphosyntactic features that have familiar types of meanings and just happen to be spelled out prosodically, rather than segmentally or tonally, in Standard American and British English. Setting aside topicality, we discuss two such features, [FoC] and [G]. [FoC] highlights contrasts and aims for highest prominence in a sentence. [G] is sensitive to discourse givenness and resists (phrase-level) prominence. There is no representation of newness. Apart from the idiosyncratic properties of [FoC] and [G], which guide their syntactic distribution, felicitous use, and phonological spellout, no special grammatical mechanisms or architectures have to be assumed to account for the many phonological, syntactic, semantic, and pragmatic manifestations of Information Structure notions related to givenness and focus.

1.　　Introduction: Deconstructing Information Structure

Information Structure, as the term is commonly used, covers concepts related to focus, givenness, or topicality. In spite of many years of research, there is no common ground on how those concepts relate to each other, what their place in grammar is, or whether there is any theoretical unity or value to them. Here we will set aside topicality and limit our discussion to givenness and focus. In what follows we will make a case that Standard American English has two *bona fide* morphosyntactic features triggering discourse requirements related to givenness and contrast. One feature, Givenness marking ([G]-marking), is sensitive to whether an individual, concept, or proposition has been

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mentioned before or is otherwise present in the context. The other feature, FoCus marking ([FoC]-marking), evokes alternatives to a mentioned individual, concept, or proposition, and thereby brings out a contrast.

Givenness and contrast have been discussed as distinct categories of Information Structure at least since Chafe (1976), with important insights contributed by the Prague School.[1] Rochemont (2016) has an in-depth discussion of givenness in the sense intended here and distinguishes it from kindred notions like presuppositionality, definiteness, repetition, and predictability. We will follow Rochemont in capitalizing *Givenness* whenever the targeted notion of givenness is the one responsible for the lack of prominence on content words under certain discourse conditions in Standard American and British English. In a similar vein, we will use the spelling *FoCus* when the intended notion of focus is tied to the introduction of alternatives to highlight a contrast.[2] FoCus in this sense needs to be distinguished from information focus ('newness focus'), which applies to expressions that merely present new information. We will take up this topic in sections 4 and 5, where we will gather together evidence from different sources confirming that Givenness and FoCus, but not information focus, are represented by morphosyntactic features in Standard American and British English.

Examples (1) to (2) below give a first illustration of Givenness and FoCus and their representation via [G]-marking and [FoC]-marking.[3]

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[1] .   In the terminology of the Prague School, constituents that are given in our sense correspond to 'themes', and those that are new to 'rhemes'. Focused constituents in our sense relate to 'contrast', and non-focused constituents to 'background'. Vallduví (2016) gives an overview of modern construals of those notions and makes clear that both the 'theme/rheme' and the 'contrast/background' dichotomies are needed.

[2] .   Pretheoretically, we'll continue to use the standard spellings for givenness and focus, and that includes occasions when we discuss examples from sources that do not necessarily assume the Information Structure notions we do.

[3] .   Technically, [FoC] and [G] are features associated with syntactic nodes and are part of their labeling. For convenience, they are usually the only labels we indicate when representing syntactic structures as labeled bracketings.

(1)　Me:　Did anybody eat the clementines? I can't find them in the pantry.

　　　You:　(I think) Paula might [have eaten the clementines]_G.

(2)　Me:　Sarah mailed the caramels.

　　　You:　(No), [Eliza]_FoC [mailed the caramels]_G.

In your answer in (1), the VP *have eaten the clementines* is Given. The concept of having eaten the clementines has just been mentioned. Its Givenness is signaled by the absence of prominence on *eaten* and *clementines* in Standard American and British English. The context of your answer in (1) discourages (but doesn't exclude) an interpretation where *Paula* is a FoCus. On its most natural interpretation, you aren't evoking alternatives to Paula, that is, you aren't contrasting Paula with other people who might have eaten the clementines. *Paula* is merely new, then. Anticipating arguments still to come, *Paula* isn't marked with any feature in (1). In (2), the VP *mailed the caramels* in your reply is Given, too, but the subject *Eliza* is now a FoCus, not merely new. FoCus on *Eliza* evokes alternatives to Eliza: other people who might have mailed the caramels. Since Sarah is one of them, your reply highlights a contrast with what I said.

The phonological and semantic/pragmatic properties of [G]-marking and [FoC]-marking will be discussed in detail in sections 6 and 7, so we will not go beyond this introductory illustration of [G]-marking and [FoC]-marking for now.

If Givenness and FoCus are realized by genuine morphosyntactic features, they would be expected to have the usual properties of morphosyntactic features. They should show syntactic behavior in at least some languages, for example, like triggering movement or agreement. Across languages, we should see variation in the way the features are spelled out: segmentally, tonally, prosodically, through a combination of those, or not at all. If spelled out segmentally, the features might influence or be influenced by the phonological realization of their environment in rule-governed ways. If spelled out tonally or prosodically, they might interact with the tonal and prosodic properties of their linguistic

environment. There would be nothing special about Givenness and FoCus affecting the prosodic structure of the sentences they occur in in Standard American and British English, then. A connection between prosody and meaning would be entirely within the range of possibilities permitted by familiar grammatical architectures

Historically, what has set the investigation of Information Structure apart from investigations of other semantic and pragmatic phenomena like speech acts, presuppositions, quantification, and what have you, seems to be precisely the fact that important Information Structure notions are realized prosodically, rather than segmentally in familiar languages like English. This apparent special relation to prosody has led to proposed grammatical architectures where prosodic representations themselves are bearers of meaning. On one implementation, which can be traced back to Ladd (1980), the input for the computation calculating the discourse anaphoric impact of prosodic prominence are binary branching metrical trees, as in Liberman & Prince (1977).[4] Metrical trees can represent relative prominence relations between sister constituents in syntactic representations. In English, the default is for a left-hand sister to be weak and for a right-hand sister to be strong. Deviations from the default signal the impact of Information Structure. When a sister that should be weak by default is actually strong, we can infer that it is a FoCus, and when a sister that should be strong is actually weak, we know that it is Given. On such an approach, the computation of discourse requirements attached to Givenness and FoCus might only need to track deviations from the default prominence pattern.[5] A separate representation of Givenness or FoCus via morphosyntactic features might seem superfluous.

However, as Aboh (2010, 2016) reminds us, Information Structure CAN have an impact on prosody, but doesn't HAVE to. There is no necessary link between prosody and Information

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[4] .   This approach is also adopted in Williams (1996, 2012), Wagner (2005, 2012), Calhoun (2010), and Büring (2015).

[5] .   Ladd (1996, 2008) makes clear that, ultimately, richer prosodic representations including information about prosodic phrasing would be needed.

Structure. Cross-linguistically, Information Structure notions can be spelled out segmentally, prosodically, tonally, or not at all, and can moreover show syntactic behavior like triggering movement or agreement, even without having any distinctive prosodic properties. Given that prosodic realization is just one option for spelling out notions related to Information Structure, proposed architectures where those notions are necessarily linked to prosodic representations do not provide an optimal basis for a typology that maps out the full range of possible realizations of Information Structure in natural languages.

For illustration, Aboh (2007a, 2007b, 2010, 2016) documents that the Gbe language Gungbe (spoken in Benin) uses overt particles to mark topic and focus. The particles appear in left-peripheral positions and attract topical or focused constituents to the edge of their projections. 3(a) and (b) illustrate constructions with the focus particle *wὲ*:[6]

(3)   a.   Sέsínú wὲ dà   Àsíàbá
                Sessinou FOC marry Asiaba
                'SESSINOU married Asiaba.'

        b.   Àsíàbá wὲ Sέsínú   dà
                Asia ba FOC Sessinou marry
                'Sessinou married ASIABA.'

        Gungbe. Aboh (2007a: 289).

According to Aboh (personal communication), neither he nor other native speakers who have worked on those constructions perceive any prosodic difference between neutral and focused constituents, but he cautions that there hasn't yet been any systematic research on this.

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[6] .   Glosses: *FOC* for focus particle. Here and in all following examples, glosses and translations are exactly as given in the cited source, except for capitalization.

The fact that meanings related to Information Structure can be spelled out in different ways, and can moreover trigger syntactic behavior supports the hypothesis that those meanings are universally introduced by genuine morphosyntactic features. We want to call this hypothesis *Aboh's Conjecture,* after Aboh (2010, 2016), where it is explicitly entertained. The consequences of Aboh's Conjecture are momentous. On the phonological side, what may seem to be more global effects of Information Structure on prosody in languages like Standard American or British English would now have to be derivable from the interaction of idiosyncratic contributions of morphosyntactic features with independently attested principles of default prosody. That is, any connection between prosody and discourse related meanings would have to be funneled through dedicated morphosyntactic features.

As Aboh (2016) is well aware, his view on Information Structure may look bold to those who are primarily looking at Indo-European languages. Taken to its most radical conclusion, the view suggests that Information Structure may be nothing but a collection of run-of-the-mill morphosyntactic features with discourse related meanings that happen to be spelled out prosodically in some languages we happen to know well. In the next section, we'll gather further support for Aboh's Conjecture by presenting more examples from languages where the realizations of focus behave like genuine morphosyntactic features.

2.   Representing focus with morphosyntactic features

This section will showcase a few selected examples supporting the conjecture that natural languages represent focus-related notions by genuine morphosyntactic features that are not necessarily spelled out prosodically. We need to begin with a caveat, though. The examples in this section are drawn from the literature, so there are bound to be terminological or theoretical misalignments between the different sources. Not all analyses assume the same notions of focus, and not all analyses make explicit the semantic or syntactic properties of the discourse contexts in which a putative focus might appear. We are nevertheless confident that the examples we discuss illustrate some kind of FoCus, as opposed to mere information focus. We'll also have to set aside givenness in this section,

for the simple reason that there is little documentation about the crosslinguistic realization of this notion.

Morphosyntactic features earn their keep by driving syntactic behavior like displacement or agreement. We already saw that in Gungbe, focused constituents move to left-peripheral positions headed by the focus particle *wὲ*. Like Gungbe, Wolof, an Atlantic language spoken in Senegal and the Gambia, has a left-peripheral focus position (Torrence 2013)[7]:

(4) a. Xale bi l-a-a   gis.
         child the XPL-COP-1SG see
         'It's the child that I saw.'

     b. Ca lekkool ba l-a-a   gis-e   Isaa.
         P school   the XPL-COP-1SG see-appl Isaa
         'It's at school that I saw Isaa.'

     c. Gaaw   l-a-a   ubbe-e   bunt bi.
         quickly XPL-COP-1SG open-mann door the
         'It's quickly that I opened the door.'

     Wolof. Torrence (2013: 182).

Torrence (2013) analyzes constructions like 4(a) to (c) as cleft constructions that are the result of movement of the clefted constituent into the left periphery. Rialland & Robert (2001) conducted acoustic analyses of several natural and elicited Wolof corpora and found that Wolof has no prosodic marking of focus: "The originality of Wolof is that it has no prosodic marking of focus, even optionally" (Rialland & Robert 2001: 937). There is essentially level pitch in all sentence types, except at the edges of intonational phrases,

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[7] .   Glosses: *1SG* for first person singular, *APPL* for applicative, *COP* for copula, *MANN* for manner suffix, *XPL* for expletive.

where tonal morphemes independent of information structure appear. Rialland & Robert's acoustic investigation of Wolof establishes that there is no necessary connection between focus and prosody. In Wolof, focused constituents occupy dedicated syntactic positions, but surface with flat intonation contours.

Focus can trigger agreement in some languages. In the 'focus concord' constructions of Sinhala, Pre-Modern Japanese, and the Japanese dialects spoken in the Ryukyus (Aldridge (2018), Kishimoto (2018), Slade (2018), Whitman (1997)), focused phrases are marked with a particle that covaries with special inflection on the predicate. (5) is an example from Sinhala, an Indo-Iranian language spoken in Sri Lanka.[8]

(5)   a.   Ranjit [Chitra ee   potə **tamay kieuwe** kiyəla] dannəwa.
           Ranjit Chitra that book FOC   read.E   that   know.A
           'Ranjit knows that it was that book that Chitra read.'

      b.   Ranjit [Chitra ee   potə **tamay** kieuwa kiyəla] **danne**.
           Ranjit Chitra that book FOC   read.A   that   know.E
           'It is that book that Ranjit knows that Chitra read.'

      Sinhala. Kishimoto (2018: 2).

In 5(a) and (b), the particle *tamay* marks *ee potə* ('that book') as a focus. The scope of the focus is indicated by the *-e* ending of the verb, which has to appear here instead of the default *-a* ending. In 5(a), the scope of the focus is just the embedded sentence. 5(a) conveys that Ranjit knows that what Chitra read was that book (and not anything else). In 5(b), on the other hand, the scope of the focus is the whole sentence. 5(b) conveys that what Ranjit knows Chitra read is that book (and not anything else). 5(b), but not 5(a)

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[8] .   Glosses: A for *-a* inflection, E for *-e* inflection, FOC for focus.

should thus be compatible with a situation where, unbeknownst to Ranjit, Chitra also read a magazine.

Hagstrom (1998, 2004) and Kishimoto (2018) assume that there is feature agreement between the focus particle *tamay* and the scope site of focus marked by the *e*-form of the verb in examples like 5(a) or (b). Both authors argue (in different ways) that the nature of this relation forces the focus particle to move to its scope site overtly or covertly.[9] (6) would be the result of an overt instance of this movement.

(6)   [Ranjit ee   potə   kieuwa] **tamay**
        Ranjit that book read.A   FOC
        'It was only that Ranjit read that book.'

        Sinhala. Kishimoto (2018: 3).

In (6), *tamay* appears clause finally and with the *a*-form of the verb. In this position, *tamay* doesn't delimit the focused constituent, as in 5(a) and (b), but marks the scope site of the focus. (6) has several interpretations depending on which part of the scope of *tamay* is understood as focused. It may convey that it was Ranjit who read that book, that it was that book that Ranjit read, that Ranjit did read that book, and so on.

An agreement relation between particles that mark focused constituents and inflection on a nearby predicate has also been posited for the *kakari-musubi* construction found in Premodern Japanese and in Japanese dialects spoken in the Ryukyus (Whitman 1997).[10]

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[9] .   For Hagstrom, the -*e* form of the verb has an uninterpretable focus feature that needs to be checked. For Kishimoto, the movement of the focus particle is criterial in the sense of Rizzi (1997): the particle moves into a dedicated focus position in the CP layer of the sentence.

[10] .   Glosses: *NEG* for negation, *IZ* for izen 'realis' inflection, *TOP* for topic, *MOD* for modal, *RT* for *rentai* 'adnominal' inflection.

(7)   Pito = koso   sira-ne   matu = pa siru   ramu.

        Person = KOSO know-NEG.IZ pine = TOP know MOD.RT

        'Though people do not understand, the pine may know.'

        Old Japanese. Aldridge (2018: 7).

In (7), the contrastive focus particle *koso* triggers the *izen* 'realis' inflection on the predicate, which would not be used here in the absence of *koso*. This dependence between a focus particle and inflection on the predicate has been analyzed as feature agreement by several researchers, including Ikawa (1998), Kuroda (2007), and Aldridge (2018).

The examples from Gungbe, Wolof, Sinhala, and Old Japanese show that, crosslinguistically, the representations of focus-related notions can show the signature behavior of morphosyntactic features: they can appear as heads of dedicated syntactic positions, can trigger displacement, and can participate in agreement relations. Taken together, those facts support the conjecture that natural languages represent focus-related notions by morphosyntactic features. We also have seen evidence that, cross-linguistically, those features do not have to be spelled out prosodically. The connection between prosody and Information Structure is not a linguistic universal.

3.   A unified account for newness and FoCus?

Section 1 already introduced the main claim of this paper, namely that Standard American English has two *bona fide* morphosyntactic features imposing discourse requirements related to Givenness and FoCus: [G]-marking and [FoC]-marking. Our claim that Standard American English has two features to mark discourse requirements related to FoCus and Givenness flies in the face of the unified accounts of Rooth (1992, 2016) and Schwarzschild (1999). Rooth and Schwarzschild follow Jackendoff (1972) and Selkirk (1984, 1995) in assuming that constituents that are FoCused (in our sense) and those that are merely new (hence not Given in our sense) are uniformly [F]-marked. Given constituents remain unmarked. This is illustrated in (1') and (2') below.

(1')   Me: Did anybody eat the clementines? I can't find them in the pantry.

       You: (I think) [Paula]_F might have eaten the clementines.

(2')   Me: Sarah mailed the caramels.

       You: (No), [Eliza]_F mailed the caramels*.*

One reason favoring such a uniform account is that in English, pitch accents are invariably associated with material that can be either FoCused or merely new. The distribution of pitch accents thus seems to indicate that English prosody treats FoCused and merely new phrases the same.

A second reason to seriously consider a uniform [F]-marking approach is that Rooth (1992) and Schwarzschild (1999) have actually proposed successful accounts that compute the discourse requirements imposed by FoCus and Givenness from representations that only have [F]-marking. To illustrate the leading ideas common to Rooth and Schwarzschild, we'll use the Alternatives Semantics of Rooth (1992, 2016) to state the discourse anaphoric requirements for Givenness and FoCus in a way that closely mimics the method of Schwarzschild (1999).

Look again at your answer in (2'), repeated here as (8):

(8)   [Eliza]_F mailed the caramels*.*

(8) is not acceptable as an out-of-the-blue utterance. The VP *mailed the caramels* needs to be Given in our sense, and the sentence as a whole seems to express a contrast, possibly with something that was said earlier. Schwarzschild (1999) proposes a unified characterization of those two discourse requirements in terms of a more general notion of givenness that subsumes both our Givenness and contrast. Schwarzschild requires that any constituent that is not [F]-marked be given in this general sense. In (8), neither the VP or its parts, nor the sentence as a whole are [F]-marked, hence those constituents all need to come out as given on his approach.

The Alternatives Semantics of Rooth (1992, 2016) provides a convenient counterpart of Schwarzschild's general notion of givenness: A-Givenness from now on.[11] A constituent α is A-Given (in a context) just in case there is a salient discourse referent (an individual, concept, or proposition) from the preceding context that is a member of the alternatives set associated with α. In Alternatives Semantics, every expression is assigned two semantic values: its O(rdinary)-value, and its A(lternatives)-value, which is its alternatives set. For example, the O-value of (8) is just the proposition that Eliza mailed the caramels. Its A-value is the set of propositions in (9).

(9)   {'Eliza mailed the caramels', 'Sarah mailed the caramels', 'Leif mailed the caramels', ...}.

Since the proposition that Sarah mailed the caramels is in the alternatives set (9) for (8) and, in the context of (2'), has just been mentioned, (8) as a whole is A-Given in that context.

To compute the alternatives set for (8) compositionally, we combine the A-values of its immediate constituents, the [F]-marked subject *[Eliza]F* and the VP *mailed the caramels*. The A-value of *[Eliza]F* is the set of all individuals: Eliza, Sarah, Leif, and anybody else in our

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[11] .   Schwarzschild states his notion of givenness in terms of a special version of generalized entailment. As Rooth (2016) points out, Schwarzschild's generalized entailment condition for givenness is sometimes too easy to satisfy. Take (i):

(i)   Every [cat]F is a complainer.

For Schwarzschild, (i) as a whole is given just in case (ii) is entailed by prior context:

(ii)   ∃P [every P is a complainer].

But the property of being a complainer is a witness for (ii), hence (ii) is trivially true and is entailed by any sentence. Defining the relevant notion of givenness within Alternatives Semantics does not run into this problem.

domain of discourse. What about the A-value of the VP *mailed the caramels*, which contains no [F]-marks? In Rooth's Alternatives Semantics, that VP's A-value is a singleton set, the set containing the VP's O-value as its only member. That's the singleton set containing the property of having mailed the caramels. The A-value of (10) as a whole is computed by pointwise combination of the A-values of *[Eliza]$_F$* and the VP *mailed the caramels*: {Eliza, Sarah, Leif, ...} × {'mailed the caramels'}. The result is the alternatives set (9).

Our Givenness falls out as a special case of A-Givenness. Since the VP *mailed the caramels* in (8) has a singleton alternatives set, it is A-Given just in case its only member, the property of having mailed the caramels, is salient in the discourse context, hence is Given in our sense. That, too, is the case in the context of (2').

Rooth's and Schwarzschild's systems provide unified accounts of the discourse requirements triggered by FoCus and Givenness. It looks like there really aren't TWO such discourse requirements. Givenness and contrast seem to be two sides of the same coin. Rooth's and Schwarzschild's systems only require a single focus-related feature: [F]-marking. Neither FoCus nor Givenness need to be represented. The case for a unified account of Givenness and FoCus in terms of [F]-marking is strong. Nevertheless, a diverse range of facts go against it. The following section will present data suggesting strongly that FoCus and newness should not be lumped together into a single feature.

4. Against a unified account of newness and FoCus

Over the years, syntacticians, phonologists, and phoneticians, have documented differences between different types of focus in a number of languages. Many of those authors have pointed to differences in the way languages mark constituents that are merely new (newness focus, information focus), as opposed to constituents that evoke alternatives and thereby highlight a contrast (FoCus).[12] In this section, we will discuss some representative

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[12] . These authors include Chafe (1976), Rochemont (1986, 2013a, 2013b), Pierrehumbert & Beckman (1988), D'Imperio (1997), Kiss (1998), Vallduví & Vilkuna (1998), Zubizarreta (1998), Frota (2000), Belletti (2001, 2004), Selkirk (2002, 2007, 2008),

examples. We will conclude that those examples pose challenges for single-feature representations of the semantic/pragmatic and phonological effects of FoCus and Givenness, which rely on [F]-marking alone. We will then explore ways of overcoming those challenges within a two-feature approach.

Our first example comes from Katz & Selkirk's experimental materials (Katz & Selkirk 2011: 802).

(10)   Gary is an art dealer. Lately he's been very picky about which museum he deals with; he doesn't do business with the Metropolitan or the Guggenheim.
So he would only offer that Modigliani to MoMA. He says that's the only museum with a space good enough to hang it in.

Our target sentence within (10) is (11)[13]:

(11)   He would ónly offer that Modigliáni to MóMA.

Both *Modigliani* and *MoMA* in (11) bear obligatory pitch accents when read aloud in the context of (10). But there are important differences between the two. In the context of (10), *MoMA* introduces alternatives and thereby sets up a contrast with the Metropolitan and the Guggenheim, the other two museums mentioned. *MoMA* is a FoCus, then. *Modigliani*, on the other hand, presents merely new information. It doesn't evoke alternatives. In the context of (10), (11) implies that Gary wouldn't offer that Modigliani to the Metropolitan or the Guggenheim. *Modigliani* thus doesn't associate with *only*. It doesn't contribute any alternatives to the computation of the alternatives set that *only* operates over. That set is illustrated in (12).

Neeleman & Szendröi (2004), Féry & Samek-Lodovici (2006), Aboh (2007a, 2007b), Ameka (2010), Beaver & Velleman (2011), Katz & Selkirk (2011), among many others.

[13] .   We use acute accents to indicate the location of pitch accents. Underlining on *MóMa* in (11) indicates greater phonetic prominence.

(12)   {'He would offer that Modigliani to MoMA', he would offer that Modigliani to the
        Metropolitan', 'he would offer that Modigliani to the Guggenheim', ...}

Sentence (11) is true just in case the mentioned alternative 'He would offer that Modigliani to MoMA' is the only alternative in (12) that is true.

The scenario described in (10) also excludes the possibility that *Modigliani* in our target sentence might be a contrastive topic scoping over *only*. In the context of (10), (11) can't be understood as contrasting the mentioned Modigliani painting, which Gary would only offer to MoMA, with other paintings of his that he might also offer to the Metropolitan or the Guggenheim. Such an interpretation would go against what we are being told in the story, namely that Gary doesn't do business with the Metropolitan or the Guggenheim.

Katz & Selkirk's examples show that the grammar of standard American English distinguishes constituents that are FoCused from those that are merely new. The difference can be detected in interactions with FoCus-sensitive operators like *only.* Katz & Selkirk's paper isn't primarily about the semantic effects of alternatives focus (FoCus) vs. information focus, though. Katz & Selkirk (2011) is foremost a phonetic study. They show that there is a systematic phonetic difference between FoCused and merely new material which, crucially, is independent of syntactic position. We'll come back to this aspect of their study in section 6.

Within current [F]-marking-only approaches, both *Modigliani* and *MoMA* in our target sentence (11) (as part of (10)) would have to be [F]-marked, since both have a pitch accent. But then we would have no syntactic representation from which to compute the right alternatives set for *only* on the one hand, and the right phonetic realization for *Modigliani* and *MoMA* on the other.[14]

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[14].   Rooth (2015) has more examples of this kind. He proposes an analysis that has syntactic features exclusively dedicated to the projection of alternatives, in addition to [F]-marking of terminal elements. Rooth's projection features do not have credentials as *bona*

English *it*-cleft constructions create a similar dilemma for [F]-marking-only approaches. *It*-clefts consist of a clefted constituent followed by the cleft clause (the subordinate clause), as in your reply in (13):

(13)   Me: Jane's lost her keys and is really upset.
        You: It was her phone that Jane lost.

In *it*-cleft sentences the clefted constituent is a FoCus. In (13), Jane's phone is contrasted with her keys. In (13), it so happens that the material in the cleft clause is Given and lacks pitch accent(s). But as Prince (1978) observed, and Hedberg (1990, 2010, 2013) discussed, the material in the cleft clause may also be new, hence accented. (14) is one of the examples quoted by Prince (her example 41(b)).[15]

(14)   The leaders of the militant homophile movement in America generally have been young people. It was they who fought back during a violent police raid on a Greenwich Village bar in 1969, an incident from which many gays date the birth of the modern crusade for homosexual rights.

Our target sentence within (14) is 15(a), and the cleft clause is 15(b).

(15)   a.   It was <u>théy</u> who fought báck during a víolent políce raid on a Gréenwich Village bár in ´1969.
        b.   … who fought báck during a víolent políce raid on a Gréenwich Village bár in ´1969.

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fide morphosyntactic features, hence won't help with the agenda we are pursuing in this paper.

15.   The example is originally from the Pennsylvania Gazette, February 1977, p. 16.

The pronoun *they in* 15(a) is a FoCus. It singles out young people among other groups of people who could have fought back during that raid on a Greenwich Village bar. What's being said about young people in 15(b) is all new information, and that's reflected in the distribution of pitch accents. To compute the inference that no other relevant group (apart from the young people) fought back during that violent police raid on a Greenwich Village bar in 1969, we want to generate an alternatives set like that in (16):

(16)   {The young people fought back during a violent police raid on a Greenwich Village bar in 1969, the older people fought back during a violent police raid on a Greenwich Village bar in 1969, ...}

But how are we going to generate this set if everything in the cleft clause 15(b) is new information, hence would have to be [F]-marked to account for the distribution of pitch accents? The dilemma for an [F]-marking-only approach is that the mechanism computing the set of FoCus alternatives wouldn't want to have any [F]-marks in the cleft clause, while the mechanism computing the prosody would need them. On an [F]-marking-only approach we would again have no syntactic representation from which to compute the right alternatives set on the one hand, and the right phonetic realization on the other.

Our last example in this section illustrates an alternation in answers to *wh*-questions that has been reported for several languages, including Italian (Kiss 1998, Belletti 2001), Spanish (Zubizarreta 1998), Finnish (Molnár 2001), Gungbe (Aboh 2007a, 2007b), and Kwa languages more generally (Ameka 2010). For illustration, we will look at an Italian example. In Italian, a simple *wh*-question like 17(a) can be answered as in 17(b) or 17(c).

(17)   a.   Chi   ha   scritto   questo articolo?
             Who has written this   article
             Who wrote this article?

b.　　L' ha　scritto　Gennaro.

It　has written Gennaro

Gennaro wrote it.

c.　　Gennaro l'ha scritto.

Gennaro it has written.

　Gennaro wrote it.

As discussed by Kiss and Belletti, a question like 17(a) can be answered with a postverbal subject, as in 17(b), or a preverbal subject, as in 17(c), with a subtle difference in meaning. As an answer to 17(a), 17(c) necessarily expresses a contrast. *Gennaro* must be a FoCus, it can't be merely new. FoCus on *Gennaro* evokes other possible authors for this article who are being ruled out. In 17(b), *Gennaro* could be a FoCus, but doesn't have to be. It could also be merely new.

To bring out intuitions about preverbal vs. postverbal subjects in Italian more clearly, consider 18(a) and (b) below, still understood as answers to the question in 17(a).[16] We made the answers longer, making it harder (not impossible) to accommodate a contrastive interpretation for the subject *Gennaro*. As a result, there is pressure for *Gennaro* to appear postverbally. 18(b) is judged infelicitous as an answer to 17(a).[17]

(18)　a.　　Credo　　che l'abbia　　　　scritto　Gennaro quando era

think.1SG　that it have.SUBJ.3SG　written Gennaro when　　be.IMPF.3SG

in Graduate School.

in Graduate School.

---

[16] .　　Glosses: *SG* for singular, *SUBJ* for subjunctive, *IMPF* for imperfective, *1* for 1st person, *3* for 3rd person.

[17] .　　The Italian examples were provided by Ilaria Frana.

I think Gennaro wrote it when he was in Graduate School.

b.   # Credo   che Gennaro l'abbia   scritto   quando era
      think.1SG that Gennaro it have.SUBJ.3SG written when   be.IMPF.3SG

in Graduate School.
in Graduate School.

I think Gennaro wrote it when he was in Graduate School.

Kiss and Belletti argue, following Rizzi (1997), that the preverbal subjects in sentences like 17(c) and 18(b) occupy a left-peripheral position reached via movement. The postverbal position of the subject is either its original position (Kiss) or a low position in the verb's functional projection (Belletti). Either way, we can conclude that the syntax of Italian makes a distinction between constituents that are FoCused and those that are merely new.

The Italian facts are another challenge for [F]-marking-only accounts. The syntactic engine for Italian needs to know that it can't move merely new constituents into the left periphery of a sentence. But if there is nothing in the syntactic representation that would distinguish FoCused phrases from those that are merely new, it's hard to see how it could accomplish that task.

We conclude that an [F]-feature-only account isn't able to connect meaning, syntax, and phonological realization in the right way. We need to make finer distinctions. If we want to hold on to Aboh's Conjecture, we should consider the possibility that languages might use two morphosyntactic features, rather than just one, to produce the semantic, pragmatic, syntactic, and prosodic effects that FoCus, Givenness, and newness are responsible for in individual languages.

5. Blind to newness

The last section concluded that, assuming Aboh's Conjecture, we seem to need two morphosyntactic features to express discourse requirements connected to Givenness and Focus. Which two? We can't seem to do without FoCus. We need a FoCus feature to compute alternatives sets for operators like *only* or cleft constructions, we need it to drive movement into the left periphery in Italian, and we need it to compute the right prosody in the Katz & Selkirk cases, for example. The choice point, then, is whether to have a morphosyntactic feature that marks material that is Given ([G]-accounts) or, alternatively, a morphosyntactic feature that marks material that is merely new ([N]-accounts). If newness is marked, Givenness would be unmarked and vice versa.[18]

[G]-accounts and [N]-accounts posit strikingly different representations for out-of-the-blue utterances, where everything is new information. In those cases, [N]-accounts produce representations that look minimally as in 19(a), whereas [G]-accounts would posit unmarked representations, as in 19(b).

(19)   Sárah mailed the cáramels.

(a) $Sarah_N$ $mailed_N$ the $caramels_N$.   [N]-accounts

(b)   Sarah mailed the caramels.   [G]-accounts

[N]-marking every content word in (19) is necessary since newness of a constituent in no way implies that any of its proper parts are new as well. Representations with merely broad [N]-marking like (20) for out-of-the-blue utterances would thus be inadequate.

(20)   [Sarah mailed the caramels]$_N$.

---

[18] .   Modern two-feature proposals are Féry & Samek-Lodovici (2006), Selkirk (2007, 2008), and Beaver & Velleman (2011). All three proposals mark focus, with possibly slightly different assumptions about what falls under this notion. Beaver & Velleman use [N]-marking for constituents that are new ('unpredictable'). Féry & Samek-Lodovici (2006) and Selkirk (2007, 2008), on the other hand, represent givenness, rather than newness.

There is an asymmetry between Givenness and newness, then: Givenness of a constituent does imply Givenness of all of its parts. Broad [G]-marking for the Given part of your answer in (21) is thus entirely justified.

(21) Me: Sarah mailed the caramels.
      You: I can't belíeve that [Sarah mailed the caramels]$_G$.

We conclude that if feature economy is a consideration, [G]-accounts have a slight advantage.

More importantly, the difference between 19(a) and (b) has consequences for the Syntax-Phonology interface. On an [N]-account, the prosody of (19) would have to be read off the representation 19(a), with all those [N]-marks. On a [G]-account, on the other hand, the right prosody for (19) would have to be determined on the basis of 19(b), which does not contain any features related to FoCus, Givenness, or newness. This means that if 19(b) is the right representation, there has to be a default prosody for English out-of-the-blue utterances whose principles are independent of any impact of Information Structure. To defend a [G]-account, then, we would need to show what that default prosody is and how it could be derived within an otherwise plausible general theory of prosody. Suppose such a demonstration succeeded. We would then be in a strong position to rule out 19(a) on conceptual grounds: All N-marking in 19(a) would be completely superfluous as far as prosody is concerned.

Accounts presupposing the existence of a default prosody for English that is independent of Information Structure have been proposed since the earliest studies of prosody within Generative Grammar (Chomsky & Halle 1968, Bresnan 1971, Chomsky 1971).
While the issue hasn't been uncontroversial, the pendulum is swinging towards default prosody in recent textbooks (Büring 2016) and handbook articles (Truckenbrodt 2016, Zubizarreta 2016). We will address this topic in the next section, where we will follow-up on Féry & Samek-Lodovici (2006) and Selkirk (2007, 2008) in working out a particular

version of a [G]-account. On a [G]-account, the prosody of a sentence is computed off syntactic structures that may include morphosyntactic features for Givenness ([G]-marking) and FoCus ([FoC]-marking), but do not indicate newness. The grammar is blind to newness. The apparent prosodic reflexes of newness in Standard American and British English are reflexes of a default prosody whose basic principles do not depend in any way on Information Structure.

6. The Phonological Interpretation of [FoC] and [G]

The fate of [FoC] and [G] is to be spelled out by the Phonology in some way, be it prosodically, segmentally, or tonally. Morphosyntactic features - whether it's features for FoCus or Givenness, or inflectional features like those for plurality or past tense - are phonologically interpreted via language-particular spellout constraints specifying the phonological expression of these features. The phonological exponence properties called for by such spellout constraints form part of the underlying phonological representation of a sentence, which is the input to the phonological component *per se*. The surface phonological representation derived from the underlying representation may show phonological constraint-driven modifications. This general architecture is the same, whether we are dealing with prosodic spellout of [FoC] and [G] in English, or with segmental spellout of related features in Gungbe, for example.

[FoC] and [G] in Standard English differ from features for plurality or tense in that they are spelled out not as segments, but in terms of prominence. The exponence of [G] is the absence of phrasal prominence. The exponence of [FoC] is highest possible prominence. Both of those features involve divergence from default prominence. At the point of contact with the phonology, then, they have to interact with an underlying representation that has information about default prominence. (22) below illustrates an architecture that makes those interactions possible. In the architecture assumed in (22), the sole point of interface between syntax and phonology in the grammar is between an output syntactic representation and the underlying (input) phonological representation. This is a serialist theory of the syntax-phonology interface, then. The relation between syntax and the

surface phonological form, which is submitted to phonetic interpretation, is mediated by an underlying phonological representation.

The sentence in 22(a) is meant to be all-new, lacking any [FoC]-marking and [G]-marking. Our task in what follows is twofold: first to explain exactly how underlying phonological representations like 22(b) come about and, second, to explain how surface phonological representations like 22(c) are derived from 22(b). The first subtask involves all aspects of the syntax-phonology interface, including the spellout of our two morphosyntactic features and the properties of underlying phonological representation they interact with. For the second subtask we are assuming an optimality theoretic, constraint-based, account (Prince & Smolensky 2004 [1993], McCarthy & Prince 1999).

(22)   a. Syntax   b. Underlying phonological representation
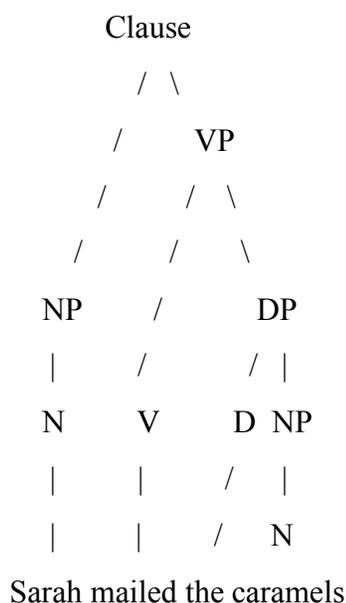
```
                Clause                                        ι
                / \                                          / \
               /    VP                                      /   φ
              /    /  \                                     /   / \
             /    /    \                                   /   /   \
          NP     /     DP                              φ      /     \
          |     /     / |                              |     /       \
          N    V     D  NP                            ωₛ    ω         φₛ
          |    |    /  |                               |    |         |
          |    |   /   N                               |    |         ωₛ
        Sarah mailed the caramels                    Sarah mailed the caramels
```

c. Surface phonological representation

```
                            ι
                           / \
                          /    φ
                         /    / \
                        /    /   \
                      φ     /     \
                      |    /       \
                     ωs   ω         φs
                      |    |         |
                     fs   fs         ωs
                     /\    |        / \
                    σs σ   σs      fs  f
                    | |    |       /\  |
                    | |    |     σ  σs σ σs
                  Sarah mailed the  caramels
                   H* L-            H*    L-
```
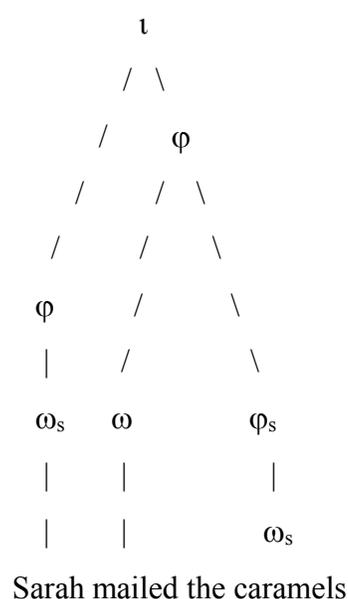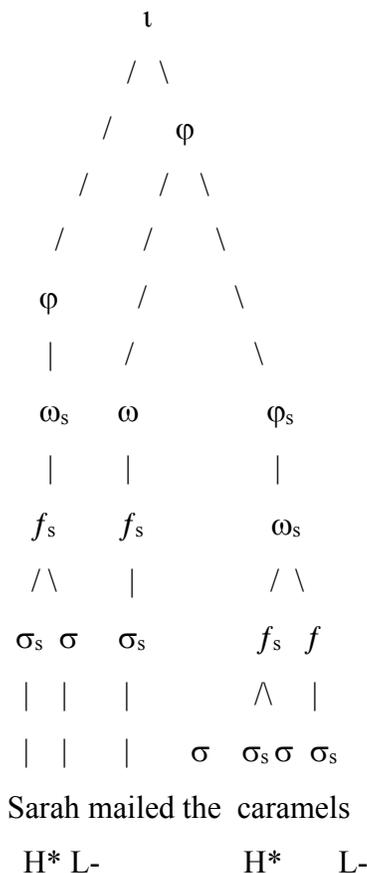
In the syntactic representation 22(a) the orthographic string stands for the abstract representation of the morphemes and morphosyntactic features of syntactic representation that are to be spelled out in the underlying phonological representation. The orthographically represented terminal strings in 22(b) and (c) stand for the phonological segments that give phonological expression to the terminal elements of 22(a). There are three key aspects of the prosody of surface phonological representations in English: prosodic constituency, prosodic prominence (stress), and tone. Prosodic constituents at levels ω (prosodic word), φ (phonological phrase), and ι (intonational phrase) have a place in the underlying representation in 22(b), where they reflect the word, phrase and clause structure of the syntactic representation in 22(a). The possibility of phonologically driven divergence, or non-isomorphism, between phonological and

syntactic constituency shows that prosodic constituents are not syntactic in kind (Nespor & Vogel 1986, Selkirk 1986, 2011, Truckenbrodt 1999).

In Match Theory (Selkirk 2011), the phonological category types ω, φ and ι are derived from the morphosyntactic category types word, phrase and clause, respectively. The constraints Match Word, Match Phrase and Match Clause (Bennett et al. 2017, Elfner 2015, Selkirk 2011, the papers in Selkirk & Lee 2015) call for prosodic constituents in phonological representation that correspond to the constituents of a syntactic structure like 22(a). Given the serial organization of the grammar assumed here, where syntax meets phonology only in the underlying (input) representation of the phonology[19], it is in the underlying phonological representation that the constituent structure of the syntax is spelled out by the Match Constraints. Match Phrase is an example:

(23)   **Match Phrase**

A phrase of syntactic structure corresponds to a phonological phrase in underlying phonological representation.

In English only phrases that are headed by a lexical item (noun, verb, adjective, and some prepositions) seem to count for Match Phrase. The position of functional category heads like *the* in prosodic structure is determined by phonological constraints.

Reviewing the distinctions between underlying and surface representation in 22(b) and (c), it happens (in this case) that the surface representation in 22(c) has fully inherited the prosodic ω, φ, and ι constituency of the underlying representation 22(b). The appearance of prosodic foot (f) and syllable (σ) structure within each ω in 22(c), however, is driven by phonological markedness constraints on surface phonological representation that organize

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[19].   In Selkirk (2011) this organization of grammar was not assumed, and Match constraints were construed as holding at surface phonological representation.

segments into syllables (Prince & Smolensky 2004 [1993], Zec 2007) and syllables into feet (Hayes 1995, Kager 2007).

In 22(b) and (c), stress is represented with an s-subscript on prosodic constituents. The s-marking notation is a convenient alternative to the grid marks of a constituent-bracketed metrical grid (Hayes 1995, and others). The distribution of stress (prominence) in the sentence is phonologically predictable in all-new sentences. We would thus expect it to only be present in surface phonological representation, were it not for the fact that [G] and [FoC], by their very nature, have to interact with default prominence. That could only happen in underlying representation, given the serial architecture we are assuming.

In general, each constituent of prosodic structure (with the possible exception of intonational phrase, to be discussed below) has a unique prominent daughter constituent. For phonological phrases, this is captured by the constraint Phrasal Prominence, which, in English, is a markedness constraint on any phonological representation, be it surface or underlying.

(24)   **Phrasal Prominence**

        Every φ has exactly one prominent daughter.

Phrasal Prominence belongs to a family of phonological markedness constraints that includes constraints for defining prominence within prosodic words and feet. In optimality theory, phonological markedness constraints are standardly construed as constraints on the 'ideal' nature of output/surface phonological representations. But since [G] and [FoC] interfere with default prosody, constraints like Phrasal Prominence in Standard English need to hold of underlying phonological representation, too.

In 22(b) and (c), Phrasal Prominence is satisfied in all three φs. The non-branching φs corresponding to the subject and object noun phrases both contain a single s-marked daughter. Within the higher φ in the recursive φ structure corresponding to the VP the

daughter φ is s-marked, rather than its ω sister. This is not yet accounted for. It suggests an additional markedness constraint privileging prominence on categories that are higher in the prosodic hierarchy.

(25)　**Unequal Sister Prominence**

　　　If sisters in a prosodic representation are of unequal category, the lower-level one(s) in the prosodic hierarchy cannot be prominent (s-marked).

What about equal sisters, then? Here the situation is more complicated. Languages seem to differ. For example, within a prosodic word that contains a sequence of feet, the prominent foot may be the right-most or the left-most foot, depending on the language. Less is known about relative prominence of equal sisters at the phrasal level. It is often assumed that the right-most phrase would receive prominence in this case. In the all-new (26), for example, the phrase corresponding to the indirect object would then be the prominent one.[20]

(26)　Syntax　　[I've [[sent]$_V$ my [[payment]$_N$]$_{NP}$ to the [[doctor]$_N$]$_{NP}$]$_{VP}$]

　　　UR　　　(I've ((sent)ω my ((payment)ω$_s$)φ to the ((doctor)ω$_s$)φ$_s$)φ)ι

　　　SR　　　(I've ((sent)ω my ((payment)ω$_s$)φ to the (doctor)ω$_s$)φ$_s$)φ)ι
　　　　　　　　　　　　　　　　　　　　H*　　　　L-　　　　H*　　　L-

We should mention, however, that the experimental evidence from Katz & Selkirk (2011) does not necessarily support the prominence asymmetry represented in (26). We therefore won't commit ourselves to a markedness constraint about prominence of equal sisters in phrases without further investigation.

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[20] .　　We are assuming a small-clause analysis for *payment to the doctor* along the lines of Harley (1995, 2002). The head of the small clause is a functional element, hence the small clause does not correspond to a φ. As a consequence, the prosodic counterparts of the two objects are sisters and are both daughters of the φ corresponding to the VP.

Stress prominence is known to account for the distribution of stress-sensitive phonological properties in English. Predictable vowel reduction, for example, takes place in Standard American English in syllables that are unstressed, that is, not s-marked (see e.g. Chomsky & Halle 1968). In the word *cáramèls* in 22(c) the prominent (leftmost) syllable-daughter of the first foot has the unreduced vowel quality of its underlying representation, as does the vowel of the prominent sole daughter of the second foot, but in the non-s-marked syllable of the first foot the reduced vowel [∂] appears.

While prominence and prosodic constituency are not completely predictable from phonological principles alone, the default tones H* and L- are. This is why they only appear in surface phonological representation in (22) and (26). These tones have no meaning that would warrant them a place in syntactic representation or in underlying phonological representation. The obligatory H* pitch accents appearing in all-new sentences are a predictable reflex of the φ-level prominence status (ω_s) of the word bearing the accent. (Selkirk 1995, Ladd 1996, Truckenbrodt 2006). This phonological analysis of the distribution of the obligatory H* pitch accent explains why the verb *mailed* lacks obligatory pitch accent in (22), while the subject *Sarah* and the object *caramels* must bear a H*. As for the L- edge tones, which coincide with the righthand edge of a φ in 22(c), they are also likely a predictable, non-morphemic property of the prosody (Ladd 1996). We are mostly leaving out morphemic tones in our representations, like the sentence final H% or L% or morphemic pitch accents like L*+H, for example (Pierrehumbert & Hirschberg 1990).

In sum, the default distribution of tones in surface phonological representation in English comes with phrase-level prosodic constituency and prominence within those phrases. General phonological markedness constraints on the relation between tone and prosodic prominence or prosodic constituent edges will ensure their presence in surface phonological representation (Yip 2002, 2007).[21]

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[21] . The attraction of H tone to stress is found at the foot level (Zec 1999), the prosodic word level (Hellmuth 2007), and the phonological phrase level (Kisseberth 1984, Gordon 2003).

We have now addressed the three aspects of sentence prosody found in all-new, unmarked, sentences. The prosodic properties of those sentences are jointly determined by general principles of spellout and general constraints on phonological representations. There is thus no role for a putative [N]-feature.

We next turn to examining the effects of Givenness and FoCus on sentence prosody. Let's look first at the phonology of [G]-marking. What is the phonological expression of morphosyntactic [G]-marking in Standard English? Since underlying phonological representation is the sole permitted contact point between syntax and phonology in the serialist version of this interface we are assuming, we propose the spellout constraint No-[G]-Prominence as formulated in (27):

(27) **No-[G]-Prominence**

In underlying phonological representation, the counterpart of a [G]-marked constituent may neither be, or include, a phrase-level prominence (an ω_s).[22]

No-[G]-Prominence is a constraint of the syntax-phonology interface that calls for the absence of phrase-level prominence with Given constituents in Standard English. Obviously, no-[G]-Prominence conflicts with Phrasal Prominence. This conflict comes out in the UR of (28).

(28) Me: Everything ok after your operation?
      You: Oh, yeah.

      Syntax   [I've [[sent]$_V$ my [[payment]$_N$]$_{NP}$ to the [[doctor]$_N$]$_{NP, G}$]$_{VP}$]

---

[22].   Ladd's (1980) original proposal was that a discourse-given constituent couldn't be the s-marked sister in an s/w labelled metrical tree.

UR   (I've ((sent)ω my ((payment)ω$_s$)φ$_s$ to the ((doctor)ω)φ) φ)ι

SR   (I've ((sent)ω my ((payment) ω$_s$)φ$_s$ to the ((doctor)ω)φ) φ)ι
                                     H*   L-   L%

No-[G]-Prominence requires the absence, but Phrasal Prominence requires the presence, of phrase-level prominence (s-marking of ω) for *doctor* in the underlying representation of (28). Phrasal Prominence is thus violated. There is, however, another possible underlying representation for the [G]-marked phrase that would avoid violating Phrasal Prominence, but would violate Match Phrase instead. This possibility is illustrated in (29): *doctor* has now been 'dephrased' in the underlying representation and Phrasal Prominence is no longer applicable.

(29)   Me: Everything ok after your operation?
        You: Oh, yeah.

        Syntax   [I've [[sent]$_V$ my [[payment]$_N$]$_{NP}$ to the [[doctor]$_N$]$_{NP, G}$]$_{VP}$]

        UR   (I've ((sent)ω my ((payment)ω$_s$)φ$_s$ to the (doctor)ω)φ)ι

        SR   (I've ((sent)ω my ((payment)ω$_s$)φ$_s$ to the (doctor)ω)φ)ι
                                     H*   L-   L%

Ladd (1980, 2008) provides evidence for the dephrasing of the prosodic counterparts of [G]-marked phrases. (30) is his example[23], analyzed within our current framework of assumptions.

(30)   Me: Everything ok after your operation?
        You: Don't talk to me about it.

---

[23] .   Example (24) in Ladd (2008), 300.

Syntax   [The [[butcher]ₙ]ₙₚ, ɢ [[charged]ᵥ me a [[thousand] [[bucks]ₙ]ₙₚ]ₙₚ]ᵥₚ]

UR   (The ((butcher)ω)φ ((charged)ω me a ((thousand) ((bucks)ωₛ)φₛ)φₛ)φ)ι

SR   (The (butcher)ω ((charged)ω me a ((thousand) ((bucks)ωₛ)φₛ)φₛ)φ)ι
        ø/H*   H*   L-   L%

In (30), there is an optional pitch accent for the subject phrase. Ladd suggests that the observed lack of a L- tone at the right edge of the subject phrase in (30) indicates that this phrase does not have the status of a φ in surface phonological representation. This absence of φ status for the phonological counterparts of [G]-marked constituents is not easily discernable in (29) because of the co-presence of the morphemic sentence-final L% tone. We are nonetheless assuming that all surface counterparts of [G]-marked constituents in Standard English are 'dephrased' in surface representation, violating Match Phrase. Match Phrase is thus subordinated to No-[G]-Prominence and Phrasal Prominence.

An account is still needed for the optional presence of a H* pitch accent with the [G]-marked subject in (30). Ladd refers to this optional H* pitch accent as a 'secondary' one, while the H* that appears obligatorily with what we are referring to as FoCus and new constituents is a 'primary' accent. The primary accent has already been characterized as one which appears by default on the most prominent syllable of a φ. As for the secondary H* pitch accent, its presence could be driven by a phonological constraint calling for the presence of a H tone on a word that appears at the left edge of a φ.[24] There's precedent for the appearance of such left-edge-based pitch accents in European Portuguese (Frota 2000) and Irish (Elfner 2012, 2015). Moreover, within English itself this initiality effect can explain the optional presence of H* pitch accents on transitive verbs, prenominal modifiers, and so on, which are predicted to be non-prominent in the default case. Localizing the H on the main-stressed syllable of the word would be achieved by markedness constraints on the tone-prominence relation.

---

[24].   Bolinger (1965), Shattuck-Hufnagel et al. (1994).

Further effects of No-[G]-Prominence are brought out by example (31), also from Ladd (1980, 2008).[25]

(31) Me: Everything ok after your operation?
     You: Don't talk to me about it.

   Syntax   [I'd [[like]$_V$ to [[strangle]$_V$ the [[butcher]$_N$]$_{NP, G}$]$_{VP}$]$_{VP}$]

   UR   (I'd ((like)$_\omega$ to ((strangle)$_{\omega s}$ the (butcher)$_\omega$)$_\varphi$)$_\varphi$)$_\iota$

   SR   (I'd ((like)$_\omega$ to ((strangle)$_{\omega s}$ the (butcher)$_\omega$)$_\varphi$)$_\varphi$)$_\iota$
                                    H*   L-   L%

In (31), because of Phrasal Prominence at the VP-level, the absence of prominence on the prosodic counterpart of the [G]-marked object results in necessary phrasal prominence and a pitch accent on the counterpart of the verb in the underlying representation.

Turning to [FoC]-marking, starting with Jackendoff (1972), it is usually assumed in accounts of English sentence prosody that a [FoC]-marked syntactic constituent is phonologically expressed with the highest possible prominence (stress) of the sentence. We propose the FoCus Prominence constraint in (32), which assumes that the morphosyntactic feature [FoC] is spelled out in Standard English in the underlying phonological representation of a sentence.

(32) **FoCus Prominence**
     The prosodic counterpart of a [FoC]-marked constituent has the highest possible prominence in underlying phonological representation that it can have without violating other constraints.

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[25] .   Example (22) of Ladd (2008), 300.

In the syntactic representation in 33(a) below, the subject phrase is [FoC]-marked and the VP is merely new. The FoC-new sequence in 33(a) could have the meaning of the cleft sentence *It was Sarah who mailed the caramels*, spoken in a context where *mailed the caramels* is not salient in the current discourse, so not [G]-marked.

(33) a. Syntax   b. Underlying phonological representation

```
            Clause                                          ι
            /  \                                           /  \
           /    VP                                        /    φ
          /    /  \                                      /    /  \
         /    /    \                                    /    /    \
      NPFoC  /      DP                        →      φs     /      \
       |    /      /|                                 |    /        \
       N    V     D NP                               ωs   ω          φs
       |    |    /  |                                 |   |          |
       |    |   /   N                                 |   |          ωs
    Sarah mailed the caramels                      Sarah mailed the caramels
```
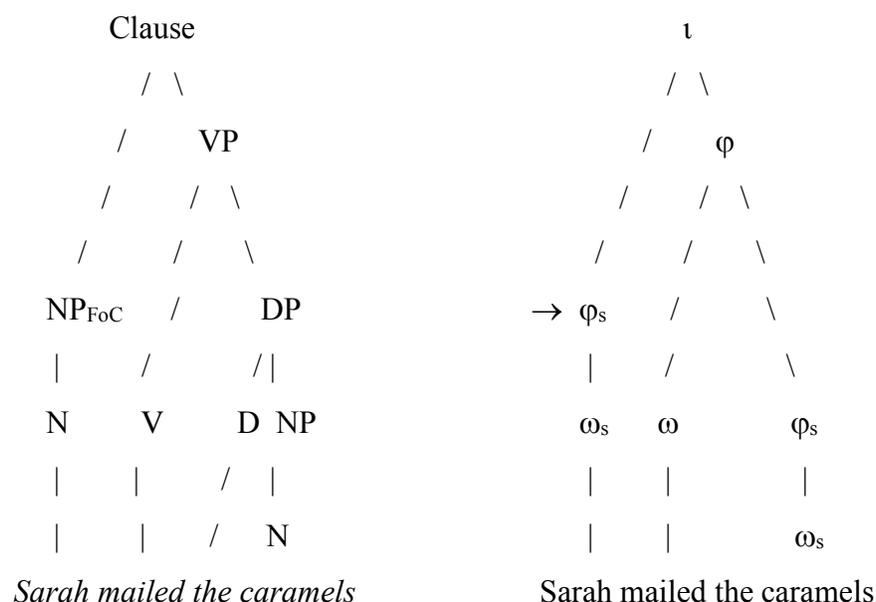
In this simple case, the φ counterpart of the [FoC]-marked phrase *Sarah* carries the highest-level prominence in the sentence. It's the prominent daughter of the intonational phrase (ι), which is the highest prosodic constituent. The prominence of *caramels* is determined by Phrasal Prominence. Both this prominence and FoCus-related prominence would be inherited in the surface representation, which is not given here. The phrase-level prominence and surface distribution of H* and L- for (33) would thus be the same as in an all-new sentence. On our account, the ι-level prominence of the [FoC]-marked constituent in phonological representation (marked with an arrow) is the source for the judgment by

speakers of English that the [FoC]-marked constituent of a sentence is more prominent relative to other, non-[FoC]-marked, constituents of the same sentence.

Direct experimental phonetic evidence for the existence of the intuited relative prominence patterns in sentences with [FoC] is provided in Katz and Selkirk (2011), which investigates the phonetics of sentences with [FoC]-marked constituents that precede or follow non-[FoC]-marked, merely new, constituents, as in 34(a) and (b), as well as the phonetics of all-new sentences like that in 34(c).

(34)   a.   FoC-New: They only produced [linen]$_{FoC}$ in [Nineveh].

       b.   New-FoC: They only produced [linen] in [Nineveh]$_{FoC.}$

       c.   New-New: They produced [linen] in [Nineveh].

Katz & Selkirk found that the surface phonological representations of the post-verbal phrases in 34(a) to (c) show the typical default surface H* L- tone pattern of a φ, whether or not one or the other phrase, or neither, is also [FoC]-marked. This baseline identity in the tonal content and phonological phrasing of the sentences of such minimal triplets provides a perfect laboratory for examining phonetic patterns of relative prominence in the pitch, duration, and intensity dimensions of the successive post-verbal phrases. The results showed a significant three-way difference in patterning of relative prominence, one which can be illustrated by the arrows in (35).

(35)   Phonological representation with phonetic pitch downstep/upstep patterns:

a.   ….. (produced)ω ((linen)ωₛ)φₛ in ((⇓ Nineveh)ωₛ)φ

                            H*   L-   H*   L-

b.   ….. (produced)ω   ((linen)ωₛ)φ in (((↑) Nineveh)ωₛ)φₛ

                            H*   L-   H*   L-

c.   ….. (produced)ω ((linen)ωₛ)φ in ((↓ Nineveh)ωₛ)φ

                            H*   L-   H*   L-

The all-new case in 35(c) reflects the phonetic baseline, namely the presence of some degree of downstep (indicated by ↓) between the pitch values of the H* pitch peaks of the two successive discourse-new phrases (Liberman & Pierrehumbert 1984 on English, Grabe 1998, Truckenbrodt 2004 on German). In the FoC-new case in 35(a), there is a significantly greater degree of downstep (indicated by ⇓) between the H* peaks of the two phrases. Following Truckenbrodt (2007b), Katz and Selkirk (2011) see this large downstep as a phonetic reflex of the higher degree of prosodic/phonological prominence on the φ corresponding to the [FoC]-marked constituent, which is initial in the sequence. As for the new-FoC case 35(b), there is some variability in the pattern observed. There may be a small upstep of the counterpart of the FoCused phrase with respect to the preceding phrase, or the pitch height of the two may be more or less on a par. Baseline downstepping is counteracted in the phonetic interpretation of the prominence of the counterpart of the [FoC]-marked constituent in 35(b).[26]

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[26] .   Katz & Selkirk (2011) did not indicate the φ corresponding to the VP in 35(a) to (c). If there was such a φ, Phrasal Prominence would call for one of its daughters to be prominent, and that would presumably be the right-most. That lower φ would not be in a position to carry ɩ-level prominence, however.

The experimental results show that the patterns of relative phonetic prominence in new-FoC and new-new are significantly different. This dissimilarity has led us to hypothesize that there is no prominent φ_s status for the counterpart of the second verbal complement in an all-new sentence like 35(c). But why wouldn't an ι-level prosodic markedness constraint that is the analogue of Phrasal Prominence call for one of the daughters of ι to be prominent? Our suggestion is that prominence at the ι-level in underlying representation is available only as the expression of [FoC]-marking. To capture this requires adding a constraint on the syntax-phonology interface in Standard English:

(36)   **FoCus Privilege**

A daughter of ι is prominent only if its counterpart in syntactic representation dominates a [FoC]-marked constituent.

FoCus Privilege would complement the constraint FoCus Prominence, the other constraint relevant to [FoC]-marking. FoCus Prominence is specific to the grammar of Standard English. Perhaps FoCus Privilege is too.

There is additional evidence for the phonological representation of [FoC] prominence from cases where the FoCus falls on a word, rather than a phrase. In (37), a [FoC]-marked verb precedes a discourse-new object.

(37)   (Guess what!)

  a.   [[Sarah] [[mailed]$_{FoC}$ [the caramels]]. (She didn't Fed-Ex them.)
  b. $(((Sarah)\omega_s)\varphi\ (((mailed)\omega_s)\varphi_s\ the\ ((caramels)\omega_s)\varphi)\varphi_s)\iota$
            H*   L-   H*   L-   H*   L-

(37) might be uttered in a situation where both speaker and hearer know that Sarah planned to send off a box of caramels yesterday, and when they saw each other today, the first thing that was reported about either Sarah or the caramels was what is expressed in (37), where, semantically, a contrast with respect to the mode of sending the caramels

(mailing (by the postal service) vs. sending by FedEx) comes into play. Neither *Sarah* or *the caramels* would be salient in this discourse and therefore there is no [G]-marking in this first exchange of the day.

The factual observation is that, when a [FoC]-marked verb is followed by a discourse-new object, the [FoC] marked verb has the status of a phonological phrase in surface representation.[27] Both the verb and the object in the grammatical surface representation of (37) carry an obligatory H* pitch accent, which is a reflex of φ-level prominence. Moreover, the right edge of the verb coincides with a L- tone, which is a default property of the right edge of a φ. What forces the prominent verb to acquire the status of a phrase? The reason, we propose, is that, if the verb didn't acquire φ status, there would be a violation of Unequal Sisters Prominence: the ω corresponding to the verb is s-marked due to FoCus Prominence, but it has a phrasal sister (corresponding to the verb's direct object), which should be the prominent one according to Unequal Sisters Prominence.

Consider next cases with two FoCus constituents in the same sentence. An example would be (38), which is a configuration not tested in Katz & Selkirk (2011). (38) could be a follow up to a preceding all-new sentence *They produced tapestries in Babylon*.

 (38)   FoC-FoC: And they [produced [linen]$_{FoC}$ in [Nineveh]$_{FoC}$]$_{VP}$.

We have to say at the outset that we do not know what the full picture of prominence is in this case. To be sure, there is at least phrasal status and phrasal prominence for *linen* and *Nineveh*, hence two H* pitch accents with following L- edge tones. What we do not know is whether one FoCused phrase is more prominent than the other and what the prominence level is. Here is how we would approach the issue on our account. FoCus Prominence aims for the highest possible prominence for the prosodic counterparts of [FoC]-marked

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[27].   Selkirk (2002) provides experimental evidence for this sort of pattern from right node raising sentences, where a FoC-marked verb is followed by a discourse new object.

constituents. The most straightforward way of satisfying this requirement for (38) would be 39(b), where the counterparts of both [FoC]-marked phrases have ι-level prominence.

(39) a. FoC-FoC: And they [produced [linen]$_{FoC}$ in [Nineveh]$_{FoC}$]$_{VP}$.

  b. (..... ((produced)$_\omega$ ((linen)$_{\omega_s}$)$_{\varphi_s}$ in ((Nineveh)$_{\omega_s}$)$_{\varphi_s}$)$_{\varphi_s}$)$_\iota$
                                H*   L-   H*   L-

However, 39(b) violates Phrasal Prominence. The φ corresponding to the VP has two s-marked daughters. The remedy in such a case would be dephrasing, that is, the elimination of the φ corresponding to the VP, as shown in 40(b):

(40) a. FoC-FoC: And they [produced [linen]$_{FoC}$ in [Nineveh]$_{FoC}$]$_{VP}$.

  b. (..... (produced)$_\omega$ ((linen)$_{\omega_s}$)$_{\varphi_s}$ in ((Nineveh)$_{\omega_s}$)$_{\varphi_s}$)$_\iota$
                          H*   L-   H*   L-

40(b) obeys FoCus Prominence and Phrasal Prominence, but there are now two strong daughters of ι. We do not know whether this is the correct result, but it should be possible to sort out experimentally whether phonetic data on relative prominence supports this analysis: if correct, 40(b) would be predicted to be distinct from each of the three configurations tested by Katz & Selkirk (2011).

If the [FoC]-feature calls for prominence at the highest possible level, while the [G]-feature bans phrase level prominence, what does this imply for configurations where a [FoC]-marked phrase appears within a [G]-marked phrase? Examples are cases of so-called 'Second Occurrence Focus' illustrated in (41) below. The context description and 41(a) are from Beaver et al. (2007: 256, example 9). We've added 41(b) and the annotations.

(41) Both Sid and his accomplices should have been named in this morning's court session. But the defendant only named [Síd]_{FoC} in court today.

a. Even [the state prósecutor]_{FoC} [only named [Sid]_{FoC} in court today]_G.

b. Even [the state prósecutor]_{FoC} [only named [him/*'m]_{FoC} in court today]_G.

In 41(a) and (b), a pitch accent H* is missing on the [FoC]-marked phrase within the [G]-marked phrase, a fact confirmed for analogous cases in Beaver et al. (2007) and other experimental studies since Rooth (1996). The missing pitch accent is expected, given our formulation of FoCus Prominence. In 41(a), [FoC]-marking of *Sid* requires that *Sid* have prominence at the highest possible level, that is, at the highest level it can reach without violating other constraints. Since *Sid* is enclosed in a [G]-marked constituent, the highest possible prominence level for *Sid* is at the ω-level (an s-marked foot): the prosodic counterparts of [G]-marked constituents cannot include φ-level prominence (an s-marked ω). Since H* requires φ-level prominence, the absence of H* for *Sid* in 41(a) follows.

It's not that [G]-marking simply nullifies [FoC]-marking. 41(b) shows that there is a role for FoCus Prominence even when a [FoC]-marked phrase is enclosed in a [G]-marked one. As observed by Susanne Tunstall and reported in von Fintel (1994), an English pronoun in configurations like 41(b) must appear in its strong, stressed, form. The full-bodied pronoun *him* is required here instead of the weak form *'m*, which is pronounced either as a syllabic nasal, or as a reduced vowel followed by the nasal. Reduced pronunciations like those of the weak forms have a syllable that carries no prosodic prominence at all. The corresponding strong forms have minimally foot-level prominence, and could thus be the locus of main word stress as well. There is a prosodic effect of [FoC]-marking, then, even within a [G]-marked constituent. This case provides support for the formulation in (32) of FoCus Prominence, which permits variation in the level of prosodic prominence of [FoC]-marked constituents.

We conclude that the hypothesis that FoCus and Givenness are represented by two morphosyntactic features [FoC] and [G] yields an insightful account of the phonological

(and phonetic) effects of those two Information Structure notions in Standard American and British English within plausible assumptions of prosodic phonology. At the same time, our account makes clear that, cross-linguistically, phonological exponence of the two features via properties relating to prosodic prominence is just one possible option, an option that sets those varieties of English apart from other varieties and many other languages where the same two features may surface in different ways or not at all. Prosodic spellout is just one language-particular way of spelling out those features.

In the next section, we will show that there is also nothing special or exceptional about the meaning of the two features [G] and [FoC]. [FoC] is a close cousin of the [*wh*]-feature, and [G] resembles discourse particles in languages like German. Positing those two morphosyntactic features, then, requires no new assumptions about the kinds of meanings that can be carried by morphosyntactic features in natural languages, or about possible semantic or pragmatic architectures that those features interact with. The many observations about focus and givenness that semanticists have gathered over the years can be naturally accounted for by interactions of [G] and [FoC] with the rest of the grammar.

7.   The Meaning and Distribution of [FoC] and [G]

Both [G]-marking and [FoC]-marking impose requirements on the current discourse. [G]-marking targets matches with what was said before or is otherwise salient in the discourse context. [FoC]-marking introduces alternatives to represent a contrast. To state the discourse requirements triggered by [G] and [FoC], we will continue to rely on the Alternatives Semantics of Rooth (1992, 2016). We saw already that, in Alternatives Semantics, expressions are assigned two semantic values: O-values (ordinary meanings) and A-values (alternatives sets). Our semantic values also depend on a representation of the discourse context C. Among other things, discourse contexts determine what the available discourse referents are. We are not assuming any particular representation of discourse contexts here, as long as they provide an updatable record of available discourse referents. Discourse Representation Theory, from its very beginning in Kamp (1981), has explored how discourse referents of various types are organized into structured

representations of discourse contexts and made available for discourse anaphoric relations of various kinds.

With our feature repertoire, it's the [FoC]-feature, rather than Rooth's [F]-feature, that introduces alternatives:

(42) **The meaning of the [FoC]-feature**
O-values:
$[\![[\alpha]_{Foc}]\!]_{O, C} = [\![\alpha]\!]_{O, C}$.

A-values:
For α of type τ,
$[\![[\alpha]_{Foc}]\!]_{A, C} = D_\tau$ (the set of all possible entities of type τ).

This is standard Roothian Alternatives Semantics: The computation of the O-value of $[\alpha]_{Foc}$ overlooks [FoC]-marks and outputs the O-value of α. For α of semantic type τ, the A-value of $[\alpha]_{FoC}$ is the set of all possible entities of type τ.[28] The only change we need to implement comes with the [G]-feature. The [G]-feature places a Givenness requirement on the discourse context:

(43) **Givenness**
An expression α is Given in a context C if there is a discourse referent (individual, property, proposition) in C that entails $[\![\alpha]\!]_{O, C}$.

(43) says that for an expression to be Given, its ordinary value must be entailed by a discourse referent in the record of the current discourse context. The discourse referent may be a preceding linguistic antecedent or whatever entity may be salient in the discourse

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[28] .   See Katzir (2013) for arguments that the generation of alternatives should be as permissive as stated and not be restricted further.

context without having been explicitly mentioned. (43) relies on a cross-categorial notion of entailment that relates individuals, properties, and propositions. We can assume that individuals entail each other when they are identical and then use a standard recursive definition (von Fintel 1999):

(44)   **Cross-categorial entailment[29]**

The relation of cross-categorial entailment $\Rightarrow$ holds between entities a and b just in case one of conditions (i) to (iii) applies:

(i) $a, b \in D_e$, and $a = b$.

(ii) $a, b \in D_t$, and $a = 0$ or $b = 1$.

(iii) $a, b \in D_{<\tau\, \sigma>}$, and for all c in D_τ, $a(c) \Rightarrow b(c)$.

(43) is non-committal about what it takes for an entity to become a discourse referent in a context. This is determined by a combination of linguistic and extra-linguistic factors that do not have to concern us here. With a characterization of Givenness in place, we can state the contribution of the [G]-feature as in (45):

(45)   **The meaning of the [G]-feature**

O-values

$[\![\,[\alpha]_G]\!]_{O, C}$ is defined iff α is Given in C.

If defined, $[\![\,[\alpha]_G]\!]_{O, C} = [\![\alpha]\!]_{O, C}$.

A-values

$[\![\,[\alpha]_G]\!]_{A, C} = [\![\alpha]\!]_{A, C}$.

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[29] .   The type system is Gallin's (Gallin 1975), with basic types e, t, and s. The definition can be made sensitive to influences of context by assuming that a context C might constrain the basic domains D_e (individuals) and D_s (possible worlds). This version of generalized entailment doesn't run into the problem of Schwarzschild's (1999) definition mentioned in footnote 11.

The [G]-feature introduces a Givenness requirement that is applied to the utterance context, regardless of how deeply embedded the feature may be. [G] does not contribute anything to the truth-conditional content of the expressions it attaches to, then, nor does it affect the computation of alternatives. Its contribution is use-conditional or expressive in the sense of Kaplan (1999), Kratzer (1999, 2004), Potts (2003), and Gutzmann (2015). In that respect, [G] resembles discourse particles like German *ja* or *doch*, as suggested in Kratzer (2004). We chose to implement the contribution of [G] as a contextual presupposition, but we remain open to the possibility that use-conditional meanings are a distinguished class of meanings requiring their own architecture, as argued in Potts (2003).

To illustrate the system, we'll compute O-values and A-values for your answer in the by now familiar example (2).

(2)   Me: Sarah mailed the caramels.
       You: (No), [Eliza]$_{FoC}$ [mailed the caramels]$_G$

(46)   **Sample computation: [FoC]-marked name**
       O-value
       $[\![[Eliza]_{FoC}]\!]_{O, C} = [\![Eliza]\!]_{O, C} = $ Eliza.

       A-value
       $[\![[Eliza]_{FoC}]\!]_{A, C} = \{$Eliza, Sarah, Leif, ...$\}$

       Sample computation: [G]-marked VP
       O-value:
       Defined iff *mailed the caramels* is Given in C, that is, iff there is a discourse referent in C that entails $[\![mailed\ the\ caramels]\!]_{O, C} = \lambda x.\lambda w.$ mailed-the-caramels (x)(w). If defined, $[\![[mailed\ the\ caramels]_G]\!]_{O, C} = [\![mailed\ the\ caramels]\!]_{O, C} = \lambda x.\lambda w.$ mailed-the-caramels (x)(w).

A-value:

⟦ [*mailed the caramels*]_G⟧_{A, C} = ⟦*mailed the caramels* ⟧_{A, C} = {λx.λw. mailed-the-caramels (x)(w)}.

To compute the O-value and A-value for your answer in (2) as a whole, we combine the O-values and A-values of their immediate constituents. The O-values are combined via functional application. The A-values combine via point-wise functional application:

(47)   **Sample computation of your answer in example (2)**

O-value:

Defined iff ⟦ [*mailed the caramels*] _G⟧_{O, C} is.

If defined, ⟦ [*Eliza*]_{FoC} [*mailed the caramels*]_G ⟧_{O, C} =

⟦ [*mailed the caramels*]_G⟧_{O, C} (⟦ [*Eliza*]_{FoC} ⟧_{O, C}) =

λx λw. mailed-the-caramels (x)(w) (Eliza) =

λw. mailed-the-caramels (Eliza)(w).

A-value:

⟦ [*Eliza*]_{FoC} [*mailed the caramels*]_G ⟧_{A, C} =

⟦ [*mailed the caramels*]_G ⟧_{A, C} × ⟦ [*Eliza*]_{FoC} ⟧_{A, C} =

⟦*mailed the caramels*⟧_{A, C} × ⟦ [*Eliza*]_{FoC} ⟧_{A, C} =

{λx λw. mailed-the-caramels (x)(w)} × {Eliza, Sarah, Leif, …} =

{λw. mailed-the-caramels (Eliza)(w), λw. mailed-the-caramels (Sarah)(w),

λw. mailed-the-caramels (Leif)(w), …}.

By now a crucial difference between [G] and [FoC] has emerged. [G] imposes a discourse requirement related to Givenness. [FoC] all by itself does not trigger any discourse requirement, it merely introduces alternatives. Following Rooth (1992), we are assuming that the contrast requirement that comes with [FoC]-marking is introduced by a separate operator (the 'squiggle') marking the scope of the FoCus. The ~ operator has a detectable presence in syntax. For example, we saw in section 2 that Sinhala has verbal inflection

marking the scope of a possibly distant focused constituent, suggesting a configuration similar to *wh*-constructions. The position of the ~ operator also seems to be a target for movement, assuming that there is focus related movement, as argued as early as Chomsky (1976) and reconfirmed most recently in Erlewine & Kotek (2018).[30]

While speakers are free to [FoC]-mark just about anything they please, [FoC]-marked constituents must be c-commanded by a ~ operator. FoCusing, then, always carries a commitment to contrast in the technical sense defined below (spelled *Contrast* from now on). A more fleshed-out representation of your response in (2) is (48).

(48) Me: [Sarah mailed the caramels]$_\alpha$.

      You: (No), ~$_\alpha$ [[Eliza]$_{FoC}$ [mailed the caramels]$_G$]

The ~ operator comes with an index α that establishes a link to a matching discourse referent of the right type, which, in our example, is the proposition that Sarah mailed the caramels. That proposition is distinct from the proposition that Eliza mailed the caramels and is also among the alternatives determined by the scope of the ~ operator. In this way your reply in (48) represents a Contrast with what I said before. (49) is a first attempt to define the notion of Contrast representation that we are after.

(49) **Contrast representation (not final)**

      An expression α represents a Contrast with a discourse referent (individual, property, proposition) α just in case conditions (i) and (ii) are satisfied:

      (i)   α $\in [\![\alpha]\!]_{A,\,C}$.

      (ii)   α $\neq [\![\alpha]\!]_{O,\,C}$.

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[30] .   The ~ operator doesn't seem to have any counterpart in prosodic structure. Assuming our serial architecture, the semantic scope or 'domain' of FoCus could not play any role in determining the prosodic domain for FoCus prominence, then, as proposed in Truckenbrodt (1995), and reflected in Féry & Samek-Lodovici 's (2006) constraint Stress-Focus and in Büring's (2016) Focus Realization condition.

The meaning definition for the ~operator can be stated as in (50):

(50) **The ~ operator**

O-values

$[\![\sim_\mathfrak{a} \alpha]\!]_{O,C}$ is only defined, if α represents a Contrast with $\mathfrak{a}$, where $\mathfrak{a}$ is a discourse referent in C. If defined, $[\![\sim_\mathfrak{a} \alpha]\!]_{O,C} = [\![\alpha]\!]_{O,C}$.

A-values

$[\![\sim_\mathfrak{a} \alpha]\!]_{A,C} = \{[\![\alpha]\!]_{O,C}\}$.

As in Rooth (1992), the ~ operator uses the alternatives determined by its scope to impose a Contrast requirement. It then blocks access to those alternatives for higher operators. Technically, it does so by setting the A-value of $\sim_\mathfrak{a} \alpha$ back to a singleton set containing the O-value of α as its only member. The A-value of α is thus no longer visible to further computations.

Unlike Rooth (1992), our notion of Contrast has no provision for antecedents that are questions. This is as it should be. When we looked at the Italian data in section 4, we saw that questions all by themselves do not necessarily trigger a FoCus in the answer. Krifka (2004) presents an additional argument that sheds serious doubts on the assumption that question-answer congruence is a relation of Contrast. (51) and (52) illustrate.

(51) Me: Lucie planted this bush.
a.   You: (No), she [pruned this trée]$_{FoC}$.
b.   You: (No), she [prúned]$_{FoC}$ [this trée]$_{FoC}$.

(52) Me: What did Lucie do?
a.   You: She only [pruned this trée]$_{FoC}$.
b.   You: # She only [prúned]$_{FoC}$ [this trée]$_{FoC}$.

Both 51(a) and (b) are acceptable replies, and are expected to be, since both represent a Contrast with what I said according to our definition.[31] Yet only 52(a) would be congruent with my question.

Krifka points out that, if alternatives sets are as permissive as Rooth takes them to be (and Katzir (2013) says they have to be), the alternatives set for the (a)-replies in (51) and (52) wind up to be the same as those for the (b)-replies. To see this, take any property of individuals P of semantic type <e<st>>. P is in the alternatives set of the VP [*pruned this tree*]$_{FoC}$. But now consider λx. P, the constant function that maps any individual to the property P. Being of type <e<e<st>>>, this function is in the alternatives set of the transitive verb [*pruned*]$_{FoC}$, hence P is in the alternatives set of the VP [[*pruned*]$_{FoC}$ [*this tree*]$_{FoC}$]. Krifka concludes that Alternatives Semantics is unfit to handle question-answer congruence: it can't distinguish the acceptable 52(a) from the unacceptable 52(b). From our perspective, those very same observations do not discredit Alternatives Semantics, rather they confirm our earlier conclusion that question answer-congruence is not a relation of Contrast to begin with.

Question-answer congruence is established via the Given part of answers on our approach. Important insights about the connection between Information Structure and questions (Roberts 1996, 2012) thus remain untouched. There is a lesson to be learned, though: The investigation of question-answer pairs cannot be used to diagnose FoCus. If we draw a distinction between what's FoCused and what's merely new by representing Givenness, rather than newness, the notion of an answer focus is no longer an obvious one. Now it's Givenness, not FoCus, that is reliably diagnosed with question-answer pairs.[32]

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[31] .   Since the alternatives sets are the same for both of your replies in (51), the revised definition of Contrast representation in (56) below will still allow both replies to represent a Contrast with the antecedent proposition.

[32] .   Féry & Samek-Lodovici (2006) and Büring (2016) have both [F]-marking and [G]-marking, yet still hold on to the notion of an answer focus. Question-answer pairs are discussed as prototypical instances of focus in Féry & Ishihara (2016), which sets the stage for the other articles in the Féry & Ishihara handbook.

Going back to our definition of Contrast representation in (49), it turns out that it is too liberal. As observed in Schwarzschild (1993) and reported in Truckenbrodt (1995), definitions like (49) allow overFoCusing and thus incorrectly predict that 53(b) represents a Contrast with the proposition expressed by 53(a), for example. The O-values of 53(a) and (b) are different, and the O-value of 53(a) is a member of the A-value of 53(b). This is not good.[33]

(53)   a.   John picked strawberries at Mary's farm.

       b.   John picked [strawberries]$_{FoC}$ at [Sandy's]$_{FoC}$ farm.

       Schwarzschild (1993: examples 9(a) and (c), using the current notation).

Schwarzschild (1993) also provides a remedy against the over-FoCusing illustrated in (53). Adapted to our framework, Schwarzschild's Contrast Constraint delivers a criterion for disqualifying an expression α from representing a Contrast with an entity ɑ if a Contrast with ɑ could also be represented by what we will call a "FoC/G-variant" of α with a smaller alternatives set. Two expressions are FoC/G-variants of each other if they are identical except for [FoC]-marking and [G]-marking. 54(a) to (e) illustrate the idea behind Schwarzschild's Contrast Constraint. Since [G]-marking does not affect the computation of A-values, we are neglecting [G]-marking possibilities.

(54)   ₚ = the proposition that John picked strawberries at Mary's farm.

       a.   John picked strawberries at [Sandy's]$_{FoC}$ farm.

       b.   John picked strawberries at [Sandy's farm]$_{FoC}$.

       c.   John picked [strawberries]$_{FoC}$ at [Sandy's]$_{FoC}$ farm.

       d.   John picked [strawberries]$_{FoC}$ at [Sandy's farm]$_{FoC}$.

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[33] .   53(b) can be used to contradict 53(a) if *strawberries* is understood as a contrastive topic, with characteristic, rising, contrastive topic intonation. That's not the contrast relation that we are trying to capture.

e.　　John [picked strawberries at Sandy's farm]$_{FoC}$.

54(a) to (e) are FoC/G-variants of each other. According to (49), they should all represent a Contrast with the proposition p that John picked strawberries at Mary's farm. Here is why. 54(a) to (e) all have the same O-value, which is the proposition that John picked strawberries at Sandy's farm. That proposition is different from p, hence condition (ii) of (49) is satisfied. Condition (i) is satisfied as well, since p is a member of the A-values of 54(a) to (e): Sandy is an alternative of Mary, Sandy's farm is an alternative of Mary's farm, strawberries are among the alternatives of strawberries, and picking strawberries at Sandy's farm is an alternative of picking strawberries at Mary's farm. Intuitively, only 54(a) represents a good contrast with p, however. All the other cases are overFoCused: They have either too many or too big constituents that are FoCused.

To find a criterion for disqualifying 54(b) to (e) from representing a Contrast with p, we compare their A-values to that of 54(a). What we see is that the A-value of 54(a) is a proper subset of all the others:

(55)　$⟦54(a)⟧_{A,C} \subset ⟦54(b)⟧_{A,C} \subset ⟦54(d)⟧_{A,C} \subset ⟦54(e)⟧_{A,C}$
　　　$⟦54(a)⟧_{A,C} \subset ⟦54(c)⟧_{A,C} \subset ⟦54(d)⟧_{A,C} \subset ⟦54(e)⟧_{A,C}$

Among the choices in 54(a) to (e), we should thus pick the one with the smallest alternatives set as representing a Contrast with p. Incorporating Schwarzschild's Contrast Constraint, our definition of Contrast representation can now be amended as in (56):

(56) **Contrast representation (final for now)**
　　　An expression α represents a Contrast with a discourse referent (individual, property, proposition) $\mathfrak{a}$ just in case conditions (i) to (iii) are satisfied:
　　　(i)　　$\mathfrak{a} \in ⟦\alpha⟧_{A,C}$.
　　　(ii)　$\mathfrak{a} \neq ⟦\alpha⟧_{O,C}$
　　　(iii)　There is no FoC/G-variant β of α such that $⟦\beta⟧_{A,C} \subset ⟦\alpha⟧_{A,C}$ and $\mathfrak{a} \in ⟦\beta⟧_{A,C}$.

Some contrasts seem trivial. In 57(a) to (c), for example, every word is part of a [FoC]-marked constituent and there are no [G]-marked or unmarked (new) parts.

(57) a.   [Eliza]_{FoC} [[mailed]_{FoC} [the caramels]_{FoC}]

     b.   [Eliza]_{FoC} [mailed the caramels]_{FoC}

     c.   [Eliza [mailed the caramels]]_{FoC}

It's too easy for those representations to satisfy the Contrast requirement for FoCus, since the alternatives sets generated for such [FoC]-marking configurations are completely unrestricted: they contain any entity whatsoever, as long as it is of the right type. Definition (56) doesn't make 57(a) to (c) ineligible for representing Contrasts, and rightly so. 57(a) to (c) shouldn't be disqualified offhand. 57(a) might be uttered by a grade school teacher giving dictation, for example, and the configurations in 57(b) and (c) are natural in the context of (58).

(58)   What did your children do for the common good today?

     a.   Sarah worked at the Survival Center all day, [Eliza]_{FoC} only [mailed the caramels to Grandpa]_{FoC}.

     b.   The only thing worth mentioning is that [Eliza mailed the caramels to Grandpa]_{FoC}.

As we will discuss shortly, there is pressure in Standard American and British English to represent Contrasts with discourse referents from the preceding context. That pressure is unlikely to extend to trivial Contrasts, though. Configurations like that in 39(c), for example, are sure to be exempt from whatever pressure there is for representing Contrasts. Speakers of English wouldn't even be able to detect whether there is a [FoC]-mark in 39(c). At what point do Contrasts become too trivial to be an organizing force in discourse? Where exactly is the cut-off point? The question needs more investigation.

FoCusing doesn't always require an antecedent in the preceding discourse. Contrasting discourse referents can be accommodated on the spot, as in Ellen Prince's cleft example, which we looked at earlier:

(14)   The leaders of the militant homophile movement in America generally have been young people. $\sim_{\mathfrak{p}}$ [It was [they]$_{\text{FoC}}$ who fought back during a violent police raid on a Greenwich Village bar in 1969], an incident from which many gays date the birth of the modern crusade for homosexual rights.

In (14), the pronoun *they* refers to the young people in the relevant domain. FoCusing *they* evokes as an alternative the complement set in that domain, the people who are no longer young. As a result, the sentence conveys that young people, rather than older people, were the ones who were fighting back during that police raid. Since the Contrasting antecedent is accommodated, the unFoCused part of the scope of the FoCus in (14) is new information, not Given. While FoCus and Givenness often travel together, (14) stands as a reminder that Givenness is in no way a necessary ingredient for Contrast representation.

FoCus on *they* triggers an exclusive interpretation in (14): the group of people who fought back is represented as a group excluding older people. Where does this exclusive interpretation come from? (59), which is inspired by an example from Wagner (2005, 2012), shows that exclusive interpretations do not necessarily have a local source.

(59)   Me: Does Sally still drive that expensive convertible her uncle gave her as a wedding present?
        You: I don't know. What I can say with confidence is that she drives a [réd]$_{\text{FoC}}$ [convertible]$_{\text{G}}$.

When telling me that Sally drives a red convertible you didn't mean to exclude the possibility that her convertible might also be expensive. What you did exclude was that you could say with confidence that she is driving an expensive convertible. The intended scope

of the FoCus on *red* stretches all the way up to the matrix clause in (59'), then, and there is again an (at least partially) accommodated antecedent:

(59') $\sim_\mathfrak{p}$ [What I can say with confidence is that she drives a [réd]$_{FoC}$ [convertible]$_G$].

It might be tempting to think that the $\sim$ operator is the source of the exclusive interpretation in (59'). But that can't be right. FoCus doesn't always trigger an exclusive interpretation:

(60)   Me: Guess what! Oliver passed the bar exam.
       You: If [Oliver]$_{FoC}$ [passed the bar exam]$_G$, bar exams have become too easy.

In (60), FoCus on *Oliver* triggers a scalar, rather than an exclusive, interpretation, which could also be brought out by an overt *even*. What (60) is conveying is that Oliver is at the lower end of a scale that ranks candidates according to their chances to pass the bar exam.

We conclude that if there is just a single $\sim$ operator, it can't come with a hard-wired exclusive interpretation. Either there is a whole family of $\sim$ operators that use FoCus alternatives in different ways, or, more plausibly, there is a single $\sim$ operator, and different flavors of FoCus are the result of separate overt or non-overt operators interacting with it, as Rooth (1992) proposed.[34] Either possibility is compatible with the theory of FoCus representation advocated for here and with our current knowledge of FoCus-sensitive operators that might contribute to the various flavors of FoCus found across languages: exhaustivity operators (discussed e.g. in Spector 2016), scalar operators (as in e.g. Lahiri 1998), contrastive topic operators (as in e.g. Constant 2014), or mirative operators (Bianchi et al. 2016).

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[34] .   See Beck (2016) for a general overview of FoCus-sensitive operators and their interaction with the $\sim$ operator.

We have now laid out the semantic properties of [G]-marking and [FoC]-marking, but we haven't yet said anything about when to [FoC]-mark or [G]-mark, or how those two features interact. Williams (1997) discusses cases where constituents are Given, but are nevertheless obligatorily FoCused. (61) illustrates with an example that is a variation of one by Williams.

(61)   Me: Roman doubted that it would be hot and predicted that it would be cold.
     # You: [Máx]$_{FoC}$ [doubted]$_G$ [that it would be cold]$_G$.

Your reply in (61) is deviant in the given context, and severely so. According to Williams (1997: 599), the problem with cases like (61) is that "cumulative destressing is not allowed. One cannot destress one phrase and then destress its neighbor, with separate licensing of each." Williams (1997, 2012), Schwarzschild (1999), and Wagner (2005, 2012) have accounts that, each in their own way, converge on Williams' diagnosis of what is wrong with cases like (61). Rephrasing the diagnosis in our own words, there appears to be a problem when two sister constituents α and β lack prominence without their mother constituent $\alpha\beta$ being Given. In your reply in (61), both *doubted* and *that it would be cold* are Given, but *doubted that it would be cold* as a whole is not.

Williams' diagnosis doesn't seem quite right yet. 62(a) and (b) go against it.[35]

(62)   a.   Sally ran into Max before getting money from the ATM. She ended up lénding
            [[Max]$_G$ [some of the money]$_G$].[36]

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[35] .   Williams would rule out 62(a) and (b) as violations of his Disanaphora Law. For Schwarzschild, his Givenness requirement would be violated, and for Wagner his Relative Givenness requirement.

[36] .   We are assuming that [*Max some of the money*] is a constituent in 62(a). This is compatible with Harley (1995, 2002) and other analyses of double object constructions. With Green (1974) and Harley, we assume further that the double object configuration here includes a silent *HAVE*, so that we have a constituent [Max [HAVE some of the money]].

b.   The Borsalino shop is having an amazing sale on hats. But Max's partner wouldn't lét [[Max]$_G$ [get a Borsalino hat]$_G$].

62(a) and (b) are acceptable without prominence on any of the Given constituents, even though Max's getting some of Sally's money or the possibility of his getting a Borsalino hat are not understood to be contextually implied by the respective stretches of preceding discourse. But then 62(a) and (b) have configurations where two sister constituents lack prominence without their mother constituent being Given. What, then, is the difference between the deviant example (61) on the one hand, and the acceptable 62(a) and (b) on the other?

Our assessment of the deviance of your reply in (61) is that in Standard American and British English, there is pressure for representing (non-trivial) Contrasts with salient discourse referents from the preceding context. (61) is deviant because opportunities for representing Contrasts have been overlooked. There were two such opportunities, which are represented in (63) and (64).

(63)   Me: Roman doubted that it would be hot and [(he) predicted that it would be cold] $_p$.

       You: $\sim_p$ [[Máx]$_{FoC}$ [dóubted]$_{FoC}$ [that it would be cold]$_G$].

(64)   Me: [Roman doubted that it would be hot] $_p$ and predicted that it would be cold.

       You: $\sim_p$ [[Máx]$_{FoC}$ [doubted]$_G$ that it would be [cóld]$_{FoC}$].

62 (a) and (b) were constructed so as to not provide opportunities for representing (non-trivial) Contrasts with salient discourse referents from the preceding context. Without those opportunities, the pressure for representing Contrasts seems off. The pressure is pressure from the discourse context, then. It's a push for discourse coherence. We propose

the principle in (65), which forces [FoC]-marking when there are opportunities for representing (non-trivial) Contrasts:

(65)   **Pressure for Contrast**

Represent (non-trivial) Contrasts.

Examples (63) and (64) not only illustrate how Pressure for Contrast can force [FoC]-marking, they also raise the question whether Pressure for Contrast can block [G]-marking. (63) has a FoCused occurrence of *doubted*, for example, but that occurrence of *doubted* is also Given according to our definition. We may wonder, then, whether it shouldn't be [G]-marked. Likewise, the FoCused adjective *cold* in (64) is part of a sentential complement that is also Given, so there is again a question whether that complement shouldn't be [G]-marked. That those [G]-marks are genuinely missing is suggested by the prosody of (63) and (64), which shows no impact of [G]-marking, not even the slightest hint of the reduced prominence characteristic of Second Occurrence FoCus. We take this is an indication that, generally, [FoC]-marked constituents can't also be [G]-marked. This doesn't exclude [FoC]-marked constituents from being properly contained within [G]-marked constituents, of course, or [G]-marked constituents from being properly contained within [FoC]-marked constituents.

There are two other constraints for [G]-marking that our representations have been conforming to without much discussion. One is that function words (as opposed to content words) and strings of function words are generally not [G]-marked. The second one bars redundant nesting of [G]-marks: a Given constituent is not [G]-marked if it is properly contained in another Given constituent. As we saw earlier, nested [G]-marking is unnecessary since any part of a Given constituent is Given, too. We have then:

(66)   **Pressure for [G]-marking**

[G]-mark a Given constituent α unless one of (i) to (iii) holds:

(i) α is [FoC]-marked.

(ii) α contains no content word.

(iii) α is properly contained in a Given constituent.

For our final example, we'll put Pressure for Contrast and Pressure for [G]-marking to work to shed light on an old puzzle about the role of FoCus in forcing or blocking coreference.[37] (67) and (67') illustrate.

(67)   [Bill blamed Amanda's father]$_\wp$ and then
   a.   [Amánda]$_{FoC}$ [[blamed]$_G$ [hím]$_{FoC}$].
   b.   [Amánda]$_{FoC}$ [blamed him]$_{G.}$

The only difference between 67(a) and (b) is that *him* is FoCused in 67(a), but not in 67(b). We observe that *him* has to refer to Bill in 67(a), and to Amanda's father in 67(b). Here is how we can derive this result. Pressure for Contrast tells us that 67(a) and (b) must represent a Contrast with the antecedent proposition $\wp$. Suppose *him* referred to Amanda's father. In that case, 67(a) would be overFoCused. It would not represent a Contrast with $\wp$, since $\wp$ is also in the alternatives set of 67(b), which is a FoC/G-variant of 67(a) and has a smaller alternatives set. 67(a) would also violate Pressure for [G]-Marking, since the property of blaming Amanda's father is Given. The right rendition would be 67(b), then. On the other hand, if *him* refers to Bill, 67(a) does represent a Contrast with $\wp$. This time round, 67(b) would be ruled out as violating both the Givenness requirement for [G]-marking and Pressure for Contrast: The VP *blamed him* is not Given, and the antecedent proposition $\wp$ is not in the alternatives set of 67(b).

A question that is now on the table is why there are such principles as Pressure for Contrast and Pressure for [G]-marking. What is it that makes [G]-marking and certain instances of [FoC]-marking obligatory in American and British English? It may be tempting to invoke the principle 'Maximize Presuppositions', which was considered in Heim (1991). As Heim was well aware, though, such a principle would need to be formulated very carefully. In our case, we would have to explain, for example, why discourse particles like

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[37] .   An early discussion of the phenomenon is in Lakoff (1971).

German *ja* and *doch*, which only have use-conditional meanings, too, are not obligatory, even when the conditions they place on the discourse context are met. Why should presence vs absence of [G]-marking or presence vs absence of [FoC]-marking be decided by Maximize Presuppositions, while presence vs absence of a discourse particle would not be? We will have to leave this question unanswered for now.

This section has laid out the syntactic and semantic properties of the features [G] and [FoC]: What they mean, when they have to be used, and when they can't. [FoC] is like the [*wh*]-feature in that it forms operator structures and may trigger movement and verbal agreement. The [G]-feature resembles discourse particles like German *ja* or *doch* (Kratzer 2004). Unlike [FoC] or [*wh*], but like discourse particles, it doesn't form operator structures, but imposes its discourse requirement directly. Whether [G] can also drive movement or trigger agreement is still an open question. Existing work on word order variation reflecting apparent givenness tends to not distinguish Givenness from related notions like presuppositionality or definiteness. If the distinction is made, as in Fanselow (2012, 2016) and Kučerová (2012), the observed variation is usually attributed to factors other than mere Givenness. An exception is Šimík and Wierzba (2015), who argue (against Kučerová) that Givenness, not presuppositionality, is reflected in Czech word order variation. According to Šimík and Wierzba, Czech Given phrases avoid stress, but, unlike English Given phrases, they move to left-peripheral positions to escape the canonical, rightmost, stress position in Czech. Šimík and Wierzba's work establishes a bridge to the work of Reinhart (2006) and Szendröi (2001, 2005, 2017), and points to the possibility that the [G]-feature, and possibly also the [FoC]-feature in some languages, might drive movement that aims at creating a phonologically more desirable input.

8.   Conclusion

We have argued our case and shown what we set out to show in this article: The core of what has been traded under the name 'Information Structure' can be deconstructed into morphosyntactic features that have familiar types of meanings and are spelled out prosodically, rather than segmentally or tonally, in Standard American and British English. [FoC]-marking highlights Contrasts and aims for highest prominence in a sentence. [G]-

marking is sensitive to Givenness and resists (phrase-level) prominence. Apart from the idiosyncratic properties of those features, which guide their syntactic distribution, felicitous use, and phonological spellout, no special grammatical mechanisms or architectures have to be assumed to account for the many phonological, syntactic, semantic, and pragmatic manifestations of notions related to Givenness and FoCus.

The proposed feature system with [G] and [FoC] is a far cry from the system of Selkirk (1984, 1995), with its baroque nested feature structures and *ad hoc* focus projection principles. We now have two genuine morphosyntactic features that fit into the typology of grammatical features. English is no longer an obstacle for Aboh's Conjecture.

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