# Deconstructing Information Structure

Angelika Kratzer & Elisabeth Selkirk
University of Massachusetts Amherst & University College London*
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To the memory of Michael Rochemont

**Abstract**

The paper argues that a core part of what is traditionally referred to as 'Information Structure' can be deconstructed into *bona fide* morphosyntactic features that can show syntactic behavior, have discourse-related meanings, and just happen to be spelled out prosodically, rather than segmentally or tonally, in Standard American and British English. Setting aside topicality, we track two features, [FoC] and [G]. [FoC] serves to highlight contrasts and aims for highest possible prominence in a sentence. [G] is sensitive to discourse givenness and resists phrase-level prominence. There is no marking of newness: The apparent prosodic effects of newness are the result of default prosody.

For the phonology, the assumption that information structure notions are carried by genuine morphosyntactic features leads to the expectation that information structure and prosody do not interact directly. As *bona fide* morphosyntactic features, [FoC] and [G] should be spelled out in underlying phonological representation. From there, the surface prosodic manifestations of givenness and contrast should be the responsibility of the phonology alone. We present an 'existence proof' showing how the prosodic effects of givenness and focus could come about through a combination of spellout conditions at the syntax-phonology interface and purely phonological constraints that are motivated independently of information structure.

* University of Massachusetts Amherst: Kratzer, Selkirk. University College London: Kratzer.

For the semantics, the assumption that [FoC] and [G] are *bona fide* morphosyntactic features means that they should have meanings that fall into attested paradigms for such features. Moreover, the assumption that there are two distinct features representing givenness and contrast in Standard American and British English means that there should also be two distinct strategies for marking discourse coherence in those varieties of English: one for marking givenness and one for marking contrasts. We show that those expectations are borne out.

## 1. Morphosyntactic features for information structure?

Information structure 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. We will build a case supporting the view that Standard American and British English has two *bona fide* morphosyntactic features triggering discourse requirements related to givenness and contrast. Newness remains unmarked. One feature, Givenness marking ([G]-marking), is sensitive to whether an individual, concept, or proposition has been 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 contributes to marking a contrast.

Features are the building blocks of natural language and are standard currency in phonology. Yet, unlike phonology, "syntax has no articulatory tract in which to ground its features" and, as a consequence, "the algorithms that build sentences are better researched than the atoms these algorithms operate over."[1] Features related to information structure don't appear in lists of canonical morphosyntactic features.[2] Nor are they standard

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[1] . British Academy conference announcement for the Alphabet of Universal Grammar: https://www.thebritishacademy.ac.uk/events/alphabet-universal-grammar.

[2] . See e.g. Corbett 2012.

currency in contemporary theories of information structure. For many scholars, the existence of *bona fide* morphosyntactic features for givenness or focus is still very much in doubt. For example, Williams (1997, 610) concludes "that it would not be appropriate to supply syntax with a feature [+Focus] assigned to focused constituents, where that feature would have the obvious semantic, syntactic, and phonological interpretations." At the end of his paper on givenness, Schwarzschild notes that the F(ocus)-feature representations used throughout his paper "have no significant syntactic properties. From the point of view of the grammar overall, they are a nuisance and do not shed light on the real question of what semantic information is relevant to phonology and what parts of the phonology see this information. Ultimately, they should be done away with" (Schwarzschild 1999, 175). Zubizarreta & Vergnaud (2006, 561) level a similar objection against the F(ocus)-feature of Selkirk (1984, 1995): "This feature is undesirable because it lacks independent justification. It is only needed to establish the relation between pitch accent and the informational structure of the sentence." Finally, Williams (2012, 184) delivers the most damning verdict against any kind of F(ocus)-feature annotations of syntactic trees: "… there is no coherent notion of focus that can serve as the intermediate between accent placement and the interpretive effects associated with accent placement."

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.[3] 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. Following Rochemont, we capitalize *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 use the spelling *FoCus* when the intended notion of focus is tied to the introduction of

[3] . 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.

alternatives to mark a contrast. FoCus in this sense needs to be distinguished from information focus ('newness focus'), which applies to expressions that merely present new information. FoCused, but not merely new constituents, can be targeted by overt or covert operators like *only* or *even*, for example. Pretheoretically, we'll continue to use the standard, neutral, 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. Since Chafe (1976) the theoretical need to distinguish between FoCus and information focus has been reaffirmed by many scholars from different disciplines. We will come back to this crucial distinction in section 4.

Examples (1) to (2) below give a first illustration of Givenness and FoCus and their representation via [G]-marking and [FoC]-marking.[4]

(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 contrasting Paula with other people who might have eaten the clementines. *Paula* is merely new, then. Anticipating

[4]. Technically, [FoC] and [G] are features associated with syntactic nodes and are part of their labeling. We are assuming that, if a node is associated with more than one feature, those features are represented as unordered sets. The labeled bracketing notation we are using to indicating the presence of [FoC] and [G] is thus misleading in that it wrongly suggests that if a node was associated with both [FoC] and [G], for example (a possibility we exclude in section 7 on principled grounds), we would have to distinguish different scope possibilities for [FoC] and [G].

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 and has just been mentioned, your reply represents 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 for now.

The six sections to follow all contribute to one sustained argument showing that the repertoire of *bona fide* morphosyntactic features for natural languages includes the features [G] and [FoC]. Here is the structure of the argument. Section 2 has a collection of representative examples documenting the well-known fact that features related to Givenness and FoCus are involved in syntactic displacement, agreement, and ellipsis in at least some languages. While this potential for syntactic behavior establishes [G] and [FoC] as morphosyntactic features, it also raises the question how syntactically motivated features of this kind relate to the F(ocus)-feature that appears in just about any contemporary semantic work on information structure, following Rooth (1992) and Schwarzschild (1999). After all, it's that same F(ocus)-feature that has been acknowledged to have no significant syntactic properties. Section 3 introduces the F(ocus)-marking systems of Rooth (1992) and Schwarzschild (1999), and highlights their theoretical benefits. Section 4 then exposes the Achilles heel of those systems: they wrongly lump together the representation of FoCus and newness. Section 5 establishes that newness is unmarked in Standard American and British English and shows that the apparent prosodic effects of newness are the result of default prosody. With newness unmarked and out of the way as a type of 'focus', the syntactically motivated features [G] and [FoC] can emerge as features that behave like *bona fide* morphosyntactic features, not only in the syntax *per se*, but also at the interfaces. Section 6 presents an 'existence proof' for a modular view of the relation between information structure and prosody in English where the interaction between the two is funneled through [FoC] and [G] at the syntax-phonology interface. The prosodic effects of Givenness and FoCus are argued to come about through a combination of spellout conditions for [FoC] and [G] and purely phonological constraints that are

motivated independently of information structure. Section 7 identifies two distinct, but interacting, requirements on discourse coherence that [FoC] and [G] are responsible for, and it thereby establishes the meanings of [FoC] and [G] as falling into attested paradigms for morphosyntactic features and particles.

## 2. Morphosyntactic features for Givenness and FoCus

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 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), or metrically annotated syntactic trees, as in Zubizarreta (1998), building on Halle & Vergnaud (1987) .[5] Metrical trees or metrically interpreted syntactic trees represent relative prominence relations between sister constituents. For English, it is claimed that 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 by default is actually weak, we know that it is Given. On such an approach, the computation of discourse requirements attached to Givenness and FoCus would track deviations from the default prominence pattern.[6] A separate representation of Givenness or FoCus via morphosyntactic features seems superfluous.

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[5] . Metrical trees or metrically interpreted syntactic trees are also relied on in Williams (1996, 2012), Wagner (2005, 2012), Calhoun (2010), and Büring (2015). Related prosody-based approaches are Reinhart (2006) and Szendröi (2001, 2017a, 2017b).

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

However, as is well-known, information structure CAN have an impact on prosody, but doesn't HAVE to. There is no necessary link between prosody and information structure.[7] 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, even without having any distinctive prosodic properties. If 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 *wɛ̀*:[8]

(3) a. Sɛ́sínú wɛ̀ dà Àsíàbá Gungbe. Aboh (2007a: 289).
Sessinou FOC marry Asiaba
'SESSINOU married Asiaba.'

b. Àsíàbá wɛ̀ Sɛ́sínú dà
Asia ba FOC Sessinou marry
'Sessinou married ASIABA.'

According to Aboh (personal communication), neither he nor other native speakers who have worked on those constructions perceive any prosodic difference between neutral and

[7] . For African languages, see, for example, Aboh (2010, 2016), Zimmermann (2011), or the overview in Güldemann et al. (2015).

[8] . 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.

focused constituents, but he cautions that there hasn't yet been any systematic research on this. Fiedler & Jannedy's (2013) phonetic study of focus constructions in the related Gbe language Ewe concludes that there is no primary prosodic focus marking in Ewe. More specifically, they did not find evidence for any prosodic properties of *ex situ* (displaced) focus phrases that could not be attributed to general prosodic effects of phrasing and the lexical high tone of the focus marking particle.

The fact that information structure notions related to topic or focus can be linked to syntactic behavior in some languages and can be spelled out in different ways, invites the hypothesis that, if information structure notions have grammatical reflexes in a language at all, they are introduced by *bona fide* morphosyntactic features. We want to call this hypothesis *Aboh's Conjecture,* after Aboh (2010, 2016), where it is explicitly entertained. Aboh's Conjecture is a radical departure from the *status quo* in information structure research. It excludes most current accounts of givenness and focus. More specifically, it excludes all approaches that directly link the discourse effects of givenness and focus to prosodic structures or to metrically interpreted syntactic trees, and it excludes just about all F(ocus)-marking approaches descending from Selkirk (1984, 1995), Rooth (1992), or Schwarzschild (1999). The first type of approach has no information structure features at all. The second type of approach does have those features, but they might be a far cry from anything that would qualify as *bona fide* morphosyntactic features.

For the investigation of information structure in Standard American or British English, the consequences of Aboh's Conjecture are significant. On the phonological side, what may seem to be more global effects of information structure on prosody in Standard American or British English have to be derivable from the interaction of specific contributions of morphosyntactic features that are spelled out at the syntax-phonology interface with general principles of phonology that are attested independently of information structure. On the semantic side, we expect meanings that fit attested typologies of discourse related meanings. Most importantly, any connection between prosody and discourse related meanings has to be funneled through features that have independent plausibility as syntactic features in at least some language.

Our next step is to solidify support for Aboh's Conjecture by presenting a selection of additional examples of languages where the presence of FoCus or Givenness points to the presence of a genuine morphosyntactic feature. 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, for example, and not all analyses make explicit the semantic or syntactic properties of the discourse contexts in which a putative focus might appear. We made every effort to pick examples that appear in contexts that would trigger the expression of FoCus in our sense, as opposed to mere information focus ('newness'). The research situation is easier with Givenness. Our examples come from Šimík and Wierzba's (2015) study of Czech and from ellipsis constructions in English. In both cases, the authors made sure that it is Givenness in the sense intended here that is at stake.

Morphosyntactic features have the potential to drive syntactic behavior like displacement, agreement, or ellipsis. We already saw that in Gungbe, focused constituents move to left-peripheral positions headed by the focus particle *wɛ̀*. Like Gungbe, Wolof, an Atlantic language spoken in Senegal and the Gambia, has a left-peripheral position that can serve as the landing site for focused constituents (Torrence 2013)[9]:

(4) a. Xale bi l-a-a gis. Wolof. Torrence (2013, 182).
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.'

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

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.'

Torrence (2013) analyzes 4(a) to (c) as cleft constructions that are the result of movement of the clefted constituent into the left periphery. Martinovič (2015) maintains that constructions like those illustrated in 4(a) to (c) are not clefts, but genuinely monocausal. On either account, Wolof has movement into the left periphery that is triggered by focus. Most importantly for our argument, acoustic studies have shown that there are no prosodic reflexes of focus in Wolof. 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, where tonal morphemes independent of information structure appear. Rialland & Robert's acoustic investigation of Wolof confirms that there is no necessary connection between focus and prosody. In Wolof, focused constituents occupy left-peripheral positions, but surface with flat intonation contours.

Focus can also trigger overt 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 Sinhala (Kishimoto 2018, 2).[10]

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

(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.'

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

Hagstrom (1998, 2004) and Kishimoto (2018) suggest 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.[11] (6) would be the result of an overt instance of this movement (Kishimoto 2018, 3).

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[11] . 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.

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

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.

A feature 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).[12]

(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 notions related to FoCus can show the signature behavior of

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

morphosyntactic features: they can trigger displacement and can participate in agreement relations. Taken together, the cases we have reviewed warrant the conclusion that there are languages that represent FoCus-related notions with features that are visible to syntactic operations. Most importantly for our argument here, among those languages are some where FoCus-related notions are not realized prosodically. This precludes grammatical architectures that directly link discourse effects related to Givenness and FoCus to representations of prosody or to metrically interpreted syntactic trees.

Whether there are languages where features related to givenness can drive movement or trigger agreement is still an open question. Existing work on word order variation reflecting apparent givenness tends to not distinguish Givenness (in the sense relevant here) 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, 2017a, 2017b), pointing to the possibility that the [G]-feature, and possibly also the [FoC]-feature in some languages, might drive movement that aims at creating an output that conforms to general prosodic constraints for a language. [13]

Givenness plays a crucial role in licensing ellipsis, as observed in Tancredi (1992), Rooth (1992b), and Winkler (2016). A syntactic feature related to Givenness, e-Givenness, was

[13] . Since her 2001 dissertation, Szendröi has argued that focus movement in Hungarian is prosody driven. Prosody-driven movement is compatible with the position we are advocating here. What's important for our argument is that it's FoCus, not mere newness, that drives this kind of movement, and that, across languages, FoCus movement is not NECESSARILY prosody driven - see Szendröi (2017b) for the state of the art on focus movement.

posited in Merchant (2001) to license ellipsis under certain conditions, some of which are syntactic, and some are semantic in nature.[14] Winkler (2016, 359) considers it a core question of linguistic theory to explain how "syntactic and information-structural theories interact in accounting for the licensing of the different types of elliptical phenomena." Merchant's answer to Winkler's question is the e-Givenness feature, which has a denotation requesting e-Givenness of its sister constituent, licenses non-pronunciation at the Syntax-Phonology interface, and whose distribution depends on syntactic properties of the phrase structure trees it occurs in. Merchant's e-Givenness feature is a *bona fide* morphosyntactic feature that impacts both the Syntax-Semantics/Pragmatics and the Syntax-Phonology interface. The e-Givenness feature thus has the kind of properties that we expect [G] and [FoC] to have, too.[15]

This section has presented a few selected examples of *bona fide* morphosyntactic features related to Givenness and FoCus. We can conclude from this survey that the repertoire of possible morphosyntactic features for natural language is likely to include such features. None of this is news to anybody familiar with the syntactic literature on information structure, of course. All of this is common ground for anybody subscribing to the cartographic program initiated in Rizzi (1997), for example. However, as pointed out earlier, there is a striking disconnect between *bona fide* morphosyntactic features and the F(ocus)-feature assumed in the most widely adopted semantic accounts of givenness and focus, which descend from Selkirk (1984, 1995), Rooth (1992, 2015), and Schwarzschild (1999). The following section will present the essentials of Rooth's and Schwarzschild's F(ocus)-marking systems, and thereby bring out a dilemma that needs to be contended with: a feature system that lacks independent morphosyntactic motivation comes with what looks like unrivalled theoretical elegance and benefits.

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[14] . Merchant's e-Givenness is stronger than mere Givenness. It requires mutual Givenness for an elided constituent and its antecedent.

[15] . See Merchant (2019) for an overview of various analytic options.

## 3. Just F(ocus)-marking?

In this section, we'll present the leading ideas common to Rooth and Schwarzschild in a unified system. We will use Rooth's Alternatives Semantics to state Schwarzschild's discourse anaphoric requirements for Givenness and FoCus, following the presentation in Rooth (2015). A fundamental assumption of Rooth's and Schwarzschild's systems (inherited from Selkirk 1984, 1995) is that there is a single [F]-feature that uniformly marks constituents that are FoCused (in our sense) and those that are merely new (hence not Given in our sense).[16] Given constituents remain unmarked. This is illustrated in (8) and (9) below.

(8) Me: Did anybody eat the clementines? I can't find them in the pantry.
You: (I think) [Paula]$_F$ might have eaten the clementines.

(9) Me: Sarah mailed the caramels.
You: (No), [Eliza]$_F$ mailed the caramels.

Historically, one motivation that has led to such uniform [F]-marking accounts - and the very notion of 'information focus' - is that in Standard American and British English, pitch accents are associated with material that might be FoCused or merely discourse new. The distribution of pitch accents thus seems to indicate that English prosody treats FoCused and merely discourse new phrases the same.

If discourse new constituents are consistently [F]-marked, representations of all new, out-of-the-blue, utterances wind up with a nested [F]-marking structure, as illustrated in (10):

(10) [Sarah$_F$ [mailed$_F$ the caramels$_F$]$_F$]$_F$.

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[16] . Uniform [F]-marking for both merely new and FoCused constituents is an essential part of Schwarzschild (1999). With the significant exception of answers to constituent questions, Rooth's work from Rooth (1985) on mostly discusses examples that involve FoCus in our sense. However, in sections 1 and 2 of Rooth (2015), which we are relying on here, syntactic structures with uniform [F]-marking of both FoCused and merely new constituents are displayed.

(10) is peppered with [F]-marks. It's representations like (10) that most vividly bring out the disconnect with *bona fide* morphosyntactic features that could also play a role in syntactic operations like displacement or agreement.

Yet Rooth and Schwarzschild have proposed accounts that are capable of computing the apparently distinct discourse requirements imposed by FoCus and Givenness from representations that only have [F]-marking. In the way of illustration,
look again at your answer in (9), repeated here as (11):

(11) $[\text{Eliza}]_F$ mailed the caramels.

(11) 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 might also 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 FoCus. Schwarzschild requires that any constituent that is not [F]-marked be given in this general sense. In (11), 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 provides a convenient counterpart of Schwarzschild's general notion of givenness: A-Givenness from now on.[17] A constituent $\alpha$ is A-Given (in a

[17] . 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 $[\text{cat}]_F$ 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].

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 $\alpha$. 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 (11) is just the proposition that Eliza mailed the caramels. Its A-value is the set of propositions in (12).

(12) {'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 (12) for (11) and, in the context of (9), has just been mentioned, (11) as a whole is A-Given in that context.

To compute the alternatives set for (11) 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 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 (11) 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 (12).

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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.

Our Givenness falls out as a special case of A-Givenness. Since the VP *mailed the caramels* in (11) has a singleton alternatives set, it is A-Given just in case its only member, the property of having mailed the caramels, has a salient antecedent in the discourse context, hence is Given in our sense. That, too, is the case in the context of (9).

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 FoCus 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 separately. The case for a unified account of Givenness and FoCus in terms of [F]-marking is strong indeed. Given the theoretical elegance and unifying power of [F]-marking systems, should we still worry about the disconnect with syntactically motivated features?

We should. The following section will present empirical problems for uniform [F]-marking approaches. We will bring together data telling us in no uncertain terms that grammar makes a distinction between FoCus and discourse newness. The two notions shouldn't be represented by a single feature.

## 4. We can't lump together 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 discourse new (newness focus, information focus), as opposed to constituents that evoke alternatives and thereby highlight a contrast (FoCus).[18] In this section, we will discuss some representative examples. We will conclude that those examples pose challenges for

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

representations of the semantic/pragmatic and phonological effects of FoCus and Givenness that rely on [F]-marking alone.

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

(13) 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 (13) is (14)[19]:

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

Both *Modigliani* and *MoMA* in (14) bear obligatory pitch accents when read aloud in the context of (13). But there are important differences between the two. In the context of (13), *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 (13), (14) 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 (15).

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

[19] . We use acute accents to indicate the location of pitch accents. Underlining on *MóMa* in (14) indicates greater phonetic prominence.

Sentence (14) is true just in case the mentioned alternative 'He would offer that Modigliani to MoMA' is the only alternative in (15) that is true.

The scenario described in (13) also excludes the possibility that *Modigliani* in our target sentence might be a contrastive topic scoping over *only*. In the context of (13), (14) 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.

Finally, interpreting the merely new direct object outside the scope of *only* wouldn't be an option in (16) (still understood as a continuation of (13)), where the object contains a negative polarity item that is licensed by *only*.

(16) He would only offer that Modigliáni or any of his Móndrians to <u>MóMA.</u>

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 (14) (as part of (13)) 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.[20]

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 (17):

(17) 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 (17), Jane's phone is contrasted with her keys. In (17), 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. (18) is one of the examples quoted by Prince (her example 41(b)).[21]

(18) 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 (18) is 19(a), and the cleft clause is 19(b).

(19) a. It was <u>thé́y</u> who fought bác̀k during a víolent políce raid on a Gréenwich Village bár in ´1969.

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[20]. 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. Rooth's projection features do not have credentials as *bona fide* morphosyntactic features, hence won't help with the agenda we are pursuing in this paper.

[21]. The example is originally from the Pennsylvania Gazette, February 1977, p. 16.

b. … who fought báck during a víolent políce raid on a Gréenwich Village bár in ´1969.

The pronoun *they in* 19(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 19(b) is all new information, and that's reflected in the distribution of 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 (20):

(20) {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 19(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 constituent 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 constituent question like 21(a) can be answered as in 21(b) or 21(c).

(21) 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 21(a) can be answered with a postverbal subject, as in 21(b), or a preverbal subject, as in 21(c), with a subtle difference in meaning. As an answer to 21(a), 21(c) necessarily expresses a contrast. *Gennaro* must be a FoCus, it can't be merely new. FoCus on *Gennaro* evokes other possible authors who might have written this article, but are being ruled out. In 21(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 22(a) and (b) below, still understood as answers to the question in 21(a).[22] We made the answers longer, adding new information that was not explicitly asked for. This change seems to make it harder (not completely impossible) to accommodate a contrastive interpretation for the subject *Gennaro*. 22(a) and (b) are not naturally understood as contrasting Gennaro with others who might have written this article while they were in

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

Graduate School. As a result, there is pressure for *Gennaro* to appear postverbally. 22(b) is judged infelicitous as an answer to 21(a).[23]

(22) 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.

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 21(c) and 22(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. But then there must be something in the syntactic representation that distinguishes FoCused phrases from those that are merely new.

[23] . The Italian examples were provided by Ilaria Frana and have been confirmed by other speakers of Italian.

The Italian facts about answers to constituent questions convey another important lesson. We have seen that the new part of an answer to a constituent question might be a FoCus, but might also be merely new. That means that a constituent question all by itself doesn't force one or the other option. Constituent questions only seem to play an indirect role in facilitating contrastive interpretations. Consider the dialogue in (23):

(23) Me: Who wrote this article?
You: I think Gennaro wrote it when he was still in Graduate School.
Me: You are right. I now remember that [Gennáro]$_{FoC}$ wrote the article.

It is possible for the second occurrence of *Gennaro* in (23) to be a FoCus. What is it that licenses that FoCus? Here is a possible answer. According to Hamblin (1973), a question determines a set of alternatives, the set of possible answers to the question. For (23), that set of alternatives might look as in (24):

(24) {Gennaro wrote this article, Armin wrote this article, Junko wrote this article, Nirit wrote this article …}

Crucially, in the context we are considering for (23), none of the alternatives in (24) has been mentioned or is contextually implied before you give your answer. I may not have had the faintest idea who might have written this article when I asked my question. My asking the question does not make any possible answer salient in any way. A constituent question itself does not provide contrasting antecedents, then, hence cannot be directly responsible for a FoCus in the answer. If there is a FoCus in the answer, it has to be licensed by a different antecedent. That antecedent doesn't have to be overtly expressed, of course, it might be contextually inferred, or accommodated. We suspect that what makes a FoCus possible for the second occurrence of *Gennaro* in (23) is the availability of a contrast with an accommodated antecedent like that in (25).

(25) Somebody who was not Gennaro wrote this article.

Your mentioning the one true alternative among the alternatives determined by the question makes available a contrasting alternative: the disjunction of all those alternatives in the question denotation that are excluded by your answer. In our example, the contrast is thus between the possibility that Gennaro wrote that article and the possibility that somebody who wasn't Gennaro did (Armin, or Junko, or Nirit ... ).[24]

For the first occurrence of *Gennaro* in (23) to become a FoCus, too, we would have had to accommodate an antecedent like (26), which is just a little implausible as an intended contrast in this particular context:

(26) Somebody who was not Gennaro wrote this article when they were still in Graduate School.

The fact that your answer in (23) contained new information beyond what was asked in the question, then, seems to have discouraged (not blocked completely) accommodation of a contrasting antecedent like (26).

Summarizing the results of this section as a whole, we conclude that an [F]-feature-only account isn't able to connect meaning, syntax, and phonological realization in the right way. The grammars of natural language distinguish FoCused phrases from those that are merely new. The two notions can't be lumped together into a single feature. This finding raises an important question about the status of newness. If newness and FoCus can't be lumped together into a single feature, is newness represented by a separate morphosyntactic feature or does it remain unmarked?

## 5. No feature for newness: it's default prosody

The last section concluded that FoCus and newness cannot be lumped together into a single feature. The question before us in this section is the theoretical status of newness. Does the universal repertoire of morphosyntactic features include a separate feature marking new

[24] . If this assessment is on the right track, alternatives sets should be closed under disjunction.

information? Or is newness generally unmarked? The available crosslinguistic data do not allow us to answer this question conclusively. The discussion of answers to questions in Italian in the last section brought out the empirical difficulty. We saw that Italian does make a difference between subjects that are merely new and those that are contrastive, but to bring out that difference, we couldn't use a simple question-answer test. We had to make some effort to construct an example that discouraged an accommodated contrastive interpretation for the answer. Crosslinguistic research mostly uses answers to questions as tests for focus. Answers to constituent questions are still "the most widespread and most widely used test for focus" (van der Wal 2016, 265). But the new part of an answer to a constituent question might be contrastive or merely new, and a simple question-answer test doesn't distinguish the two. As a consequence, the available crosslinguistic record on whether there are languages that mark mere newness is inconclusive.[25] Given the lack of crosslinguistic evidence, we will turn our attention to English for the remainder of this article. We will argue that the grammar of Standard American and British English marks Givenness and FoCus, but is blind to newness. Material that is merely new ('information focus') remains unmarked in English. From a theoretical perspective, there is no such thing as 'information focus' in English.

The consequences of the assumption that newness might be unmarked in a language are momentous. If newness can be unmarked, we can no longer say that the "classical pragmatic use of focus is to highlight the part of an answer that corresponds to the *wh*-part of a constituent question" (Krifka 2008, 250), nor that in "an answer to a constituent

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[25] . An example illustrating the empirical difficulty is the discussion of *in situ* vs. *ex situ* focus in Hausa and other Chadic languages: Green & Jaggar (2003), Jaggar (2006), Hartmann & Zimmermann (2007), Zimmermann (2011). Hartmann & Zimmermann document that the new part of an answer to a constituent question can appear *in situ* or *ex situ* in Hausa, and they conclude from this that 'information focus' can be realized in both of those positions. Since they didn't' control for accommodated contrasts in the answers, we can't quite draw that conclusion, though. Interestingly, in a corpus study, Hartmann and Zimmermann found that almost 80% of all cases they identified as 'information focus' were realized *in situ*, while more than 90% of all cases they identified as 'selective, contrastive, or corrective focus' were realized *ex situ*.

question, the element to a <*wh*>-phrase must be a focus" (Büring (2016, 12). Büring, Krifka, and much of the traditional and contemporary literature on focus take 'answer focus' to be an unquestioned subtype of focus. The rational for classifying 'answer focus' as a type of focus along with contrastive focus (our FoCus) is the assessment that these foci "behave identically in all respects" (Büring 2016, 23). The data we saw in the previous section go against this assessment.

There are even more far-reaching consequences of positing a category like 'answer focus'. If just about anything we say can be understood as being part of an answer to an implicit question under discussion, as Roberts (1996, 2012) has argued, then just about anything new we say should be part of an 'answer focus', which should then be marked for focus. But then we are again uniformly marking FoCus and newness, which we should not, as the previous section has shown.

Finally, if there is evidence that newness is unmarked in the grammar of English, the problematic data discussed in section 4 could not be accounted for by simply adding more features to an [F]-marking-only system like that presented in section 3, a move made in Rooth (2015). Nor could we have a two-feature-system like that of Beaver & Velleman (2011), where an [N]-feature marks new (unpredictable) material.

Our argument for the unmarked status of newness ('information focus') in Standard American and British English comes from the syntax-phonology interface. The difference between marking vs. not marking newness is brought out most dramatically in all-new, out-of-the-blue, utterances like (27), where everything is new information. Accounts where newness is marked would produce representations that look minimally as in 27(a) (with an [N]-feature used for illustration), whereas accounts where newness is unmarked posit representations like 27(b).

(27) Sárah mailed the cáramels.
(a) $\text{Sarah}_{N}$ $\text{mailed}_{N}$ the $\text{caramels}_{N}$.
(b) Sarah mailed the caramels.

[N]-marking every content word in 27(a) 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 (28) for out-of-the-blue utterances would thus be inadequate.[26]

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

The difference between 27(a) and (b) is critical for figuring out the architecture of the syntax-phonology interface. With 27(a), the prosody of the sentence would have to be read off a representation that has several instances of [N]-marks. With 27(b), on the other hand, the right prosody would have to be determined on the basis of a representation that does not contain any information structure features at all. This means that if 27(b) is right, there has to be a default prosody for English, all new, out-of-the-blue utterances whose principles are independent of any impact of information structure. To defend representations like 27(b) against 27(a), then, we need to make a case that there is such a default prosody and show how it can be derived within an otherwise plausible general theory of prosodic phonology. If the demonstration succeeds, we have to reject 27(a) on conceptual grounds: All [N]-marks in 27(a) would be entirely superfluous as far as prosody is concerned. They might as well not be there at all. Positing representations like 27(b) would miss important phonological generalizations. The prosody of all-new sentences in English would be derivable without recourse to information structure.

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, Jackendoff

[26] . All-new, out of the blue, utterances are often analyzed as instances of 'broad focus'. Instead of 27(a), we would have a representation like *[Sarah mailed the caramels]$_F$*. Default phonology would have to derive the right prosody for everything contained in a 'broad focus' (Jackendoff 1972). Added [G]-marking could designate those parts within a 'broad focus' that are not new. However, once we invoke default prosody and [G]-marking, there is no more need for 'broad focus' marking of all-new sentences in the first place.

1972). The recognition of default prosody in Standard American and British English is at the very heart of approaches linking the discourse effects of givenness and focus to prosodic structures or metrically interpreted syntactic trees.[27] While there have been dissenting opinions in the past (Bolinger 1965, Schmerling 1976), the importance of default prosodic phonology for an insightful account of all-new sentences is now generally acknowledged (Truckenbrodt 1995, 2006, 2007, 2016, Gussenhoven 2004, Féry & Samek-Lodovici 2006, Selkirk 2007, 2008, Büring 2016, Féry 2017). It therefore seems safe to conclude that representations like 27(a) for all-new sentences are not a likely option. Newness is likely to be unmarked in English.

If newness is unmarked and the apparent prosodic effects of newness are the result of default prosody, we can seriously consider the possibility that all apparent effects of information structure on prosody in Standard American and British English can be traced back to syntactically motivated features like [FoC] and [G] and other equally well motivated features (e.g. features for contrastive topics). As genuine morphosyntactic features, [FoC] and [G] would be expected to influence the mapping from syntactic structure to prosodic structure at the syntax-phonology interface, but from then on, it would be the phonology, and the phonology alone, that determines the final output. This modular, T-model, view on the architecture of the syntax-phonology interface is in line with Bocci (2013, 113):

"As the discourse-related properties are encoded in the syntactic output and immediately accessible to the mapping rules at the syntax-prosody interface, the prosodic representation can be built on the syntactic output. The computation proceeds from syntax to phonology all the way down, in a very simple way, and in compliance with the T-model of grammar ... the prosodic computation is fed by the syntactic representation and discourse-related features, but the prosodic component elaborates the input in accordance with its intrinsic rules …"

The remainder of this section will present a proposal about how the prosodic

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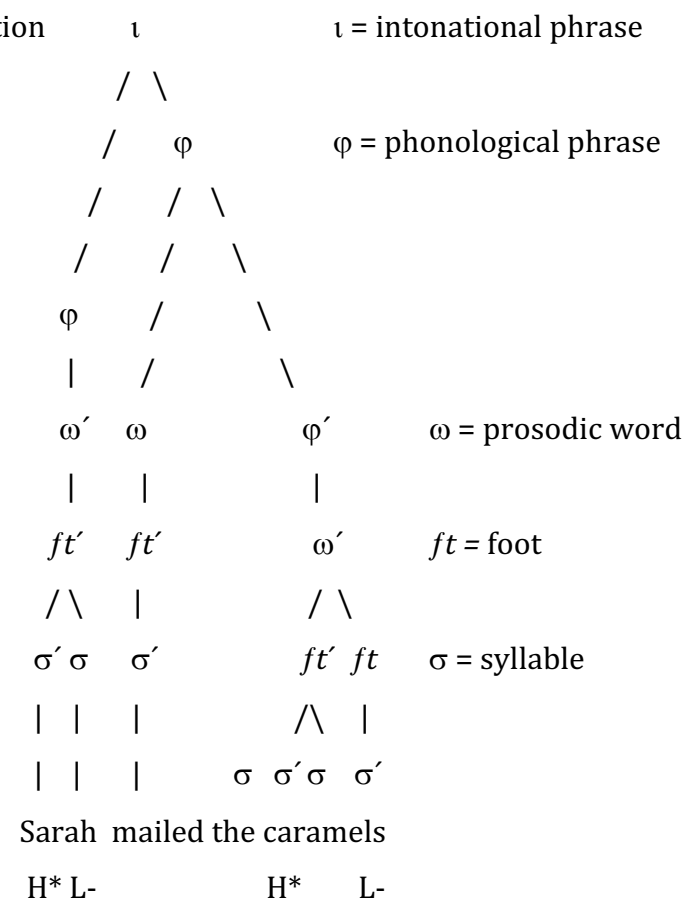
[27] . See e.g. the overviews in Arregi (2016) and Zubizarreta (2016).

properties of the surface phonological representations of all-new sentences in Standard American and British English can be derived without any influence of information structure.

The three key characteristics of the phonological representation of sentence prosody in Standard American and British English are illustrated in the surface (output, SR) representation of *Sárah mailed the cáramels* in (29): prosodic constituency, prosodic headedness (prominence), and tone. The assumption of a default prosodic phonology is that the distribution of all three of these prosodic properties in SR is predictable in an all-new sentence of English.

(29) Surface phonological representation




A first observation is that the subject and object noun phrases *Sarah* and *caramels* necessarily contain two tones: a high tone (H) on the head/prominent syllable of the sole

word in the phrase, and a low tone (L) on the final syllable of the phrase. Our usage of the 'H*' notation for a H pitch accent merely provides the information that the H tone is associated with the prominent syllable of a φ, as in (29). The notation 'L-' indicates that the L tone is associated with the right edge of a φ. The transitive verb *mailed* carries no L edge tone in an all-new sentence like (29); it may carry an optional H tone, however, whose status will be discussed below. The distribution of the H* in (29) reflects a long-recognized generalization that in neutral, all-new, sentences in Standard English, a H tone is necessarily found on some word within every phrase, but not on a word which is not itself a phrase (Schmerling 1976, Gussenhoven 1983, 1992, 2004, Selkirk 1984, 1995, 2000, Truckenbrodt 1995, 2006, 2007). In what follows we show that the distribution of tones in pragmatically neutral all-new sentences in Standard English can be understood as a language-particular phonological consequence of the prosodic constituency and prosodic headedness/prominence patterns within the sentence. The basic phonology of tone and prosodic headedness in all-new sentences will be expressed in constraint-based optimality theoretic terms (Prince & Smolensky 1993/2014).

Prosodic structure can be understood as a variety of metrical structure. As originally used in Liberman and Prince (1977), the term 'metrical structure' referred to a binary branching tree, inherited from the syntax, whose branches are labelled strong (s) or weak (w). The term 'prosodic structure' introduced in Selkirk (1980, 1981/1978) designates a phonological constituent structure that consists of prosodic categories of distinct types. The existence of these distinct prosodic category types crosslinguistically has been revealed in the structure-sensitivity of a broad range of phonological and phonetic phenomena (e.g. Nespor & Vogel 1986, Selkirk 1986, 2009, 2011, Inkelas & Zec eds. 1990, Truckenbrodt 1999, Selkirk & Lee eds. 2015, Féry 2017). The necessary appearance in Standard English all-new sentences of a tonal pitch accent on the head syllable of any phonological phrase (φ), but not on just any prosodic word (ω), is an example of the evidence for distinguishing between prosodic category types. The prosodic headedness/prominence status of a constituent in (29) is indicated here by an orthographic acute accent mark. It could just as well have been marked with the 's' label of

a standard metrical tree. The bracketed grid representation in Hayes (1995) is notationally equivalent to the prosodic constituent structure tree of (29) with its head-markings (see Selkirk 1980, Hayes 1980, 1995, McCarthy 2003, and others).

Determining the prosodic head status (prominence) of a constituent in all-new sentences is arguably a matter of phonology, not syntax. Feet may have heads (σ´); prosodic words may have them (*ft´*). Syntax has nothing to say about either the presence or the location of a head/prominence within these constituents. It makes theoretical sense, then, to assume that properly phonological optimality theoretic markedness constraints (Prince & Smolensky 1993/2014) are responsible for the presence and position of a prosodic head within the phonological phrase (φ) or within the intonational phrase (ι), too.

In an all-new sentence of English like (29) each constituent of prosodic structure (with the possible exception of intonational phrase, see section 6) has a unique prominent daughter constituent. For phonological phrases, this is captured by the phonological constraint (30):

(30) HEAD-PROMINENCE-IN-φ [HD-IN-φ]
Every φ has exactly one prominent daughter, its head.

HD-IN-φ would belong to a larger family of phonological markedness constraints that call for a head/prominence within prosodic constituents of all types. It has been recently argued that phonological constraints that assign prosodic headedness are violable (Ito & Mester 2016, Elordieta & Selkirk 2018). In an optimality theoretic approach, this would imply that, universally, prosodic constituents are not required to have a prosodic head, and also that the presence of headedness in a constituent in a particular language may vary according to context and the optimality theoretic ranking of constraints of the phonology.

In (29), HD-IN-φ is satisfied in all three φs. The non-branching φs corresponding to the subject and object noun phrases both contain just a single daughter, which is the head ω´. Within the φ corresponding to the VP node in the sentence, the daughter φ corresponding

to the direct object phrase is the head, rather than the daughter ω corresponding to the verb. This raises the general question of which daughter, when there is more than one, counts as the head. It is well known that when the daughters of a prosodic constituent are of the same prosodic category type, languages may differ in whether it is the rightmost, or the leftmost, of these daughters that has the status of head (Hayes 1995, Gordon 2002, McCarthy 2003, Kager 2007, among others). This holds for syllables within feet, feet within prosodic words or prosodic words within compound prosodic words.[28]

But the head status of the φ of the object *caramels* found at the right edge of the higher φ corresponding to the VP in (29) can't be analyzed as an edge-related effect. As Truckenbrodt (1995, 2006, 2007) points out, in German a verb with a sister phrase will never have greater prominence than that sister, regardless of the linear order in which they appear. Kahnemuyipour (2009) gives crosslinguistic support for this generalization. Given the recursive φ structure in phonological representation assumed for the verb phrase in (29), this generalization about the distribution of prominence within the VP suggests an additional type of phonological constraint for determining which of multiple daughters has the status of head:

(31) UNEQUAL- SISTERS [UNSIS]
If sisters in a prosodic representation are of unequal category, the sister(s) lower in the prosodic hierarchy cannot be the head.

UNEQUAL-SISTERS imposes head status in (29) for the post-verbal phrase *(caramels)*$_{\varphi'}$ within the φ of the VP; it would do the same if English word order allowed the phrase to precede the verb. It also makes broader predictions: in a prosodic word consisting of a foot and a syllable, the foot will be the head, in a clitic structure where a prosodic word dominates

[28] . A two-word compound of English would have a simple recursive ω structure with lefthand prominence among the daughter ω's being determined by a prosodic Compound Rule.

another prosodic word and a clitic syllable, the clitic syllable would not bear prominence, and so on.

The constraint Stress XP proposed by Truckenbrodt (1995, 2006, 2007) and adopted in Féry & Samek-Lodovici (2006) is a syntactic-structure-based account of the prosodic head status of the object phrase in an all-new sentence like (29). But the prominence assignment effects of Stress XP are no different from those of the purely phonological account provided by the independently motivated phonological markedness constraints HD-IN-φ and UNEQUAL-SISTERS. It is the recursive φ structure of the VP that is crucial to the account of φ-prominence; it allows for UNEQUAL-SISTERS to come into play in the φ-over-φ structure in (29). That recursive φ structure derives from the Match theory of the relation between syntactic XP and prosodic φ constituency (Selkirk 2011), to be discussed below[29]. The recursion of φ as a reflection of recursive syntactic XP organization renders Stress XP superfluous as part of the syntax-phonology interface, given the phonological constraints HD-IN-φ and UNEQUAL-SISTERS. With the analysis proposed here then, in the default case of all-new sentences, the presence and position of prosodic heads within a prosodic constituent structure can be understood as a matter for the phonology alone.

The formal status of a prosodic constituent as a prosodic head or prominence is abstract, but it comes with a broad variety of phonological and/or phonetic consequences, depending on the language. In all-new, pragmatically neutral sentences in Standard English, the most salient, phonological, consequence of prosodic headedness is the appearance of a predictable, epenthetic, H tone on the head syllable of a phonological phrase, that is, on the head syllable of the head foot of the head prosodic word of φ. Moreover, in Standard English, the prosodic head status of a syllable within foot and word - with or without pitch accent - is interpreted by the phonetics as 'stress', with higher levels of prominence showing increasingly greater duration (Sugahara 2012, Katz & Selkirk 2011), among other properties. By comparison, Standard Japanese, for example, shows no

[29] . Recursive structures may also be created in response to phonological markedness constraints on prosodic structures, see e.g. Ito & Mester (2011), Bennett et al. (2016).

such durational effect on accented syllables (Beckman 1982, 1986), though tonal pitch accent is arguably associated with headedness/prominence (Ito & Mester 2016, Elordieta & Selkirk 2018).

In many languages, tones which have no lexical or morphemic status appear by default - introduced by epenthesis - in surface phonological representation. The appearance of epenthetic elements is driven by phonological markedness constraints (Prince & Smolensky 1993/2002, McCarthy & Prince 1995). Epenthetic tones often appear in association with the prosodic head/prominence of a prosodic constituent of a particular type, or in association with an edge - right or left - of a prosodic constituent of a particular type. It is not uncommon for an epenthetic H tone to be predictably associated with the head syllable of every prosodic word in any sentence of a language; Cairene Arabic (Hellmuth 2006, 2007) offers a particularly well-studied example. It is also not uncommon for the head syllable of a phonological phrase to be predictably associated with a H tone; modern Irish provides an example (Elfner 2012, 2015), as does Standard English. Kolkata Bengali is an example of a language where it's a predictable L tone that appears on the head syllable of any φ in all-new sentences (Hayes & Lahiri 1991). Several varieties of German also show L tone on the phrasal head, with a H tone at the right phrase edge (Truckenbrodt 2002). Truckenbrodt (2006) and Ladd (1996, 2008) assume the predictability of tonal 'accent' in terms of 'stress'. These and other cases show that a universal set of phonological markedness constraints on surface phonological representation must include constraints which call for a prosodic head to be associated to some tone (deLacy 2002, Yip 2002, Elordieta & Selkirk 2018). A phonological constraint like HEAD(φ):TONE would be responsible for the predictable appearance of the tone commonly referred to as a H* pitch accent associated with a phrasal head/ prominence in all-new sentences in Standard English.

(32) HEAD-OF-φ-HAS-TONE [HEAD(φ):TONE]

The head syllable (σ́) of a phonological phrase (φ) must be associated with tone. (The head syllable of a phonological phrase is the head syllable of the head foot of the head prosodic word of a phonological phrase.)

Preference for it to be a H tone that is associated with a prosodic head, whether alone (as in English H*) or in combination with an L tone (as in Tokyo Japanese H*L), could be independently specified by further phonological markedness constraints (deLacy 2002).

The default H* pitch accent in the surface phonological representation of pragmatically neutral all-new sentences in standard English must of course be distinguished from other tonal pitch accents observed in the language, which famously contribute pragmatic meanings to the sentence and arguably have morphemic status (Ladd 1980, Pierrehumbert 1980, Gussenhoven 1983, Pierrehumbert & Hirschberg 1990, among others). These morphemes would occupy semantically appropriate positions in syntactic representation and would be spelled out in underlying phonological representation with lexically specified tone(s). The observed alignment of these morphemic tonal accents with the head σ́ of a φ in surface phonological representation would be consistent with the demands of HEAD(φ):TONE, and would preempt the epenthesis of the default H* tone. The general phonological approach to the tone-prosodic structure relation suggested here meshes well with the recent proposal of Torreira and Grice (2018) that metrical/prosodic structure plays a role in determining the association properties of 'intonational tones.'

A constraint like HEAD(φ):TONE can also be understood as the driver of other phonological phenomena, e.g. the displacement of lexical H tone seen in Bantu languages like Digo (Kisseberth 1984) and Giryama (Volk 2011, 17). In these and other languages like them a lexical H tone which in underlying representation is associated with a host morpheme in a nonfinal word of a phonological phrase may be 'shifted' rightwards in surface phonological representation to the penultimate syllable of the final word of that phrase, where that phrasal penult syllable is plausibly the head syllable σ́ of that φ (Hyman 2011, 2019). In other words, the epenthesis of the H tone onto the head syllable of φ in English, an

'intonational language', and the shift of underlying lexical H tone to a head syllable of φ in Digo and Giryama, 'lexical tone languages', would both be a matter of the phonology *per se.* They would simply be different language-particular responses to the need to satisfy the universal phonological markedness constraint HEAD(φ):TONE.

Another constraint family that plays a role in determining the default surface distribution of tone in Standard English involves the edges, or boundaries, of prosodic constituents. The sentence in (29), with its predictable L- tones at the right edge of the phrases *Sarah* and *(mailed the) caramels,* provides motivation for (33), a markedness constraint targeting the R-edge of φ[30] :

(33) RIGHT-EDGE-OF-φ-HAS-TONE [R-EDGE(φ):TONE]
The syllable at the right edge of a φ must be associated with some tone.

It is very common crosslinguistically for there to be a predictable appearance of some tone or tonal complex at the right or left edge of a phrase of some type in the surface prosodic structure representation of a sentence (e.g. Beckman & Pierrehumbert 1986, Gussenhoven 2004, Jun (ed.) 2006, 2014, Féry 2017). Note that the quality (L vs. H) of the default edge tone is not specified in (33); it is sometimes contextually predictable on the basis of the quality of the preceding pitch accent, or the tonal quality of the pitch accent may determine the quality of the edge tone, depending on the language.

Left out of the discussion of predictable tone in Standard English sentences so far is the fact that a H tone may optionally appear on the verb *maíled* preceding the necessarily pitch-accented direct object in (29). It has been widely observed in phonological accounts (e.g. Gussenhoven 1992, 2004, Ladd 1996, 2008) that 'prenuclear accents' may optionally appear preceding, but not following, the 'nuclear accent' that is associated with the head/'main prominence'/'nucleus' of a φ. We should entertain the possibility that these

[30] . Beckman et al. (2008) and Barnes et al. (2018) point to some variability in the precise phonetic alignment position of the L- boundary tone in Standard American English.

optional tones in Standard English represent a third category of epenthetic tone, introduced by a constraint with the properties of (34).

(34) HEAD-AT-LEFT-EDGE-OF-φ-HAS-TONE [HD@L(φ):T]
The closest prosodic head to the left edge of a φ is associated with some tone.

As Gussenhoven (2004, 285) points out, in a recursive φ structure like the one that characterizes (*mailed the (caramels)$_{\varphi}$)$_{\varphi}$* in (29), the verb *mailed* lies at the left edge of a φ, and its first and only stressed syllable would (optionally) receive an 'edge-accent' H tone, but no R-φ-edge tone could appear to its right. There is cross-linguistic motivation for this sort of edge-accent. A constraint with these composite conditions would explain the appearance of what comes close to being an edge or boundary tone in Connemara Irish (Elfner 2012, 2015). Elfner shows that in Irish, along with the H tone that always appears on the prosodic head of the final word in any φ (transcribed as H*), there is a LH tonal complex that obligatorily appears on the first stressed syllable of a nonminimal φ (i.e. of a φ that dominates another φ (Ito & Mester 2012, 2013). Moreover, a simultaneous appeal to a phrase edge and an edgemost lower-level prosodic head characterizes the sort of post-nuclear 'phrase accents' which Grice, Ladd & Arvaniti (2000) document for various languages of Eastern Europe.

Summing up, the distribution of the tonal accents found in the surface phonological representation of all-new sentences in Standard English is characterizable in terms of cross-linguistically supported types of phonological markedness constraints. This is true of the pitch accents associated with the prosodic head of a φ, as well as the edge accents associated with the head of a foot or ω that is located at a left edge of φ. The main lines of an entirely phonological, constraint-based, analysis of tone and its relation to prosodic structure in all-new sentences like (29) in Standard English appear to be in place.

What about the prosodic constituent structure itself? What explains its presence in phonological representation? The parsing of the surface phonological representation (29) into prosodic constituents of type intonational phrase (ι), phonological phrase (φ), and

prosodic word (ω) reflects the syntactic clause, phrase and word structure of the sentence, including the recursive syntactic phrase structure of the VP. More specifically, in Standard English the φ and ω constituents of (29) mirror constituents of syntactic representation that are headed by lexical, open class, items like noun and verb, not by functional, closed class, items like determiners. Over the years a range of different proposals concerning principles governing the relation between syntactic and prosodic phrasal constituency have been put forward (e.g. Beckman & Pierrehumbert 1986, Ladd 1986, Nespor & Vogel 1986, Selkirk 1986, Truckenbrodt 1999, Gussenhoven 2004, Selkirk 2011). A new hypothesis concerning the syntax-prosodic constituency relation now seems more compelling than the earlier ones: prosodic constituency at word level and above is simply the phonological expression, or spellout, of the constituent structure of the output representation of the (morpho)syntax. This proposal incorporates Selkirk's (2009, 2011) Match theory as part of a theory of spellout conditions at the syntax-phonology interface.

(35) Match theory, informal statement (Selkirk 2011)[31]

(i) Match Clause
A clause in syntactic representation must be matched in phonological representation by a constituent of type ι.

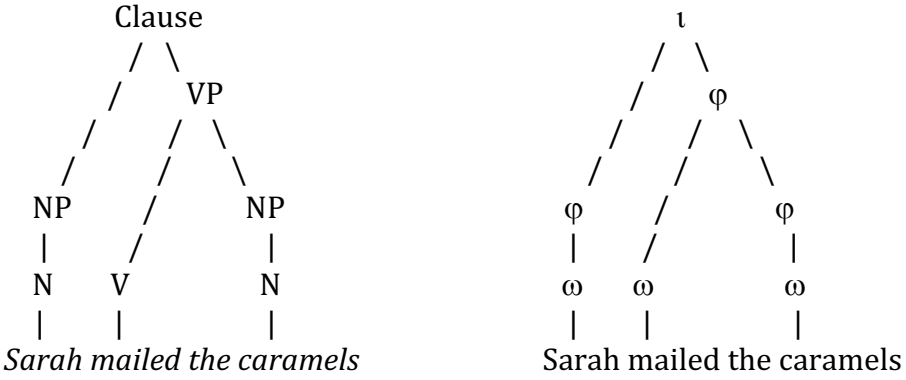
(ii) Match Phrase
A phrase in syntactic representation must be matched in phonological representation by a constituent of type φ.

(iii) Match Word
A word in syntactic representation must be matched in phonological representation by a constituent of type ω.

[31] . See Elfner (2012, 2015) and Bennett, Elfner & McCloskey al. (2017) for a formal statement of Match conditions. Selkirk (2009) already suggested that Match conditions are conditions on spellout.

In English, only words and phrases that are headed by a phonologically overt open class, lexical category, item are spelled out as ω or φ. To save space, then, except for the clause[32], all morphosyntactic XP or X constituents that are *not* headed by an overt lexical item are absent in the morphosyntactic tree 36(a). The embedding of the NP object within the VP results in the recursive φ structure seen in the underlying phonological representation (UR) in (36b)[33].

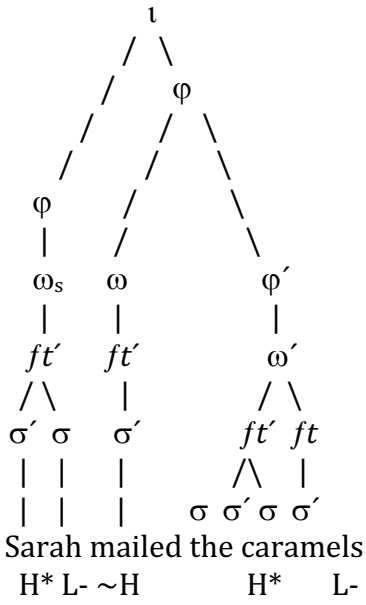
(36) a. Output of the morphosyntax b. Underlying phonological representation (UR)




[32] . The 'clause' has a special status in the syntax-phonology mapping. See e.g. Selkirk (2009). Selkirk (2011) discusses the differences between the Match theory and the Truckenbrodt (1999) theory, including the interface constraints Wrap XP and Align XP.

[33] . The recursion-based subtypes of prosodic category that Ito and Mester (2012, 2013) propose allow a principled flexibility in the category subtypes in terms of which phonological and phonetic phenomena can be defined: a minimal φ is one that dominates no other φ, a nonminimal φ dominates another φ, a maximal φ is one that is dominated by no other φ, etc.

c. Surface phonological representation (SR)




In the morphosyntactic representation 36(a), the italicized orthographic string stands for an abstract representation of the morphemes/morphosyntactic features of syntactic representation that are to be spelled out in UR. The orthographically represented terminal strings in 36(b) and 36(c) stand for the actual phonological segments that give phonological expression to - i.e. spell out - the terminal elements of 36(a). And the prosodic constituency of UR in 36(b) is the phonological expression (spellout) of the morphosyntactic constituency of 36(a). The organization of segments into syllables and of syllables into feet in the surface phonological representation 36(c) is typically predictable by phonological constraints alone and so would not be assumed to be present in UR.[34] The appearance and distribution of prosodic heads and tones is predictable, described as above. Note that the 'prenuclear' edge-head H tone, transcribed as ~H to distinguish it from the H* of the head of φ, makes an optional appearance on *mailed* in 36(c).

The Match-as-spellout hypothesis proposed here is a departure from Selkirk (2011). There Match conditions were taken to be phonological constraints that hold of SR and interact

[34] . Note that a functional head like a determiner is given no ω status in 36(c). The stranded σ *the* presumably would cliticize to a ω or a φ, either to the right or to the left.

with phonological constraints in determining a possibly non-matching, 'non-isomorphic', SR representation of prosodic constituency. Classical OT doesn't subscribe to a modular organization of the grammar (Legendre et al. 1993). In fact, most accounts of the relation between syntactic and prosodic constituency in optimality theoretic accounts assume that (morpho)syntactic representation interfaces with the surface (output, SR) representation of the phonology (Selkirk 1995, 2000, 2011, Truckenbrodt 1995, 1999, 2007, Gussenhoven 2004, Elfner 2015, Büring 2016, Féry 2017). Truckenbrodt (2012) and Bocci (2013) are noteworthy exceptions.

Our Match-as-spellout hypothesis is compatible with a modular restricted-interface organization of grammar that posits a morphosyntax that interfaces with the phonology on the one hand and with the semantics/pragmatics on the other. This is the Chomskyan T-model. In this model the syntax-phonology interface consists of a set of mapping conditions linking two different modules of the grammar that are governed by different principles. Interface conditions map information from the syntax to representations that the phonology can read. We conjecture that, in contrast to the phonology *per se*, the requirements on the syntax-phonology interface are not governed by an optimality-theoretic constraint ranking. Spellout conditions for the interface between syntax and the underlying phonological representation (UR) all have to be satisfied.

A major argument for the existence of prosodic constituency above the word in phonological representation is the existence of mismatches ('nonisomorphisms') between surface prosodic constituent organization and the morphosyntactic structure of a sentence (Selkirk 2011, Bennett & Elfner 2019). The Match-as-spellout hypothesis combines with a standard optimality theoretic, phonological constraint-based, theory of the relation between UR and SR to account for these mismatches, as in the theory of correspondence of McCarthy & Prince (1995). The Match-as-spellout hypothesis requires the output morphosyntactic constituent structure of a sentence to match up with the UR prosodic constituent structure of a sentence. But the prosodic constituency of SR is in no way guaranteed to match up entirely with the prosodic constituency of UR. Phonological markedness constraints on SR, if ranked higher than input-output prosodic structure

faithfulness constraints, can be given responsibility for SR departures from the syntax-matching constituency of UR. As we will see in section 6, recognizing the distinction between UR and SR prosodic constituency makes possible a purely phonological account of nonisomorphisms between SR and the morphosyntactic output representation that show the impact of [FoC] and [G].

The preceding paragraphs put forward an entirely phonological account of the distribution of prosodic headedness within phrases in Standard English, and crosslinguistically. A family of violable HEAD-IN-Π prosodic markedness constraints call for the presence of a head of a prosodic constituent π. The constraint HD-IN-φ mirrors in the phonology the effects of Truckenbodt's Stress XP (Truckenbrodt 2006). Distinct markedness constraints, including UNEQUAL SISTERS, locate the head/prominence required by HEAD-IN-Π within a prosodic constituent π. In section 6 we will see evidence that there is no requirement that the prosodic head of a φ or an ι be rightmost in Standard English (pace Büring 2016).

Finally, in the spirit of the constraint-based proposals by Yip (2002), deLacy (2002) and Selkirk (2008), and in line with general thinking on cross-linguistic tendencies in the predictable distribution of tone from Beckman and Pierrehumbert (1986 ) on through Féry (2017), we have proposed a set of violable universal markedness constraints on the prosodic structure-tone relation which call for prosodic heads and/or edges to be associated with some tone(s) in the surface, output, representation. Language-particular optimality theoretic rankings of such markedness constraints and relevant tonal faithfulness constraints provide the basis for characterizing crosslinguistic differences in the surface distribution of predictable tones.

In sum, in an all-new, pragmatically neutral, sentence of Standard American and British English, spellout conditions at the syntax-phonology interface determine underlying prosodic constituency. With this input to the phonology, all aspects of surface prosodic headedness/prominence and tone are predictable by the constraint system of the phonology *per se* without any appeal to information structure anywhere. Newness marking

is superfluous. Accounts assuming newness marking thus miss crucial phonological generalizations.

The preceding decades have seen considerable experimental phonetic and psycholinguistic research on prosody. Our account of the default prosodic phonology of Standard English of course makes the assumption that a surface phonological representation in terms of prosodic constituency, prosodic prominence (headedness) and tone is the locus of the interface between phonological representation and its phonetic implementation in terms of quantitative, measurable, properties like pitch, duration, and intensity. It would also be the site in the grammar where nongrammatical paralinguistic effects on prosody, as well as production or performance factors might come into play. Wagner and Watson (2010) reviews the relevant literature.

In the following section, we will track the impact of [FoC] and [G] at the syntax-phonology interface and beyond. We will present an 'existence proof' showing how the varied surface prosodic effects of Givenness and FoCus can plausibly come about in a modular architecture through a combination of natural spellout conditions for [FoC] and [G] at the interface and properly phonological constraints that are motivated independently of information structure.

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

Since Ladd (1980) it has been commonly recognized that Given phrases in Standard American and British English lack phrasal prominence ('phrase stress'). This lack of phrasal prominence is reflected in the lack of an obligatory H* pitch accent, illustrated in the paradigm in (37), where the location of [G]-marking in otherwise pragmatically neutral declarative sentences is varied.

(37) a. [ [Sarah] ]$_G$ [ [mailed] the [ [caramels] ] ]
~H ~H H* L-

b. [ [Sarah] ] [ [mailed] the [ [caramels] ]$_G$ ]
H* L- H* L-

c. [ [Sarah] ] [ [mailed] the [ [caramels] ] to [ [Ewan] ]$_G$ ]
H* L- ~H H* L- L-

Within our current framework of assumptions, [G]-marking has to be spelled out as a lack of φ-level headedness/prominence in UR, and this lack of headedness has to survive unchanged in SR. But this implies that, in the UR of a sentence with [G]-marking, there must also be a representation of headedness in any φ which is not [G]-marked, for the obvious reason that lack of headedness can only be represented against the background of the presence of headedness. This motivates the pair of spellout principles (38) and (39).

(38) Prosodic-Spellout-of -[G] (Standard American and British English)
A [G]-marked constituent in morphosyntactic representation corresponds to a UR constituent that does not have φ-level prominence.[35]

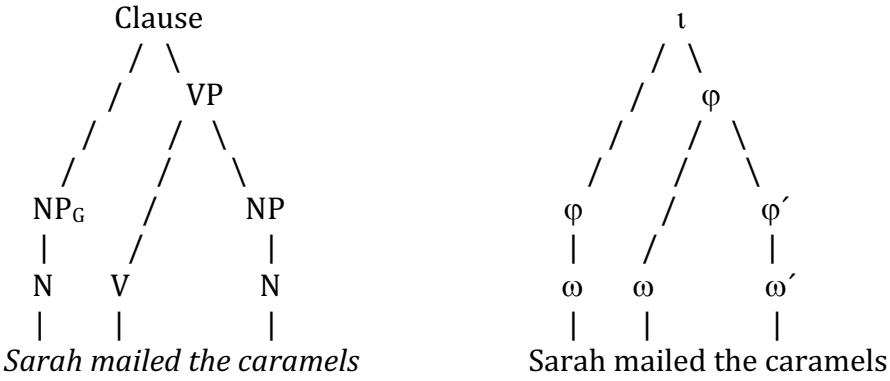
(38) states the spellout condition for [G]-marked constituents themselves. (39) ensures a phonological representation for [G]-marked constituents that is distinct from that of non-[G]-marked constituents:

(39) Distinctive-Prosodic-Headedness-in-UR
If a sentence α contains a constituent β which is marked with a feature that is spelled out as the absence or presence of a prosodic head, all φ of the UR of α outside the UR of β must have a prosodic head.

[35] . A similar principle, though one which holds of SR, is proposed by Féry and Samek-Lodovici (2006), who do not adopt the modular, restricted-interface, grammatical architecture assumed here.

As a result of (38) and (39), the φ of the UR of the [G]-marked subject phrase in 40(a) does not have a φ-level head, but all other φ in the UR of that sentence do, as shown in 40(b).

(40) a. Output of the morphosyntax b. Underlying phonological representation




If the lack of φ-level status in UR for the ω of the [G]-marked subject phrase is retained in SR, its lack of a surface H*, indicated in 37(a), (b), and (c), is accounted for. But what would prevent the phonological markedness constraint HEAD-IN-φ from supplying prosodic head status to that ω ? That would have a bad result: *all* surface φ would be headed, and would have H*, just as in all-new sentences. There must thus be a faithfulness constraint (McCarthy & Prince 1995, 1999) on prosodic headedness/prominence at play. Such a faithfulness constraint could prevent the introduction of Hd(φ) status in SR in sentences where a distinction between headless φ and headed φ is made in UR.

No faithfulness constraints relating to φ-level headedness have been previously formulated, since no case for φ-level headedness in an input UR has previously been made. In prosodic morphology, however, prosodic faithfulness constraints involving foot constituency or the headedness of a foot, for example, have played a role (McCarthy 1995, Ito et al. 1996). The hypothesis here is that an input-output faithfulness constraint blocks the introduction of Hd(φ) status in SR for the daughter of the UR counterpart of the [G]-marked subject in 40(b). This faithfulness constraint should not simply block the introduction of Hd(φ) status in SR, because such an introduction of the head of a φ is necessary in all-new sentences, where all φ in their UR lack prosodic heads. It must be a

constraint that calls for the maintenance in SR of some other prominence-related property present in UR.

We propose that the universal set of input-output (UR-SR) faithfulness constraints includes a constraint that calls for the pattern of relative φ-prominence in UR to be retained in SR. The formulation of this constraint would be (41).

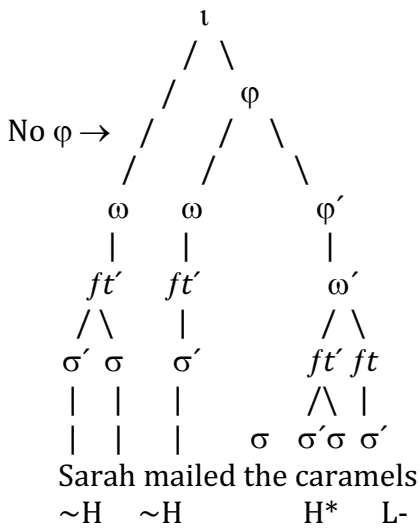
(41) IO-IDENT-RELATIVE-PROMINENCE [IDENTRELPROM]
The pattern of relative prominence in UR must be preserved in the corresponding SR.

Preserving a UR pattern of relative prominence in SR means that whenever, in a UR, any two prosodic constituents of the same level, e.g. two ω, differ in head status, they must preserve that difference in the corresponding SR. To illustrate, in a UR like 40(b) only the ω of *caramels* is the head of a φ; the preceding two ω are not. IDENTRELPROM makes sure that the spellout of a [G]-marked constituent as the absence of a prosodic head of φ in UR is retained as an absence of Hd(φ) in the corresponding SR. Assuming the constraint ranking IDENTRELPROM >> HEAD-IN-φ in Standard American and British English will ensure that the UR absence of prosodic head status for the first ω in 40(b) survives in SR.

As Ladd points out (Ladd 2008, 300), a Given subject phrase like that in 37(a) has a particularly informative tonal profile in SR. It lacks the L- edge tone which would normally appear at the right edge of a phonological phrase.[36] Moreover the Given subject bears only a 'secondary' H tone edge-accent, transcribed here as ~H. Ladd's proposal is that there is no φ in the SR of the Given subject and as a consequence no L- and no H* accent:

[36] . Ladd uses the term 'intermediate phrase' for our φ.

(42) SR of sentence 37(a): (UR is 40(b))




We will see that absence of φ is a property of the SR of the [G]-marked phrases in the syntactic contexts in 37(b) and 37(c) as well. How does this 'dephrasing' come about? As illustrated in the UR 40(b), the spellout of morphosyntactic constituency calls for the presence in UR of a φ corresponding to any lexical-item-headed syntactic phrase, including [G]-marked phrases. On our account, the spellout of [G]-marking requires the absence of a prosodic head of the φ corresponding to a [G]-marked phrase in UR. It's thus the phonology *per se* that must be responsible for the 'dephrasing' in (42). On an optimality theoretic approach, we would say that, in Standard English, a markedness constraint driving the SR absence of a φ in UR is higher ranked than a faithfulness constraint calling for the retention of that φ in SR. The markedness constraint HEAD-IN-φ is the likely suspect driving the dephrasing. If the SR of the [G]-marked subject phrase of (40/42) were to include the φ of the UR, there would be a violation of HD-IN-φ. The SR representation (42) avoids that violation, but at the price of introducing a violation of the faithfulness constraint calling for the preservation of a φ present in UR. Such a faithfulness constraint has not yet been proposed, but falls into the broad class of MAX constraints posited by McCarthy & Prince (1995, 1999).

(43) MAX(φ)

A φ of a UR must have a corresponding φ in the SR ('No deletion of φ').

The phonological constraint ranking HEAD-IN-φ >> MAX(φ) in Standard English yields the dephrased SR (42) as optimal.

The SR prosodic structure and tone of 37(b) and 37(c) above are straightforwardly accounted for, given the analysis for 37(a). The 'stress shift' in 37(b), first documented by Ladd (1980), involves the lack of φ-head status in UR for the direct object *caramels*, due to Prosodic-Spellout-of-[G]. The consequently necessary presence of Hd(φ) status for the verb *mailed* can be ascribed to Distinctive-Prosodic-Headedness-in-UR. The φ corresponding to the VP must have a prosodic head, and only the verb can satisfy that requirement, given the required absence of Hd(φ) in the [G]-marked object phrase itself. The φ-head status in UR for the verb *mailed* in 37(b) is reflected in the presence in SR of a φ-head H* tone for the verb. The lack of φ status in SR for the [G]-marked direct object is reflected in the absence of the secondary ~H edge-accent that could appear at the left edge of a φ. The absence of the L- boundary tone at the right edge of the direct object is obscured by the fact that the L- that is required for the edge of the higher φ of the VP is in a position indistinguishable from the would-be position of the L- of the (absent) φ of the object NP. Like 37(a), 37(b) testifies to the absence of any tones in the SR of a Given phrase due to the absence a prosodically headed φ. And in 37(c), where the [G]-marked second object phrase *Ewan* follows a discourse-new first object phrase, we have another example of the absence in SR of the φ corresponding to a Given phrase: absence of pitch accent H*, of right boundary tone L-, and of left-edge accent ~H.

It should be noted that, on our account, the status of the SR counterpart of the [G]-marked phrase in 37(b) and 37(c) as dephrased, deheaded and 'detoned'/deaccented has nothing to do with its 'post-nuclear' position in the sentence, contra Büring (2016) on English, or Féry & Kügler (2008) on German. The 'pre-nuclear' [G]-marked subject phrase has the same de-prosodified status. In that position, the optional appearance of the left-edge

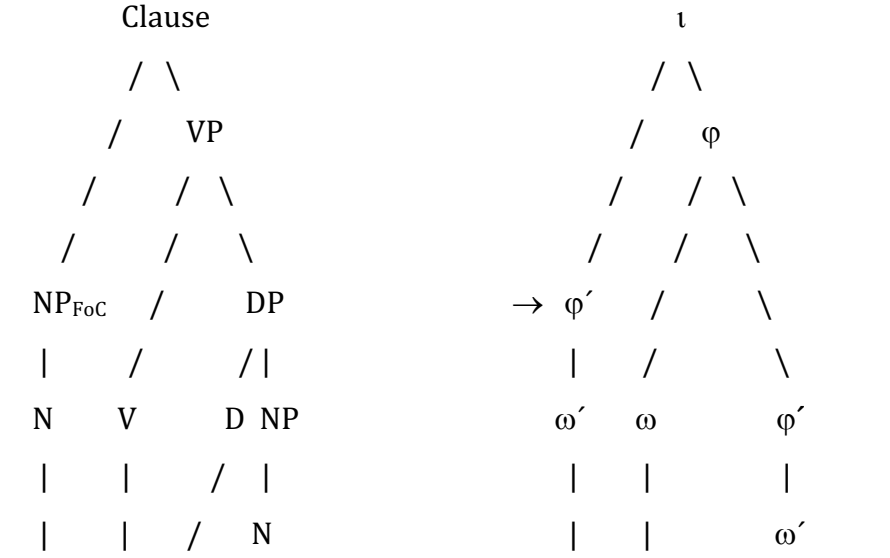
secondary edge-accent ~H is due to the presence of the left edge of the higher intonational phrase. The proposal by Gussenhoven (2004, 287) that the 'non-nuclear' H tone is confined to the left edge of φ is naturally extended to account for the appearance of the ~H at the left edge of ι.

In summary, given the ranked phonological constraint system of Standard American and British English, the absence of φ-level prominence imposed on UR by Prosodic-Spellout-of-[G] results in a SR for the [G]-marked phrases in 37(a), (b), and (c) that lacks surface φ status, hence lacks the surface tones H* and L-. The syntax-phonology constituency mismatch attested here could be referred to as a surface *underparsing* (or 'dephrasing') of the underlyingly spelled out φ of the [G]-marked syntactic NP constituent.

In all, the SR properties of sentences with [G]-marked constituents can be accounted for within a modular architecture. An interface spellout component relates the morphosyntax to the phonology and determines the properties of UR, including prosodic constituent structure and prosodic headedness. The SR for a sentence is then determined by a language-particular optimality theoretic ranking of independently motivated types of markedness and faithfulness constraints of the phonology *per se.*

Turning to the phonology of [FoC]-marking, the central question is how to spell out the morphosyntactic [FoC] feature in UR. The early proposal by Jackendoff (1972) is that a FoCus constituent carries the 'main (nuclear) stress' of the sentence. In the simple case of [[*Sarah*]$_{\text{FoC}}$ [ *mailed the* [ *caramels* ]]], illustrated in (44) below, the [FoC]-marked subject phrase is spelled out in UR as a φ that bears ι-level prominence, which is the highest level of prominence in UR, in absolute terms. In (44), the [FoC]-marked subject is followed by a VP that is discourse-new. The FoCus-new sequence in (44) 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, and where *Sarah* belongs to a salient alternatives set.

(44) a. Syntax b. Underlying phonological representation




*Sarah mailed the caramels* Sarah mailed the caramels

Distinctive-Prosodic-Headedness-in-UR requires the presence of the prosodic heads φ´ and ω´ in the φ of the UR that corresponds to the all-new VP. The prosodic headedness of the constituents in the UR 44(b) is retained in SR, due to the faithfulness constraint IDENTRELPROM. That SR would then be phonetically interpreted.

On our account, ι-level prominence in the SR counterpart of the [FoC]-marked constituent in (44) and in (45) below is the ultimate source for the judgment by speakers of English that a [FoC]-marked constituent is more prosodically prominent than other, non-[FoC]-marked, constituents of the same sentence. Direct experimental phonetic evidence for these relative prominence patterns in sentences with a single FoCus comes from Katz and Selkirk (2011), which investigated the phonetic properties of sentences with [FoC]-marked constituents that precede or follow non-[FoC]-marked, merely new, constituents in minimal triplets like (45). The SRs of *both* post-verbal phrases in 45(a) to (c) showed the typical default H* L- tone pattern of a φ, whether or not one or the other phrase, or neither, was also [FoC]-marked. Moreover, the results showed a statistically significant three-way

difference in patterning of the relative pitch, duration and intensity of these constituents within the same sentence.

(45) SR with phonetic pitch downstep/upstep patterns (Katz and Selkirk 2011)

a. FoC-New: ( They only ( ( produced )ω ( ( li´nen )ω´ )φ´ in ( ( Ni´neveh )ω´ )φ )φ´ )ι
H* L- ⇓H* L-

b. New-Foc: ( They only ( ( produced )ω ( ( li´nen )ω´ )φ in ( ( Ni´neveh )ω´ )φ´ )φ´ )ι
H* L- (↑) H* L-

c. New-new: ( They ( ( produced )ω ( ( li´nen )ω´ )φ in ( ( Ni´neveh )ω´ )φ )φ )ι
H* L- ↓H* L-

In 45(a) the considerable downstepping (⇓) between the FoCus phrase and the following new one testifies to a higher level of prosodic prominence on the FoCus; the lack of downstep or optional small upstep (↑) in the new-[FoC] case 45(b) again implies greater prominence for the FoCus, this time on the right. The observed patterns of relative phonetic prominence mirror the degree of phonological prominence (ι-level vs. φ-level) hypothesized for the constituents in SR.[37]

Importantly, the hypothesis that a FoCus constituent is realized with highest, ι-level, prosodic headedness/prominence in sentences where it co-exists with merely new constituents has consequences for properties of SR other than its phonetic interpretation. We see this in the derivation of the sentence in (46), which might be uttered in a situation where both speaker and hearer know that Sarah planned to send off a box of caramels yesterday. When they saw each other today, the first thing that was reported about either Sarah or the caramels was what is expressed in (46), where, semantically, a contrast with

[37] . The contrast between 45(a) and 45(c), with its small degree of downstepping (↓), was taken to indicate that all-new sentences lack prominence at the ι-level.

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 verbal exchange of the day. Evidence of the ι-level prominence of the [FoC]-marked verb comes from its φ-status in the SR 46(c), as compared to its hypothesized status as a mere ω in UR 46(b). This mismatch in constituency between UR and SR is straightforwardly analyzed as an effect of the phonology *per se.*

(46) (Guess what!)

a. MS: [ [ [*Sarah*] ]$_{DP}$ [ [*mailed*]$_{FoC}$ [*the* [*caramels*] ]$_{DP}$ ]$_{VP}$ ] (She didn't Fed-Ex them.)

b. UR: ( ( (Sarah)ω´)φ ( (mailed)ω´ the ( (caramels)ω´ )φ )φ´ )ι

c. SR: ( ( (Sarah)ω´)φ ( ( (mailed)ω´ )φ´ the ( (caramels)ω´ )φ )φ´ )ι
H* L- H* L- H* L-

The factual observation is that, when a [FoC]-marked verb is followed by a merely new object, that verb has the status of a φ in SR.[38] Both the verb and the object in the SR 46(c) carry an obligatory H* pitch accent, which is a reflex of φ-level prominence. Notably, the right edge of the verb coincides with a L- tone, which is a default property of the right edge of a φ. This shows that the verb has acquired the status of a φ in SR.

Here is how the SR in 46(c) would come about. In accordance with the spell-out of the [FoC]-marking of the verb in 46(a), the ω corresponding to the verb in the UR 46(b) carries ι-level prominence. As a consequence, the φ counterpart of the direct object of the [FoC]-marked verb cannot be the head of the φ counterpart of the VP. In SR, a configuration

[38] . 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.

where a ω is a head and its φ sister is not would violate UNEQUAL SISTERS. However, due to IDENTRELPROM, greatest prominence in the SR of (46) must remain on the verb. A surface violation of UNEQUAL SISTERS can be avoided through the presence in SR of φ´ status for the verb itself, which creates the equal-sister [ φ´ φ ]φ´ structure seen in 46(c). 'Epenthesis' of the φ for the verb does violate a constraint like DEP(φ), though. DEP(φ) is an anti-epenthesis prosodic faithfulness constraint in the broader DEP family of faithfulness constraints (McCarthy & Prince 1995, 1999) which rule against the SR presence of any element that is not part of UR.

(47) DEP(φ)

A φ of an SR must have a corresponding φ in UR. ('No epenthesis of φ').

A constraint-ranking UNEQUAL SISTERS >> DEP(φ) for Standard American and British English would select as optimal the candidate with the attested φ constituency for the verb in the SR of (46), with its accompanying distribution of H* and L- tones.

(46) illustrates how a well-motivated markedness-faithfulness constraint-ranking derives the constituency mismatch between the spellout of the [FoC]-marked verb in UR as a mere prosodic word ω and its surface incarnation as a phonological phrase φ. We can refer to this as an *overparsing* mismatch. Within the grammatical architecture assumed here, the [FoC]-driven ι-level prominence on the verb in UR, is indirectly responsible for this mismatch in constituency between the morphosyntactic output representation and SR.

In sum, there's evidence from single-clause sentences with a single [FoC]-marked constituent that its prosodic counterpart is the head of an intonational phrase ι, which is the highest prosodic constituent within the UR of the sentence. In the sentences providing this evidence, the FoCus is preceded and/or followed by merely new phrases which correspond to φ in SR and which themselves carry φ-level prominence. This sentence-internal difference in level of prominence between the FoCus and merely new constituents has consequences for the phonetic interpretation of the sentence, illustrated in (45), and

can moreover be given responsibility for the promotion to φ status of the [FoC]-marked verb in (46).

But ι-level prominence cannot be a property of a [FoC]-marked constituent in sentences with two [FoC]-marked constituents or in cases of second occurrence FoCus in Standard American or British English. The two sentences in (48) each have a pair of [FoC]-marked constituents. The [FoC]-marking in the first sentence anticipates the contrast found in the second.

(48) Sarah [mailed]$_{FoC}$ [the caramels]$_{FoC}$. But she [FedEx-ed]$_{FoC}$ [the chocolates]$_{FoC}$.

Neither one in a sequence of two FoCus constituents in the same clause has been reported to be more prominent than the other (Truckenbrodt 1995, Féry and Samek-Lodovici 2006, Ladd 2008, Büring 2016), and neither one of two FoCus constituents in the same clause has been reported to carry ι-level prominence. Rather, it appears that each FoCus in clause-internal dual-FoCus pairs bears only φ-level prominence in SR. Since this lack of ι-level prominence in SR for the two Focus must be faithful to their relative prominence in UR, the formulation of Prosodic-Spellout-for-[FoC] cannot be stated as requiring ι-level prominence. The formulation in (49) allows for variation in the level of prominence for a FoCus in UR.

(49) Prosodic-Spellout-for-[FoC]
The UR counterpart of a [FoC]-marked constituent is as prominent as it can be, given all other spellout conditions on UR.

Given that Prosodic-Spellout-for-[FoC] is a spellout condition on UR, it's expected that variation in the degree of prominence for [FoC] constituents might depend on other conditions on UR.

The level of prominence for two [FoC]-marked constituents of a same clause in UR is subject to two structural conditions on UR. One is that a clause in morphosyntactic

representation is spelled out as a single intonational phrase ι in UR, in accordance with the Match Clause condition. The other is that a prosodic constituent may have at most one head daughter constituent; this is a defining property of prosodic headedness. Since these conditions must be met at UR, it would be impossible for more than one [FoC]-marked constituent in a clause to be spelled out with ι-level prominence. Assuming that there are no reasons for the two [FoC]-marked constituents to be spelled out differently, neither one can have ι-level prominence at UR.

Consider the derivation in (50):

(50) a. MS: [ [ [*Sarah*] ] [ [*mailed*]$_{FoC}$ [ *the* [*caramels*] ]$_{FoC}$ ] ]

b. UR: ( ( (Sarah)ω´)φ ( (mailed)ω´ the ( (caramels)ω´ )φ )φ )ι

c. SR: ( ( (Sarah)ω´)φ ( ( (mailed)ω´ )φ the ( (caramels)ω´ )φ )φ )ι
H* L- H* L- H* L-

In the UR 50(b) the counterparts of both [FoC]-marked constituents have mere φ-level prominence. This is the highest level of prominence they can have in a double FoCus configuration. Prosodic-Spellout-for-[FoC] is satisfied with respect to the object phrase in 50(b) because its prosodic counterpart in UR contains a constituent with φ-level prominence. Prosodic-Spellout-for-[FoC] is satisfied with respect to the verb because its corresponding ω in UR is itself the head of a φ, namely that of the VP.

However in SR, the verb now has to have φ status because of the constraint ranking UNEQUAL SISTERS >> DEP(φ). [39] The 'epenthesis' of the φ for the verb in SR avoids a surface

[39] . Gussenhoven (2004, 287) and Ladd (2008, 300) report that instead of the expected recursive (… (…)φ )φ for comparable cases, a division into two φ, is found, with the expected H* L- tonal pattern for each.

violation of UNEQUAL SISTERS. The signature surface H* L- contour indicates φ status in the SR, for the counterparts of both [Foc]-marked constituents.

Summing up, the variation in the level of prominence for FoCused constituents follows from Prosodic-Spellout-for-[FoC], which requires that [FoC]-marked constituents be as prominent as they can be, given all other spellout conditions on UR.

We turn next to the spellout of clauses that combine [FoC]-marking and [G]-marking. When a [FoC]-marked constituent precedes or follows a [G]-marked constituent in the same clause, there is nothing that would prevent the UR counterpart of the [FoC]-marked constituent from carrying ι-level prominence. The same is true in configurations where a [FoC]-marked constituent contains a [G]-marked constituent, as in (51):

(51) A: Why did your boss fire you?
B: I [circulated [a hostile [letter]] ]. I didn't [tell [the guy]$_G$ off ]$_{FoC}$
~H ~H H* L- ~H ~H H*L-

We conclude from the absence of surface tones on the epithet *the guy* in 51(B) that the SR counterpart of the [G]-marked constituent lacks φ-level prominence. That lack of φ-level prominence is the result of Prosodic-Spellout-for-[G] in UR. The absence of φ-level prominence for the [G]-marked object in UR has no impact on the spellout of the FoC-marked VP that contains it. That VP is a φ whose prosodic head falls on the particle, which could have the status of head of ι in UR.

But in cases of second occurrence FoCus, where the [FoC]-marked phrase is contained in a [G]-marked phrase, Prosodic-Spellout-for-[G] makes it impossible for the prosodic counterpart of the [FoC]-marked constituent to bear even φ-level prominence in UR. An example is 52(b), where the [G]-marked phrase *[only named [Sid]$_{FoC}$ in court today]$_G$* contains the [FoC]-marked *[Sid]$_{FoC}$*. 52(a) and (b) are from Beaver et al. (2007, 256).

(52) a. 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.

b. Even [the prósecutor]$_{FoC}$ [ only named [Sid]$_{FoC}$ in court today ]$_{G}$.

H* L-

The absence of H* in the SR of a second occurrence FoCus was experimentally confirmed by Beaver et al. The lack of H* indicates the absence of φ-level prominence for the counterpart of *[Sid]$_{FoC}$* at SR, which is inherited from UR, given the constraint ranking motivated above. The absence of φ-level prominence at UR is required by Prosodic Spellout-for-[G] and is compatible with Prosodic Spellout-for-[FoC], which only requires the UR counterpart of a [FoC]-marked phrase to be as prominent as it can be, given other spellout constraints.

As a final note, the absence of φ-level prominence within the SR counterpart of the [G]-marked VP in 52(b) should also lead to the absence of φ constituency for that VP, along with the absence of the H* accent. We pointed out above that SR 'dephrasing', like 'deaccenting', is one of the phonological consequences of the UR absence of φ-level prominence for the counterparts of [G]-marked constituents. The SR for 52(b) should therefore be (53):

(53) ( Even the ( (prosecutor )ω′ )φ′ only (named)ω (Sid)ω in (court)ω (today)ω )ι.

H* L-

Note that ι -level and φ-level prominence in the SR of *prosecutor* and absence of ι -level and φ-level prominence for any part of the SR of the predicate is established at UR, and these prominence relations are preserved in SR by IDENTRELPROM.

Summarizing, we have shown that the assumption that FoCus and Givenness are represented by *bona fide* morphosyntactic features yields an insightful account of the prosodic effects of those two notions in Standard American and British English. As morphosyntactic features, [FoC] and [G] would be expected to only affect spellout at UR,

but purely phonological constraints would determine the relation between UR and SR. We've proposed spellout conditions for [G] and [FoC] that account for the observed variation in the prominence level for [FoC]-marked constituents. We've also proposed a language-particular ranking of phonological markedness and faithfulness constraints as the source of 'underparsing' and 'overparsing' mismatches between UR and SR, and of the predictable distribution of surface tones for sentences with [G]- and [FoC]-marking.

The following section will track the effects of [FoC] and [G] at the syntax-semantics/pragmatics interface and show that the two features are responsible for two distinct pressures for marking discourse coherence in Standard American and British English. The existence of two distinct discourse requirements related to Givenness and FoCus was obscured by the unifying F(ocus) approaches of Rooth and Schwarzschild, as well as by the various featureless approaches to information structure. The existence of two discourse requirements only emerges once two distinct morphosyntactic features [FoC] and [G] are recognized.

## 7. The meaning and distribution of [FoC] and [G]

The preceding section tracked the behavior of [FoC] and [G] at the syntax-phonology interface. We made a case for the plausibility of the assumption that [FoC] and [G] can influence the mapping from syntactic representations to underlying phonological representations, but the derivation of the surface prosody after that point is driven by phonological principles alone. This is the profile of a morphosyntactic feature in a grammatical architecture where the only interaction between syntax and phonology takes place at the interface. This section will add to this profile by establishing that the meanings of [FoC] and [G] also fit into familiar crosslinguistic paradigms of meanings carried by morphosyntactic features and particles. The major new factual finding of the section is that [FoC]-marking and [G]-marking impose two distinct discourse requirements, with [FoC]-marking taking priority over [G]-marking.

Following up on section 3, we will continue to rely on the Alternatives Semantics of Rooth (1992, 2015, 2016). In Alternatives Semantics, expressions are assigned two semantic

values: O-values (ordinary meanings) and A-values (alternatives sets). Since the discourse requirements triggered by [FoC] and [G] depend on the linguistic and non-linguistic discourse context, we will ultimately need some representation of context. We are not assuming any particular representations of discourse contexts here, as long as they provide an updatable record of available discourse referents within a relevant window.

The meaning contribution of [FoC] is to introduce alternatives, as stated as in (54):

(54) **The meaning contribution of [FoC]**

O-values:

$[\![ [\alpha]_{Foc} ]\!]_{O, C} = [\![\alpha]\!]_{O, C}$.

A-values:

For $\alpha$ of type $\tau$,

$[\![ [\alpha]_{FoC} ]\!]_{A, C} = D_\tau$ (the set of all possible entities of type $\tau$).

This is standard Roothian Alternatives Semantics: The computation of the O-value of $[\alpha]_{Foc}$ overlooks [FoC]-marks and outputs the O-value of $\alpha$. For $\alpha$ of semantic type $\tau$, the A-value of $[\alpha]_{FoC}$ in a context is the set of all possible entities of type $\tau$.

The [G]-feature places a Givenness requirement on the discourse context, which amounts to establishing an anaphoric relationship with a preceding discourse referent.

(55) **Givenness**

An expression $\alpha$ is Given with respect to an individual, property, or proposition $\mathfrak{a}$ iff $[\![\alpha]\!]_{A, C} = \{\mathfrak{a}\}$.

For an expression $\alpha$ to have a chance to be Given with respect to some discourse referent according to (55), it has to have a singleton alternatives set. For this to be possible, it can't contain any [FoC]-marked constituent that has generated alternatives that have not been

blocked from propagating ('consumed') by a FoCus evaluating operator within $\alpha$. This property of Givenness has important consequences for the semantic part of the analysis of second occurrence FoCus to be discussed shortly. To implement the Givenness requirement attached to [G], we are assuming that, technically, [G] is indexed with a discourse referent, a point we have neglected up to now in our representations, and will continue to neglect for convenience when not relevant. We have then:

(56) **The meaning contribution of [G]**

O-values

$[\![ [\alpha]_{G_\alpha} ]\!]_{O, C}$ is defined iff $\alpha$ is a discourse referent in the discourse window preceding C and $\alpha$ is Given with respect to $\alpha$.[40] If defined, $[\![ [\alpha]_{G_\alpha} ]\!]_{O, C} = [\![\alpha]\!]_{O, C}$.

A-values

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

The [G]-feature introduces a Givenness requirement that has to be satisfied by 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, nor does it affect the computation of alternatives. Its contribution is purely use-conditional 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 remain open to the possibility that use-conditional meanings are a distinguished class of meanings requiring their own architecture, as argued in Potts (2003).

Comparing (54) and (56), a crucial difference between [G] and [FoC] becomes apparent. [G] imposes a discourse requirement related to Givenness. [FoC] all by itself does not trigger any discourse requirement, it merely introduces alternatives that can then be used by

[40] . There doesn't seem to be anticipatory licensing of [G]-marking (Rooth 2015) – the antecedent for a [G]-marked constituent needs to come from the preceding discourse.

various FoCus evaluating operators (Beck 2016). 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).

While speakers are free to [FoC]-mark just about anything they please, [FoC]-marked constituents must be c-commanded by a ~ operator. This requirement might be enforced in the syntax via a feature agreement relationship between an interpretable occurrence of [FoC] that marks the FoCused constituent, and an uninterpretable version of [FoC] that comes with the ~ operator, which marks the scope of the FoCus.[41] Such an agreement relation is suggested by the Sinhala facts reviewed in section 2. FoCusing thus always carries a commitment to contrast in the technical sense defined below (spelled *Contrast* from now on). A more fleshed-out representation of our earlier dialogue about Sarah vs. Eliza mailing the caramels is (57).

(57) Me: [Sarah mailed the caramels]$_{\alpha}$.
You: (No), $\sim_{\alpha}$ [ [Eliza]$_{FoC}$ [mailed the caramels]$_{G}$]

Like [G], the ~ operator comes with an index 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 (57) represents a Contrast with what I said before. (58) is a first attempt to define the notion of Contrast representation that we are after.

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[41] . We will neglect the presence of uninterpretable [FoC] on the ~ operator in our representations.

(58) **Contrast representation (not final)**

An expression $\alpha$ represents a Contrast with a discourse referent (individual, property, proposition) $\mathfrak{a}$ iff conditions (i) and (ii) are satisfied:

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

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

The meaning definition for the ~operator can be stated as in (59):

(59) **The ~ operator**

O-values

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

A-values

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

As in Rooth (1992), the ~ operator uses the alternatives determined by its scope to impose a Contrast requirement. But there are two crucial departures from Rooth. The first one is that our notion of Contrast has no provision for antecedents that are questions. This is as it should be. We saw in sections 4 and 5 that constituent questions all by themselves do not necessarily trigger a FoCus in the answer. The new part of a question could be merely new, and would then be unmarked. FoCus has no privileged relation with questions, then. This does not mean that we shouldn't care about question-answer-congruence. Question-answer congruence is established via the Given part of answers to constituent questions on our approach. Important insights about the connection between Information structure and questions, in particular about implicit questions as potential discourse organizers (Roberts 1996, 2012), remain untouched.

Our second major departure from Rooth is that we are not assuming that the ~ operator stops the propagation of alternatives and thereby blocks access to those alternatives for

other FoCus evaluating operators. Bade & Sachs (2019) make a convincing case that not all operators that evaluate alternatives stop the propagation of alternatives. If they did, all such operators would trigger intervention effects, which they document is not the case. We propose that our ~ operator never blocks ('consumes') the propagation of FoCus alternatives. It's FoCus-evaluating operators like *only* and *even* that do, and this is why those operators show intervention effects (Beck 2006). *Only* and *even* might either directly block the propagation of alternatives, or else they might subcategorize for a species of ~ operator that does, as proposed by Bade & Sachs. For convenience, we will illustrate the first possibility, but without prejudging the issue either way. A simplified version of the semantics of *only* (neglecting presuppositions, for example) would look as follows[42]:

(60) **The semantics of *only* (good enough for present purposes)**

O-values

$[\![ \textit{only}\ \alpha ]\!]_{O, C} = \lambda w\ \forall q\ ((q \in [\![ \alpha ]\!]_{A, C}\ \&\ q(w)) \rightarrow [\![ \alpha ]\!]_{O, C}$ entails q)

A-values

$[\![ \textit{only}\ \alpha ]\!]_{A, C} = \{[\![\textit{only}\ \alpha ]\!]_{O, C}\}$.

As stated, the semantics in (60) amounts to saying that for a sentence like 61(a) below to wind up true, Amanda has to have passed the bar exam, and all other propositions in the alternatives set for 61(b) (the scope of *only*) have to be false. This alternatives set is shown in 61(c). Crucially, those alternatives are no longer available once they have been consumed by *only*. The alternatives set for 61(a) as a whole is thus the singleton set 61(d).

(61) a. Only [$\sim_{\alpha}$ [Amanda]$_{FoC}$ passed the bar exam].

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[42] . We are aware that meaning definitions for *only* that directly access FoCus alternatives may feel like a step backwards in the light of Rooth (1992), which does not posit any alternatives evaluating operators apart from his version of the ~ operator. While we are not committed to an analysis along the lines of (60), the best we could do would be an analysis conforming to what Rooth (1992) calls an "intermediate theory" of association with FoCus, which is the option chosen in Bade & Sachs (2019). Apart from Bade & Sachs (2019), Rooth's strong theory has been challenged in Beaver & Clark (2003, 2008). The explanation of Secondary Occurrence FoCus facts below also support a weaker theory of association with FoCus.

b. [$\sim_{\alpha}$ [Amanda]$_{FoC}$ passed the bar exam].

c. {Amanda passed the bar exam, Noah passed the bar exam, Eliza passed the bar exam, Leif passed the bar exam …}.

d. {'Only Amanda passed the bar exam'}.

All the ~operator itself contributes to the interpretation of 52(a) is a Contrast requirement with a possibly accommodated antecedent. In this particular example, the Contrasting antecedent could be the accommodated proposition that somebody who was not Amanda passed the bar exam. This proposition would be in the alternatives set for 61(b) if we assume that alternatives sets of relevant types are closed under disjunction.

Our assumptions about [FoC], the ~ operator and operators like *only*, imply the important consequence in (62):

(62) **The interaction of Givenness and FoCus (derivable)**
No constituent α can be Given (with respect to some entity) if it contains a [FoC]-marked constituent $\beta$ without also containing an operator that consumes the alternatives generated by $\beta$.

Constituents that are [FoC]-marked have non-singleton alternatives sets, assuming that no semantic domain is a singleton. Since Givenness of a constituent requires a singleton alternatives set, it follows that no constituent can be both [G]-marked and [FoC]-marked. More generally, any constituent that contains a [FoC]-marked constituent has a non-singleton set of alternatives, unless it also contains an operator that consumes those alternatives. If *only*, but not the ~ operator, stop the propagation of alternatives, we have an explanation for the otherwise puzzling distribution of pitch accents in examples like (63) from Büring (2015).

(63) Our grad students only quote the faculty. — No, the FAculty only quote the faculty. Büring (2015, 74).

The second part of this exchange has two instances of the DP *the faculty*, which already occurred in the first sentence. Both instances of *the faculty* in the second sentence are FoCused. The first instance shows the expected prosodic effects of FoCus, the second one has the prosody of second occurrence FoCus. Within our framework of assumptions, (63) would be represented as (64), neglecting the index for [G]:

(64) [Our grad students only quote the faculty]$_{p}$ .— No
$\sim_{p}$ [ [The faculty]$_{FoC}$ [only $\sim_{a}$ [quote [the faculty]$_{FoC}$ ] ]$_{G}$ ].

Even though it repeats an earlier occurrence, the first instance of *the faculty* in (64) can't be Given, hence can't be [G]-marked, since it is [FoC]-marked to produce the intended Contrastive interpretation. This instance of *the faculty* is thus expected to show the prosodic effects of FoCus. It has a pitch accent. The second occurrence of *the faculty* in (64), on the other hand, is a FoCused phrase contained within a VP that is headed by *only*, which consumes the alternatives generated in its scope. This VP is Given, and the second occurrence of *the faculty* in (64) thus shows the prosodic effects of second occurrence Focus. It has no pitch accent. Note that the embedded $\sim_{a}$ operator has no overt antecedent in the previous sentence. We have to accommodate a Contrasting antecedent like the property of quoting someone who is not a member of the faculty.

The discussion of example (64) shows that on the proposed analysis, [FoC] and [G] interact so as to imply that a [FoC]-marked phrase is never [G]-marked, even if it has just been mentioned before. It will then be realized with a pitch accent, unless it appears within a [G]-marked constituent that also contains an operator that consumes its alternatives. Büring (2015) meant examples like (63) to show that the simple and intuitive idea of a second occurrence FoCus as a FoCus contained within a Given constituent is not viable. We have shown that this idea is viable indeed – the apparently problematic facts in Büring (2015) follow from natural assumptions about FoCus, Givenness, and the propagation and consumption of alternatives within an alternatives semantics.

Going back to our definition of Contrast representation in (58), it turns out that it is too liberal. As observed in Schwarzschild (1993) and reported in Truckenbrodt (1995), definitions like (58) allow overFoCusing and thus incorrectly predict that 65(b) represents a Contrast with the proposition expressed by 65(a), for example. The O-values of 65(a) and (b) are different, and the O-value of 65(a) is a member of the A-value of 65(b). This is not good.[43]

(65) 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 (65). Adapted to our framework, Schwarzschild's Contrast Constraint delivers a criterion for disqualifying an expression $\alpha$ from representing a Contrast with an entity $\mathfrak{a}$ if a Contrast with $\mathfrak{a}$ could also be represented by what we will call a "FoC/G-variant" of $\alpha$ 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. 66(a) to (e) illustrate the idea behind Schwarzschild's Contrast Constraint. Since [G]-marking does not affect the computation of A-values in this particular example, we are neglecting [G]-marking possibilities.

(66) $\mathfrak{p}$ = 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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[43] . 65(b) can be used to contradict 65(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]$_{FoC}$.

66(a) to (e) are FoC/G-variants of each other. According to (58), they should all represent a Contrast with the proposition ƥ that John picked strawberries at Mary's farm. Here is why. 66(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 ƥ, hence condition (ii) of (58) is satisfied. Condition (i) is satisfied as well, since ƥ is a member of the A-values of 66(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 66(a) represents a good contrast with ƥ, 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 66(b) to (e) from representing a Contrast with ƥ, we compare their A-values to that of 66(a). What we see is that the A-value of 66(a) is a proper subset of all the others:

(67) $[\![ 54(a) ]\!]_{A, C} \subset [\![ 54(b) ]\!]_{A, C} \subset [\![ 54(d) ]\!]_{A, C} \subset [\![ 54(e) ]\!]_{A, C}$
$[\![ 54(a) ]\!]_{A, C} \subset [\![ 54(c) ]\!]_{A, C} \subset [\![ 54(d) ]\!]_{A, C} \subset [\![ 54(e) ]\!]_{A, C}$

Among the choices in 66(a) to (e), we should thus pick the one with the smallest alternatives set as representing a Contrast with ƥ. Incorporating Schwarzschild's Contrast Constraint, our definition of Contrast representation can now be amended as in (68):

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

Some Contrasts are trivial. In 69(a) to (c), for example, every word is part of a [FoC]-marked constituent and there are no [G]-marked or unmarked (new) parts.

(69) 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 of the relevant type. Such alternatives sets are trivial in the sense that they coincide with a semantic domain $D_\tau$ for some type $\tau$. Definition (68) doesn't make 69(a) to (c) ineligible for representing Contrasts with some discourse antecedent. We think that this is right, since examples like 69(a), for example, might easily be uttered by a grade school teacher giving dictation. However, 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 does not extend to trivial Contrasts. While there is nothing ungrammatical about representing trivial Contrasts on our account, then, there is no pragmatic pressure to represent them. At what point do Contrasts become too trivial? Where exactly is the cut-off point? The question needs more investigation, and we have to leave it open here.

We have now laid out the semantic properties of [G]-marking and [FoC]-marking and explored how those two features interact, but we haven't yet said anything about when to [FoC]-mark or [G]-mark. Williams (1997) discusses cases where constituents that might seem to be Given are nevertheless obligatorily FoCused. (70) illustrates with an example that is a variation of one by Williams.

(70) 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 (70) is deviant in the given context, and severely so. According to Williams (1997: 599), the problem with cases like (70) 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 (70). Rephrasing the diagnosis in our own words, there appears to be a problem when two sister constituents $\alpha$ and $\beta$ lack prominence without their mother constituent $\alpha\beta$ being Given. In your reply in (70), both *doubted* and *that it would be cold* lack prominence, but *doubted that it would be cold* as a whole is not Given.

Williams' diagnosis doesn't seem quite right yet. 71(a) and (b) go against it.[44]

(71) a. Sally ran into Max before getting money from the ATM. She ended up lénding [ [Max]$_G$ [some of the money]$_G$].[45]

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

71(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 71(a) and (b) have configurations where two sister constituents lack prominence without their mother constituent being Given. What, then, is the difference

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[44] . Williams would rule out 71(a) and (b) as violations of his Disanaphora Law. For Schwarzschild, his Givenness requirement would be violated, and for Wagner his Relative Givenness requirement.

[45] . We are assuming that [*Max some of the money*] is a constituent in 71(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]].

between the deviant example (70) on the one hand, and the acceptable 71(a) and (b) on the other?

Our assessment of the deviance of your reply in (70) is that in Standard American and British English, there is pressure for representing (non-trivial) Contrasts with salient discourse referents from the preceding discourse.[46] (70) is deviant because opportunities for representing Contrasts have been overlooked. There were two such opportunities, which are represented in (72) and (73).

(72) Me: Roman doubted that it would be hot and [(he) predicted that it would be cold]$_{\text{p}}$.
You: $\sim_{\text{p}}$ [ [Máx]$_{\text{FoC}}$ [dóubted]$_{\text{FoC}}$ [that it would be cold]$_{\text{G}}$].

(73) Me: [Roman doubted that it would be hot]$_{\text{p}}$ and predicted that it would be cold.
You: $\sim_{\text{p}}$ [ [Máx]$_{\text{FoC}}$ [doubted]$_{\text{G}}$ that it would be [cóld]$_{\text{FoC}}$].

71(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. It's a push for discourse coherence. We propose the principle in (74), which forces [FoC]-marking when there are opportunities for representing non-trivial Contrasts:

(74) **Pressure for [FoC]-marking**
[FoC]-mark constituents to represent non-trivial Contrasts with discourse referents in the preceding discourse.

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[46] . While English also allows Contrasts to be represented with discourse referents in the subsequent context, there doesn't seem to be pressure to do so.

Examples (72) and (73) illustrate how Pressure for [FoC]-marking can force [FoC]-marking, and thereby preempt [G]-marking. Once a phrase is [FoC]-marked, it can no longer be [G]-marked, since it's no longer Given. (72) has a FoCused occurrence of *doubted*, for example, even though that occurrence of *doubted* is a second occurrence. Likewise, the FoCused adjective *cold* in (73) is part of a second occurrence of a sentential complement. Neither (72) nor (73) show even the slightest hint of the reduced prominence characteristic of second occurrence FoCus. This is another illustration of one of the major consequences of the proposed semantics of [FoC] and [G]: [FoC]-marking a constituent preempts its being Given.

While [FoC]-marking can preempt [G]-marking, its powers are reined in by the condition for Contrast representation. The semantics of the ~operator will rule out as deviant (presupposition violations) representations like 75(a) and (b), for example.

(75) a. [Mari climbed Mount Toby] $_{p}$ before ~ $_{p}$ [Molly climbed Mount Toby]$_{FoC}$.
b. Mari [climbed Mount Toby] $_{a}$ before Molly ~ $_{a}$ [climbed Mount Toby]$_{FoC}$.

75(a) violates the condition for Contrast representation, since there is a FoC/G variant of the [FoC]-marked constituent that has a smaller alternatives set that also contains the antecedent proposition. In such a variant, the second occurrence of the VP *climbed Mount Toby* would be [G]-marked, and *Molly* would be [FoC]-marked. 75(b) also violates the condition for Contrast representation, but for a different reason. In this case, the antecedent is identical to the [FoC] marked constituent, hence the distinctness requirement of the condition for Contrast representation is not satisfied. Unlike 75(a) and (b), example (64) from Büring (2015), which we discussed earlier, has no violation of the condition for Contrast representation:

(64) [Our grad students only quote the faculty]$_{p}$. — No,
~$_{p}$ [ [The faculty]$_{FoC}$ [only ~$_{a}$ [quote [the faculty]$_{FoC}$ ] ]$_{G}$ ].

The Contrast condition for the matrix $\sim_p$ operator is clearly satisfied. What about the embedded $\sim_a$ operator? Here, it is important to note that the contrasting antecedent has to be accommodated. We are contrasting the property of quoting the faculty with the property of quoting somebody who is not a faculty member, a property that has not been mentioned explicitly, but is contextually understood. Neither (72) nor (73) above violate the condition for Contrast representation. In both cases, the matrix $\sim_p$ operator has the option of choosing a properly contrasting antecedent. It seems, then, that the condition for Contrast representation is able to prevent [FoC]-marking from indiscriminately preempting [G]-marking.

Returning to [G]-marking, there is a condition on [G]-marking that our representations have been conforming to without much discussion. Function words (as opposed to content words) and strings of function words are generally not [G]-marked[47]. We have then:

(76) **Pressure for [G]-marking**
[G]-mark constituents that are Given with respect to discourse referents in the preceding discourse unless they contain no content word.

Also, as a notational convention, we have not been indicating predictable nesting of [G]-marking in our representations, but this has no theoretical significance.

A question that is now on the table is why there are such principles as Pressure for [FoC]-marking 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 hold Heim's (1991) principle 'Maximize Presuppositions' responsible, as proposed in Wagner (2005, 2012). 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 German *ja* and *doch*, which only have use-conditional meanings,

[47] . At the end of the day, this property is likely to follow from general properties of function words and doesn't have to be stipulated.

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 for another occasion.

Another important question that we will have to leave for more detailed investigation is what happens when there are opportunities for representing non-trivial Contrasts with two or more distinct or overlapping discourse referents. Might there be a ranking among eligible antecedents, maybe privileging Contrasts that 'maximize backgrounds', as Truckenbrodt (1995) has suggested? We don't know (yet).

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 be. The two features have very different types of meanings, but both types fall into familiar categories that, crosslinguistically, are known to be carried by features and particles. [FoC] is like the [*wh*]-feature in that it forms operator structures and may trigger movement and verbal agreement. One of the differences between [FoC] and [*wh*] is that [FoC], but not [*wh*], has to enter an agreement relation with a ~operator that carries an uninterpretable version of [FoC] and imposes a Contrast requirement, rather than creating a question denotation, for example. The [G]-feature falls into the category of discourse particles like German *ja* or *doch* (Kratzer 2004). Unlike [FoC], but like the discourse particles *ja* or *doch*, [G] directly imposes a discourse requirement related to properties of the ongoing discourse. It doesn't form operator structures.

A major new finding reported in this section was that [FoC] and [G] trigger two distinct discourse requirements, with the Contrast requirement triggered by [FoC] taking priority over the Givenness requirement imposed by [G], a fact that follows from the properties of [FoC] and [G] within an alternatives semantics. A speaker of Standard American and British English, then, has to monitor the preceding discourse both for opportunities to mark Contrasts and for opportunities to mark Givenness. This finding seems relevant for theories

of language production and processing, as it adds even more chores to the already overloaded to-do list of a discourse participant than what was previously known.

Finally, we were able to complement the phonological analysis of Secondary Occurrence FoCus presented at the end of section 6. Our overall analysis instantiates the intuitive idea that a second occurrence FoCus is a FoCus enclosed within a Given constituent. We saw that this idea makes the right predictions if implemented within the proposed semantics, as long as the enclosing Given constituent also contains an operator that consumes the alternatives the enclosed FoCus generates.

## 8. Conclusions

In this long argument stretching over the last six sections, we took our lead from the known fact that there are syntactically motivated features for Givenness and FoCus. But there is currently no account of the fate of those features at the syntax-phonology or the syntax-semantics/pragmatics interfaces. Some scholars have argued that the prosodic effects of notions related to focus or givenness in Standard American and British English are not due to any features at all, others have assumed features that could not possibly play any role in syntax. As a first step towards arriving at a view that might reconcile the divergent positions, we confirmed that in Standard American and British English there is no representation of newness. We showed that the apparent prosodic effects of newness are due to default prosody. With 'newness focus' eliminated as a type of 'focus', a Contrast-related notion of FoCus emerged that can be identified with a syntactically motivated feature [FoC], and which would then combine with FoCus sensitive operators to generate a whole range of Contrast-related types of FoCus, including contrastive topics, mirative focus, exclusive focus, corrective focus, and so on. While newness isn't represented, Givenness is, as has already been widely assumed since Féry & Samek-Lodovici (2006). Even though there is wide consensus about the representation of Givenness, this has not led to the elimination of the notion of 'answer focus' in the existing literature. Answers to constituent questions continue to be a standard diagnostic for the presence of focus, as e.g. in the introduction to the Féry & Ishihara's (2016) handbook, following Krifka (2008), or in

Büring's (2016) textbook. Yet, as we saw, if newness is not represented, it's Givenness not any notion of 'focus' that is responsible for question-answer congruence.

In sections 6 and 7, we provided an account of the fate of [FoC] and [G] at the syntax/phonology and the syntax-semantics/pragmatics interfaces. No major theoretical innovations were needed to spell out the meaning contributions of [FoC] and [G]. However, the recognition of two distinct features for Givenness and FoCus led to a new analysis of second occurrence focus and the discovery of two distinct interacting pressures for marking coherence relations in an ongoing discourse.

The phonological part of our account in sections 5 and 6 required major theoretical innovations, for the simple reason that there is no existing account of what it would even mean to prosodically spell out a morphosyntactic feature. We posited an underlying phonological representation for prosodic structure where syntactic constituency is spelled out as prosodic constituency at ω-level and above, and where the features [G] and [FoC] are spelled out in terms of prosodic prominence or the absence thereof. Purely phonological constraints on the surface distribution of prosodic headedness accounted for the distribution of prosodic prominence in the surface phonological representation of all-new sentences, as well as those with [G]- and [FoC]-marked constituents. The new markedness constraints HEAD-IN-φ and UNEQUAL SISTERS were proposed to supplant any version of the still widely assumed 'Nuclear Stress Rule', which would wrongly place greatest prominence at the right of any prosodic constituent and thus goes against the results of Katz & Selkirk 2011. The English-particular ranking of prosodic markedness and faithfulness constraints of the phonology *per se* provided new accounts of constituency mismatches between surface phonological φ structure and the corresponding morphosyntactic structure, including the 'dephrasing' of Given phrases, and the surface 'overparsing' of a verb as a φ.

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