

# Unalternative Semantics for Beginners

## A story with quite a few pictures

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### Abstract

UNALTERNATIVE SEMANTICS (UAS), the theory introduced here, presents a new way to calculate focus alternatives. It directly and compositionally calculates focus alternatives from stress patterns, without the mediation of [F]-markers or similar devices. These alternatives, once assigned to the tree by the semantic rules of UAS, can then be put to use in pretty much the same way as in all other theories. There are other differences, and potential for even more radical changes, but these are not discussed in this paper, the aim of which is to give an informal, yet concise presentation of the basic ideas and techniques, leaving out technical details (for which see Büring, 2015, forthcomingb,f).

**UAS**  
UNALTERNATIVE  
SEMANTICS

## 1 Basic Concepts

### 1.1 What is focussing?

The interpretation of intonation —stress and accent in particular— routinely relies on the notion of ALTERNATIVES. Alternatives are meanings, assigned to sentence complete with prosody by the compositional semantics. Pragmatic rules about when which intonation is appropriate can then refer to these alternatives.<sup>1</sup> Different proposals employ slightly different rules, but the bottom line is usually that one of the alternatives is identical, or at any rate directly semantically related (e.g. by entailment), to some other utterance in the discourse, its FOCAL TARGET,

FOCUS AL-  
TERNATIVES

**FT**  
FOCAL TAR-  
GET

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<sup>1</sup>In some cases, like where *only*, *also* and similar expression are involved, alternative might also feed into the compositional semantics, influencing truth conditions; we'll leave these for later.

henceforth FT. Consider the following dialogue:

- (1) Abby: Oh look, Mom made pancakes!  
Ben: No, DAD made pancakes!

Ben will most likely pronounce his reply in a particular way: the word *dad* must bear heavy stress and a pitch accent, and no pitch accents may follow it; as is usual, I indicate this by capitals. A simple theory of this goes as follows: Ben wants to relate his utterance to Abby's. In order to signal this relation, he FOCUSSES those constituents in his utterance that make it different from Abby's (or equivalently: BACKGROUNDS those that do not). Put differently, replacing the focussed constituents by others, you could turn Ben's sentence into Abby's.

FOCUSSING  
BACKGROUNDING

- (2) 

DAD
mom

 made pancakes

We can state this as follows:

- (3) a. help to identify your focal target by...  
b. using a prosody that helps to identify those constituents that...  
c. need to be 'replaced' in order to turn your sentence into the focal target

The felicity of the prosody in (1) shows that putting the main (and only) stress and accent on *dad* is a way to signal it as a constituent that needs to be replaced to get the meaning of the target. Put in common theoretical parlance, this prosody is a licit realization of FOCUSING the constituent *dad*, and focussing *dad* in this sentence allows us to derive the FOCUS ALTERNATIVE 'mum' for *dad*, and ultimately, the focus alternative 'mum made pancakes' for *DAD made pancakes*. The stress and accent pattern therefore succeeds in signaling a relation to an utterance of *Mum made pancakes*.

## 1.2 What should a theory of focussing deliver?

The relation between the prosody and what is focussed should be modeled by a theory of FOCUS REALIZATION; often this takes the form of rules that relate accent and stress on words to a diacritic [F] on non-terminal syntactic nodes dominating those terminals, e.g. 'an [F]-marked constituent contains the main stress'. Modeling the relation between structures in which the focus has been identified and their focus alternatives is the responsibility of FOCUS SEMANTICS; arguably

FOCUS RE-  
ALIZATION

FOCUS  
SEMANTICS

the most popular variant of this is Alternative Semantics, as developed by Mats Rooth, which I just gave a toy version of using the notion of ‘replacing a constituent’. Finally, stating what relation has to hold between these FAs and the context for the focussing (and thus ultimately: the prosody) to be felicitous is the subject of FOCUS INTERPRETATION or, if your will, FOCUS PRAGMATICS. The particular hypothesis just sketched—that the focal target needs to be one of the focus alternatives—is again a slightly simplified version of the proposal in Rooth (1992).

FOCUS  
PRAGMATICS

Summing up:

- (4) **focus pragmatics:** a focal target must be a focus alternative of the sentence which targets it

**focus semantics:** whether or not some A is a focus alternative of a sentence S depends on the location of F-markers in S: A must be obtainable by replacing (the meaning of) F-marked constituents in (composing the meaning of) S

**focus realization:** the location of F-markers in a sentence S tightly restricts the prosody S must have: roughly, the main stress of S must be within the F-marked constituent

There is no inherent directionality among the components in (4). Once the details are filled in, the components in (4) jointly describe a relation (a ‘mapping’) between focal targets and PROSODIFIED TREES (i.e. syntactic phrase markers plus a representation of the relevant aspects of their prosody).

PROSODIFIED  
TREES

It may, however, be helpful to *think* of it in more ‘directional’ terms. In one direction, we start with a FT (‘I know what I want to reply to’) and a syntactic tree (‘I know what I want to say’), and derive the correct prosody for the tree (‘how to say it’). In the other direction, we start out with a prosodified tree (‘I know what I heard’) and derive the set of meanings this could target—the POTENTIAL FOCAL TARGETS (PFTs).

PFT  
POTENTIAL  
FOCAL  
TARGET

As the reader probably noticed, the two directions are a bit lopsided: starting with a FT and a tree, we get *the* correct prosody for the tree; starting with a prosodified tree, we merely get the set of all PFTs it *could* target. It is, as it were, left to the hearer to look around for one of them in the context and figure out if that is plausibly the one the speaker meant to relate to. While this lopsidedness is partly owed to the simplified way of describing things here (in reality, we do not derive a unique prosody for the tree, but merely a unique stress or accent pattern, which can still lead to a number of different actual prosodic realizations), there is

also something fundamental in it: We cannot expect the theory to predict *the* FT from the prosodified tree alone; at best we can get *the* set of PFTs.

## 2 Introducing Unalternative Semantics

Unalternative Semantics (UAS), the theory to be introduced here, is first and foremost a new way to calculate focus alternatives. It rolls focus realization and focus semantics into one, by directly and compositionally calculating focus alternatives from stress patterns, without the mediation of [F]-markers or similar devices. These alternatives, once assigned to the tree by the semantic rules of UAS, can then be put to use in pretty much the same way as in all other theories of focus pragmatics. Since this latter part is not the topic of this paper, it will be ignored here; a few pointers to the pragmatic and prosodic implications of UAS are given in section 3 below.

We will approach UAS in small steps which hopefully help to illustrate the main ideas and general shape of it, without getting bogged down in technical, particular semantic, details (again, see Büring, 2015, for a full exposition of those). Likewise, comparison with other approaches and demonstration of the particular advantages of UAS are not included here; again some pointers can be found in section 3.

### 2.1 Prosodifying Trees

Starting with the speaker’s perspective, take Ben who wants to correct Abby. He starts out with the FT —that mom made pancakes— and the syntactic tree for what he wants to say. From that he determines, as first steps, which nodes of the tree need to be ‘replaced’, see fig. 1.

In order to figure out the stress pattern for his utterance, Ben needs one more thing: he needs to know the default rules for assigning stress in syntactic trees (to ‘prosodify’ the syntactic tree). For right now, that is actually just one rule:

- (5) **DEFAULT STRESS (DS):**  
label the left sister “w(eak)” and the right sister “s(trong)”

**DS**  
DEFAULT  
STRESS

Now Ben can proceed from the root of the tree down, using DS and the following constraint:

- (6) **What Must Not Happen (WMNH):** The weak sister contains a con-

**WMNH**  
WHAT  
MUST NOT  
HAPPEN

Abby: “Mom made pancakes!”

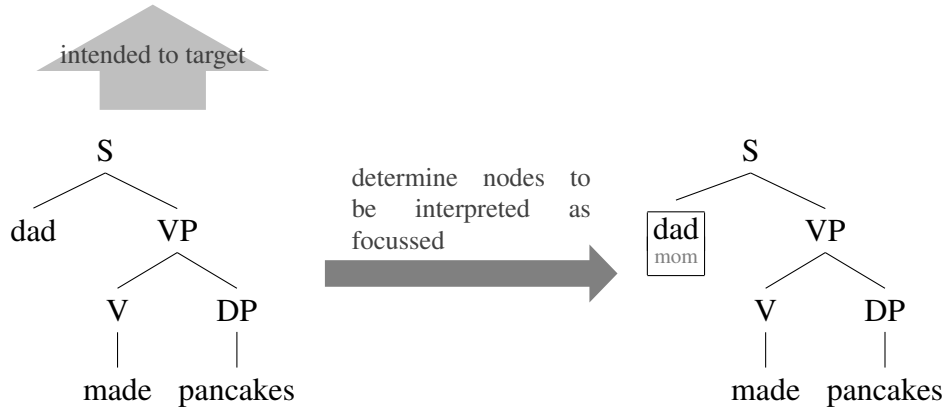
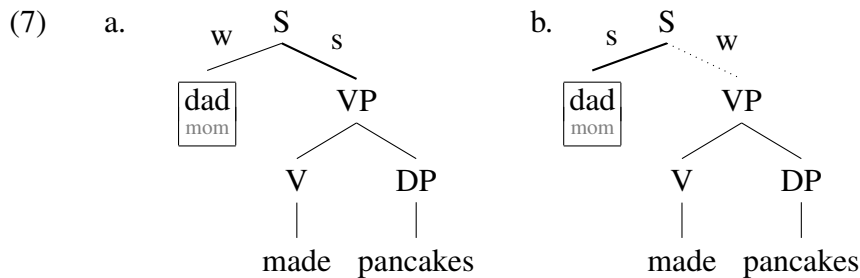


Figure 1: Ben figures out what needs to be interpreted as focussed.

stituent to be focussed, and the strong sister does not.

(WMNH is not part of the official theory, but illustrates the principal idea behind the two official rules, WEAK and STRONG RESTRICTION, to be introduced below, which do its job in the formal version.)

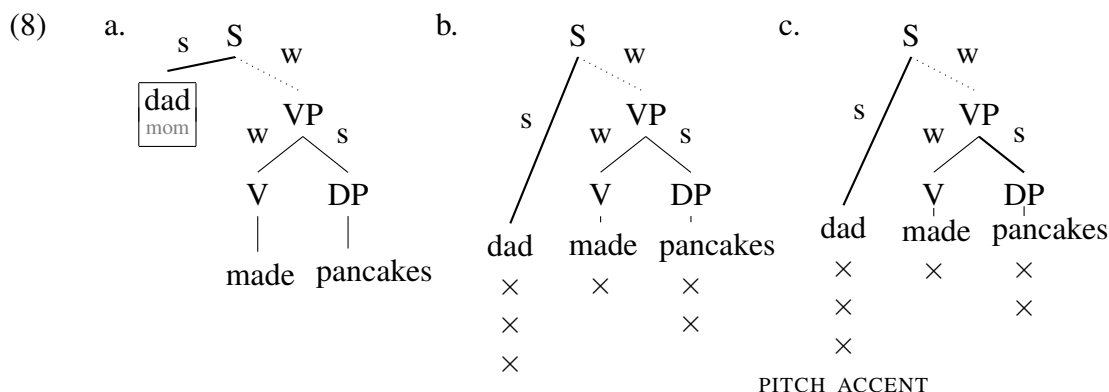
Starting with the second tree from figure 1, Ben runs into a conflict between DS and WMNH right away, at the root node. By DS, he should label as in (7a), but that runs counter to WMNH. Labeling as in (7b) conforms to WMNH but goes against the default. In such a case, WMNH always wins. Ben labels as in (7b).



For perspicuity, the branch to the strong daughter is bolder; also, where a branch that ought to be strong by DS ends up weak instead (due to WMNH) that branch is dotted; these are just to help keep track of what is happening, they are not part of the official system (as the labels are). I will say that the S node in the tree in

(7b) has undergone PROSODIC REVERSAL (PR), and that the VP *made pancakes* has been PROSODICALLY DEMOTED.

As a last step, VP needs to be labeled. Since neither of its daughters need to be interpreted as focussed, WMNH is vacuously met and DS applies, (8a).



(8a) is a metrical tree, as familiar from metrical phonology, which leads to the stress pattern in (9b), and ultimately to the accent pattern in (9c). The rules that do this need not concern us much here, since they are fairly standard, and do not interact with focussing at all.<sup>2</sup> By deriving (10a) we have derived the metrical ('prosodified') tree needed to contrast Ben's utterance with 'mom made pancakes'.

As good recipes do, this recipe works across the board. Suppose Ben wanted to say *mom bought pancakes*, he would start out in the situation depicted in figure 2. From there, things proceed as in (11).

<sup>2</sup>If you *must* know...

- (9) **Metrical Tree to Stress Grid:**  
An assignment of degrees of stress to the terminals of a metrically annotated phrase marker T is legitimate iff for any branching node N in T, N's s(trong) daughter dominates a terminal with a higher degree of stress than that of any terminal dominated by a w(eak) daughter of N.
- (10) **Stress–Accent Association:**  
For every (improper) substring S of terminals, the rightmost pitch accent in S is associated with a strongest-stress-level terminal in S (i.e. a terminal T in S for which there is no T\* in S that bears a higher stress level than T).

Abby: “Mom made pancakes!”

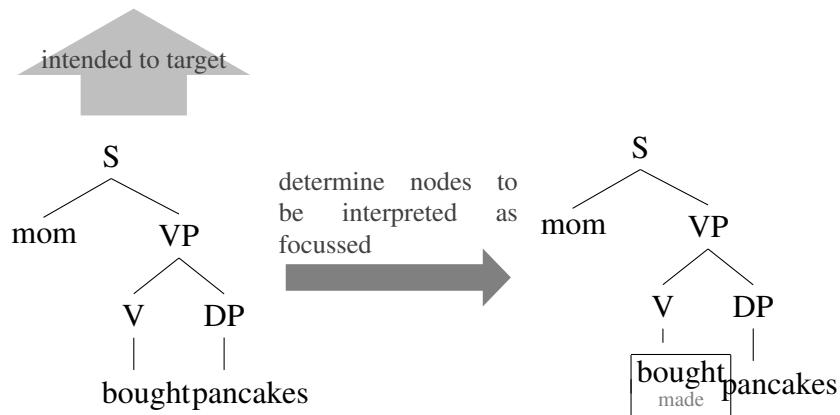
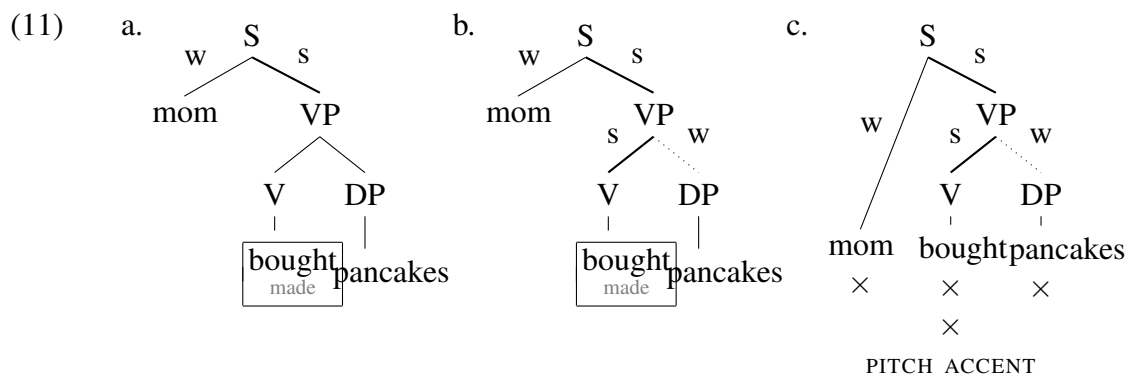


Figure 2: Once again, Ben figures out what needs to be interpreted as focussed.



This time, there is no problem labeling S according to DS, (11a), since the default strong daughter, VP, contains a constituent to be interpreted as focussed (in which case, WMNH is automatically satisfied, regardless of the weak sister’s content). However, at VP, default weak–strong labeling among V and DP would violate WMNH. Again, PR must apply, (11b), ultimately leading to the intuitively correct stress and accent pattern (11c).

## 2.2 Deriving Potential Focus Alternatives

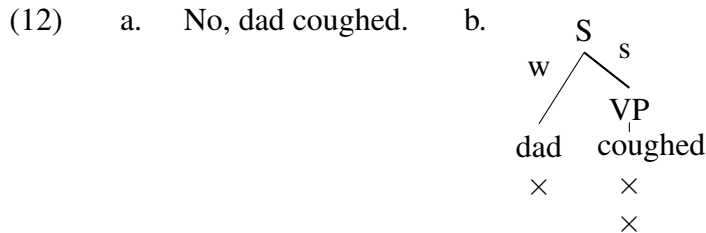
Now let us assume the hearer’s perspective, which will bring us closer to the formal implementation of UAS. When Abby hears Ben say *DAD made pancakes*

the grammar of focus should tell her that Ben intends to relate his utterance to a proposition of the ‘form’ **x made pancakes** (recall that it is up to Abby, not grammar, to figure out which particular proposition that is). The strategy for that starts by assigning a prosodified tree to Ben’s utterance, which will be the one we already saw in (8); deriving PFTs from that involves, as before, knowledge of DS.

Abby must practically run the steps that lead to Ben’s prosodification backwards. If a branching node has non-default prosody, this must be because of WMNH. The one case WMNH excludes is for the weak daughter to contain a constituent to be interpreted as focussed, while the strong daughter does not; the contraposition of that is that *non*-default prosody will be found if and only if the weak daughter contains a constituent to be interpreted as focussed, while the strong daughter does not.

Applying this to (8), we find that the subject *dad*—strong, against the default—must be focussed, while VP (and anything inside of it) must not be. In other words, (8)’s prosody unambiguously indicates narrow subject focus; the PFTs are all meanings of the form **x made pancakes**, as desired.

What if Ben had said (12a), an utterance with normal intonation? The structure that corresponds to that is given in (12b).



Given that there is default prosody in this tree, this means that the intended focussing here is compatible with WMNH, i.e. it is *not* the case that the weak sister contains a constituent to be interpreted as focus and the strong sister does not. Applying a little propositional logic, we find that this actually comprises three possibilities for what *could* be the case:

- the weak sister does not contain a constituent to be interpreted as focus and the strong sister does
- both sisters contain constituents to be interpreted as focus
- none of the sisters contain constituents to be interpreted as focus



In traditional parlance: either we have (broad) mother focus, or strong-daughter focus, or no focus at all. In the case of (12): S focus, VP focus, or no focus at all. Given that Ben’s utterance was not discourse initial, Abby might reason that Ben wanted to relate his utterance to something in the context, and then deduce that her previous *Mom made pancakes* is the intended FT.

Instead of running WMNH ‘backwards’ at every branching node, UAS employs, at its heart, two restrictions which will actually yield the same results as running WMNH backwards:

- (13) **WEAK RESTRICTION (WR; applies among sisters that show default prosody)**  
 If the weak daughter contains a constituent to be interpreted as focus, the strong daughter does, too.  
 (‘weak daughter is not a narrow focus’)
- (14) **STRONG RESTRICTION (SR; applies among sisters that show prosodic reversal)**  
 The strong daughter contains a constituent to be interpreted as focussed, the weak daughter does not.  
 (‘strong daughter is a narrow focus’)

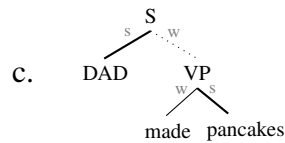
**WR**  
WEAK RE-  
STRICTION

**SR**  
STRONG RE-  
STRICTION

Applying WR and SR at every branching node, we actually derive a description of the focussings compatible with a prosodified tree. (15) shows this for the three logical possibilities in the structure discussed so far. They show how the restrictions ‘add up’ in these simple trees. ‘Is focal’ abbreviates ‘is or contains (part of a) focus’; the bottom lines show which constituents may be interpreted as focussed ( $\approx$ introduce alternatives) according to these restrictions.<sup>3</sup>

- (15) a.
- $WR_S$  : if *mom* is focal, *made pancakes* is focal  
 $WR_{VP}$ : if *made* is focal, *pancakes* is focal  
 POSSIBLE FOCI: Obj, VP, S (Sbj +Obj)
- b.
- $WR_S$  : if *mom* is focal, *bought pancakes* is focal  
 $SR_{VP}$ : *bought* is focal, *pancakes* is not  
 POSSIBLE FOCI: V (Sbj+V)

<sup>3</sup>Parenthesized are DISCONTINUOUS FOCI, which are of no concern in the present paper, see Büring, forthcominga, for discussion.



$SR_S$  : *dad* is focal, *made pancakes* is not

$WR_{VP}$ : if *made* is focal, *pancakes* is, too

POSSIBLE FOCI: *Sbj*

The reader may verify that the resulting possible focussings are exactly the expected ones. Example (15a), which shows default prosody, is compatible with interpreting *pancakes*, *made/burned pancakes* or *mom made/burned pancakes* as focussed. Examples (15b) and (15c), with non-default prosody restrict focussing possibilities to *bought* (or *mom bought*, again an option I will ignore for now) and *dad*, respectively.

### 2.3 Sketch of the official system

The official formalism of UAS works very much like we just illustrated; it has two essential rules, WEAK RESTRICTION and STRONG RESTRICTION, and directly interprets metrical weights on prosodified trees, comparing the actual weak-strong pattern against the structural default ( $\approx DS$ ). The main difference is that, where the structures in (15) characterize the *syntactic constituents* that could be foci in these structures, official UAS directly and compositionally derives meanings, the PFTs, as in standard Alternative Semantics. But there is no big risks for readers who prefer the more syntactic characterization used in this illustration when checking what UAS does, and how.

The official UAS formalism works as follows: at every branching node, WR and SR determine those meanings which are *not* PFTs, given the metrical structure; those are the UNALTERNATIVES appearing in the name; unless a meaning is an unalternative, it can be a FT.

UNALTERNATIVES

As an illustration, take the restriction...

(16) ‘if *made* is focal, *pancakes* is focal’

...on VP in (15a). Now consider the VP meanings ‘swam’, ‘made muffins’, ‘bought muffins’ and ‘bought pancakes’ as possible FTs. Of these, ‘bought pancakes’ is excluded, because it replaces the weak daughter ‘made’ (i.e. *made* is ‘focal’), while not replacing the strong daughter ‘pancakes’. Any meaning of the form ‘ $R^{made}$  pancakes’ —where  $R^{made}$  is any transitive verb meaning other than ‘made’— is excluded; the formula ‘ $R^{made}$  pancakes’ thus denotes the UNALTERNATIVES of VP in (15a).

‘swam’ is evidently not one of these unalternatives, so *made pancakes* could contrast with ‘swam’ ( $\approx$ VP focus); the same is true for ‘bought muffins’ (also VP focus) because here *both* daughters are ‘replaced’, satisfying the conditional ‘if *made* is focal, *pancakes* is focal’. Likewise for ‘made muffins’, which only replaces *pancakes*, satisfying the condition (since the ‘if’ part is false). Note that in this last case, we have what would be called a (narrow) object focus. So the set of PFTs for VP in (15a) includes what we would call VP alternatives as well as object DP alternatives (just like the restrictions in (15a) allow for VP or object focus). This, too, is a central trait of UAS: Stress patterns that are, in Jacobs’s (1991) term, FOCUS AMBIGUOUS are not ambiguous at all: they simply allow for broad focus FTs and narrower focus FTs at the same time. Note that, because UAS directly interprets metrical relations, rather than a syntactic marker [F] related to them, there is in principle no way to ‘disambiguate’ such sentences: structures with identical metrical representations must, by necessity, have the same (un)alternatives.

### 3 Outlook and Comparison to Standard Alternative Semantics

The aim of this paper was to explain the inner workings of UAS as informally as possible. I did neither discuss the empirical consequences nor the conceptual underpinnings. This section gives some pointers to that, emphasizes some novel aspects of UAS and tries to pinpoint, why or to what extent they are intrinsically tied to the basic concepts of the theory, as opposed to STANDARD ALTERNATIVE SEMANTICS.

SAS  
STANDARD  
ALTER-  
NATIVE  
SEMANTICS

#### 3.1 Other defaults

In the present paper, DS —right sister strong— was the only prosodic default. At least two other principles are active in default stress, though, which in fact outweigh the right-over-left preference when determining the default, namely: that predicate (or head) sisters are weaker than argument sisters; and that functional sisters (pronouns, auxiliaries and similar) are weaker than lexical, open-class ones. The former reflects what is often called the INTEGRATION effect (so christened in Jacobs, 1992, but see Bierwisch, 1966, Schmerling, 1976, Fuchs, 1980, Gussenhoven, 1983, Selkirk, 1984, von Stechow and Uhmman, 1986, Uhmman, 1991 for pedigree), particular in verb final structures. The latter captures the well-known

preference for functional elements to stay unstressed, see e.g. Williams, 1980, 1997. While this leaves everything discussed in this article unaffected, it does have the broader consequence that prosodic reversal is not the same as deaccenting. Whenever the default favors ‘strong before weak’, PR may in fact result in the *addition* of pitch accents. The lexical-v-function preference also entails that the non-accenting of pronouns should be seen as very different from the non-accenting of given full nominals.

### 3.2 Interpreting metrical trees

There are two ways in which standard focus semantics is PRIVATIVE: First, a syntactic node gets to introduce alternatives (is interpreted as focussed) if and only if it is [F]-marked; this is true for all variants of SAS I am aware of. Second, whether or not a node, at least a terminal node, may be marked [F] depends on whether or not it bears a certain amount of stress, or a pitch accent. Both these decisions are made looking at the node alone, regardless of its syntactic/prosodic context, whence privative.

UAS, as opposed to that, is inherently RELATIONAL; the prosodic marking relies on relative metrical weight —there is no one prosodic correlate of ‘being focussed’— and apart from ‘I am focussed’ and ‘I am not focussed’ (the two restrictions that result from prosodic reversal), there are, if you will, conditional states such as ‘I may be focussed’ (strong daughter in default prosody), as well as relational conditional states such as ‘I may be focussed, but only if my sister is, too’ (weak daughter in default prosody).

This naturally leads to corollaries which appear desirable: stress patterns within broad foci and ones entirely outside of a focus are predicted to be identical, namely default. This has often been observed, but is not modeled by any accent-based theory I am aware of. Even *accent* patterns within broad foci and outside of foci — which in this case means: linearly preceding foci— are predicted to be the same, which again seems correct, but hard to achieve in theories based on privative focus realization.

### 3.3 Focus vagueness, rather than focus ambiguity

As pointed out several times, since UAS does not have [F]-markers, it does not disambiguate between different sizes of foci realized by the same metrical pattern. Rather, it —loosely speaking— assigns to such a metrical structure the sum total of focal alternatives that all the different [F]-patterns compatible with it would get

under SAS. So in principle there could be instances in which the same metrical pattern is simultaneously interpreted as broad and narrow focus (with different FTs, of course). Details are complex, for one such case see the discussion of the *granny's dog* example from Kadmon and Sevi (2011) in Büring (2015).

### 3.4 The set of PFTs

While PFTs serve the exact same function as focus alternatives in SAS, they are not in all cases exactly the same. For example, the focus alternatives for  $[_{VP} \textit{made PANCAKES}]_F$  in SAS are the set of *all* VP meanings, including, for example, ‘bought pancakes’. This leads to the so-called problem of OVERFOCUSSING: wrongly [F]-marking a larger constituent rather than a smaller one it dominates, given that the focus alternatives of the larger are by necessity a superset of those of the smaller.

OVERFOCUSSING

In UAS, the PFTs for  $[_{VP} \textit{made PANCAKES}]$  exclude VP meanings of the form  $R^{make}$  **pancakes**, i.e. those that would be PFTs under narrow verb focus. This automatically solves the problem of overfocussing, without the need to used constraints to the effect of ‘[F]-mark as few constituents/as small a constituent as you can’.

One consequence of this is that in the case of answer focus, not all propositions in the denotation of a constituent question are among the PFTs (while they are all focus alternatives in SAS). This requires some re-thinking of question–answer conditions for focussing, the most conservative one being simply that not all question alternative may be unalternatives (but some may).

The more restricted focus alternatives of UAS could presumably be added to an [F]-marking system, essentially by interpreting [F]-marking on a branching node along relational lines, similar to WR. In this case, however, the interpretation (not just the assignment) of [F]-marking would require access to metrical structure, arguably a doubling of efforts.

### 3.5 Anaphoric deaccenting

In the foregoing we did not discuss examples involving so-called ANAPHORIC DEACCENTING. These can roughly be characterized as cases in which within a broad focus, or in sentences without any focussing, the default stress rules are ignored because the strong daughter is contextually anaphoric or given. While such

ANAPHORIC  
DEACCENT-  
ING

a mechanism could presumably be added to UAS (see Reinhart, 2006, for something along these lines), the path envisioned in UAS is a different one, namely that all anaphoric deaccenting is in fact focussing. There is no such thing as anaphoric deaccenting within a focus, but rather, there are cases in which the focussed constituent is smaller than a contextually salient target. To give a quick example, Selkirk (1984, 2001), Schwarzschild (1999) or Büring (2006), among many others, would argue in essence that in example (17) (a variant of ex. (9) in Schwarzschild, 1999), VP is focussed (because the question is what Kim’s mother did, not what she did to Kim), while within that focus, *Kim* is anaphorically deaccented, with no effect on the focussing.

- (17) (What did KIM’s mother do when you complained about Kim’s behavior? —) She deFENded Kim.

The UAS analysis in Büring (2015, forthcomingb), as opposed to that, sees *defended* as narrowly focussed here, contrasting with something like ‘she (also) criticized Kim’. In a nutshell, the expected answer focussing of VP can be forgone in favor of establishing a more specific, relevant contrast. This in turn requires that the FT, ‘Kim’s mother criticized Kim’, need not itself be contextually salient, as long as the addressee can otherwise figure out what it is. On the other hand, the contextual salience ( $\approx$ givenness) of ‘Kim’ is a necessary (but not sufficient!) condition for realizing the narrow focus on *defended* by prosodic reversal (otherwise it would be much too easy to deaccent something on account of some non-given focal target).

### 3.6 The pragmatics of focussing

The ideas hinted at in the previous subsection open up the possibility to strengthen pragmatic conditions on focussing. In the present paper I followed what we may call the WEAK ANAPHORIC VIEW on focussing advocated in works such as Rooth (1992) and Schwarzschild (1999). However, once it is admitted that FTs may not be contextually salient—that focus is not anaphoric—it is possible to coherently implement a stronger view of focussing as truly contrastive, as urged for example in Wagner (2006, 2012).

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