Syntactic Alternative Projection

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1. Phonologically motivated uses of prosodic focus

Prosodic focus can be used to flag contrasts in phonological form. Bolinger (1961: 93) observes the cartoon caption in (1-a) (Gardner Rea, The New Yorker, April 14 1956, p. 36); (Ladd 2008: 234) reports the BBC news line in (1-b). In both cases, prominence (small caps) falls in an exceptional place, and the repeated material that usually would receive prominence remains unaccented (indicated by grey-shading):

(1) a. In such a case, our first concern is to persuade the patient that he is a stalagMITE.
b. Greek divers have found the wreck of the British liner Britannic, sister ship of the TItanic

The parts of the words that exceptionally carry stress and align with the last pitch accent of the utterance, [maɪt] and [taɪ], do not have an identifiable meaning. Apparently non-semantic uses of focus also arise when words are contrasted that appear to share a morpheme, but whose meaning is not compositional:

(2) a. 'This whiskey,' said O'Reilly, sampling spirits that claimed to be from his homeland, 'was not exported from Ireland; it was DEported.' *(Bolinger 1961: 83)*
b. John is more concerned with affirmation than with CONfirmation. *(Chomsky 1971: 205)*
c. John expected to be promoted, and was shocked at being DEmoted *(Wennerstrom 1993: 311)*

These cases are problematic if prominence flags the constituent where alternative *meanings* are introduced. Rooth (1992), e.g., argues that alternative meanings are introduced locally and compose pointwise (Hamblin 1973) up to the focus operator ~ ('squiggle'). ~ quantifies over these alternatives and a pronoun C, and requires its antecedent to be a member or subset of the alternatives set (cf. Wagner 2021a):

(3) Amal gave up, and then [[~ C][FRANKIE$_F$ threw in the towel]]

This meaning-based analysis accounts for why focus antecedence requires semantic and not form identity, e.g. *gave up* and *threw in the towel* share a meaning but differ in form. Similarly, *Who called me?* can be an antecedent for *AMAL called you*, provided that *me* and *you* denote the same individual. The puzzle raised by (1) and (2) is now apparent: Focus prominence supposedly flags sites of meaning substitution, but [maɪt] and [taɪ] have no meaning; alternative meanings supposedly compose pointwise up to ~, but *demote* or *confirmation* are not compositional. But should focus theory really be responsible here? Couldn't the exceptional stress be phonologically motivated? Jacobs et al. (2015) claim that repeated material tends to be reduced, including in cases like homophones, where no meaning is shared; Williams (1981, 1997) proposes a "rhyming law", which holds that "the final nucleus of an Intonation unit (roughly, clause) cannot be identical to any final portion of the preceding intonation unit." Could this explain (1) and (2)? Artstein (2002) points out a property of phonologically-motivated focus which, if true, dooms any such phonological explanation: Outside metalinguistic uses (more on these below), contrasting (['taɪtænɪk] vs. ['brɪtænɪk]) implies that the word *meanings* (⟦Titanic⟧ vs. ⟦Brittanic⟧) are contrasted with each other, just as in other uses of focus. The next section provides experimental evidence for Artstein's claim.

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2. Phonological focus conveys a semantic contrast

The meanings of *remember* and *dismember* do not easily lend themselves to be contrasted, and the speaker in (4-a) does not seem to contrast them. And yet, the speaker in the more contrived (4-b) does:

(4) a. *No Contrast:* She had a nightmare that she just remembered.
She dreamt she fought aliens who she all dismembered.
b. *Contrast:* No, the nightmare is what she remembered.
It's the aliens in it that she dismembered.

A phonological account cannot make a distinction between these two cases, and would predict that speakers shift prominence to the prefix in both cases. However, deaccentuation of *member* seems intuitively much more likely and felicitous in the second case. To firmly establish that this intuition carries water, a production experiment was conducted. It included two additional control conditions:

(5) a. *Repetition:* The aliens in the movie were all dismembered. They were all dismembered.
b. *New:* Just go to therapy. Your problems will all be dismembered.

The data reported here is from a replication of the experiment reported at the conference, which removed some confounds due to word order differences between conditions. Materials included 16 item sets with 4 conditions parallel to (4) and (5). 32 native speakers of North American English recruited on Prolific participated in the study, which was run on a McGill server using the Prosodylab Experimenter (Wagner 2021b). Each participant produced one example from each item set, with an equal number from each condition, so they would produce a given target word only once. Data was aligned with the Montréal Forced Aligner (McAuliffe et al. 2017). Fig. (5) illustrates the relative difference in log duration between the first and the lexically stressed syllables as a proxy measure of focus marking. The results suggest that prominence shifts regularly only when speakers contrast the word meanings, as in (4-b).

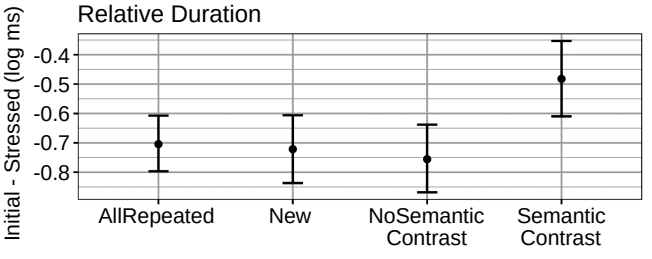


Figure 1: Difference in log duration of the initial syllable (e.g., [taɪ] in *Titanic*) and the lexically stressed syllable (e.g. [tæn]) for three 4 conditions, with confidence intervals.

A mixed effect linear regression with random effects for item and participant was fit, estimating p-values with lmerTest. Conditions were Helmert-coded. The *new* baseline in (5-b) did not significantly differ from the pooled other conditions with repeated target words ($\beta = 0.06; p < 0.27$); the all-repeated condition did not significantly differ from the (4-a) and (4-b) conditions ($\beta = -0.12; p < 0.16$); but crucially, the case without intended contrast in (4-a) differed significantly from (4-b) ($\beta = 0.28; p < 0.011$). Qualitative annotations, not reported here, further confirm these results.

The results support Artstein's claim that even phonologically-motivated foci encode a semantic contrast, and speak against a separate phonological mechanism.[1] Artstein (2002) proposed that meaningless word-parts denote their own phonological form, and evoke phonological alternatives, similar to Williams's (1997) idea of focus based on phonetic rather than semantic content. This will turn out not to

[1] The results also seem incompatible with the claim that *all* deaccentuation is phonological (Tachikawa Shapiro & Anttila 2020), a view that overgenerates in (4-a), but also many other cases, see e.g. the contrastiveness restriction observed in Wagner (2006). It also undergenerates, e.g. it fails to predict focus marking in (3) above.

be general enough, as we will see when looking at metalinguistic uses of focus. The alternative solution proposed here is that focus alternatives project pointwise in syntax, rather than (just) in semantics.

3. Syntactic Alternative Projection and Phonological Focus

Sets of alternative expressions are familiar from pragmatic reasoning, where inferences are standardly made based on utterances that a speaker didn't make. The idea that focus involves syntactic substitutions is also not new. Katzir (2007) and Fox & Katzir (2011) argue that F-substitutions are expressions, based on a complexity constraint on alternatives: Substituted for *F* can at most be as syntactically complex as the replaced constituent. For this, it would be sufficient to require that substituted meaning be generable from syntactic constituents of a certain size, while maintaining Hamblin-style projection. What is new here is he argument that alternatives *project* in syntax. To implement this, we need a grammar that can quantify over (sets of) expressions. A related idea was proposed in Li (2017), where focus is also calculated over expressions, but instead of projection, a scoping mechanism is assumed, to which we return below.

3.1. Metalinguistic access and syntactic alternatives

We can think of a linguistic expressions as having a syntactic category (e.g. NP), a meaning (e.g. an individual), and a phonological form (e.g. [fræŋki]) (*italics* are used when referring to an expression):

(6) *Frankie* = $\langle NP; \textbf{frankie}:e\ ;$ [fræŋki]$\rangle$

To give grammar 'metalinguistic access', let's assume with Potts (2007) that for any expression, there is also a homophonous and syntactically equivalent expression denoting that expression, an individual of type *u* for 'utterance': *Frankie* can denote the expression *Frankie*, which in turn denotes an individual (I'm using raised corner brackets to refer to an expression that denotes its regular-denotation version):

(7) $\ulcorner$*Frankie*$\urcorner$ = $\langle$NP; $\langle$NP; **frankie**:e; [fræŋki]$\rangle$:u ; [fræŋki]$\rangle$

Metalinguistic predications provide some motivation for this duality of use, though in this case the expression is necessarily a noun and might just refer to an individual that happens to be an expression:

(8) *gold* is a noun, has 4 phonemes, and denotes something precious (# and glitters)

Pott's assumption that expressions of different syntactic category can denote expressions helps explain why the verb *say* can operate over both content and form of what was said, and other cases of quotation:

(9) Lisa said "Homer is bald"

Potts employs an *utter*-operator, which takes an individual b and an expression δ, and returns a multidimensional meaning, which say_q then operates over:

(10) $[\![say_q(\delta \in D_u)(b \in D_e)]\!] = \langle\ [\![utter(\delta)(b)]\!], [\![say(\delta)(b)]\!]\ \rangle$

Let us use these formal tools to rethink focus projection, and assume that every expression comes with a set of alternative expressions, by default the empty set, instead of a set of meanings as in Rooth (1992):[2]

(11) *Frankie* = $\langle NP; \textbf{frankie}:e; \varnothing;$ [fræŋki]$\rangle$

[2] Having the singleton expression itself as default alternative instead of ∅ (analogous to the singleton meaning in alternative semantics) would not be well-defined. A probably more intuitive way to rig up the system is to argue that utterances are really a tuple consisting of the expression (Potts's elements of type *u*) and a set of alternative expressions, but would require introducing yet another type to the system. See Wagner (2023) for an analysis long these lines. There are other formal options, and it's not clear to me how to choose between them at this point.

The operator F, our formalization of F-marking, introduces non-trivial alternatives. In order to avoid infinite regress, alternatives are restricted to the subset of expressions without alternatives ($D_u^{\emptyset}$):

(12) $\quad \mathrm{F} \in D_{<u,u>} = \lambda\delta \in D_u.\ulcorner\langle \mathrm{SYN}(\delta);\ [\![[\![\delta]\!]]\!];\ \Delta \subseteq D_u^{\varnothing}; \mathrm{PHON}(\delta)\rangle\urcorner$

The alternatives to *Frankie* could be any expression the grammar generates. However, many potential substitutions will not lead to well-formed new expressions once we combine them with their surroundings, either for syntactic or semantic reasons. We could assume that F-substitution is additionally restricted by the complexity constraint proposed in Katzir (2007). Applying F to $\ulcorner$*Frankie*$\urcorner$ will derive the following:

(13) $\quad F(\ulcorner Frankie\urcorner) = \langle NP; \textbf{frankie}{:}e; \{\ulcorner Amal\urcorner, \ulcorner Robin\urcorner, \ldots\}; [\mathrm{fræŋki}]\rangle$

But how can these syntactic alternatives project?

3.2. Pointwise Merge and projection

Metalinguistic access allows us to formalize an operator within the grammar itself that composes expressions (the work that proof rules do in Pott's analysis). Let's assume that expressions can denote not just expressions, but also to pluralities of expressions, and that these can combine pointwise to create a new set of larger expressions. SYN(δ), $[\![\delta]\!]$, ALT(δ), and PHON(δ) access the individual parameters of δ). I will use $[\![\mathrm{ALT}(\delta)]\!]$ as a shorthand for the set of meanings denoted by the expressions ALT(δ):

(14) $\quad \textsc{PointwiseMerge}{:}\lambda\Delta \subseteq D_u.\lambda\Gamma \subseteq D_u.\left\{\ulcorner\left\langle \begin{array}{c} SYN(\delta) + SYN(\gamma) \\ [\![[\![\delta]\!]]\!]([\![[\![\gamma]\!]]\!])or([\![[\![\delta]\!]]\!])[\![[\![\gamma]\!]]\!] \\ Alt(\delta) \times Alt(\gamma) \\ [Phon(\delta) \prec Phon(\gamma)]_{\omega} \end{array}\right\rangle\urcorner \mid \delta \in \Delta; \gamma \in \Gamma\right\}$

PointwiseMerge combines two sets of expressions by merging each element of the first with each element of the second set. I use '+' as a shorthand for how the syntactic properties of the new expression are derived, be it by slash reduction, as assumed by Potts, or sub-categorization or feature checking. The meaning of the new expression is composed by function application (only possible if the types match); and the phonological representation is the the concatenation of the phonological representations of the two parts, checking for phonological wellformedness (e.g. making sure the output is minimally a well-formed phonological word, more on this below). Alternatives are composed pointwise as well:

(15) Pointwise composition of alternatives: $\mathrm{Alt}(\delta) \times \mathrm{Alt}(\gamma) =$

$$\left\{\begin{array}{l} \varnothing,\ if\ Alt(\delta) = ALT(\gamma) = \varnothing \\ else: \left\{\left\langle \begin{array}{c} SYN(x) + SYN(y) \\ [\![x]\!]([\![y]\!])or([\![x]\!])[\![y]\!] \\ \varnothing \\ [Phon(x) \prec Phon(y)]_{\omega} \end{array}\right\rangle \mid x \in Alt(\delta) \cup \{\delta^{\varnothing}\}; y \in Alt(\gamma) \cup \{\gamma^{\varnothing}\}\right\} \end{array}\right.$$

I will follow Potts (2007) in assuming direct compositionality, where composition is strictly local. In a grammar with metalinguistic access, this no longer necessarily implies that there is no represented ellipsis (Potts 2007), and if we allow abstraction over individuals of type u, one could implement syntactic movement as well. These are issues beyond the scope of this paper, however.

3.3. A 'metalinguistic' theory of focus

In the new focus account proposed here ~ is a 'metalinguistic' operator that quantifies over the set of alternative syntactic expressions and introduces a presupposition, resetting the alternatives to ∅:

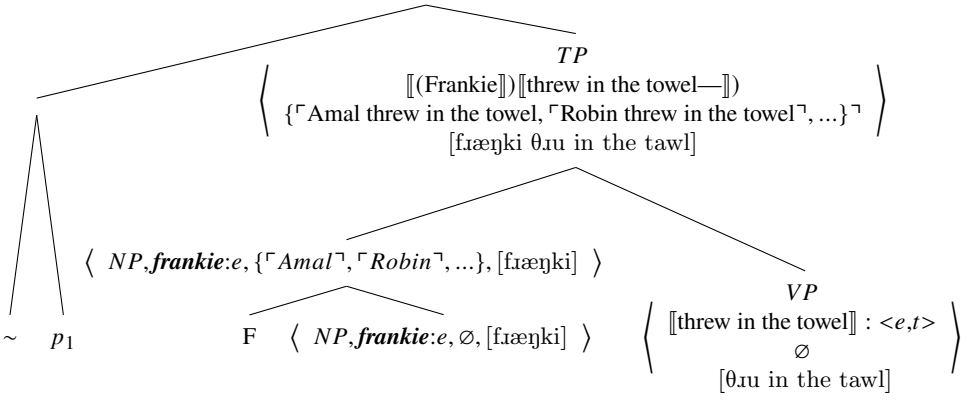
(16) $\quad \sim(\delta) = \langle SYN(\delta);\ \textit{focus-presupposition}: [\![\delta]\!]\ ; \varnothing; PHON(\delta)\rangle$

An entry inspired by Pott's ellipsis analysis, similar in effect to the 'individual case' of Rooth (1992):[3]

(17) Potential focus presupposition of ~ based on Potts's operator *utter*:
$\sim = \lambda\delta \in D_u.\exists\gamma \in D_u.\exists b \in D_e.utter(b)(\gamma)\ \&\ [\![\gamma]\!] \in [\![\mathrm{ALT}(\delta)]\!]\ \&\ [\![\gamma]\!] \neq [\![\delta]\!] : \delta^{\varnothing}$

Note that we *could* have required γ to be an element of ALT(δ) rather than its meanings being an element of $[\![\mathrm{ALT}(\delta)]\!]$, but then *x gave up* shouldn't license focus marking on *x threw in the towel*:

(18) ⟨ *TP*, *focus presupposition:* ([[Frankie threw in the towel—]]), ∅, [fɹæŋki θɹu in the tawl] ⟩



The revised account of focus maintains most of the elements from Rooth (1992), it only revises the mechanism of alternative generation. How does this help with focus on meaningless pieces?

3.4. Early insertion, late interpretation

Let's assume that well-formed phonological shapes are available to grammar as meaningless expressions before they are assigned a meaning. We could call this assumption 'Early Insertion':

(19) If ϕ is a well-formed phonological shape, then $\langle\varnothing;\varnothing;\varnothing;\phi\rangle$ is an expression.

For example, in English, there is a meaningless expression with the pronunciation [mɛmbɹ]:

(20) ⌜[mɛmbɹ]⌝ = ⟨∅; ∅; ∅; [mɛmbɹ]⟩

Access to expressions let's us assign meanings *within the grammar*. Little *n* could provide expressions with syntactic and semantic content (or maybe semantic content is added separately by a $\sqrt{}$-functor):

(21) $[\![n_{<u,u>}]\!] = \begin{cases} \ulcorner[\mathrm{baik}]\urcorner \rightarrow \ulcorner\langle N; \textbf{\textit{bike}}{:}\langle e,t\rangle; \varnothing; [\mathrm{baɪk}]\rangle\urcorner \\ \ulcorner[\mathrm{mɛmbɹ}]\urcorner \rightarrow \ulcorner\langle N; \textbf{\textit{member}}{:}\langle e,t\rangle; \varnothing; [\mathrm{mɛmbɹ}]\rangle\urcorner \\ \ulcorner[\mathrm{taitænɪk}\urcorner \rightarrow \ulcorner\langle N; \textbf{\textit{Titanic}}{:}\langle e,t\rangle; \varnothing; [\mathrm{taɪtænɪk}]\rangle\urcorner \\ \ldots \\ \textit{returns a meaningless noun otherwise} \end{cases}$

Treating *n* as a function of type <*u*,*u*> can account for why entire meaningful phrases can be turned into common nouns and denote a predicate: *a hand-me-down* (e.g. Bruening 2018). Proper names like *Titanic* can be given a predicate meaning that picks out individuals that have a particular expression as their name (most other proper names in English lexicalize the definite determiner as well) (cf. Elbourne 2005, Jambrović 2021). Allowing functions from *expressions* to individuals (rather than phonological

[3] This entry requires non-identity, but the difference in (4) illustrates already that this will not be sufficient—I assume that a stronger contrast requirement is in fact required, following Wagner (2006), but leaves this open here.

forms, as in Matushansky 2008) helps explain why even compositional expressions can be names, e.g. *Big Bear* (a famous Cree 19th century Cree leader), or more ad hoc conventions, like *I don't like beans*, used to pick out someone who said this when first showing up to a Mexican cooking class.

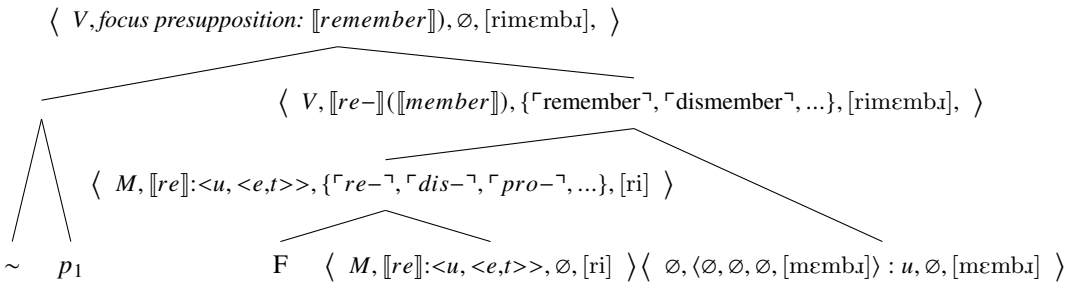
The prefixes *re-* and *dis-*, e.g., might similarly map meaningless expressions to meaningful verbs:

(22) $[\![re]\!]=\begin{cases} \ulcorner[\text{mɛmbɹ}]\urcorner \rightarrow \langle V; \textbf{\textit{remember}}{:}\langle e,\langle e,t\rangle\rangle; \varnothing; [\text{rimɛmbɹ}]\rangle \\ \ulcorner[\text{læps}]\urcorner \rightarrow \langle V; \textbf{\textit{relapse}}{:}\langle e,t\rangle; \varnothing; [\text{rilæps}]\rangle \\ \ldots \\ \textit{return meaningless verb otherwise} \end{cases}$

(23) $[\![dis]\!]=\begin{cases} \ulcorner[\text{mɛmbɹ}]\urcorner \rightarrow \langle V; \textbf{\textit{dismember}}{:}\langle e,\langle e,t\rangle\rangle; \varnothing; [\text{dɪsmɛmbɹ}]\rangle \\ \ulcorner[\text{ɹʊpt}]]\urcorner \rightarrow \langle V; \textbf{\textit{disrupt}}{:}\langle e,t\rangle; \varnothing; [\text{dɪsɹʊpt}]\rangle \\ \ldots \\ \textit{return meaningless verb otherwise} \end{cases}$

We can now account for focus marking constrating *remember/dismember*, because meaningless expressions like *member* can compose before being embued with meaning or syntax ('Late interpretation'):

(24) No, the nightmare is what she remembered. It's the aliens in it that she DISmembered.



Contrasts with the absence of a constituent seem to be legitimate we well:

(25) a. I wasn't RE$_F$invited, i was ∅ INVITED. b. I wasn't ∅ INVITED, I was REinvited.

Maybe *re-* contrasts here with the null expression $\langle \varnothing; \varnothing; \varnothing; \varnothing \rangle$, and emphasis is realized on the stem because ∅ cannot carry it, similar to the preferred pronunciation of *invited* when past tense is focused.

3.5. Words and other idioms

Early insertion of phonological pieces seems like the opposite of what is assumed in Distributive Morphology, and yet it is DM-ish in that it separates where pieces are inserted and where syntax and meaning are fixed, and that words receive their meaning in the same way as idioms (cf. Marantz 1995). This can shed light on how expressions like *ointment* come about, which involve a bound morpheme. Suppose meaningless expressions can combine to create larger expressions before meaning assignment:

(26) Meaningless meaning composition: If $[\![\delta]\!] = \varnothing$ or $[\![\gamma]\!] = \varnothing$, then $[\![\delta]\!]([\![\gamma]\!]) = \varnothing$

Meaningless 'bound' pieces are also found in phrasal idioms, for example *by **dint** of*, *run the **gamut***, *in **cahoots** with* (Harley & Stone 2013). Let's posit an operator IDIOM, which can assign a new meaning even to already meaningful expressions like *throw in the towel*:

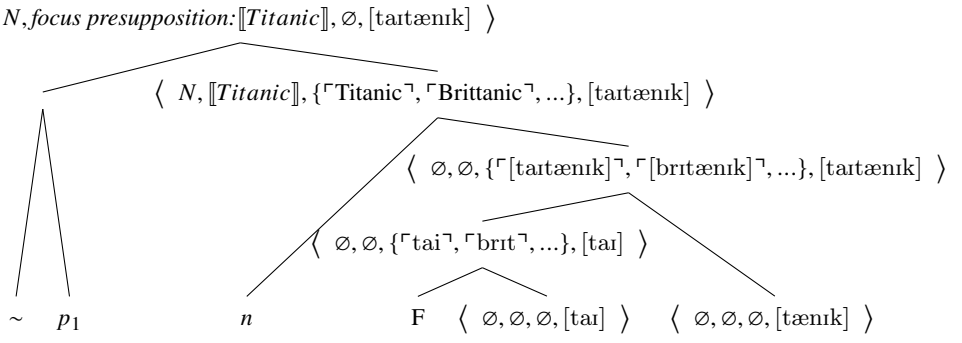
(27) IDIOM $\in D_{\langle u,u\rangle}$, such that $[\![\text{IDIOM}]\!] = \begin{cases} \ulcorner\langle VP; [\![\text{throw in the towel}]\!]; \varnothing; [\theta\text{ɹow in the tawl}]\rangle\urcorner \rightarrow \\ \qquad \ulcorner\langle VP; [\![\text{give up}]\!]; \varnothing; \theta\text{ɹow in the tawl}\rangle\urcorner \\ \ldots \end{cases}$

Being able to assign 'non-compositional' meanings within the compositional system is a good result—even if this alone does not help explain syntactic constraints on idioms (see Kay et al. 2015, Bruening 2020, and Harley & Stone 2013). The ability to 'overwrite' meanings captures the intuition that idioms, nouns, and names seem to saliently 'embed' their literal meaning, even if it does not enter their overall meaning. In fact, generating the expression with the literal meaning is the only way to access the idiomatic one. This analysis is also compatible with idea that roots have no syntactic properties (Borer 2005) in that syntactic properties will be overwritten by *n* and other functors whose complement we think of as roots.

3.6. Ad hoc meaningless decomposition

We now have an account of focus in non-compositional words like *remember*, but what about focus in *Titanic*? Following Artstein 2002, let's assume this involves ad hoc decomposition:

(28)



The decomposition here is truly ad hoc—the speaker chops up the word just to enable prosodic focus marking, even though if the name *Titanic* has a structure at all, it is *titan-ic*. Ad hoc decomposition may also explain hyper-emphatic utterances where each syllable is accented: *tí–tá–níc*; and 'stray focus' (Ahn et al. 2021), where a final syllable is assigned exceptional prominence, might involve ad hoc decomposition of the last syllable: *appàrent–lý*. Note that neither involves focus in the sense of substituting alternatives locally, but just trigger an expressive inference about emphasis. Ad hoc decomposition also facilitates a compositional analysis of expletive insertion: *Ti-frick'n-tanic*. Expletives are operators over expressions that introduce an expressive conventional implicature and return the expression itself (Wagner 2023). Other operators like *only* require arguments of a particular semantic type, and hence cannot attach within words. Ad hoc word-pieces arguably must conform or be made to conform to prosodic word constraints. Target words in the experiment with an initial schwa vowel (require, receipt) mostly didn't mark focus, or if it was, the vowel was changed to [i]. The same happens optionally in expletive insertion: *r[i]-frick'n-quire*. This prosodic word requirement could be a general output condition on PointwiseMerge.[4]

4. Metalinguistic uses of focus

Under the analysis here, focus is metalinguistic in that ~ operates over linguistic expressions.[5] But ~ is also *not* metalinguistic in that it contrasts *meanings* and not expressions—even in cases of phonologically-motivated focus, in line with the experimental results. However, syntactic projection lends itself easily to account for uses of focus that are truly metalinguistic. Consider (Horn 1989):

(29) I only eat 'civet de lapin' (⇝ I don't eat 'rabbit stew').

[4] Focus is possible even if the generated alternatives do not quite have the desired shape, e.g. *stalagmite* has a voiced [g] (cf. Artstein 2004). Maybe meaning assignment can apply even if the phonology is just close enough.

[5] Buccola et al. (2022) discuss evidence, however, that sometimes focus alternatives cannot be structural.

A food snob might report with this sentence that they only eat rabbit stew when it is referred to as *civet de lapin*. Alternative Semantics cannot capture such examples since semantic alternatives do not provide the granularity to distinguish the alternatives involved, since ⟦civet de lapin⟧ = ⟦rabbit stew⟧. If focus involves alternative expressions rather than meanings, we can adapt Potts's analysis of mixed quotation to derive differing alternatives for these examples. Potts uses a QUOTE-SHIFT-operator which allows the speaker to use a description to pick out an individual without endorsing it:

(30) I only [eat [QUOTE-SHIFT ⌜civet de lapin⌝$_F$]]

The operator *only* quantifies over the meanings of the syntactic expressions {*eat* QUOTE-SHIFT *'rabbit stew'*; *eat* QUOTE-SHIFT *'civet de lapin'*}. Each alternative expression comes with its own conventional implicature. If we had projected meanings instead of syntax, *only* would be unable to encode the right contrast because the conventional implicature should project. Projection in metalinguistic focus is possible from islands, and syntactic projection more generally may be island-insensitive:

(31) I only date people who eat 'civet de lapin' (⇝not s.o. who eats it and calls it 'rabbit stew')

Metalinguistic focus shows a limitation of Artstein's account: Analyzing *civet de lapin* as denoting a phonological string and treating the unfocused rest of the sentence as a function from forms to meanings would fail to capture the compositionality of the sentence. Syntactic projection can cover both focus on word parts and metalinguistic focus, and we can combine both in one example (32):

(32) We don't serve QUOTE-SHIFT [əˈmjuz buʃ], we serve QUOTE-SHIFT [əˈmyz buʃ]

5. 'Confusing' use and mention at large

Phenomena such as quotation and metalinguistic focus show that grammar can operate and predicate over expressions. This paper argued that if we allow for such 'metalinguistic access,' and in addition assume syntactic rather than semantic projection, various puzzles in focus theory can be resolved. A similar result is achieved in Li (2017) with a scoping mechanism for syntactic alternatives. Li (2017) levels two arguments against an in-situ account, which can't be addressed here in detail: The first is that alternative projection is known not to play nice with quantifier scope (Shan 2004). This issue, however, arguably does not arise if focus alternatives project syntactically, as long as scope-taking can occur separately in each syntactic alternative. Li's second argument relates to selective association in the presence of multiple foci, which is a challenge also for standard Alternative Semantics.

Several other phenomena might require syntactic projection. Echo questions, like focus, require an antecedent, and antecedence is possible through entailment (*A: Amal threw in the towel. B: WHO gave up*?; *A: Amal called me. B: WHO called you?* (cf. Banfield 1982). This can be captured if *wh*-words in echo questions introduce semantic alternatives which project Hamblin-style to the root (as in Artstein 2002, Poschmann 2018, Beck 2018). But substitutions have to fit syntactically, as well as semantically: In (33), the only meanings of syntactically (but not necessarily semantically) plural nouns qualify (e.g. *scissors'*, but not *knife*); in (b), only the meanings of feminine nouns qualify due to the determiner *die*.

(33) a.You put these *what* in the drawer? b. German: Du hast die *was* in die Schublade getan?

Such syntactic matching effects are predicted if the *wh*-word introduces syntactic alternatives, which then project (Wagner 2021c, Ji 2022). The echo question denotation is either simply a set of expressions, or a Q operator converts them into a set of meanings. Syntactic projection also explains why echo questions of any sentence type are possible, including second order questions. Within-word echo questions (*stalagwhat?*, Artstein 2002) can be analyzed parallel to within-word focus.

Another example is disjunction, which is often analyzed as introducing semantic alternatives which can project and be existentially quantified over, similar to (at least certain) indefinites (as proposed in Kratzer & Shimoyama 2002, Aloni 2003, Alonso-Ovalle 2006). If disjunctions introduce syntactic alternatives instead, this may be explain why disjunctions allow for certain readings that indefinites do

not. With (34-a), at least some speakers get an intermediate scope reading under which Sue wants to interview one of the top two runners, but (34-b) can only convey the (odd) low-scope reading under which there is a single unique runner with the property, and the widest-scope reading ('I forget which'):

(34) a. Sue wants to interview the runner that will come in first or second.
b. Sue wants to interview the runner that will take one of the top two spots.

Syntactic projection can derive the set {*the runner that will come in first; the runner that will come in second*}, an existential metalinguistic OR operator can deliver desired meaning.[6] Thinking about coordination in terms of syntactic alternatives can also explain syntactic matching effects (**these scissors or knife*), or why coordination is possible within words (cf. Booij 1985, Artstein 2002, 2005): *stalagmite or -tite*. Projection derives the set of expressions {*stalagmite; stalactite*}, pointwise composition with *n* assigns the words meanings. Syntactic projection may also improve on Hamblin-style analyses of Alternative questions (Uegaki 2014), which also show syntactic matching effects:

(35) a. Does Nadal or Federer come from Spain? (✓Polar question; ✓Alternative question)
b. Do Nadal or Federer come from Spain? (✓Polar question; *Alternative question)

The impossibility of an AQ reading in (b) follows if alternative questions involve syntactic projection, yielding a syntactic disjunction of two polar questions, following (Uegaki 2014), but now assuming a syntactic generation mechanism. Expressions like *in turn*, *alternately*, and *respectively*, which require metalinguistic access, further motivate such an analysis of coordination and disjunction in terms of pluralities of expressions, and quantification over them. For the beginnings of such a plurality-of-expression analysis of coordination and disjunction see Harada (2022) and Wagner (2023). Note that a *projection*-analysis of focus can be extended to such a 'plurality of expressions'-analysis of coordination more easily than a *scoping* analysis—this may be one reason why the projection analysis is ultimately preferable.

Letting grammar operate over expressions renders composition structure-sensitive, similar to structured meaning accounts such as the analysis of metalinguistic focus in Mankowitz 2020, or of echo questions in Sudo 2013). In contrast to structured meanings, however, the only structure needed here is syntactic structure itself, modulo the syntactic projection mechanism proposed here. The cost is that the composition process itself becomes part of part of grammar: Expressions can denote, operate over, and compose other expressions. This kind of self-referentiality can, but does not have to have, paradoxical effects. See Skyrms (1978) and Barwise & Moss (1996) for strategies on how avoid them.

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[6] If syntactic projection is unavailable for indefinites, a mechanism is needed that delivers lowest and widest scope for them. A comparison with attested intermediate scope readings for indefinites (Schwarz 2011, Charlow 2020) would necessary here, but will have to wait for another occasion.

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