

Relational Focus Semantics

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Abstract

This paper presents a novel approach to focus semantics in English, one in which the relational nature of metrical trees, and the distinction between default and marked structures directly input to compositional focus semantics. Our proposal is simpler than existing approaches, yet covers a wide range of phenomena, including ones that have proven problematic for previous accounts, to wit pre-nuclear accents and focusings, second occurrence focus, optional deaccenting and non-constituent foci. In a first step, we show how focus alternative sets can be directly and compositionally derived without the mediation of syntactic [F]-markers, from metrically annotated syntactic trees. In a second step we eliminate the need for competitive focus minimization principles like AVOIDF by restricting focus alternative sets for focused nodes. We show that this relational account derives known generalizations, but also makes new, fine-grained predictions about focusing patterns in English.

1 Introduction

The interpretation of intonation —stress and accent in particular— routinely relies on the notion of ALTERNATIVES, as pioneered in the work of Mats Rooth (1985, 1992). A tree (analyzed sentence) with some indication of prosody is assigned a set of meanings, the alternatives, by the compositional semantics (in addition to its ordinary meaning); pragmatic rules for relating intonation to context can then refer to these alternatives. Existing proposals differ on details, 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, which we call its FOCAL TARGET. Consider the following dialogue:

FOCUS AL-
TERNATIVES

FOCAL TAR-
GET

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

In Ben's reply the word <dad> will bear heavy stress and a pitch accent, with no further pitch accents following it; as is usual, we indicate this by capitals. A simple analysis of (1) goes as follows: Ben wants to relate his utterance to Abby's. In order to signal this relation, he FOCUSES those constituents (here: <dad>) in his utterance that make it different from Abby's. Put procedurally, replacing just the focused constituents by others (alternatives), you can turn Ben's sentence into Abby's.

FOCUSING

- (2)

DAD
mom

 made pancakes

Technically, focus semantics will assign to the sentence Ben used in (1) the set of *all* meanings of sentences that replace the focus <dad> by some other expression that syntactically fits (after all, the sentence could correct *any* utterance of the form 'so-and-so made pancakes' with this focusing); these are the aforementioned FOCUS ALTERNATIVES to the sentence, or its (FOCUS) ALTERNATIVE SET. This step of the procedure —calculating the alternative set of an expression— we call FOCUS SEMANTICS. Then FOCUS PRAGMATICS checks whether the alternative set stands in one of a few admitted relations to some other meaning, the focal target. The focal target in (1) is the meaning of the previous utterance, the proposition 'that mom made pancakes'. The requisite relation here is that that proposition is one of the focus alternatives of the reply <DAD made pancakes> (note that *expressions*, not meanings, have alternatives, because obviously the focus alternatives depend on the form of the expression, not just its content).

FOCUS AL-
TERNATIVES

(FOCUS) AL-
TERNATIVE
SET

FOCUS
SEMANTICS

FOCUS
PRAGMAT-
ICS

1.1 Empirical Objectives

What we want from a theory of focusing is to predict if a TARGET+FOCUS-UTTERANCE PAIR is acceptable. In the initial exposition of our proposal we will restrict attention to cases in which the target is expressed by a declarative sentence, and in which the focus utterance is a declarative, too, by and large: corrections. In the second half, we will expand this to non-declarative and non-correction pairs.

TARGET+FOCUS-
UTTERANCE
PAIR

We assume a standard focus pragmatics, according to which, as sketched above, a target–correction pair is predicated to be felicitous only if the target is among the focus alternatives of the correction. As our interest in the following sections is focus *semantics*, i.e. which focus alternatives to generate for a given

utterance, we can turn the assumptions made so far into a simple adequacy criterion for our focus semantics:

- (3) **First Adequacy Test for a Theory of Focus:**
If a target–correction pair is intuitively acceptable, then the (meaning of the) target is a focus alternative of the correction.

Given these minimal assumptions about focus pragmatics in correction cases, we may also say that the focus alternatives of an utterance is the set of its POTENTIAL TARGETS.¹

POTENTIAL
TARGETS

1.2 Outlook/Theoretical Objectives

Virtually all existing focus theories, i.e. works that attempt to present a comprehensive and formal account of the realization, representation and interpretation of focus, involve a three step procedure: prosodic properties like stress or pitch accents are (i) mapped onto privative syntactic markers, usually [F], which in turn are (ii) mapped onto semantic focus alternatives, which then are (iii) subject to focus pragmatic conditions. Our initial objective, mostly in §2, is to eliminate step (i), i.e. to directly map prosodic properties—in our case: metrical strength—onto semantic focus alternatives, completely eliminating syntactic markers like [F]. [F]-projection rules and focus ambiguities disappear along with them.

Our second objective, tackled in parallel in §2 and extending to §3, is to show the advantages of a system that takes relational stress patterns, not accents or stress levels, as the prosodic input to focus semantics. To decide what the focus alternatives of a constituent are, it is not sufficient to look at that constituent (if it has an accent, or a certain degree of stress), one has to look at it in its syntactic context, and in relation to the prosodic defaults for that context. Such a perspective has been urged by various works, most notably Williams (1997) and Calhoun (2010a), but also Reinhart (2006) and Szendrői (2001), and we show how it can be integrated with an explicit focus semantics; as one might expect, our seman-

¹With the caveat that the ‘if’ in (3) is not quite an ‘if and only if’: while generally, any focus alternative will make for a good focal target, an additional condition for acceptability is that the *content* of the correction is appropriate. Thus *⟨Kim ate beans. — No, Kim ate LEGUMES⟩* or *⟨Kim is asleep. — No, Kim is from AUSTRIA⟩* may not be judged acceptable, yet most any theory of focus (including this one) allows ‘beans’ and ‘be asleep’ as focus alternatives of *⟨LEGUMES⟩/⟨be from AUSTRIA⟩*. The intuitive difference is operationalizable: if a correction C is not acceptable given the target, but some other prosodic rendering C’ (i.e. a C’ with the same words and structure as C) is, then the meaning of the target should *not* be a focus alternative of C.

tics involves no privative constructs, be it accents or [F]-markers. Our system is furthermore strictly local and compositional, only looking at immediate dominance (mother–daughters) relations, both for the focus semantics and prosody (this will become particularly clear in our treatment of second occurrence focus in §6). Overall, our proposal, though simpler, will yield better predictions for the actual realization of focus than most existing systems, as shown in §3 and, in greater detail, §7.

Third, we show how to directly code complementarity or blocking in the focus semantics. With the introduction of a second restriction in §4, we ensure that the sets of focus alternatives for two different metrical realizations of the same tree are always disjoint; any particular focus alternative can only be gotten in one metrical way. While this is generally acknowledged to be a property of focusing—in traditional terms, pragmatic focus and permitted [F]-patterns stand in a one-to-one relationship—it is not built into the focus semantics of any account we are familiar with. Rather, these rely on extraneous transderivational measures such as ‘Minimize Focus’ or ‘Avoid [F] Marking’ to achieve it. On the present proposal, as explicated and discussed in §4 and §5, no such principles are necessary, their effect is directly built into the compositional focus semantics.

The presentation of the semantic system in the main part of the paper is kept at a semi-formal level. A formal implementation of the semantics is given in §9.

2 First Sketch of the Proposal

2.1 Metrical Defaults

We follow Ladd (1996), Truckenbrodt (1995), Calhoun (2006, 2010a) a.m.o. in assuming that metrical stress, rather than pitch accents, is the input for calculating focus alternatives (pitch accents are associated with stress patterns—metrical grids, to be precise— without reference to focus, see §3). Concretely, we assume that syntactic trees with metrical weak–strong annotations are the (sole) input to focus interpretation.

At every branching node, restrictions on the focus alternatives of that node may apply, depending on whether the metrical pattern (which sister is strong, and which is weak) corresponds to the structural default or not. This kind of approach is pioneered in Williams (1997), from which we also quite directly adopt the operative defaults in (4) (cf. Williams, 1997, p.602).

- (4) Prosodic Defaults
- a. functional is weak, lexical is strong
 - b. predicate is weak, argument is strong
 - c. left is weak, right is strong

As in Williams (1997), (4a–c) take precedence from (a) through (c), i.e. ‘right=strong’ kicks in only if there is neither functional–lexical difference between sisters, nor an argument–predicate relation between them. As virtually all our examples involve lexical elements only, and all predicate–argument structures considered are head-initial, the reader may safely take ‘right=strong’ to be the only operative default, however.

2.2 Strong Restriction: Standard Focus Values Without [F]-Markers

Assume that the unmarked case for any constituent —terminal or not— is to have a rich alternative set, namely the set of all meanings expressible by its category (we will propose a refinement to this in §4); that is, they behave as though they were [F]-marked. If, however, a branching node has a non-default prosodic pattern like (5) (non-default because *<potatoes>* —following *<eat>* (cf. (4c)), and being its argument (cf. (4b))— rather than V should be the strong sister), what we call the STRONG RESTRICTION on its alternatives applies.

STRONG RE-
STRICTION

- (5) Kim should. . .
-

- (6) STRONG RESTRICTION:
A metrically reversed (i.e. non-default) node only has alternatives composed of an alternative to the strong sister with the ordinary meaning of the weak sister. (*‘Only the strong sister is focal.’*)

STRONG RE-
STRICTION

We call a constituent C FOCAL if its alternative set contains other meanings of the same category, but not its literal meaning; this corresponds by and large to ‘[F]-marked’, ‘focused’ or ‘part of the focus’ in standard theories. So in (5), *<eat>* is focal and *<potatoes>* is not, meaning that e.g. ‘peel potatoes’ and ‘boil potatoes’ are alternatives to it, but ‘buy meat’, ‘eat beans’ and ‘sleep’ are not. Put differently, the strong sister is a narrow focus.

FOCAL

We write R^{eat} for the set of transitive verb meanings other than ‘eat’, and formulae like R^{eat} potatoes for set of meanings obtained by semantically composing each member of that set with the ordinary meaning ‘potatoes’ (by whichever rule the semantics provide). R^{eat} potatoes, then, stands for the alternative set of (5), as restricted by SR in (6).

A bit of terminology: Following Calhoun (2010a), we refer to (5) as an instance of METRICAL REVERSAL (i.e. a metrical strength pattern that defies the defaults); we say that the mother node is (METRICALLY) REVERSED, the weak daughter(s) of a reversed node is (METRICALLY) DEMOTED, and the strong daughter is (METRICALLY) PROMOTED. For reasons to become clear, we impose a general condition on metrical reversal:

METRICAL
REVERSAL
(METRICALLY)
REVERSED
(METRICALLY)
DEMOTED
(METRICALLY)
PROMOTED

- (7) CONDITION ON METRICAL REVERSAL
 The demoted sister must be contextually given.

As is usual, a constituent counts as contextually given if a synonymous expression or a hyponym has been uttered before (or its meaning made otherwise salient).²

In our trees, the branches to the demoted daughters are dotted, rather than solid (e.g. (5) above). This is for ease of reading only, since all relevant information can be gathered from the weak–strong labeling together with the defaults in (4); but in case you forgot about the defaults: whenever you see a dotted line, reversal has taken place and Strong Restriction, as well as (7), applies at the reversed (mother) node.

SR in (6) formalizes the intuition at the heart of metrical approaches to focus such as Williams (1997) and Calhoun (2010a) —to quote the latter: ‘if... the speaker does not use the expected pattern, ... this is highly likely to show F-marking’ (p.16); ‘this not only implies that [the promoted constituent] is F-marked, but also blocks extension of the ... F-marking rightward’ (p.13).³ What Calhoun calls ‘expected’ corresponds to our prosodic defaults— though obviously without actual [F]-marking.

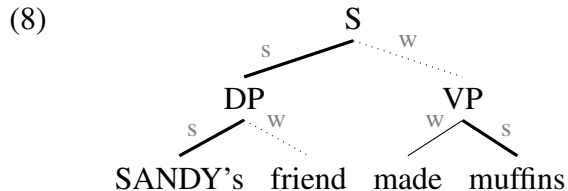
²This is the ‘classical’ notion of givenness, which doesn’t make reference to the prosody/[F]-marking of the expression, unlike Schwarzschild’s (1999) GIVENness, which is of no relevance here.

³Calhoun seems to suggest that ‘blocking of the extension of the focus to the right’ —in present terms, the marking of the weak sister as background— follows from ‘unexpectedly’ making the left sister strong, saying ‘[u]nder the metrical approach, by definition, for one part of the structure to

On the present view, however, SR is obligatory, meaning its effects aren't just 'highly likely' but exceptionless. Despite her wording, none of Calhoun (2006, 2010a,b) discuss any examples of metrical reversal that do *not* signal focusing, and we cannot think of any either. We thus take SR to be an inviolable rule of English grammar.

2.3 Propagation

Strong Restriction applies at every reversed node in a tree. Thus in (8), neither *<friend>* nor *<made muffins>* are focal, alternatives are only 'allowed' for *<SANDY>*, so we get narrow focus on the possessive.



In fact, to make sure we derive the correct focus alternatives for (8), we need to be more specific about the effect of SR. It is clear that DP only has alternatives that replace *<Sandy>* and keep *<friend>*, and S only has alternatives that replace DP and keep VP.⁴ But does that mean that S only has alternatives that replace *<Sandy>* and keep everything else? Not unless we add a mechanism to PROPAGATE restrictions from a lower node (e.g. DP in (8)) to a higher, dominating node (S in (8)), along the lines of (9).

PROPAGATE

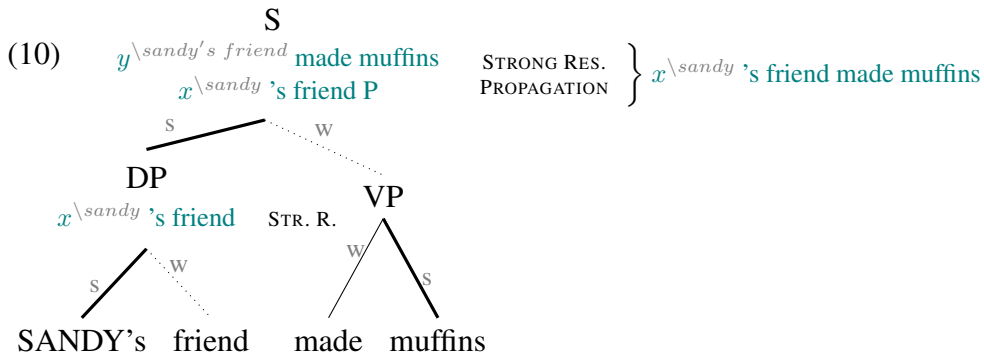
- (9) Propagation (informal)
 Restrictions imposed on daughters' focus alternatives become restrictions on the mother's focus alternatives.

be more prominent another must be less' (p.13). We suspect a slight equivocation here: *metrically*, strengthening of one sister entails weakening of the other. But this doesn't entail that there has to be a concomitant asymmetry in focality. After all, in the default structure, one sister is metrically stronger than the other, too, yet they can be equally (non-)focal. Nothing in principle excludes an alternative SR that says the promoted sister *has* to be focal, and the demoted one *may* be (the mirror image of Weak Restriction in §4). We do believe SR as stated in (20) to be the correct choice, but it doesn't follow automatically from the relational metrical approach.

⁴For the sake of brevity we continue to characterize meanings in syntactic terms, like 'alternatives of the form... ', 'replacing this meaning by that meaning' etc., instead of more cumbersome but precise locutions such as 'consists of the meaning of *<friend>* composed with a meaning of the same type as, but different from, that of *<Sandy>* etc.

Without propagation, the effect of a SR would ‘disappear’ on the next higher node (see also §7). Our proposal, on the other hand, will have restrictions ‘accumulate’ towards the root of the tree.⁵

Using the same notation as before, with $x \setminus_{sandy}$ being the set of all DP meanings other than Sandy, and $y \setminus_{sandy's\ friend}$ the set of all DP meanings other than ‘Sandy’s friend’, (10) shows the workings of propagation.



The lower restriction on the root node is the propagation of the restriction on DP. It restricts focus alternatives of S to be ‘so-and-so’s (\neq Sandy’s) friend does something’. The upper restriction, imposed by the metrical reversal of, and concomitant SR on, the root node itself, restricts that set further to propositions ‘so-and-so (\neq Sandy’s friend) made muffins’. Combined, they only allow focus alternatives ‘so-and-so’s (\neq Sandy’s) friend made muffins’, i.e. narrow possessor focus alternatives, as desired.

2.4 Interim Summary

This concludes the presentation of the first incarnation of our proposal. We have introduced a simple system which predicts focus alternatives directly from metrically annotated trees, without syntactic [F]-marking. Its current predictions can be summarized as follows: In a metrical default structure, any focus alternative at any level is allowed. In case of metrical reversal, interpreting the demoted sister as focus, or as part of the focus is excluded; the structure must be interpreted as narrow focus on the promoted sister.

⁵Alert readers may wonder if the propagation effect could be achieved more easily if we simply required the higher node, say S in (8), to only ‘work with’ the alternatives of its daughters, as is done for [F]-less nodes in [F]-marking accounts. While this would work in (8), it won’t in general, as we discuss at the end of §4.

This may sound like an absurdly short list of predictions, but it is in fact the same as, or similar to, that of the majority of focus semantics on the market. Additional restrictions in these theories generally come from an extraneous constraint that seeks to MINIMIZE focus. Thus, default stress cannot be used to express, e.g., narrow transitive V focus, but not because the structure lacks the prerequisite alternatives, but because an alternative structure —the one with metrical reversal— is available that also has the required narrow-V alternatives.⁶ The same effect could straightforwardly be achieved on the present proposal by a constraint like (11).

MINIMIZE

- (11) AVOID FOCALITY (only for expository purposes)
 Use as few nodes with alternatives as possible to generate the alternative needed to meet the focus pragmatic conditions.

Since the default is that all nodes have rich focus alternative sets (see above), only metrical reversal/SR can achieve nodes without alternatives; (11) then effectively says to use reversal/SR as often as possible, provided the pragmatically needed alternatives are still allowed. For example *⟨Kim LIKES potatoes⟩* and *⟨Kim likes POTATOES⟩* currently both allow ‘Kim hates potatoes’ as a focus alternative, but only the former can *de facto* be used to correct *⟨Kim hates potatoes⟩*. This is predicted by (11), because only the former involves metrical reversal and has alternative-less nodes (namely *⟨potatoes⟩*). This is the familiar logic of constraints like ‘AvoidF!’ (Schwarzschild, 1999) or ‘Maximize Presuppositions’ (Sauerland, 2005).

Let us emphasize some of the choices we made, reasons for them, and consequences thereof. First, the relational nature of our proposal: Being stressed, or bearing an accent (see §3) is not *per se* relevant for our theory. The very same prosodic realization of a constituent may result in it being focal in one tree, and non-focal in another; even being the strong sister entails being focal only in some trees (when that sister has been promoted, i.e. been made strong against the default), but not in others (when the sister is strong by default). There is no single correlate of being a focal constituent; the only correlate there is is between a branching node being metrically reversed, and its strong daughter (but no other daughter) being focal.

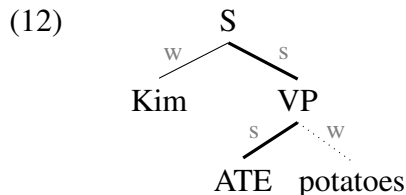
This, as mentioned, is in line with the arguments in Calhoun (2010b,a), as well

⁶The ‘last’ proposal to not use such trans-derivational constraints appears to be Selkirk (1995); the resulting problems are discussed in Schwarzschild (1999), §1, and Büring (2016), ch.3.2.

as ideas in Williams (1997), but notably distinct from the kind of [F]-marking theories which are usually combined with formal focus semantics (Rochemont, 1986; Schwarzschild, 1997; Schwarzschild, 1999; Selkirk, 1984, 1995).

Second, by including Propagation, we made sure that metrical reversal once and for all marks the demoted sister as background to a focus, that is, the effect of metrical reversal on a clause's focus alternatives cannot be 'wiped out' at a higher node. This may sound unremarkable, but many existing proposals allow for just that in all (Büring, 2006; Schwarzschild, 1999) or some (Selkirk, 1984, 1995) cases; we will discuss the different implications of these views in §7.

On the other hand, and third, metrical reversal does not necessarily restrict the focus to the promoted daughter alone. In (12), the 'aunt' node $\langle Kim \rangle$ could be focal again, since it is not affected by the metrical reversal/SR at VP.



In projection talk, our theory allows the V-focus to 'project' to S, without being able to include the object (or VP), which, of course, is an impossible state of affairs for [F]-projection theories; again, we will return to this in detail in §7.

Fourth and finally, our account knows no focus ambiguities (cf. Jacobs, 1991). For example, transitive S focus, VP focus and object focus structures are not formally distinguished at all. They all have the same default metrical structure, and the same rich (at present: completely unrestricted) set of alternatives; consequently, (11) cannot distinguish between them either. The structure can, descriptively, be called SYNCRETIC between different focus sizes, but there is no prosodic, semantic, or —given our elimination of [F]-markers— syntactic difference between the structures used to answer a $\langle whom \rangle$ -question, correct a previous VP, or utter an all-new sentence. Since '[F]-ambiguities' of this sort are spurious by definition, we know of no arguments against analyses like the present one, which doesn't assume them in the first place.

SYNCRETIC

3 From Metrical Trees to Stress and Accent Patterns

3.1 Metrical Tree to Grid to Accent

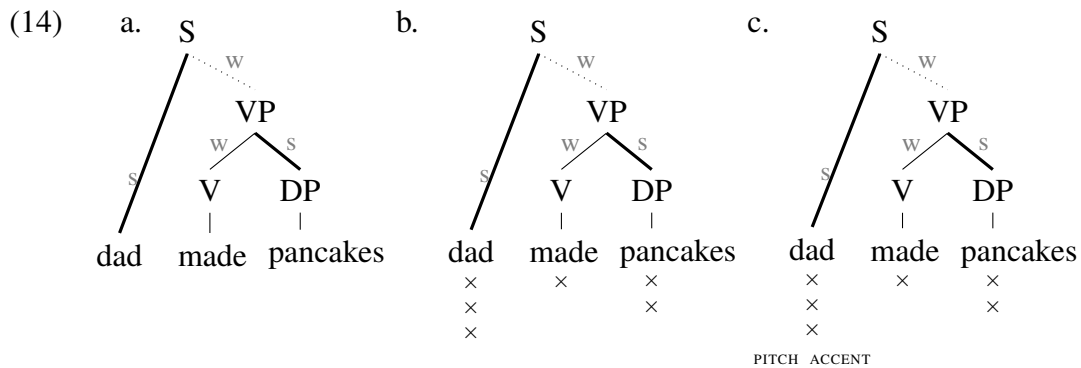
So far we relied on readers' intuitive understanding of which prosody the metrically annotated trees will lead to. This section defines the mapping from those trees to stress and accent pattern formally. The rules that do this are fairly standard, and, notably, *do not interact with focusing at all*.

First, (13) maps a tree to a metrical grid. A result for the simple tree in (14a) is given in (14b); note that many more stress patterns are legitimate by (13), as long as they reflect the same relative strength pattern (<dad>> <pancakes>> <made>).

(13) METRICAL TREE TO GRID

A strong sister bears more stress than its weak sister(s).

Formally: 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.



In a second step, metrical grids are related to accent patterns by (15). (14b) is mapped onto (14c).

(15) STRESS-ACCENT ASSOCIATION

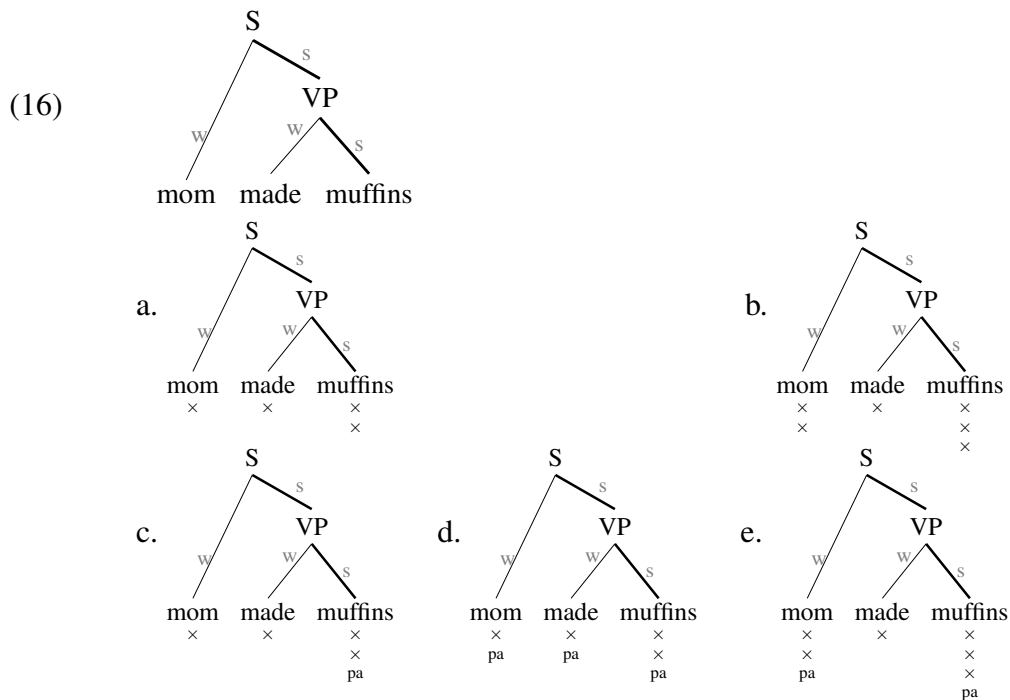
An association of pitch accents (PAs) to a metrical grid G is legitimate only if

- the rightmost PA is associated with the highest column of G, and, as far as compatible with that
- if a column of height *n* is associated with a PA, every column of

height n or higher is associated with a PA.

In the case of (14b), only one accent pattern, (14c), is legitimate by (15), because there are no stresses preceding the highest column (the NUCLEAR STRESS). In principle, however, (15), too, is a one-to-many mapping. Take (16): (16a) is the minimal metrical grid for it,⁷ which, by (15), may yield either one of the accent patterns (16c) and (16d). In addition (16b) (among many others) also meets (13), yielding the additional accent pattern (16e) (a.o.).

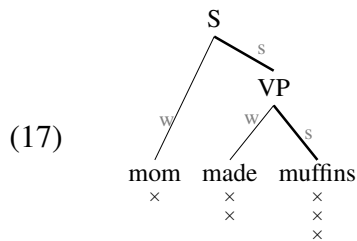
NUCLEAR
STRESS



The one-to-many mapping of metrical trees, and hence alternative sets, to stress and accent patterns is intentional. We submit that there rarely ever is the *one* prosody for realizing a particular focusing; rather, it is once again the syntagmatic *relation* between the prosodic markers used that indicates focusing.

The choice of which of the permitted realizations will actually be used may depend on speech register, speaker's style or speech tempo etc., but, orthogonally to those, also on general prosodic constraints; for example, stress grids beyond the minimal one are typically subject to rhythmic constraints. While a grid like (17) is permitted by (13) as a realization of (16) ...

⁷A minimal grid is one which uses the smallest number of \times to meet (13).



... it, unlike (16b), has a non-alternating rhythmic structure and a so-called ‘beat clash’ on level 2, which arguably makes it dispreferred on phonology internal grounds (see e.g. Prince, 1978). Also, there evidently is more to prosodic structure than degrees of stress and pitch accent placement, for example phrasing and its concomitant tones, as well as pitch accent choice and syllabic alignment. This is not the place to elaborate on those, especially since the minimal version given here delivers the same amount of prosodic information most theories of focusing do.

3.2 Pre-Nuclear Accents

As Calhoun (2010a:13) points out, ‘the metrical account elegantly explains “optional” accents that do not F-mark’, so-called ORNAMENTAL ACCENTS.⁸ For example, the pitch accent on <mom> in (16e) is permitted regardless of whether this structure is used to correct <A bomb exploded in the kitchen> (‘S focus’) or <Mom destroyed the kitchen> (‘VP focus’) or <Mom made pancakes> (‘Obj focus’).

ORNAMENTAL
ACCENTS

While it is generally acknowledged that such ornamental accents are common, especially where open class elements precede the focus, accent-based theories of focus such as Selkirk (1984, 1995) or Rochemont (1986) systematically exclude them, because they are constructed around (a version of) the *Basic Focus Rule*, which says that every pitch accent leads to focality ([F]-marking), so: ‘accent→focal’.⁹ One essential function of this rule is to prohibit pitch accents *following* the focus, i.e. to force leftward ‘shifting’ of the nuclear pitch accent in cases like (14) above (<DAD made pancakes>). Given that the nuclear pitch accent in those theories has no defining properties other than being the last one, it is far from straightforward to implement something like ‘ornamental accents are okay before the nuclear pitch accent, but not after’.¹⁰ On our account, the nuclear stress

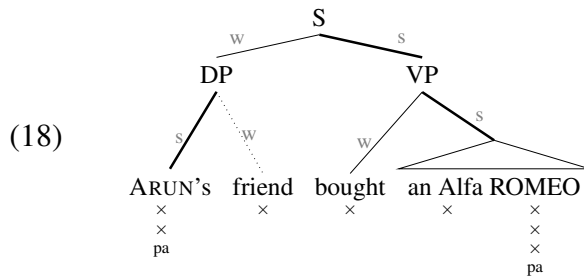
⁸Büring (2007)

⁹Selkirk (1984:207), Selkirk (1995:555), Rochemont (1986:84)

¹⁰Essentially, the Basic Focus Rule itself would need to be restated along the lines of ‘An accented word is F-marked, unless followed by an accented *and F-marked* word; in that case it *may*

position for any particular tree is determined by the prosodic defaults and the focus alternatives one desires, and the left/right asymmetry of non-nuclear accents is encoded relative to it by (15), in particular (15a).

Additionally and more importantly, *some* pre-nuclear accents *are* relevant for focusing. Take (18) from Calhoun (2010a:16), provided here with a full metrical tree and (minimal) grid.



The nominal *⟨Arun's friend⟩* in (18) is metrically reversed, triggering a strong restriction, so *⟨Arun⟩* ends up focal: it needs a target involving 'someone else's friend', e.g. 'Kim's friend bought a Prius'.¹¹ As Calhoun (2010a) notes, no similar focal reading results if instead *⟨friend⟩* is strong and pitch accented, i.e. if no metrical reversal took place. So while pre-nuclear pitch accents can be unrelated to focus, they do impact focus interpretation if their placement reveals metrical reversal; it is hard to see how this could be accommodated in a system that employs a version of the Basic Focus Rule, even if it somehow managed to allow pre-nuclear accents while still banning them post-focally. Clearly, a relational view of focusing, where *non-default* strength (and concomitant accent placement), rather than strength (or accent) *per se* is central, has a leg up in accounting for these generalizations.

Note that technically, the obligatory focality of *⟨Arun⟩* in (18) is due to the reversed stress within DP, not the pitch accent on *⟨Arun⟩*; in principle *⟨Arun⟩* could stay accent-less, provided everything else (except *⟨Romeo⟩*) does, too. *If* there are prenuclear accents, however, then by (15) *⟨Arun⟩* in the reversed structure will bear one; in fact, the pattern where *⟨Arun⟩*, but not *⟨friend⟩* is accented can, by (15), *only* result from a metrically reversed DP. In other words, our rules predict

be F-marked.'

¹¹There still needs to be a focus on or in VP, too, because otherwise, the S node would have to be reversed, too, as in (8)/(10), due to (11), or, eventually, (20).

that a ‘shifted’ pre-nuclear accent unambiguously leads to a focal interpretation.

It bears reiterating that, unlike Calhoun (2010a), we take the emergence of pre-nuclear focal readings due to metrical reversal/Strong Restriction, as in (18), to be systematic and exceptionless, not merely statistical.¹² Also, unlike Calhoun (2010a), we take the default weak–strong pattern on *⟨Arun’s friend⟩* to be assigned by metrical defaults in the tree, not just a rhythmic addition of stress on *⟨friend⟩*.¹³

4 Weak Restriction and How to Eliminate a Trans-derivational Constraint

So far, default structures do not impose any restrictions on the focus alternatives of their daughters. We will now add a second restriction, which does exactly that. The idea is very simple again: A default structure excludes precisely those focus alternatives that would be alternatives of the reversed structure; or as Williams (1997:605) puts it: ‘what are the conditions under which the Normal pattern is used? They are exactly the complement of the conditions under which the Special pattern is used’.

So for example, (19) will no longer have *all* VP meanings as alternatives, but only those that are *not* of the form ‘do something else to potatoes’ (semi-formally: not of the form $R^{\setminus eat} potatoes$).

¹²Calhoun (2010a) writes ‘If, however, the speaker does not use the expected pattern, and places a prenuclear accent on *⟨Arun⟩*, this is **highly likely** to show F-marking—that is, as opposed to other people’s friends’ (p.16, emphasis added). Yet, as mentioned in §1, neither there nor elsewhere did we find examples in which metrical reversal is claimed to *not* yield a narrow focus reading. This is consonant with the present approach, but unexpected given Calhoun’s own claim that such effects are mere tendencies or ‘stochastic’.

¹³[T]he prenuclear region [in (18)] would ... be too long without a stress on the second tier of the grid. Therefore, a purely rhythmic stress would be ‘added’ on *⟨friend⟩* (...). This stress is unlikely to occur on *⟨Arun⟩* because the region between *⟨Arun⟩* and *⟨Romeo⟩* would again be too long’ (Calhoun, 2010a, p.16). But the placement of higher stress on the final element in the subject DP, rather than the possessor or the like, is again entirely systematic, and seems independent of the length of the material between it and the next stress. For example, if *⟨bought⟩* were gapped—*⟨I bought a Porsche, and Arun’s friend an Alfa⟩*—the prenuclear accent is no likelier to occur on *⟨Arun⟩* than in the original, even though the distance is now the same.

Interestingly, Calhoun (2006), pp.74f, unlike Calhoun (2010a), explicitly calls the accent on *⟨Arun⟩* a ‘metrical reversal’, which seems to indicate that it originates in the metrical tree, rather than the grid, just as we assume here.

- (19)
-
- eat poTAtoes

The requisite restriction is given in (20).

- (20) WEAK RESTRICTION:
 A metrically default structure has no alternatives that are composed of the literal meaning of the strong daughter plus an alternative to the weak daughter (*‘If the weak daughter is focal, the strong daughter is focal.’*)

WEAK RE-
 STRICTION

One may think of WR in (20) as excluding the worst misalignment between focality and metrical strength: that the weak daughter has alternatives, but the strong daughter does not. Put differently, it allows three situations —which in standard [F]-marking accounts would be [W S], [W S_F], [W_F S_F]_F— while excluding the fourth — [W_F S].¹⁴ As a result, default and reversed structure have complementary sets of focus alternatives: (19) is no longer predicted to be a possible realization of a narrow V focus.

WR achieves what a ‘minimize focus’ constraint such as (11) was needed for so far. Without WR, the focus alternatives of the reversed structure would always be a subset of those of the default structure (as they are in all existing accounts). It was therefore left to a transderivational constraint to ‘pick’ the reversed structure if narrow focus was to be expressed. With WR in place, no principle like (11), AVOIDF, or MAXIMIZE BACKGROUND is required. Given the computational complexity of transderivational constraints, as well as the notorious problems with defining a competitor set for such principles, we take this to be a desirable feature of our proposal.

Calhoun’s (2010a; 2010b) proposal doesn’t mention a ‘minimize focus’ constraint, but, like that in Reinhart (2006), needs an extra rule referring to the nuclear stress in order to make sure that the default structure cannot be used to express narrow, non-final foci (Calhoun, 2010a, p.12; Reinhart, 2006, p.139). WR takes care of that as well: by the implication ‘if the weak daughter is focal, so is the strong daughter’, if the node dominated by only strong branches (and hence the position of the strongest stress) in a tree isn’t focal, nothing in the tree can be.

Before turning to the discussion of more, and more complex, examples we will

¹⁴Quoting Williams (1997:605) again: ‘the complement is a complicated disjunction, and it includes the [remaining] cases’.

again motivate and flesh out our proposal some more. The wording of (20) may strike readers as cumbersome: why not simply say that alternatives to the default structure ‘change’ either just the strong daughter, or both (but not just the weak one)? To see the reason, consider a property like ‘sleep’. Is it an alternative of (19)? It is not composed of some relation plus ‘potatoes’, so (20) allows it; this is a good result, because if (19) is to represent what we usually call a VP-focus, it better include intransitive VP meanings such as ‘sleep’, ‘laugh’ etc. among its alternatives. But ‘sleep’ is not composed of some alternative to the V *plus* some alternative to the object either (it is not a transitive VP meaning). So while (20) allows ‘sleep’ as an alternative to (19), a rule that derives all VP alternatives as combinations of V and Obj alternatives would not, which is why we use (20).

Aside for semanticists: Formal semanticists, at this juncture, may be tempted to derive ‘sleep’ as composed of a relation and a DP meaning after all, for example $\lambda x.\lambda y.sleep(y)$ applied to (an alternative of) *potatoes*. Granted, $\lambda x.\lambda y.sleep(y)$ is a perverse relation, because it entirely ignores its first argument; but it *is* a relation in the technical sense nonetheless, and it would derive ‘sleep’ as an alternative to what would standardly be represented as $\langle eat_F potatoes_F \rangle$ (with no [F] on the VP). The problem is that, indeed, it would derive ‘sleep’ even as an alternative to $\langle EAT_F potatoes \rangle$, without focusing the object either, given that all that is required is replacing ‘eat’ by the perverse relation $\lambda x.\lambda y.sleep(y)$ and applying it to an arbitrary argument; by analogous maneuvering, broad focus alternatives could be derived for reversed structures whenever it is the semantic functor that got promoted. That is not a good thing, as it hopelessly over-generates. All remedies for that we know of systematically exclude perverse functions like $\lambda x.\lambda y.sleep(y)$ from focus alternatives, for example, as we do here, by limiting alternatives to things expressible by expressions of the same syntactic category as the focal item. Without perverse relations like $\lambda x.\lambda y.sleep(y)$ as alternatives to transitive V, focusing V alone can no longer give us ‘sleep’, as desired; nor can focusing V *and* Obj, however, which is why we must directly derive ‘sleep’ as a VP alternative, without relying on the V and object alternatives. **End of Aside.**

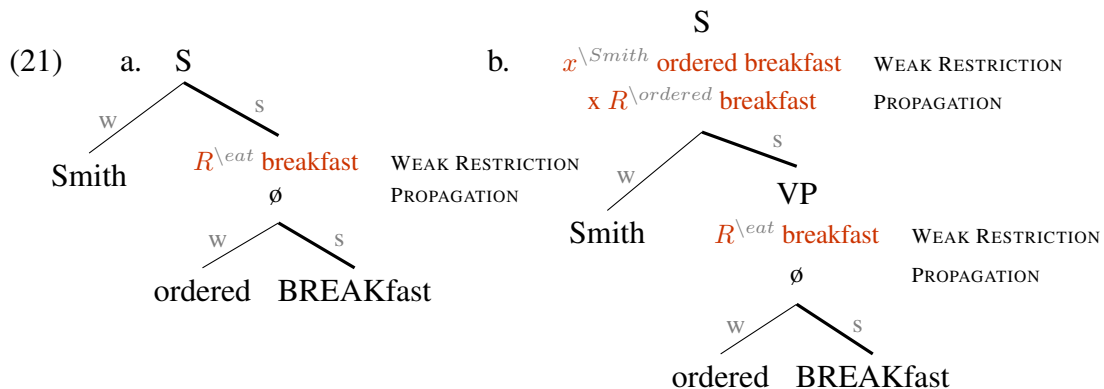
We will write R *potatoes* to mean ‘a set (of properties) that does *not* contain properties composed of some relation applied to ‘potatoes’.’ So WR, applied to (19) restricts the alternative set of VP to such a set. More precisely, it restricts VP’s alternatives to be $R^{\setminus eat}$ *potatoes*, read: a set of properties that does not contain properties composed of some relation *other than* ‘eat’ applied to ‘potatoes’. That way, the literal meaning ‘eat potatoes’ is an alternative of (19), for reasons we will return to in §5 (see esp. the discussion of (24) there).

Like SRs, WRs are subject to (9), Propagation. In propagating $R^{\backslash eat}$ potatoes to the S level, we want to ensure that all of the properties above are still excluded, regardless of which subject denotation they are combined with. For that we can write $v_{DP} R^{\backslash eat}$ potatoes, read: ‘S has no alternatives that are composed of a DP meaning (v_{DP}) and a property composed of a relation other than eating ($R^{\backslash eat}$) and potatoes’.

This concludes the presentation of our focus semantics. The division of focus alternatives between the two restrictions is summarized in figure 1 on p.19.

5 Accounting for the Standard Data

With all pieces in place, let us look at some complete trees. (21) starts off with a ‘double-default’ transitive sentence. In (21a) we see the familiar weak restriction at the VP level; since VP’s daughters are non-branching, they impose no restrictions themselves, so nothing is propagated to VP.

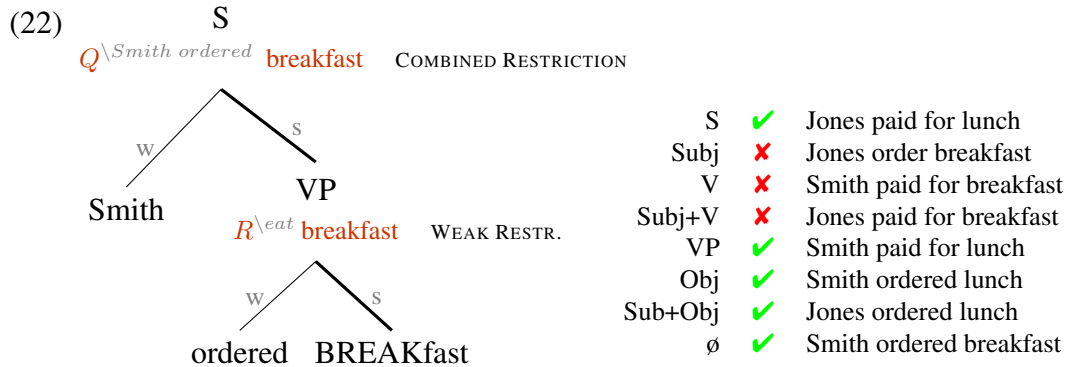


(21b) includes the restrictions at the S level. The top line is the WR introduced there, the second line shows the propagation from the VP level. So now we have two restrictions for the S node: no alternatives that have anyone but Smith order breakfast, and no alternatives that have anyone at all do something other than ordering breakfast. These two constraints are compatible, in fact they can be summarized into one: nothing about breakfast, except if it’s Smith ordering it, see the root node in (22).

WEAK RESTRICTION		
$\langle \overset{w}{eat} \overset{s}{potatoes} \rangle$ $R^{\overset{eat}{potatoes}}$	Right (Strong) Sister's Meaning same	changed (=focal)
Left (Weak) Sister's Meaning same	$eat\ potatoes$ $eat\ potatoes$	$eat\ x^{\backslash potatoes}$ $eat \left\{ \begin{array}{l} hummus \\ apples \\ \dots \end{array} \right\}$
changed (=focal)	$R^{\backslash eat} potatoes$ $\left\{ \begin{array}{l} buy \\ sell \\ \dots \end{array} \right\} potatoes$	Q_{VP} $\left\{ \begin{array}{l} buy\ hummus \\ sell\ apples \\ sleep \\ run \\ \dots \end{array} \right\}$

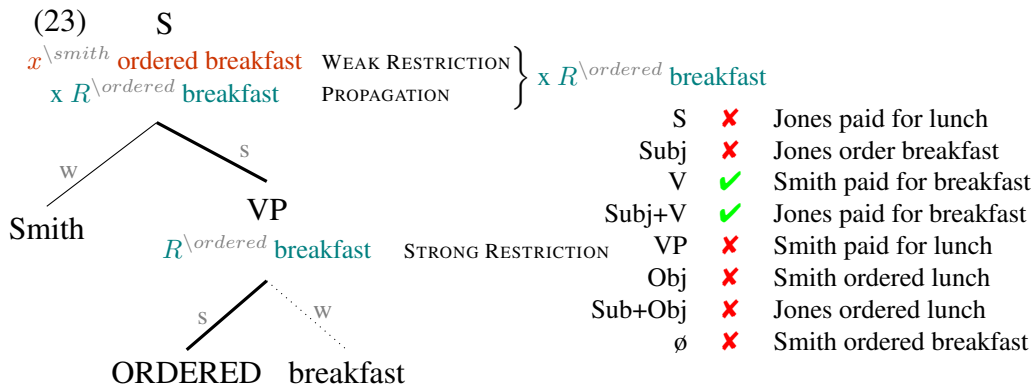
Figure 1: The focus alternatives allowed/excluded by Weak (above) and Strong (below) Restriction, exemplified with a transitive VP.

STRONG RESTRICTION		
$\langle \overset{s}{EAT} \overset{w}{potatoes} \rangle$ $R^{\overset{eat}{potatoes}}$	Right (Weak) Sister's Meaning same	changed (=focal)
Left (Strong) Sister's Meaning same	$eat\ potatoes$ $eat\ potatoes$	$eat\ x^{\backslash potatoes}$ $eat \left\{ \begin{array}{l} hummus \\ apples \\ \dots \end{array} \right\}$
changed (=focal)	$R^{\backslash eat} potatoes$ $\left\{ \begin{array}{l} buy \\ sell \\ \dots \end{array} \right\} potatoes$	Q_{VP} $\left\{ \begin{array}{l} buy\ hummus \\ sell\ apples \\ sleep \\ run \\ \dots \end{array} \right\}$



The table on the right in (22) illustrates which alternatives/focal targets the restriction $Q \backslash \text{Smith ordered breakfast}$ permits, basically any that doesn't include 'breakfast'; i.e. (22) can express object-, VP- and sentence focus, as well as a non-constituent subject+object focus (see §7.2). The final line in that table just says that the tree could also be entirely in the background of a focus, i.e. its ordinary meaning is a focus alternative as well.

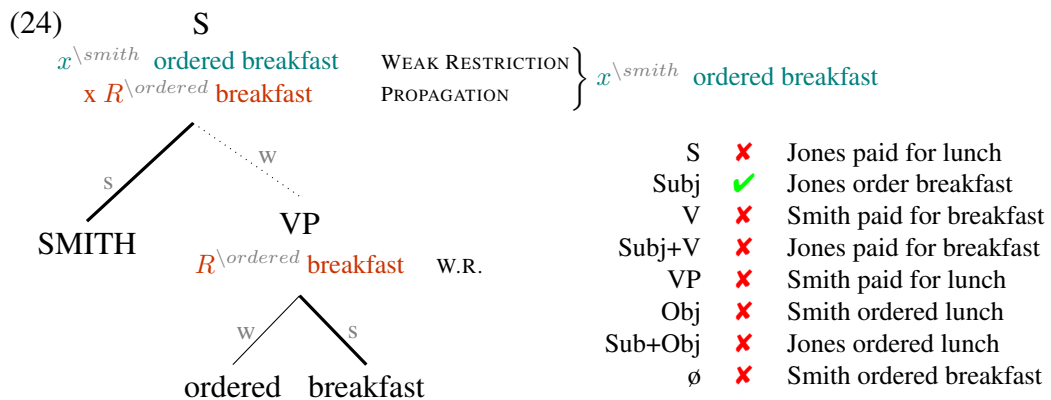
(23) illustrates the interaction of weak and strong restrictions. The SR at the VP level is propagated to the S node, where it is joined by a WR (due to S's default $w-s$ pattern). In (23), the propagated strong restriction subsumes the weak one at the root: alternatives *have* to be 'someone doing something, but not ordering, with breakfast' ($\times R \backslash \text{ordered breakfast}$), so it doesn't matter that the only permitted 'ordering breakfast' alternative would have to have Smith do the ordering ($x \backslash \text{smith ordered breakfast}$). The combined restriction is thus the same as the propagated SR: (23) can only be narrow V or a non-constituent subject+V focus (see §7.2 for discussion of the latter).



As indicated in the last line of the table in (23), the ordinary meaning of the clause

—that Smith ordered breakfast— is not a permitted alternative. This is typical for structures involving metrical reversal/SR: the ordinary meaning of the promoted element is not a permitted alternative; the structure *has* to express focus.

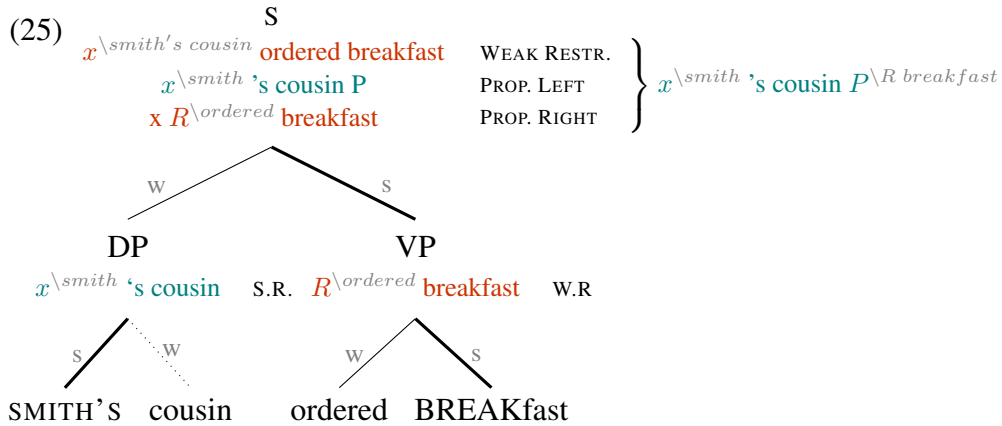
(24) shows the other possible combination of WR and SR for this simple syntactic tree, with metrical reversal of subject and predicate. Here, too, the SR subsumes the WR (triggered by default weak–strong in VP and then propagated). The tree must be interpreted as subject focus.



Note, too, that it is crucial that the VP in (24) allow its ordinary meaning as an alternative (since it ends up being entirely within the background), i.e. that WR permit this ‘trivial alternative’. This, again, is an advantage of *relational* focus semantics: Being metrically strong does not *force* a focal interpretation, if it reflects the default.¹⁵

Finally, restrictions may propagate from both daughters of a node, resulting in a highly articulated alternative set for the mother, as seen in (25) (as in (18), small caps indicate a pre-nuclear accent position).

¹⁵(24) still yields higher stress on *breakfast* than on *ordered* —though neither word can be accented, due to (15)— cf. the parallel tree in (14c). This is intended, as it has been shown that people can reliably detect post-nuclear stress positions and their changes, see Huss (1978), Bartels (2004), Norcliffe and Jaeger (2005), Beaver et al. (2007) a.o.



It is not always easy to grasp what the combination of the various restrictions on the root will amount to; in the case of (25), only proposition that the cousin of someone other than Smith did something unrelated to breakfast (e.g. ‘Preston’s cousin made/ordered lunch’ or ‘Duke’s cousin left’) are permitted alternatives.

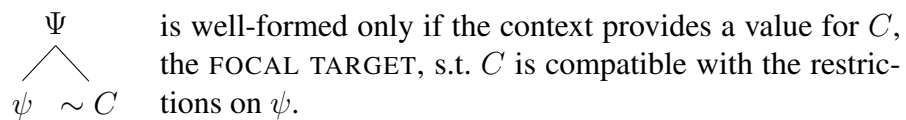
6 Focus Retrieval

6.1 Enter the Squiggle

Throughout, we have used correction pairs to test the predictions of our theory, with the understanding that the target meaning must be allowed as a focus alternative at the root of the correction (recall the adaequacy condition in (3)). Following Rooth (1992), we can make this explicit by representing the target as a variable in the logical form of the correction, which is related to the focus alternatives of the clause by a \sim (‘squiggle’) operator, which in turn imposes the prerequisite conditions on the relation between the variable and the focus alternatives of the clause. We refer to this as the RETRIEVAL of the focus, as it is the point in the interpretation, where focus semantics (the focus alternatives, as calculated by the rules) meets focus pragmatics, hence become ‘active’. (26) adds the Roothian squiggle to our system.

RETRIEVAL

(26) FOCUS RETRIEVAL



If so, the set of alternatives of Ψ may (but need not be) RESET to the ordinary meaning of Ψ (i.e., Ψ). RESET

In short, if the value of C is not excluded by the restrictions (weak and strong) accumulated on ψ , the structure is well-formed (we will discuss the ‘reset’ clause momentarily). (26) is deliberately vague on two points: first, on whether C is a regular meaning, or a set of meanings, and, accordingly, whether ‘compatible’ means that C is a permitted alternative, or a *set* of permitted alternatives (readers familiar with Rooth, 1992, will recognize this as his ‘individual case’ and ‘set case’). Second, on what exactly ‘the context provides a value’ means; options for this are that a previous utterance in the context *has* that meaning, or that the meaning is salient in the context (but perhaps not explicitly articulated), or merely that it can be identified in the context (more or less like a pronoun reference has to be identifiable in the context). We will in fact argue for something like the last option, but this is not crucial at this point. Here, we merely want to demonstrate that our proposal is technically compatible with any one of these assumptions.

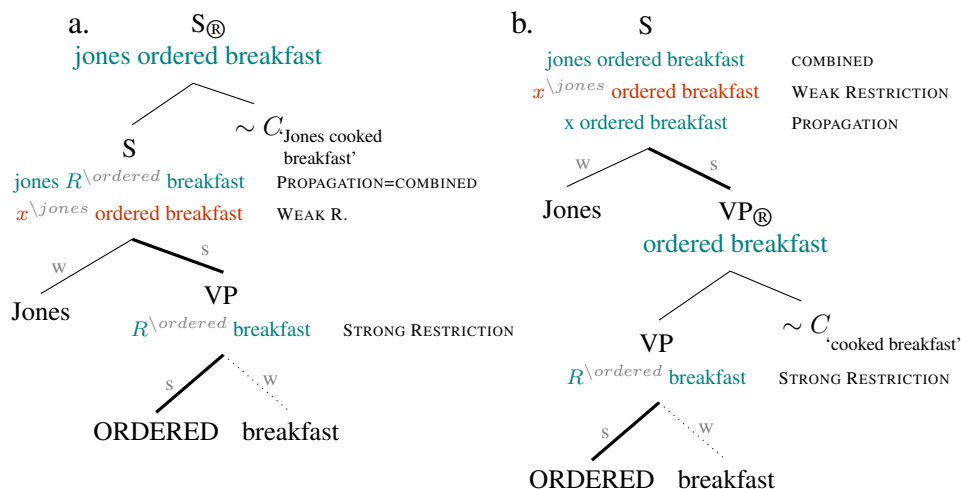
We can also put (26) to use to rule out spurious focusing. The idea is that any non-standard prosody needs to be ‘justified’ by finding a target. To that effect we introduce a rule ‘Use Focus’.

- (27) USE FOCUS!
Any root node must allow its literal meaning as an alternative.

(27) is met if the tree has default prosody throughout. If there is metrical reversal in it, its literal meaning is excluded as a focus alternative. The only way to meet USE FOCUS! in that case is to insert a squiggle somewhere above the reversed node, and that is where the reset clause of (26) comes into effect: Once the focus is retrieved by a squiggle—which in turn means it has found a target—the restrictions can be reset to the literal meaning of the sister of the $\sim C$; thus (27) is met again. This is true regardless of whether $\sim C$ is attached to the root, as in (28a), or to a lower node (but still c-commanding all and any reversed nodes), as in (28b) (nodes where restrictions are reset are marked by ®): the result of propagation plus the higher WR necessarily yields restrictions that allow the ordinary meaning as an alternative, and indeed allows *only* the ordinary meaning if $\sim C$ is on a strong branch, as it is in (28b).¹⁶

¹⁶For the examples discussed in this paper, we could have \sim trigger a reset obligatorily, as it does in Rooth (1992). We make it optional, following arguments in Schwarzschild (1993) that the same focus alternatives can be used twice, once by a focus sensitive particle (see §6.2) and then again by targeting a contrasting utterance (cf. also Büring, 2016, §10.5.4).

(28) Jones cooked breakfast. — No, ...



6.2 Embedded Domains: Second Occurrence Focus

The c-command domain of the squiggle operator is called the (syntactic) FOCUS DOMAIN; it contains the focus and its background, and determines the size and semantic category of potential focal targets. In (28b) above we already showed a focus domain smaller than the entire tree, though there was no particular reason for this placement of $\sim C$ (other than to illustrate). Clearer case of ‘low squiggles’ can be seen in SECOND OCCURRENCE FOCUS examples such as (29).

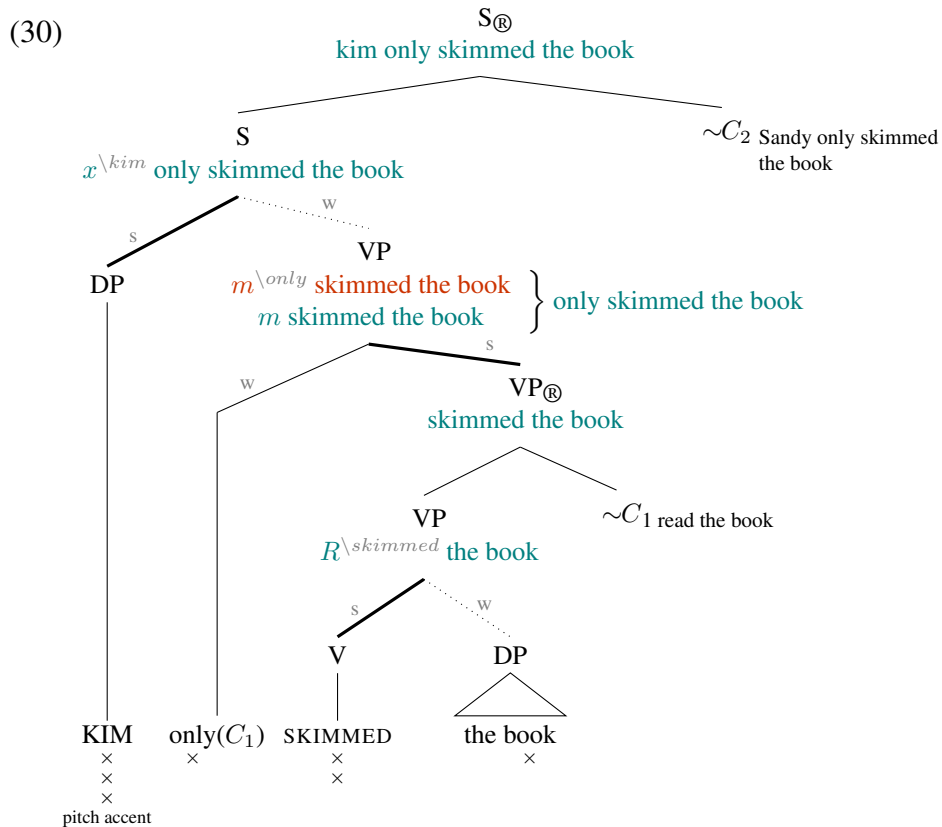
FOCUS
DOMAIN

SECOND OC-
CURRENCE
FOCUS

- (29) (A: Sandy only SKIMMED the book.)
 B: No, KIM only skimmed the book. (Sandy read it cover to cover.)

The underlined focus on *skimmed* in (29), which is needed for alternatives like ‘read the book’ for *only* to quantify over, is realized not by a pitch accent, but merely by stronger stress/metrical reversal; this seems okay, intuitively because it was properly accented on its *first* occurrence, in A’s utterance (see Rooth (1996), Bartels (2004), Beaver et al. (2007) a.o.). Using the present, stress-based system, we can analyze such cases as shown in (30): the subject *Kim* is metrically promoted at the root, thus receives the highest stress and —according to (15) in §3.1— the rightmost, nuclear, pitch accent in the sentence, leaving *skimmed*, which is also promoted, with increased stress (relative to *the book*) but no accent.

By the SR that comes with the metrical reversal on S, that node allows $x \backslash^{kim}$



only skimmed the book' as alternatives, among them the target in (29) (written on the focus variable C_2 in (30) for perspicuity). Following Rooth (1992), $\langle only \rangle$ in (30) is restricted by a variable C_1 , which in turn is coindexed with a minimally c-commanded focus variable. There are thus two focus domains (two squiggles), each with its own target: the alternative(s) for $\langle only \rangle$ for the lower, $\sim C_1$ (narrow focus on $\langle skimmed \rangle$), and the previous sentence for the higher, $\sim C_2$ (focus on $\langle Kim \rangle$).

A structure like in (30) thus has exactly the prosodic and pragmatic properties discussed in Büring (2013), and they follow entirely from the assumptions made so far, with no extra provisos.

Crucially, the lower squiggle in (30) resets the restriction to the ordinary meaning of VP , as it is allowed to by (26); the lower focus has been 'used' at that point. For the higher squiggle, only the SR on $\langle Kim\ VP \rangle$ is 'visible'; after retrieving the corresponding alternatives (so as to target 'Kim only skimmed the book'), the

restrictions are reset again, thereby meeting (27) at the root of the tree.

Note that without the reset at the middle VP, its restriction would be $R^{\backslash\text{skimmed}}$ **the book**, which would propagate to S as $x\ m\ R^{\backslash\text{skimmed}}$ **the book** (where m ranges over $\langle\text{only}\rangle$ -alternatives). In addition, the metrical reversal on S itself triggers a SR $x^{\backslash\text{kim}}$ **only skimmed the book**, the same as in (30). These two restrictions, however, are incompatible: the first only permits alternatives ‘so-and-so (only/even/also...) did some non-skimming with the books’, the second requires alternatives ‘so-and-so (not Kim) only skimmed the books’; plainly, the first wants ‘skimmed’ replaced, the second one kept. Clearly, the intersection of these restrictions yields the empty set: no alternative could meet both restrictions. Reset at VP is crucial.

Conflicting restrictions like that will generally result if the weak branch of a reversed node dominates another reversed node, i.e. if there is a marked focus in the background of a marked focus (or put yet differently: a SR within the weak side of a SR). So we correctly predict —correctly, see §6.4 below— that such a metrical prominence pattern will only be possible if the lower focus is retrieved *within* the background of the higher focus (the higher demoted constituent), i.e. if there is an embedded focus domain, as is typical for second occurrence focus examples like (29)/(30).

6.3 Answer Focus

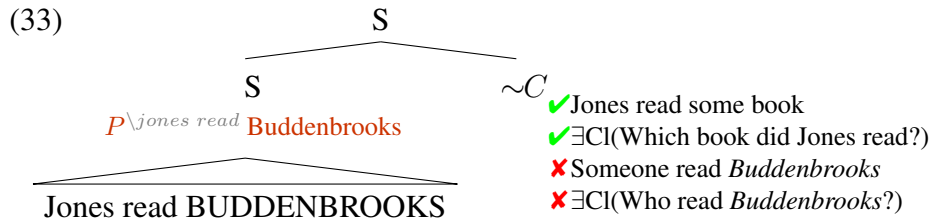
So far we have restricted our attention to declarative targets because there is a virtual consensus in the literature on what is expected of focus semantics in such cases. Yet, pairs of constituent questions and answers are a standard litmus test for focus theories as well. The generalization we aim to capture is rather straightforward: the constituent corresponding to the $\langle\text{wh}\rangle$ -phrase in the question needs to be focused in the answer. This generalization is commonly referred to as QUESTION–ANSWER CONGRUENCE (QAC).

We follow Schwarzschild (1999) in assuming that the target provided by a constituent question Q is its EXISTENTIAL CLOSURE, $\exists\text{Cl}(Q)$, the proposition that the question has a true answer. The existential closures of (31a) and (32a) are (the meanings of) (31b)/(32b), respectively. In other words, the questions in (31a)/(32a) provide the same targets as the parallel declaratives in (31b)/(32b).

- (31) a. Who read *Buddenbrooks*?
- b. Someone read *Buddenbrooks*.
- (32) a. Which book did Jones read?
- b. Jones read some book.

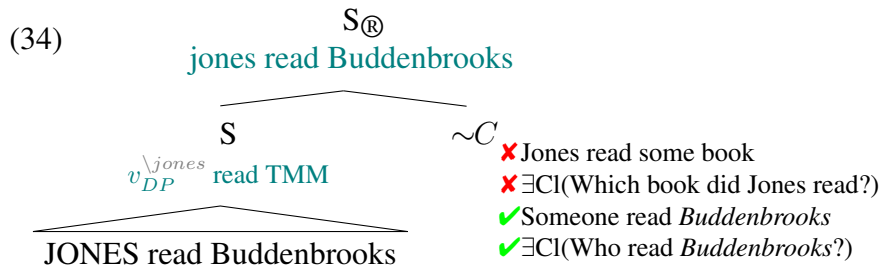
QUESTION–
ANSWER
CONGRU-
ENCE
(QAC)
EXISTENTIAL
CLOSURE

Application of (26) to the answer case is then straightforward: We just have to check that the existential closure of the question is a permitted focus alternative of the answer.¹⁷ Take the answers in (33)–(35).



Obviously, ‘Jones read some book’ is not of the form prohibited in (33), $P \setminus \text{jones read}$ **Buddenbrooks** (‘something about *Buddenbrooks*’); so both the declarative and the question in (32) qualify as targets for (33), as will ‘What did Jones do?’ and ‘What happened?’ (neither about *Buddenbrooks*). Equally clearly, ‘someone read *Buddenbrooks*’ is of just that form (it is about *Buddenbrooks*, but not ‘Jones read it’), which means both sentences in (31) are disqualified as a target, as desired.

(34) requires a target that keeps the VP meaning, but combines it with another subject meaning. Intuitively, (31) qualifies, and (32) does not.



Formally, too, (31) (‘*Someone/who read Buddenbrooks?*’) qualifies if we include generalized quantifiers (or at least existentially quantified individual variables) among the alternatives of $\langle \text{Jones} \rangle$ (which is why we wrote $v_{DP} \setminus \text{jones}$ rather than our usual $x \setminus \text{jones}$ in (34)); (31) still does not qualify, no matter the semantic type

¹⁷It would be trickier to add a Set Case à la Rooth (1992) to our squiggle condition, since not all propositions in the denotation of the question are permitted alternatives in our system. For example $\langle \text{Kim’s DOCTOR is singing} \rangle$ excludes alternatives like ‘Sam’s doctor is singing’, even though that proposition is arguably in the denotation of $\langle \text{Who is singing?} \rangle$; this happens *mutatis mutandis* whenever the focus is branching. The proposition based approach used in the main text does not require any special provisos for such cases.

of *v*.¹⁸

As desired, neither (31) nor (32) qualify as targets for (35), which instead requires a target like ‘so-and-so did something with *Buddenbrooks*’ or the existential closure of a question like \langle *What did Jones do with Buddenbrooks?* \rangle or \langle *What happened to Buddenbrooks?* \rangle (see §7.2 for the latter type).

(35) a. Jones READ *Buddenbrooks* b. $x R^{\setminus read}$ TMM

(35) also does not allow the target ‘Jones did something’/‘What did Jones do?’ (since that’s not about *Buddenbrooks*). For analogous reasons, neither (35) nor (34) are predicted to be possible answers to ‘What happened?’.

Lastly, note again that, due to the more restricted alternative sets of the present approach, the default-prosody answer, (33), cannot answer \langle *What did Jones do with Buddenbrooks?* \rangle , since the corresponding target ‘Jones did something with *Buddenbrooks*’ is ruled out as an alternative of (33). That is, we don’t need an extra AVOIDF condition to exclude VP focus answers to narrow transitive V questions.

6.4 Ineffable Foci

As discussed in Rooth (2010), Büring (2013) and Schwarzschild (2020), certain combinations of focus domains in the same sentence seem impossible to realize, such as in Schwarzschild’s (36).

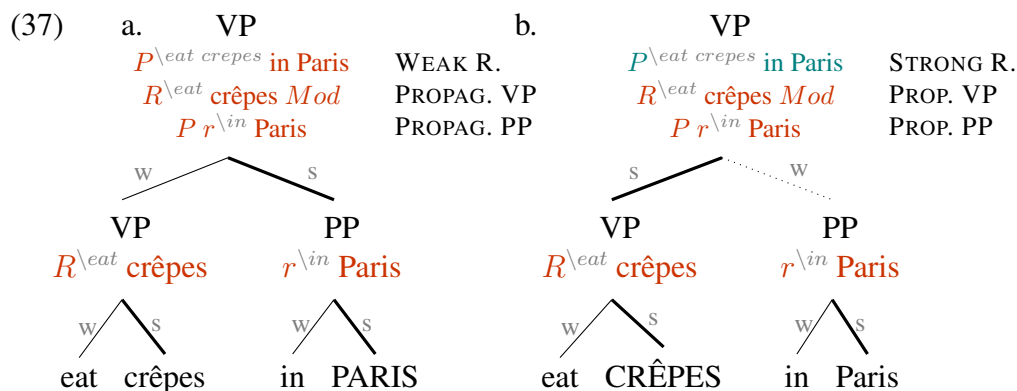
(36) (What did John only eat in PARIS?)
a. #John only ate crêpes in PARIS.
b. #John only ate CRÊPES in Paris.

\langle *Paris* \rangle should be the second occurrence focus of \langle *only* \rangle , while \langle *crêpes* \rangle wants to be an answer focus, to be retrieved by a sentence-level squiggle. (36b) seems to fit that description, yet is as infelicitous as (36a).

This follows from our present account; consider the metrical options: \langle *eat crêpes* \rangle must have default *w-s* prosody, so \langle *crêpes* \rangle can be a focus (to be retrieved at the root-level, to target the preceding question). The next node to merge with is \langle *in Paris* \rangle , which would be strong by default, giving us (37a), which yields nuclear

¹⁸The reset in (34) is required to meet (27), since (34) has metrical reversal. (33) meets (27) with or without reset.

stress and pitch accent on $\langle Paris \rangle$, i.e. (36a). It allows alternatives of the form ‘ate crêpes in x ’, which is good for $\langle only \rangle$, but none of the form ‘ate y in Paris’, due to the WR at the upper VP level ($\langle eat\ crêpes \rangle$ cannot be focal unless PP is, too). So we can no longer target the question ‘What does John only eat in Paris?’ This jibes with the intuition that (36a) conveys the intended proposition, but fails to address the question.



In the alternative rendering (36b), the higher VP is revered, as in (37b), leaving $\langle Paris \rangle$ accent-less, as befits a second occurrence focus. (37b) restricts the upper VP’s alternatives to $P \backslash^{eat\ crêpes} in\ Paris$, so all permitted alternatives are about doing something in Paris. This is good for targeting the question ‘What does John only eat in Paris?’, but it doesn’t allow the kind of alternatives $\langle only \rangle$ is intended to quantify over, leaving only the reading ‘eats nothing but crêpes’, which again jibes with intuitions about (36b).

Generally, we predict that the entire domain (including $\langle only \rangle$) of the lower focus, not just the focus itself, must be within the background of the higher focus domain. This is the case in (29)/(30) above, but not in the $\langle crêpes \rangle$ example. This is exactly the generalization Büring (2013) argues for, but unlike there, we don’t need rules relating focus domains to prominence to derive it; it follows from the local restrictions on alternatives alone.

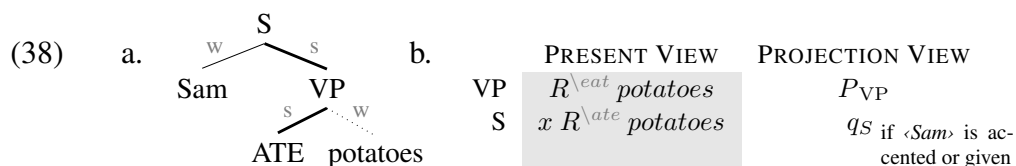
7 Deaccenting

This section looks at more complex focusing and accenting patterns, which we show to pose a conundrum for [F]-marking accounts. In §7.1 we present novel deaccenting data that show that, *pace* such accounts, metrically promoted nodes cannot ‘project’ focus, or, put differently: demoted constituents cannot be part of a larger focus. We then show in §7.2 that default-weak, unaccented nodes *can* be part of a broader, non-constituent focus. Both properties follow from our proposal, but they impose contradictory demands on [F]-marking accounts: discontinuous foci would require the very kind of [F]-projection that must be prohibited to explain the deaccenting data. A coherent account of both is beyond the reach of existing [F]-marking accounts.

7.1 So-called ‘Givenness Deaccenting’ is in Fact Narrow Focusing

7.1.1 Setting the Stage

Consider a structure like (38a), and the different positions on what the alternatives of VP and S are in (38b).



On the present view, metrical reversal marks V and only V as focal within VP, and V plus possibly the subject, but not the object, as focal within S. The Projection View effectively ignores the metrical reversal and assigns both VP and S the full sets of alternatives (all VP meanings and all sentence meanings, respectively). Both positions agree that $\langle \text{potatoes} \rangle$ must be given.

What we call the Projection View in (38b) might seem implausibly permissive, but it is the position entailed by the proposals in Selkirk (1984, 1995), Rochemont (1986), Schwarzschild (1999) or Büring (2006) a.o. In all of these, [F] may ‘project’ from the promoted/accented V to VP and eventually to the root node.¹⁹ In other words, the metrical reversal *may* signal narrow V focus, but it may also be broad VP or even clausal focus with a deaccented, given object.

¹⁹Taken to be TP, with [F] copied from VP to T^0 to \bar{T} to the root, TP.

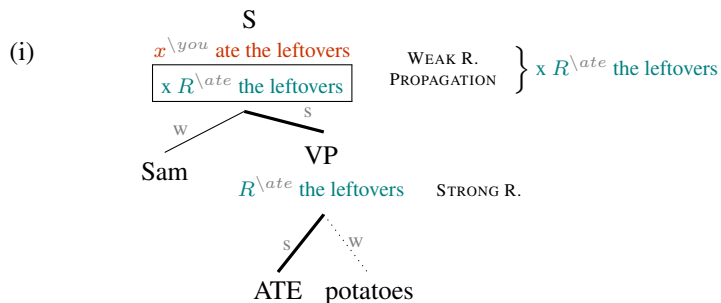
It would be rather easy to derive that same prediction in the present system; we'd give up Propagation, so that the effect of metrical reversal reduces to the givenness requirement for the demoted daughter, (7) in §2.4 above.²⁰ But we think this would be the wrong move, and that the left column in (38b) is the correct one.

The issue at stake here —the choice between the present view and the Projection View in (38b)— can be phrased in many different ways, depending on one's theoretical background and specific view point, among them:

- Can a metrically reversed node be all focal ('broad focus')?
- Can a metrically demoted sister still be part of a larger focus?
- Is [F] on a transitive head sufficient to put [F] on the phrase?
- Can a phrase within a focus be metrically demoted just because it is given?
- Does metrical reversal ever leave the focus alternatives of the mother unchanged?

We submit that the answer one way or other is 'no'. To show that, we have to show that reversal patterns like (38a) may only target meanings that involve 'potatoes', or more abstractly, that the demoted constituent is invariably part of the *background* of the sentence. This, however, is trickier than one might expect. After all, both positions agree that 'potatoes' must be contextually salient for demotion in (38a) to begin with. So we have to look for contexts in which 'potatoes' is salient, but, for some reason, not part of a plausible focal target. In such contexts, the present account predicts that metrical reversal is impossible.

²⁰To see why this is, consider (i), where the propagated SR on the root is boxed.



Without Propagation, only the WR would remain on the S node, which simply says that S is not narrow subject focus. It could be clausal, VP or object focus (or V focus, ignoring 'Avoid Focality'). The only effect of the metrical reversal on VP is, like on the Projection View, that *<potatoes>* must be given.

The Projection View, on the other hand, predicts that reversal is possible, in fact obligatory (AVOIDF!) as soon as *⟨potatoes⟩* is given, no matter what the eventual focus (and focal target) of the utterance is.

7.1.2 The Argument in Detail

Consider the paradigm in (39).

- (39) Microsoft's founder is a respected philanthropist, but whatever he does,...
- a. #...he's at the same time PROMOTING Microsoft
 - b. ...he's at the same time promoting MICROsoft
 - c. ...he's no longer LEADING Microsoft.

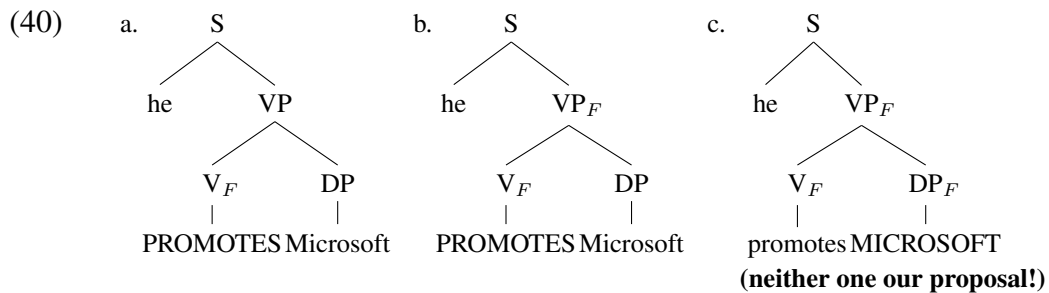
In (39a), we reversed the VP ('deaccented the object'), to ill effect: at best, one gets the strange implication that philanthropy is *bad* for the company's reputation, and so contrasts with promoting it. (39b), with default prosody, is much more natural to express a coherent meaning, which relies on VP focus alternatives: doing philanthropy is juxtaposed with promoting the company (altruistic initiative vs. business interests).

Could (39a) simply be bad because *⟨Microsoft⟩* is not 'given enough' in this context and *therefore* cannot be deaccented? (39c) says 'no': though the context is the same as for (39a) and (39b), deaccenting seems perfect here (though still not obligatory, see §7.1.3 below), so clearly 'Microsoft' *is* salient in the context. The difference appears to be that in (39c), founding the company is contrasted with (no longer) leading the company, narrow V alternatives both.

But then, why can't we take 'founding the company', rather than 'being a respected philanthropist', to be the target of *⟨PROMOTING Microsoft⟩* in (39a) as well? We'd argue that, for one thing, *⟨at the same time⟩* in (39a)/(39b) makes it likely that some other thing the founder is doing *at the same time* as promoting the company —namely being philanthropic— is the intended target, rather than that they, once upon a time, founded it. Plus, likely there is no pragmatic reason to want to juxtapose founding and promoting a company.

The present proposal offers a coherent and straightforward explanation for the pattern in (39): (39a) and (39c) both can be narrow V, but not VP, foci. But only in (39c), which contrasts 'leading Microsoft' with 'founding Microsoft', is narrow V focus felicitous; with *⟨promoting Microsoft⟩*, only VP focus, contrasting with 'doing the philanthropist thing', makes sense, hence (39b).

On the Projection View, on the other hand, (39a) has, apart from narrow V focus as in (40a), a second construal as a *bona fide* VP focus, (40b), which would give it the same VP and S alternatives as (40c) (the structure of (39b) on the Projection View). And since (40b) still has one fewer [F] than (40c), (39a) should be preferred over, and by AVOIDF! block, (39b), even if the Projection View were to grant that (39a) cannot be narrow V focus for pragmatic reasons (if it doesn't grant that, it is hard to see how to ever rule out (39a)).



There are two lessons to be learned from this: First, there is what we may call an INTENTIONAL component to all focusing and deaccenting. Mere saliency of meaning in context is not sufficient, the speaker must have intention and reason to target something about that meaning with their utterance, be it contrasting, elaborating, or pointing out parallelism. This general point has repeatedly been made in the past two decades or so, often summarized by the slogan ‘focusing requires true contrast’,²¹ and is what rules out narrow V focus in (39a).

INTENTIONAL

Second, however, this means that metrical reversal has to be viewed within a larger domain; it is generally not sufficient to look at the demoted element, or the reversed mother node, in isolation. And this is where the fundamental problem with a Projection View structure like (40b) lies: The [F] on VP ‘erases’ all effects the lack (or presence) of [F] on the object could have on the focus alternatives of VP and nodes dominating it. As long as (40b) is allowed in principle, no consideration about the focal target of the whole sentence (or VP) can rule out (39a) vis-à-vis (39b). This is why we favor the present view, no ‘projection’ from promoted heads, over the Projection View in (38b).

²¹e.g. Wagner (2012), Büring (2019)

7.1.3 More Cases of Merely Apparent Deaccenting

We just argued that there is no such thing as ‘anaphoric deaccenting’, that metrical reversal always excludes the demoted sister from the focus. Since this is a notable departure from standard wisdom, we support and contextualize this position with more cases in this section and the next.

Schwarzschild (1999) offers an example similar to (41) in support of the possibility to project [F] from a promoted V to VP, i.e. the Projection View.²²

(41) What did John’s mother do? — She [[PRAISED]_F John]_F

According to Schwarzschild (1999), mentioning of John in *John’s mother* makes John salient, so *John* can remain unfocused in the answer, despite being part of the (answer) focus *praised John*.

In contradistinction, we argue —like in §7.1.2— that the answer in (41) must in fact be narrow V focus, contrasting ‘praising John’ with some other reaction to John. While it is true that the question in (41) could also be answered by *she left* or *she called the police* —i.e. the question *per se* does not force a narrow V answer— it is equally true that the *actual* answer in (41) requires us to accommodate a lot of additional context: John’s mother was not just occupying her time by praising John (*What did John’s mother do yesterday afternoon?—#She PRAISED John.*), rather she was reacting to something John did. For (41) to be a satisfactory answer, we must interpret the question more specifically, for example as ‘How did John’s mother react to John’s statement?’ or ‘Did John’s mother criticize his behavior?’.

One indication of this is that the default variant (42) is not unacceptable to answer the question; one simply accommodates a different kind of context for it.

(42) What did John’s mother do? — She praised JOHN.

If John is the king, and the queen mother gave a speech supposed to console and unite the nation in a crisis, (42) would be the way to express that, instead, she tried to make the royals look good; in such a context, (41) would in fact sound less natural than (42).

This kind of ‘optionality with pragmatic impact’ seems to us to be typical of

²²Schwarzschild’s example, (9) has a pronoun, *him*, instead of *John* in the answer. This is not ideal to discuss the point: since the object is a pronoun, strong–weak is actually the default prosody, so a VP focus interpretation would be unremarkable. We therefore changed the pronoun to a name.

alleged ‘deaccenting’ examples. Take (43).

- (43) John’s mother simply showed up here!
a. No, she CALLED John first. b. No, she called JOHN first.

Both answers are possible, but there is a pragmatic difference: (43a) is appropriate, for example, if *here* refers to John’s residence, so that ‘simply showing up’ implies ‘not calling the resident, John, first’. (43b) is appropriate if *here* is a place unrelated to John, in which case ‘simply showing up’ is taken to imply ‘without doing anything else’, which is contradicted by ‘calling John first’.

That this is on the right track is further supported by (44), where deaccenting seems plain odd.

- (44) John’s mother will show up here!
a. # No, she’s VISiting John. b. No, she’s visiting JOHN.

Like in (43), if *here* is not John’s place, (44a) is understandably strange, since nothing obvious about John’s mother in relation to John is implied by ‘showing up here’ in that case. However, this time, if *here* is John’s residence, ‘showing up here’ and ‘visiting John’ are the same, so, unlike in (43), the correction with deaccenting in (44a) still does not make sense (note, too, that without *No*, (44a) seems fine again, as expected).

(44b) on the other hand —the structure that would be blocked by AVOIDF whenever John is salient—, is fine if ‘here’ is some other place than John’s, saying that in fact she is at John’s place, and not wherever ‘here’ is.

With constituent questions, we can specify contexts more, too, to manipulate plausible targets, as in (45).

- (45) What is the first thing Russian spies do once they arrive in a foreign country? —
a. They contact RUSSIA. b.# They CONTACT Russia.

It seems odd to deaccent *Russia* in (45b), even though it is clearly given in the context. But the mentioning of arriving in a foreign country makes the spies’ relation to *that* country more salient than their relation to their own country, plus there is hardly anything other than making contact one would expect them to do in relation to Russia once they arrived in a foreign country. Therefore it is difficult to

think of some other ‘they *R* Russia’ the narrow focus in (45b) could be targeting.²³

All these examples show that, in order to make any predictions about the felicity of the reversed/default variants in context, the *sentences* (not just the demoted constituents) have to have different focus alternatives. On the Projection View, however, both variants have the same clausal (and VP) alternatives, so no difference about the potential focal targets of the two variants can be derived. On our view, as opposed to that, reversal leads to a different clausal alternative set, and signals a pragmatic choice in these examples, namely to target a narrow, rather than a broad focus alternative.

Deliberate choices between different focusing targets in the same context have been discussed before, if briefly, in Schwarzschild (1999). The factors that influence a speaker’s choice of target mentioned there include the intention to answer a particular question (FN5, p.160) or to contradict a particular aspect of a previous utterance (§5). Our analyses of the reversed cases in this section go one step further, in permitting focal targets that are not articulated in the context. For example, we argued that *⟨She PRAISED John⟩* in (41) targets something like ‘she criticized John’, even though the question was just *⟨What did she do?⟩*, and ‘she criticized John’ is not salient before the utterance of the answer. So the speaker chooses to ignore a contextually salient broad focus target (the question) in favor of a merely implicit narrow focus target. The only connection between the focusing and the *previous* context in these cases is that —per (7)— *demoted* material must be contextually salient, in the sense used in all common theories; see Büring (2019) for a detailed defense of this division of labor.

7.2 An Argument against [F]-Marking Accounts

The previous subsection argued that apparent givenness deaccenting is in fact narrow focusing, and that ‘focus projection’ in a metrically reversed structure is impossible. This is an argument against the [F]-projection rules assumed by the Projection View, in particular projection from promoted transitive heads, but it is not yet an argument against [F]-marking in general. An [F]-marking theory that blocks projection from promoted nodes would seem to be able to accommodate

²³Wagner (2012), Katzir (2013) and Büring, 2019 a.o. include a semantic notion of ‘contrast’ in the pragmatic conditions on target-focus pairs (in present terms: into the conditions on the squiggle) in order to rule out intuitively odd target–focus pairs. Since the precise reasons why some narrow foci seem more felicitous than others is orthogonal to the issues discussed here, we refer the interested reader to these works.

the facts in the same way we did in §7.1. We now show that such a maneuver does not provide a general solution.

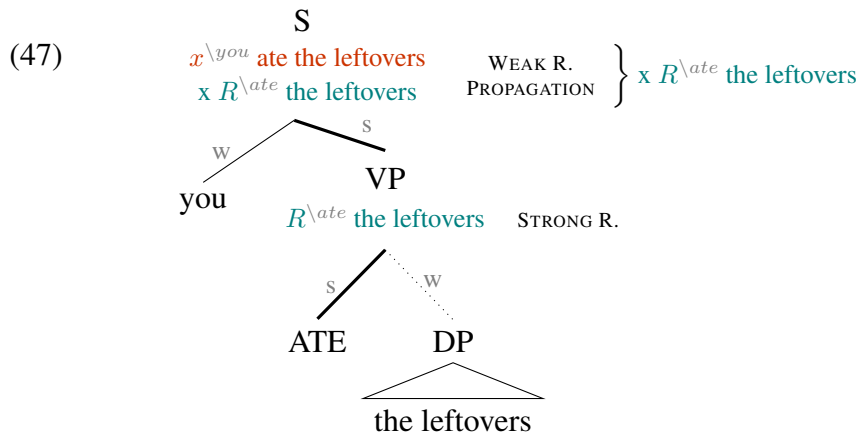
7.2.1 Non-Constituent Foci: The Simple Argument

In (46), Bo contrasts ‘Chris put the leftovers in the fridge’ with ‘Al ate the leftovers’.

- (46) Al: Help yourself, Chris put the leftovers in the fridge last night.
 Bo: You ATE the leftovers (remember?)

(47) shows our analysis of (46)B. We have metrical reversal on the VP, imposing a SR which makes ‘the leftovers’ background and ‘ate’ focal. The S node has default prosody, imposing the WR that *<you>* is not narrow focus (which it can’t be anyway, given the SR within VP). The resulting restriction at the root is $x R^{ate}$ the leftovers: someone did something about the leftovers that is not ‘eating them’; ‘Chris put the leftovers in the fridge’ qualifies, predicting (46) to be felicitous. A different way of saying this is that (46) contrasts two properties of the leftovers: ‘being in the fridge’ (or ‘having been put there by Chris’) and ‘having been eaten by Al’; since neither of these is expressed by a constituent in (46), we have a NON-CONSTITUENT FOCUS, subject+transitive-V.

NON-
CONSTITUENT
FOCUS



[F]-marking accounts have no analysis for such examples, unless they do what we just argued must not be done: Project [F] from V to VP to S. First, note that [F]-marking V alone won’t suffice since it is neither given nor intuitively targeted that the addressee, Al, did something else with the leftovers; *<you>* needs to be (part of the) focus as well. Next, *<you>* in the context of (46) doesn’t have to be

accented; it is perfectly fine to even phonologically reduce $\langle you\ ATE \rangle$ to $\langle ya\ ATE \rangle$ or $\langle y'ATE \rangle$, which shouldn't be possible if the pronoun bore a pitch accent or additional stress. But, not having either, $\langle you \rangle$ cannot, on [F]-marking accounts, be itself [F]-marked.²⁴

The only way for [F]-marking accounts to get the subject to be part of the focus (be 'replaced' to get the alternative 'Chris put the leftovers in the fridge'), then, is to project [F] from the promoted V all the way to the root. [F]-marking accounts thus face a dilemma now: If they don't allow projection from promoted heads, they wrongly rule out non-constituent foci like in (46); if they do, they lose any hope of accounting for the kind of contrasts just discussed in §7.1.

What gives the present proposal the advantage here is, again, its relational nature: Even though the subject and the object in (46) are equally accent-less (and may bear the same amount of (non-)stress), one of them, the subject, is so by default, while the other, the object, has been demoted. Consequently, the subject may be focal (together with the V), but the object may not. Evidently, a theory that derives the focus alternatives of a constituent by looking at that constituent alone (e.g. whether it is accented or not), has no way of achieving the same predictions.

7.2.2 Non-Constituent Foci: The Complex Argument

We close by discussing a complex variant of the non-constituent focus argument above, starting with an example from Selkirk (1995:557).

- (48) (We sat around the campfire all night talking about bats. And then today, guess what happened?) MARY bought a BOOK about bats.

Selkirk argues that the answer in (48) must be clausal focus (because of the question 'what happened'), and consequently the reason $\langle bats \rangle$ is unaccented must simply be that it is given.

As we did in §7.1 above, we start by observing that the metrical reversal in $\langle BOOK\ about\ bats \rangle$ is not pragmatically inert, as an 'anaphoric deaccenting' view would have it. Controlling for the focal target allows us to render the reversed structure ('deaccenting') odd.

- (49) (We sat around the campfire all night talking about bats. But today at the mall, Mary sneaked off to play in the arcade all morning.) No! #Mary

²⁴Which in itself isn't problematic: $\langle you \rangle$ is given anyway —the addressee of a conversation can safely be assumed to be salient— so it doesn't need [F]-marking for its own sake.

bought a BOOK about bats.

There is no reason why ‘(about) bats’ should be any less salient, and hence *<(about) bats>* any less given, in (49) than in (48). The crucial difference, we submit, is that the reply in (49) targets ‘Mary played in the arcade all morning’, and since that has nothing to do with bats, a narrower focus is unacceptable. This in turn entails that *<about bats>* is not part of a larger VP focus, *pace* the Projection View. We submit that the target in (48), on the other hand, is not the question ‘What happened?’, but the previous sentence’s entailment ‘we talked about bats’ (note again, too, that *<Mary bought a book about BATS>* is a possible answer in (48) as well, in which case it plausibly targets something like ‘Mary did whatever non-bat related things she used to do before last night’).

(50) and (51) provide analogous examples in which deaccenting the nominal attribute is clearly dispreferred.

- (50) (This entire week, we talked about the dangers of UV radiation. But then today at the mall, Mary went to a tanning booth. —) No!...
- a. #Mary bought a BOOK about radiation.
 - b. Mary bought a book about RADIATION.
- (51) Ever since we showed the docu about climate change, our students no longer study math, but...
- a. #organize MARCHES against climate change
 - b. organize marches against CLIMATE change

In both examples, the most plausible target for focusing is provided by the last clause in the context (‘went to a tanning booth’, ‘study math’), neither of which is built around a relation with radiation/climate change, so the latter cannot be part of the background; they have to be part of the focus, which, we claim, is why they are not deaccented. If deaccenting *<radiation>/<climate change>* were merely a reflex of givenness within a VP focus, with no consequences for the focus alternatives to VP and nodes above it, as [F]-marking accounts would have it, the (de)accenting of the DPs should not be sensitive to this.

Next, as in §7.2, we show that an [F]-marking account cannot retreat to the position that the examples above are simply narrow foci on *<book>* (*<radiation>/<climate change>*), i.e. disavow projection from promoted heads. This time, the verb plays the role of the pronominal subject in (46) above. According to the original [F]-marking analysis, the verb can be unaccented in, say, (48) because it can inherit an

[F]-marker from *<book>* via the object DP node. Like projection from V to VP to S in §7.2, this is no longer viable since we just saw that *<(about) bats>* is *not* part of the focus and hence must not be dominated by any [F] markers, in particular not one on the object DP. But without that [F]-marker, no copying [F] to the V is allowed, so the verb ends up non-focal, which is evidently the wrong result for these cases (it is neither given nor part of any conceivable focal target).

Like in the non-constituent case discussed in §7.2.1, the present proposal has no difficulty accounting for these data: *<bought>* (*<film>*) is weak by default, not by demotion, so —accent or not— it may be focal. Only *<about bats>* is demoted, hence confined to the background.

8 Conclusions

In this paper we showed how to connect relational metrical structure to a theory of focus pragmatics based on alternatives. Alternative based focus pragmatics are the predominant and best understood type of focus theories; likewise, it has been argued, that focus semantics should be based on stress in general (e.g. Ladd, 2008), and relational stress representations in particular (Williams, 1997; Calhoun, 2010a). Yet, this is, we believe, the first explicit proposal implementing such a combination.

Key to our treatment is to assign focus alternatives to branching constituents based on the weak–strong relation between their immediate parts, crucially distinguishing default and non-default strength patterns. We argued that an alternative view, which looks at privative properties of each constituent alone (such as bearing an accent) will not succeed, because the very same property may be indicative of focus in one configuration, but neutral in the other (recall the discussion of prenuclear accents in §3.2 and of the focal status of weak elements in §7). This follows the line of argument in Calhoun (2010a), which, however, lacks any explicit semantics, and, in calling stress–focus correlations ‘stochastic’, could be understood as doubtful that such a formalization is even possible.

Our particular proposal eschews syntactic [F]-markers or any other means of syntactic focus representation. We do not claim that a relational focus semantics mediated by syntactic [F]-markers is impossible to define, merely that [F]-marking doesn’t appear to be necessary, and that existing [F]-marking accounts are not easily modified to the task.

The three rules of our focus semantics, Strong Restriction, Weak Restriction,

and Propagation, are built around the same general ideas, but are logically independent. Strong Restriction alone, combined with a ‘minimize focus’ meta-rule such as (11) in §2.4 already delivers accurate predictions on the canon of examples discussed in the literature on focus in English, including the ones problematic for non-relational accounts. The addition of Propagation tightens these predictions, especially for cases involving ‘deaccenting’ (which we argued is really always narrow focus), for reasons we discussed in §7. The addition of Weak Restriction builds complementarity into the focus semantics and therefore renders superfluous any ‘minimize focus’ principles. In combination they offer a coherent and novel view on a wide range of focus data in English.

9 Appendix: Formal Definitions

As in existing accounts, we assume that each node comes with a second dimension of meaning, providing its focus alternatives. For the case of Strong Restrictions, we could do this just as in the standard way: the focus alternatives of the reversed node are all alternatives to the strong daughter, each composed with the literal meaning of the weak daughter.

For the case of Weak Restriction and Propagation, on the other hand, doing things this way becomes cumbersome. For example, in *⟨eat POTATOES⟩*, we want...

1. its ordinary meaning, plus
2. any alternative of the strong daughter (\neq its ordinary meaning) composed with the any alternative (including the literal meaning) of the weak daughter, plus
3. any meaning of the semantic category of the mother, except those equivalent to an alternative of the weak daughter with an alternative of the strong daughter

1 corresponds to ‘background’, 2 to narrow strong daughter focus plus strong *and* weak daughter focus, and 3 to mother (broad) focus.²⁵ Note in particular that, while we do want to get genuine mother-category type meanings through 3 (e.g. *⟨sleep⟩* in case the mother constituent is a transitive VP, recall the discussion in

²⁵Recall that we do not want to derive all mother alternatives as compositions of daughter alternatives, since we want to restrict alternatives to the meanings of actual expressions of the requisite syntactic category.

§4), we cannot allow all of them, lest the restrictions articulated in 1 and 2 become void.

To make definitions a little easier, we will therefore associate with each node not the set of its alternatives, but the set of its *unalternatives*, i.e. those excluded by the restrictions.

We write $\text{Dom}(X)$ for the set of all meanings expressible by expressions of the syntactic category of X ; $\llbracket X \rrbracket_{\mathcal{O}}$, $\llbracket Y \rrbracket_{\mathcal{O}}$ etc. for the ordinary meaning of X and Y , and $\mathcal{Y} \otimes_X \mathcal{Z}$ for the semantic composition of each element of \mathcal{Y} with each element of \mathcal{Z} by the composition rules for syntactic category X . For example $\text{Dom}(\text{V}_{\text{tr}}) \otimes_{\text{VP}} \text{Dom}(\text{DP})$ is the set of all transitive VP meanings. In analogy to the common notation $\llbracket \alpha \rrbracket_{\mathcal{F}}$ for the focus alternatives of a constituent α , we write $\llbracket \alpha \rrbracket_{\mathcal{U}}$ for the set of excluded alternatives of α ; transparently, $\text{Dom}(\alpha) \setminus \llbracket \alpha \rrbracket_{\mathcal{U}}$ in the present theory directly corresponds to $\llbracket \alpha \rrbracket_{\mathcal{F}}$ in standard theories.

(52) For any terminal X , $\llbracket X \rrbracket_{\mathcal{U}} = \emptyset$

(53) For any branching node $\begin{array}{c} Z \\ \swarrow \quad \searrow \\ X \quad Y \end{array}$ or $\begin{array}{c} Z \\ \swarrow \quad \searrow \\ Y \quad X \end{array}$, the set of UNALTERNATIVES of Z , $\llbracket Z \rrbracket_{\mathcal{U}}$, is the smallest set such that...

- a. $(\text{Dom}(X) \setminus \{\llbracket X \rrbracket_{\mathcal{O}}\}) \otimes_Z \{\llbracket Y \rrbracket_{\mathcal{O}}\} \in \llbracket Z \rrbracket_{\mathcal{U}}$
if Z has default prosody Weak Restriction
- b. $\text{Dom}(Z) \setminus (\{\llbracket X \rrbracket_{\mathcal{O}}\} \otimes_Z (\text{Dom}(Y) \setminus \{\llbracket Y \rrbracket_{\mathcal{O}}\})) \in \llbracket Z \rrbracket_{\mathcal{U}}$
if Z is metrically reversed, Strong Restriction
- c. $\llbracket X \rrbracket_{\mathcal{U}} \otimes_Z \text{Dom}(Y) \in \llbracket Z \rrbracket_{\mathcal{U}}$ and $\text{Dom}(X) \otimes_Z \llbracket Y \rrbracket_{\mathcal{U}} \in \llbracket Z \rrbracket_{\mathcal{U}}$
in either case Propagation

(54) For any non-branching node $\begin{array}{c} Z \\ | \\ X \end{array}$, $\llbracket Z \rrbracket_{\mathcal{U}} = \llbracket X \rrbracket_{\mathcal{U}}$

(55) Focus Retrieval: $\begin{array}{c} \Psi \\ \swarrow \quad \searrow \\ \psi \quad \sim C \end{array}$ is defined if the value of $C \notin \llbracket \psi \rrbracket_{\mathcal{U}}$.

If defined $\llbracket \Psi \rrbracket_{\mathcal{O}} = \llbracket \psi \rrbracket_{\mathcal{O}}$, and $\llbracket \Psi \rrbracket_{\mathcal{U}} =$

- a. $\text{Dom}(\psi) \setminus \llbracket \psi \rrbracket_{\mathcal{O}}$ if Ψ carries $\textcircled{\text{R}}$
- b. $\llbracket \psi \rrbracket_{\mathcal{U}}$ otherwise

(53)[a–c] are the formal versions of WR, SR and Propagation, respectively.

To aid understanding, note that $Dom(X) \setminus \{\llbracket X \rrbracket_{\mathcal{O}}\}$ corresponds to $v_X^{\setminus X}$ in our informal notation (‘all meanings of the same category as X, except its ordinary meaning’), $Dom(X) \otimes_Z \{\llbracket Y \rrbracket_{\mathcal{O}}\}$ to $v_X Y$ (‘all meanings of the same category as X properly composed with the ordinary meaning of Y’), and $Dom(X) \otimes_Z Dom(Y)$ to $v_X v_Y'$ (‘all meanings of the same category as X properly composed with all meanings of the same category as Y’).

$Dom(Z) \setminus \dots$ in (53b) is ‘all meanings of the same category as Z, except those in ...’. Using it, we turn the positive characterization of the alternatives in SR—informally $v_Y^{\setminus Y} X$ —into the set of *unalternatives*.

Focus retrieval simply makes sure that the value of C , the target, is not an unalternative. This is of course the same as if we calculated the set of alternatives first, $Dom(\psi) \setminus \llbracket \psi \rrbracket_{\mathcal{U}}$, and then checked whether the value of C is an element.

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