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Reply to commentaries, “On the identity of roots”

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It is an amazing and humbling thing to have a baker’s dozen of one’s most insightful colleagues engage seriously with one’s actual proposals on paper. I am edified and inspired by these commentaries, all of which have made an important contribution to my understanding of my own ideas, as well as my understanding of the commentators’ views on these and related issues. All of the commentaries adduce important empirical evidence bearing on all these questions, which would not normally be collected in a single place; this strikes me as an incredibly valuable resource. I also appreciate this opportunity to expound further on some of the issues discussed in light of the responses, articulate where I see connections and opportunities arising, and respond to one or two criticisms. Luckily for me, some commentaries include discussion and data that I will invoke in responding to critical points raised in other commentaries; how great is that?

One thing the commentaries make abundantly clear is that the discussion of roots’ essential natures, in and out of syntax, is far from over. On the one hand, Borer argues for a fundamentally phonological characterization, raising questions concerning the paradigmatic character of the suppletion data I present. On the other hand, Rappaport Hovav and De Belder emphasize the essential character of the semantic content of roots, including and especially suppletive ones. Labelle points out the importance of semantic content in realizing the project of integrating roots into a concrete model of sentence production and processing, as it must be communicative intent that drives selection of the Numeration. Acquaviva argues that root nodes are crucially non-syntactic entities, fundamentally different from other abstract morphemes in List 1, while Svenonius argues strongly against postulating a foundational distinction between functional, syntactic elements and encyclopedic, non-syntactic elements. This latter division on roots’ fundamental nature is closely connected to another foundational syntactic question that arises in several of the commentaries, concerning the position of

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base-generation of internal arguments. Since only syntactic elements can project and take complements, the non-syntactic view of the fundamental nature of roots aligns with the view that all internal arguments are base-generated externally.

Mapping all the interesting connections and mutual implications and points of reflection and refraction in these commentaries would require a book-length effort on my part. I've chosen to try and divide the threads into three main groups, and will discuss each in turn. The first section is mostly about syntactic domains of locality and the position of internal arguments, asking again whether roots take complements in light of the evidence presented in many of the commentaries that shows that many internal arguments are *not* complements of roots. The second section is mostly about suppletion, addressing first the question of whether the suppletive patterns of Hiaki are truly suppletive, and second the problem of incomplete complementarity in suppletive patterns. The third section is mostly about interpretation, considering first the problem of polysemy vs. homophony within the framework, and second the question of whether idiomatic interpretations should be assigned to phrasal constituents, as suggested by several commentators, or, as I suggested in the article, should be assigned to terminal nodes, operating in a kind of semantic conspiracy to compositionally derive the idiomatic, 'noncompositional' interpretation.

1 The syntax of internal arguments and domains of locality

Several commentators, including Borer, Alexiadou, Anagnostopoulou, van Craenenbroeck and especially Cuervo, correctly point out that I have brought together several arguments concerning the special relationship of internal arguments with their verb roots without being careful to ensure that all of my arguments bear on the same *type* of internal argument, and are sensitive to the same type of locality constraints. Failing that, it seems likely that some of my arguments illustrate the existence of one kind of locality restriction in the 'first-phase' domain, and others illustrate other kinds of locality restrictions.

1.1 Idiomatic domains of locality and root-external internal arguments

One example of this kind of mismatch in my discussion involves the notion of domains of idiomaticity. I went to some pains to point out that idiomatic interpretations can be conditioned by environments larger than the immediate catego-

rizing head (§4), but I didn't explicitly note that this conclusion contradicts what I described as the moral of the discussion of Kratzer's proposal in §3.2:

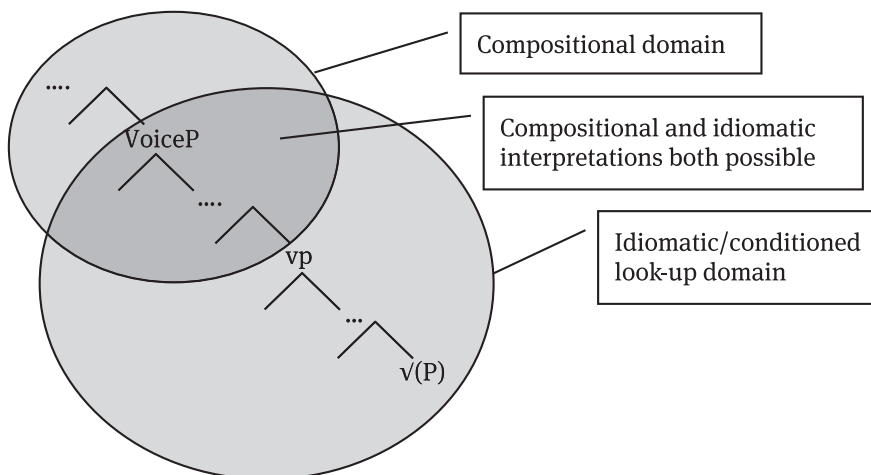
[Kratzer's] analysis [of verb-object idioms] is, I think, not compatible with the idea that objects are introduced by a separate verbal functional head, nor with the notion that roots do not compose directly with their internal arguments."

Clearly, according to my own later reasoning about cases like *hopsit-al-ity*, idiomatic truth-condition look up at LF is able to examine a larger domain than sister-to-root, so although I still maintain that Kratzer's and Marantz's results show us that there is something interpretively special about external Agent arguments (*pace* Labelle's and Panagiotidis' commentaries), they do *not* show us that sister-to-root is the domain for idiomatic truth-condition look up. Anagnostopoulou's commentary, in particular, shows clearly that there is a difference between the 'idiomatic' domain (perhaps VoiceP) and the 'allosemantic' domain (within vP), the latter equivalent to what Panagiotidis calls the domain of 'obligatory idiomaticity'. As I noted in the article, and as expanded upon by Panagiotidis, at least the first cycle of look up *has* to be 'idiomatic', since roots only acquire an interpretation in a categorial context. If LF-access of root truth conditions happens first at the VoiceP phase, no allosemantic/idiomatic distinction could be possible. What Anagnostopoulou's results clearly show is that LF-access happens at the vP cycle (the allosemantic level, vP), and then again, possibly, at the VoiceP cycle (maybe the idiomatic level). Outside VoiceP, compositionality perhaps is the rule (again, *pace* Labelle and Panagiotidis¹). The picture that emerges from Anagnostopoulou's

¹ Both Labelle and Panagiotidis provide examples of idioms which involve constituents larger than VoiceP. The latter shows that there are special interpretations associated with certain past/perfective verb forms in Italian and Greek that are unavailable for other tenses/aspects. The former provides extensive argumentation from a range of very interesting French examples against the notion that the Agent argument is excluded from participating in idiomatization and VoiceP is an idiomatic cutoff point. The main points I wish to emphasize in response is that a) stativity matters, since there are arguably no Agents of stative predicates, and b) having an open position *within* the idiom, demonstrating that the idiomatic portion composes with a non-idiomatic portion, also matters. So fully fixed expressions like Labelle's (11), or expressions including a fixed Agent with no lower open position like Labelle's (14c), (15b), (20) and (21), are not counterexamples to (my conception of) the 'No-Agent-Idioms' proposal. I think there's a chance that Labelle's (10) is stative (the English equivalent is, at any rate), and that the embedded subjects in (14a, b, 15a) are not structural Agents, though obviously I can't just assert that without empirical investigation. The special verbal interpretations conditioned by subject type in (12) and (13) do not strike me as idiomatic; they are all perfectly interpretable as direct translations into English with the equivalent verbs. In any case, the collection of examples presented by Labelle is a very rich dataset and a stimulus to further investigation.

results and Panagiotidis' discussion could allow us to characterize the structural contexts in which *both* idiomatic and compositional interpretations are available for the same structures, in the vein of *kick the bucket* 'die'~'kick the bucket', or *transmission* 'mechanism in a car that changes gears'~'the event or result of transmitting'. If there is an upper bound on idiomatic interpretations at agentive VoiceP, the picture of domains of idiomaticity might then look like this, for the verbal domain (one could substitute category labels for the various projections to apply the picture to the nominal domain):

(1)



A very much active research question concerns what it means for an idiomatic interpretation to be accessed in the compositional domain. Anagnostopoulou's discussion seems to suggest that the second cycle of look-up does not cancel or overwrite the first cycle's results, but in some sense modifies or modulates them. I think this connects to Labelle's point about the coexistence of literal and idiomatic interpretations in the early stages of sentence processing of idiomatic strings. If the above is on the right track, such early dual interpretations would appear in the processing of idiomatic interpretations in the overlapping domain, but not in the lower domain, where only look-up, and not independent composition from previously looked-up interpretations, is possible. If type-theoretic restrictions imposed by functional categories above vP are non-negotiable ingredients in this second round of look-up, that could perhaps provide the basis for explaining the etiology of the different characters of first and second layer idiomaticity. I develop this idea further in section 3.2 below, building on Marantz's and

McGinnis’ results concerning the contributions of functional heads contained within idiomatic phrases.

Anyway, to come back to the question of idiomaticity above vP: In their commentaries, Cuervo and Alexiadou remind me of the results of theirs and others that provide clear and convincing evidence that not all internal arguments of unaccusative verbs are created equal. Particularly, both have independently argued that the internal arguments of CoS verbs are not base-generated in the complement position of the root, but rather in an ‘inner subject’ position, spec of vP or higher. Hale and Keyser (1993, 2002) originally proposed a similar ‘inner subject’ relation for such arguments, but the distinction between those internal arguments and others was sometimes blurred in subsequent years in mine and others’ work.² Basilico (2003) makes a similar point.

Explicitly recognizing that idiomaticity can extend above the vP node makes Cuervo’s, Borer’s and Alexiadou’s (and others’) results compatible with the existence of verb-object idioms like *break the ice*, which clearly involve such ‘inner subject’ arguments, rather than complements to v. As Borer notes, it also reconciles the overall picture with the examples she provides of Hebrew idioms involving derived verbs whose internal arguments are not selected by their root.³

1.2 At least some roots still take complements

The recognition that *some* internal arguments, including some idiomatically-interpreted ones, are not base-generated as sister to a root, does not then entail that *all* internal arguments are base-generated externally, as specifiers of a higher functional projection. Below I summarize what seem to me to be the main points that still suggest certain roots do take complements.

First, Cuervo’s commentary makes it extremely clear that some internal arguments behave differently than others, showing that Levin 1999’s ‘non-core’

2 ... though in Harley 2005 I did distinguish such inner subjects from root complements for transitive activity verbs. However, I never have distinguished internal arguments of change-of-state verbs (inner subjects) from internal arguments of change-of-position verbs (apparently complements), though, which is a key result of Cuervo’s work, and which makes the correct predictions about the lexical-semantic categories which exhibit root suppletion, see discussion below.

3 Some of Borer’s examples are further support for the ability to specify presence or absence of a transitivity-affecting functional head in the morphosyntactic domain conditioning the idiomatic interpretations; see the discussion of Punske and Schlidmier Stone 2013 in van Craenenbroeck’s commentary, and also the discussion of (non)alternating Japanese causative/incohesive idioms in Takehisa 2013.

transitive verbs, whose internal argument is ‘semantically licensed’, and ‘core’ transitive verbs, whose internal argument is the subject of an inner predicate, correspond cleanly with the structural positions of sister-to-root and spec-of-vP, respectively.

Cuervo’s observations concerning Levin’s non-core transitive verbs fits neatly with Svenonius’s reminder that adpositional selection in many verbs is both a robust and idiosyncratic phenomenon (*gaze at* vs *watch*, etc), and a property of roots in many cases, preserved across categorial derivation, as *to* is in *similar to*~*similarity to*, etc. If roots were so different from other kinds of syntactic categories, eschewing complement selection entirely, such selectional idiosyncrasy (as well as e.g. root-dependent quirky case assignment) would be surprising.

Also as noted by Cuervo in her commentary, the particular lexicosemantic categories of Hiaki verbs which exhibit suppletion are extremely suggestive. They are mostly either verbs of motion and stance, or caused change of motion and stance. (The three suppletive transitive verbs besides the non-motion one discussed in the paper, *mea~sua*, KILL, are *kecha~ha’abwa*, ‘STAND.UP’; *yecha~hoa*, ‘SET.DOWN’; and *kivacha~kiima*, ‘BRING’.) In Hiaki, at least, there does not appear to be any canonical change-of-state (CoS) verbs that exhibit suppletion. When the crosslinguistic picture is considered, by Veselinova, overall the Hiaki lexical-semantic pattern repeats itself. In Veselinova’s data, most number-sensitive suppletive verbs are verbs of motion or position, judging by their glosses – 43 motion/position glosses encompassing 120 suppletive verbs in a variety of languages. The remainder are: eight stative glosses representing 16 suppletive verbs (in a variety of languages); nine glosses involving dying, killing or injuring representing 29 suppletive verbs in various languages; and eight ‘other’ glosses representing 10 suppletive verbs in a variety of languages, including clearly ‘non-core transitive’ glosses like ‘eat’ and ‘say’. Obviously in-depth investigation of the precise lexical semantic and argument structural content of each of these non-motion/position verbs in their respective languages is needed (particularly for the two languages which exhibit number-conditioned suppletion in a verb glossed as ‘break’!), but the overall picture outlined by Veselinova is remarkably consistent with Cuervo’s conclusions about the special status of verbs of motion, with an internal argument base-generated as sister to the root. Those espousing the idea that all internal arguments are introduced in a position external to the root need an alternative explanation for why it is *these* verbs, but not other verbs (whether unergative, unaccusative, or transitive), that show number-sensitive suppletion crosslinguistically.

But is suppletion relevant to root selection at all? In her commentary, Alexiadou correctly makes the point that if Hiaki roots undergo head-movement to higher functional domains, including into or through heads which agree with

internal arguments, then root suppletion could be triggered under Bobaljik's formulation of the locality requirement on suppletion, since both trigger and target would be contained within the complex X^0 that is created by such movement. This is certainly true. However, if such X^0 -internal conditioning of root suppletion were possible, it predicts not only that the phi-features of 'inner subject' internal arguments from any lexical-semantic class of verbs could condition suppletion, but also that phi-features of *external* arguments could do so, which appears never to happen (judging from Veselinova's survey). That is, the problem is with Bobaljik's formulation of the locality requirement, not with the claim that number-conditioned suppletion is internal to vP. Bobaljik and Harley (to appear, §4) note this issue as well, and outline several possible approaches to understanding why the pattern appears to be lexically restricted in the way it is; as things stand, however, the correct formulation of the locality constraint remains an open question.

Finally, with respect to the effectiveness of my *one*-replacement argument for root-selection of internal arguments, a great deal hinges on the outcome of the debate concerning the possibility of argument structure for non-deverbal relational predicates. If Borer, and Alexiadou & Grimshaw, are correct that all true argument-structure nominals are deverbal in character, then the *one*-replacement test only diagnoses selected-argument status at the vP level, not at the VP level, leaving open the possibility that internal arguments are all arguments of vP, and none are arguments of the V. As Borer's commentary makes clear, such inner subject arguments certainly *can* be contained within deverbal nominalizations, as in *the verbalization of that root*; on my proposal, *one*, being able to pronominalize any nP including one which nominalizes a constituent like vP, is correctly predicted to include the inner subject of the adjectival stem of *verbal-ize* in its scope, yielding the ill-formedness of **the verbalization of this noun and the one of that adjective*. However, although certainly some nPs are nominalizations of vPs, others, including the n° in *student of chemistry*, look more like root nominalizations, both morphologically and semantically. Since *student* is at least potentially deverbal, however, there could indeed be a vP contained within it. It seems to me, however, that it is important that the *one*-replacement pattern works exactly the same way with event nominals with *no* obvious deverbal morphology, like *murder* or *death* (**the death of my father was nothing in comparison to the one of my mother*), and more importantly with relational nouns which are not deverbal in character, like *father*: **the father of the bride and the one of the groom got into a fight*. To avoid the conclusion that such argument DPs, necessarily included in the scope of *one*-pronominalization in non-deverbal contexts, are not arguments of their root, one would have to a) adopt the FP/CIP approach to *one*-pronominalization sketched in fn. 22 and developed in the commentaries of

Borer, Alexiadou and van Craenenbroeck and b) allow arguments of relational nominals like *father* to be introduced in spec-nP below CIP.

van Craenenbroeck introduces data from Frisian illustrating a form of *one*-pronominalization (*ein*-pronominalization) that appears to permit stranding of arguments, in support of an FP/CIP approach to argument introduction in that language at least. However, before fully endorsing his conclusions, I am curious about two aspects of the Frisian picture: a) Does *ein*-stranding work also for non-deverbal argument nominals like those I mention above (*father*)? b) And is the preposition *fan*, ‘of’, a true equivalent of English inherent-case-marking *of*? It seems to me that great deal of the non-strandable behavior of English argument nominals rests on the unique properties of inherent, last-resort *of*, which resists extraposition; in contrast I think most selected PPs in English can extrapose and hence can permit stranding under *one*-pronominalization: *In Hiaki I have seen a few similarities to Japanese and also one to German*. So if *fan* is more like a true preposition (like the *to* that appears in the *likewise/the same* pronominalizations also discussed by van Craenenbroeck), it might be able to extrapose from vP and hence its stranding would not disconfirm the possibility that *ein* pronominalizes nP above vP in Frisian in the way that I argue *one* does in English.

In short, although I recognize that some internal arguments are introduced in a projection higher than vP, it seems to me that the empirical picture still indicates that some internal arguments are introduced within vP, with the attendant theoretical consequences.

2 Suppletion, irregularity and zeros

2.1 Does root suppletion exist?

In this section, I address the question of whether Hiaki root suppletion is truly suppletion or not, raised by Borer and de Belder. By ‘true suppletion’, I mean form alternations that are characterized by morphological blocking effects, indicating competition for insertion at a terminal node. Both Borer and de Belder suggest that the separate root forms of suppletive elements are separate lexical items. This debate is crucial in establishing whether the phonological view of root identity can be maintained or not, and leads into discussion of other issues, including the existence of null roots, polysemy, (half-)homonymy, and back again to idiomaticity.

As noted above, De Belder and Borer argue that suppletion of the kind I discuss simply doesn’t exist. Both hold that these apparently suppletive Hiaki forms

are in fact separate, near-synonymous lexical items. De Belder characterizes these separate items as near-synonyms, each with a defective paradigm. Borer, emphasizing the absence of a relevant nonsuppletive paradigmatic opposition in the language, holds that each verb form is simply lexico-semantically specific enough that it just can not occur in the 'wrong' context, i.e. with a plural or singular internal argument, as the case may be. That is, for Borer, no paradigmatic opposition is at issue.

Each proposal makes clear predictions when considered from the perspective of language acquisition. In De Belder's treatment, in order to motivate the creation of a new lexical item with the appropriate paradigm gap, e.g. restricted to the context of a singular internal argument, the LAD⁴ would need to adopt an extremely conservative approach to new verbs in general, resisting the temptation to extend them to environments including unattested plural (or singular) internal arguments until positive evidence demonstrated a particular new item's compatibility with an argument marked by the other number. Without such a conservative approach, recovery from overgeneralization would not be possible, since in De Belder's proposal the opposition in question is not grammatical – that is, in her proposal, blocking is not at issue. If the child's LAD assumed that an arbitrary verb could be extended to plural-argument environments when it was first encountered in a singular-argument context, or vice versa, then the 'defective' verbs which give the appearance of a suppletive alternation would quickly disappear, since they would be so extended, and no grammar-internal pressure would exist to promote recovery from such overextension (see further discussion of this notion in section 3.1 below). So if De Belder's model is correct, the LAD would have to adopt an extremely conservative approach to all new verb forms. This does not seem to be consistent with the productive nature of children's language use.

In Borer's treatment, in contrast, the LAD would attribute particular lexico-semantic properties to each of the apparently alternating verbs, properties which give rise to number expectations on the internal arguments of otherwise semantically overlapping forms. Her analogy is with English *murder* vs *massacre*; the latter's lexical-semantic content gives rise to the expectation of a plural object. This expectation is not grammatically conditioned, but is instead about semantic multiplicity; English *murder* is fine with plural objects (*Jack the Ripper murdered five women*) and *massacre* is fine with singular ones (*The soldiers massacred the whole village*).

4 Language Acquisition Device.

Is the Hiaki opposition about semantic multiplicity? A key piece of evidence in this regard comes from the behavior of intransitive suppletive verbs in the Hiaki passive construction, possible with any verb which takes a [+human] subject argument. Such forms, which introduce no entailment concerning the number of unspecified persons participating in the activity, must always be formed from the plural stem of a suppletive intransitive verb; the singular stem cannot participate. An illustrative impersonal passive example is given in (2).

- (2) Aman yahi-wa/*yevih-wa
 There arrive.PL-PASS/*arrive.SG.PASS.
 “Arriving is happening over there.”
 or “Someone/people/they is/are arriving over there.”

Importantly, the plural stem must be used even in a context in which it is overwhelmingly likely that only one unspecified actor is participating. Consider the transitive compound verb ‘push-go’ headed by *siime~saaka*, ‘GO.sg~pl’, in (3) below. An active sentence using this compound is given in (3a), below. The passive of this sentence *must* be formed as in (3b), using the plural stem *saka-* rather than the singular stem *sim-*, for ‘GO’, which is flatly ungrammatical (3c). Nonetheless, no lexical-semantic implication that (3b) involves plural unspecified ‘push-goers’ results. The sentence in (3b) could well be used to describe the same real-world situation as (3a), as long as the discourse situation justified the promotion of the object argument to subject position and the backgrounding of the subject (examples from Trueman 2014).⁵

- (3) a. Uu hamut ili usi-ta yu’u-sime
 DET woman little child-ACC push-go.SG
 “The woman is going along pushing the little child.”
 b. Uu ili uusi wam vicha yu’u-saka-wa
 DET little child there toward push-go.PL-PASS
 “The little child is being pushed along toward there.”
 c. *Uu ili uusi wam vicha yu’u-sim-wa.
 DET little child there toward push-go.SG-PASS

It seems unlikely that a hypothetical lexical-semantic restriction to singular actors would prevent a verb from participating in a passive construction which does not introduce number-related entailments, and which is compatible with

5 Unfortunately Hiaki impersonal passives (indeed, both personal and impersonal passives) do not permit the presence of any *by*-phrase adjunct, see Escalante (1990).

contexts in which the unexpressed argument is singular. It is far more likely to be the case that, absent a specific conditioning feature on a syntactically present internal argument, the verb surfaces in its elsewhere form, the plural stem (see ex (14) in the target article).

What about in contexts where we can contrast interpreted number with a pleonastic grammatical number? It turns out that in such cases, the Hiaki suppletive verbs, both transitive and intransitive, are sensitive to actual interpreted number, not the surface grammatical number marking.⁶ A formally plural *pluralia tantum* noun like *ume palam*, 'the shovel(s)', takes the singular or plural form of the verb according to the intended interpretation; in (4a) only the singular is possible, since only one shovel can be used by a single person. In contrast, a formally singular but interpretively plural group noun like *uu vato'ora*, 'the baptized ones, the people', takes the plural form of a suppletive root (4b).⁷

- (4) a. Heidi ume pala-m bwia-po kecha-k
 Heidi the.PL shovel-PL earth-in stood.SG-PRF
 "Heidi stuck the shovel in the earth" (i.e. she is digging hard)
- b. Haivu yahi-taite uu vato'ora
 Already arrive.PL-begin the.SG.NOM baptized.ones
 "The people are already arriving."

Does this prove that the alternation is semantic in character, rather than grammatical? Not necessarily. In (4a), the formal plural marker on the noun is not the

⁶ The one domain in which this is not fully clear is in the context of conjoined singular object DPs. Our consultants seem to vary as to whether those are treated as plural or singular in suppletive verb stem choice; this is an area requiring considerable further investigation. See Martinez Fabian (2007) for relevant data and discussion.

⁷ Note that the subject DP, *Uu vato'ora*, 'the baptized ones', is also acceptable in this sentence in its canonical preverbal position. We also have recently discovered an interesting and relevant fact about number marking in Hiaki adjectives. Postnominal adjectives, which inflect for the number of the noun that they modify, can be doubly marked for number: via prefixal reduplication and the addition of the formal suffixal exponent *-m*. It turns out that when a *pluralia tantum* noun has a postnominal adjective, suffixation of *-m* is mandatory, agreeing with the formal plurality of the head noun. However, reduplication tracks the intended semantic number, as shown in (i) and (ii):

- | | | | | | |
|-------------------|----------|----------------------------|------------------|----------|---------|
| (i) Ume | supe-m | te-tewi-m | (ii) Ume | supe-m | tewi-m |
| The.PL | shirt-PL | RED _{PL} -blue-PL | The.PL | shirt-PL | blue-PL |
| 'The blue shirts' | | | 'The blue shirt' | | |

This pattern argues against the idea that the interpretively-dependent nature of verbal suppletion dictates a two-lexeme approach. Reduplicative marking here is also interpretively dependent, but it clearly is implausible to suggest that these two related forms are independent lexical items, one covering plural blue things and the other singular blue things.

reflex of an interpretable [+sg] (or '[+atomic]', in the system of Harbour (2014)) number feature, which we know is present to give the correct LF interpretation of the sentence. Rather, it is the result of the insertion of a dissociated morpheme late in the PF side of the derivation for morphological well-formedness. Given that the evidence from passives, above, shows us that the alternation is grammatical, rather than lexical-semantic in character, (4a) is showing us that verbal root selection is sensitive to the interpretable, not the uninterpretable, feature. That is, root suppletion is conditioned by the interpretable number features inserted from List 1 as part of the structure-building operations that feed LF as well as PF. This restriction in fact follows from the hypothesis of bottom-up, root-first cyclic lexical insertion. In the cycle at which the verb root is inserted, the dissociated number morphemes required by a particular *pluralia tantum* noun for morphological well-formedness are not yet present in the representation.

With regard to (4b) (if the result holds up, see fn. 7), I suggest that in a system of interpretable number features like that of Harbour (2014), the number complex associated with a singular group noun like *uu vato'ora* in (4b) contains the feature [–atomic]. If the singular form of the verb stem is sensitive to the interpretable feature [+atomic], then the plural verb stem is predicted to occur when a group noun like *uu vato'ora* is used.⁸

Taken together, these facts show that suppletive blocking of the Hiaki kind can be 'paradigmatic' in character – i.e. subject to Elsewhere-driven competition – despite being sensitive to interpreted, rather than surface, grammatical number.

In her commentary, Borer emphasizes the absence of an external language-wide, non-suppletive paradigmatic pattern of morphologically marked form pairs sensitive to object number. Hiaki object number is not otherwise marked on verbs in the language; there is no verbal object agreement paradigm, and she is right that the number of object-conditioned transitive suppletive verbs is small (four).⁹ Does this call the suppletive nature of the alternation into question?

⁸ In contrast, the number marking on the noun and determiner would be conditioned by an independent number feature, either [–augmented] or [–additive]. In Hopi, another Uto-Aztecan language, a similar pattern where verbal number marking is sensitive to one number feature and nominal number marking is sensitive to another – in the same pattern as Hiaki, with verbal number marking tracking [–atomic] and nominal number marking tracking [–augmented] – is exhibited in the 'constructed dual', see Slobodchikoff (2009), Nevins (2011). I'm excited to investigate this potential connection between the Hopi pattern and the Hiaki pattern.

⁹ It is perhaps worth noting that the number of transitive suppletive verbs is considerably less small in Hopi, where 10 transitive verbs supplete in agreement with plural objects. Interestingly, there are also 8 more that reduplicate in agreement with plural objects (Jeanne 1978), so 18 verbs in total.

First, it is worth noting that suppletion may not be relevant only to inflectionally marked categories, i.e. is not restricted to cases which fit the traditional notion of 'paradigm'. Richards (2001) argues that *give*, *get* and *have* stand in what is effectively a suppletive relationship (realizing CAUSE+HAVE, BECOME+HAVE, and BE+HAVE, respectively), based on the persistence of idiomatic readings across the three, as in *give/get/have the creeps*. Similar English causative/inchoative pairs that have been treated as suppletive include *teach/learn*, *bring/come*, and of course *kill/die*.¹⁰ Folli and Harley (2012) argue for a similar suppletive status for the light verbs *dare* 'give', *fare* 'do, make' and *prendere* 'take' in Italian. If such analyses have merit, a language-wide paradigm is not necessary to support a suppletive alternation, given sufficient evidence for it in the input to the learner.

Second, Borer's point about the absence of a paradigm to support the object suppletion alternation *also* applies to the intransitive suppletive verbs: As noted in the text, there is no *subject* agreement in Hiaki either. No verbs except the intransitive suppletive ones are marked for subject number.¹¹ Number-governed suppletion simply isn't part of *any* inflectional agreement paradigm, whether with the subject of an intransitive or the object of a transitive. In general, the

10 However, since there is a zero-derived nominal *kill* for the transitive member of the last pair, I find only the first two plausible candidates for a suppletive causative/inchoative alternation myself.

11 Number-sensitive suppletion tracks the 'deep' roles of selected arguments, not surface grammatical roles. Agreement inflection, in contrast, tracks surface grammatical roles. So, for example, Comrie (1982) shows that in Huichol, where there is both agreement inflection and number-sensitive suppletion, the introduction of an unselected object via an applicative morpheme triggers a change in agreement inflection but not in the suppletive stem, which continues to track the number of its selected object:

(i) Nee waakana-ari ne-mec-uqɪʔii-ri eeki.
 1.SG chicken-PL 1.SG.SUBJ-2.SG.OBJ-kill.PL-BEN you
 'I killed you(SG) the chickens.'

In short, number-sensitive suppletion, unlike tense/aspect suppletion, does not form part of an inflectional agreement paradigm, even in languages that independently have such paradigms. Similarly, in Hiaki, if the single argument of an intransitive suppletive verb does not wind up in subject position (for example, because it is in a causative construction), that does not affect its relevance to the form of the verb stem of which it is an argument:

(ii) Karlos uusi-ta vuiti-tua
 Karlos child-ACC.SG run.SG-CAUS
 "Karlos is making the child run."

A parallel example is given for object-number suppletion in fn. 33 of the target article. It seems clear that suppletive agreement is not the reflex of a formal Agree relation the way that agreement marking is.

point that number-governed suppletion patterns distinctly from inflectional agreement cross-linguistically has been made repeatedly in the literature (see discussion and citations in Bobaljik and Harley, to appear). The subtle lexico-semantic distinctions Borer hypothesizes to exist in the transitive suppletive verbs, then, would have to be extended to include the interpretations of all the intransitive verbs as well, pulling some of the teeth from the observation that the number of such verbs is very small. The morphological competition-under-locality analysis that I outlined clearly (and appropriately) distinguishes the phenomenon from inflectional agreement formally, while still predicting that the alternation should exhibit paradigm-style blocking effects, capturing the grammatical character of the alternation.

It is also important to underline that the suppletive distinctions at issue are made throughout the Uto-Aztecan language family; most Uto-Aztecan languages, in different branches of the family, exhibit number-sensitive suppletion of this kind (and have been described by field linguists of far greater sophistication and insight than myself). Of particular interest is the recent observation of Haugen and Everdell (2014), who reviewed several suppletive forms across the language family. They argue that number-sensitive suppletion can and should be reconstructed to Proto-Uto-Aztecan, despite the fact that the particular forms that enter into such suppletive alternations in a given semantic field are sometimes, surprisingly, not cognate. The semantic fields which exhibit suppletive behavior remain constant, but one or both members of the pair that realize the underlying root have sometimes undergone wholesale replacement in different languages, rather than descending from a common ancestor form. Does this indicate that number-sensitive suppletion independently evolved in the same semantic fields several branches of the same family? It seems unlikely; the phenomenon is sufficiently rare crosslinguistically that its prevalence in Uto-Aztecan languages must be ascribed to its presence in the ancestor language. It seems more reasonable, then, to conjecture that the original suppletive paradigms of Proto-Uto-Aztecan were subject to invasion by different, semantically related verb stems in different daughter languages. That is, learners conflated a different verb stem from a semantically related verb into the gap when evidence for the original opposing member of the pair was inadequate in the input.

This diachronic pattern has the following implication, I feel: If lexico-semantic distinctions underlie this persistent and peculiar alternation within the language family, such a paradigm-preserving renewal of the alternation is unexpected. Rather, one would predict the two lexico-semantically distinct verbs to simply be subject to semantic drift and regularization. Why should a learner feel the need to repopulate a *semantic* gap by coercing a separate verb root into the pattern, thereby denying it the possibility of composing with plural or singular

arguments that it had previously been perfectly happy with? If, however, a single underlying abstract root is suffering from a paradigm-gap effect in half of its distribution, it seems to me that *that* could exert intragrammatical pressure on the LAD to find an appropriate filler for the empty grammatical slot, even when the alternation occurs in only a relative handful of verbs (this notion is discussed further in section 3.1 below).¹²

As an additional piece of suggestive evidence for the formal non-existence of suppletion, Borer remarks on its relative rarity crosslinguistically, which I attributed to the acquisition puzzle posed by suppletion in the article. However, it is worth noting that many others contend that *all* irregularity in stem formation is formally indistinguishable from suppletion. (For a recent statement of this idea, as pointed out by Rappaport Hovav, see Haugen and Siddiqi 2013, but the basic idea is very prevalent in the psycholinguistic literature. See, e.g. Pinker 1999's summary of the 'dual route' hypothesis). That is, for many theorists, alternations like *buy~bought* and *run~ran* are treated in exactly the same way as *go~went* by the grammars of English speakers. If they are right, then this apparently exotic phenomenon is actually much more quotidian than otherwise, irregularity of that kind being virtually ubiquitous in the languages of the world.¹³ If Haugen and Siddiqi (and others) are right that there is no principled way to distinguish between suppletion and irregularity, then dismissing the existence of the phenomenon on the basis of its rarity would be considerably more problematic.¹⁴

Finally, for what it's worth, I would like to report that in conducting field elicitation with Hiaki speakers, the reactions to the combination of a singular object with a plural form of a suppletive verb, or vice versa, are quite categorical in character, very different from the thoughtful and nuanced discussions of verb meaning that arise when I mistakenly use a breaking verb that has 'shatter' implications with the wrong kind of object, or use a verb of placing that selects for round containers of liquid with an object like 'book'. A number mismatch between verb and object with a suppletive verb pair doesn't trigger a discussion

12 Such pressure is considered to be the motive force behind diachronic patterns of renewal like the Jespersen cycle, if I understand correctly. For discussion of the latter, see van Gelderen (2008), among many others.

13 In fact, I do not subscribe to this view of irregularity myself; in my opinion, irregular alternations, sharing considerable overlap in their phonological exponence, and falling into recognizable subpatterns, represent the action of morphophonological constraints – readjustment rules, or better yet, co-phonologies – and only suppletion is a true instantiation of straight-up competition for root exponence (see Harley and Tubino-Blanco 2013 for further discussion).

14 Labelle proposes a treatment of the irregular verb *boire*, 'drink', in French, that adopts effectively this view of the alternations it undergoes in various person/tense/aspect combinations, see her example (4).

of how the two forms have different interpretive implications that renders my proposed sentence infelicitous. Instead, the reaction is simply, “You used the wrong form. You have to say it this way instead.” Speakers’ reactions, in my personal experience, are qualitatively similar to other paradigmatic, grammatical, ill-formedness judgments, and dissimilar to lexical semantic judgments – they’re not *#Colorless green ideas sleep furiously* reactions, but **Those babies is sleeping* reactions. That’s just an impression, of course – but it’s one I have shared with other, better field linguists before me.

2.2 Imperfect parallelism between suppletive pairs

In my footnote 17, I mentioned Peter Svenonius’s observation that the two forms of some suppletive pairs, for example in English *person~people* PERSON.sg~pl, exhibit imperfect parallelism. In their basic sense, the suppletion works as expected, filling out the paradigm with a separate stem form. But in some extended senses, one form takes over and is inflected as if it were not a part of the suppletive paradigm (*people* in the sense of ‘clan, tribe’, for example, is singular and has the plural *peoples*, or *person* in the sense of ‘body’ (*not on his person, missing person*) has the plural *persons* (*missing persons*). I speculated that such regularized distributions for specific senses reflected the positing of separate, homophonous roots for those senses. Arregi and Nevins in their commentary propose a much more satisfying approach. Given that the extended senses are extended in particular, characteristic ways, not just random ‘semantic drift’, they hypothesize that a null abstract functor has been composed with the root in these cases, disrupting the locality relation that conditions insertion of the suppletive form, and thereby triggering the appearance of the elsewhere realization. In the case of the *person~people* alternation, they propose that the insertion of *person* is conditioned by a singulative operator SEP which extracts individuals from collectives; *people* is the elsewhere form.

Arregi and Nevins’ proposal to link the (non-)conditioning of suppletion to the presence of such abstract formatives brings together interesting threads of argument from the literature on regularization and lexical semantics. The regularizing effect of zero derivation has long been a staple in discussion of cases like the plurals of sports team names; see e.g. Pinker’s 1999 discussion of why the Toronto hockey team the *Maple Leafs* has the regular stem *leaf* and not the normal plural stem *leave-s*, or why when someone *grandstands*, the next day they have not *grandstood* – a layer of null morphology blocks the locality relation that would normally condition the irregular stem. In the lexical semantics literature, Jackendoff 1991 argues for the existence of six paired semantic functors of a similar

type, building on work by Bach on 'extracting' and 'including' functions. He includes *PL* as a functor of this class, an 'including' function. Its extractive inverse is *ELT* 'element of N' equivalent to Arregi and Nevins' *SEP*. The second pair is *COMP* 'unit composed of N', responsible for packaging mass nouns in cases like *I'll have three coffees*, and *GR* 'grinder', responsible for deriving a substance-denoting mass noun from count nouns in cases like *There's dog all over the street*. The last pair is meronymic in character. The extracting function is *PART* 'part of N' or 'partitive', extracting bounded subparts from wholes, and its including inverse is *CONT*, 'containing N as a subpart', which he proposes is active in exocentric identifying compounds, e.g. *Hey, Fathead!*, where the subpart is deployed as a nickname or epithet denoting the whole.

In Jackendoff's model, these operators sometimes map onto an element present in the morphosyntax, and other times are 'lexically subsumed', present in lexical-conceptual structure but not in the morphosyntax, in the spirit of his notion of 'Simpler Syntax'. Borer (2005), De Belder (2011) and Mathieu (2012), among many others, have considered these kinds of structures from a robustly morphosyntactic perspective, but Arregi and Nevins' proposal gives us an additional empirical basis for supposing that such null semantic elements do in fact correspond to abstract morphosyntactic formatives.

The research program which their proposal engenders is a potentially rich and very interesting one. For other cases of apparently 'half-homophonous' suppletion, can the application of similar intervening null morphosyntactic formatives be motivated? What is exciting about the current collection of commentaries is that a rich array of data relevant to this very issue has been brought forward by De Belder and Faust, the former illustrating half-regular patterns of suppletion in Dutch nouns and verbs, and the latter presenting some half-regular patterning of irregular stem forms in Hebrew nominals.

In Dutch, De Belder shows (example 9) that certain compound nouns headed by *man*, 'man' require one or the other of three possible plural forms: a regular one with a suffixal exponent, a suppletive one, or a suppletive one in combination with a regular suffixal exponent. However, some such compound nouns permit variation in which plural they take, and one remarkable one, *Fransman* 'Frenchman' apparently rejects pluralization entirely. Two others reject singularization. She identifies *rijke-lui*, RICH-MAN.PL 'rich people' and *junge-lui* YOUNG-MAN.PL, 'youth', as lacking singular forms.

Interestingly, the latter two may admit of a motivated analysis in which a formative of the type invoked by Arregi and Nevins plays a role. The two cases she mentions are reminiscent of a family of related expressions involving no overt head noun whatsoever that has been extensively discussed in the literature (see, e.g. Borer and Roy 2010, among many others). Even in languages like English

where nominal ellipsis is impossible, adjectives can appear as the heads of nominal expressions referring to a class of people identified by the adjective, *the rich*, *the poor*, *the meek*, *the recently displaced*, etc. In English, these expressions are necessarily plural (*The rich are/*is getting richer*), and necessarily human. Indeed, parallel expressions exist in Dutch, *de rijk-e-n*, THE RICH-ADJ.INF-PL. Is it possible that the *-lui* in *rijke-lui* is an overt realization of a null noun referring to a class of people, further morphologically and semantically restricted by an abstract formative of the Arregi and Nevins type? Sleeman (2013), analyzing the Dutch facts within a Distributed Morphology framework, proposes a nominalization approach, but De Belder's data here perhaps suggest that an analysis involving a null head noun with the same root as *-lui* could be worth pursuing. Note that Arregi and Nevins invoke a potentially related null root VNTN321, 'nation' in their covert-compound analysis of *people* in the sense 'clan, tribe', fn. 10, though that one must be singular.

Some of Faust's pairs in his example (3) appear to fall into a pattern similar to the *Maple Leafs/*Leaves* type of cases mentioned above, or the cases in which I suggest above the possibility of compounding involving a null head noun. For example, when irregular *šana*, 'year', appears with the adjective *tova*, 'good', two readings are possible. The compositional one is 'good year', in which case the irregular plural *šan-im tov-ot* is observed (sensibly, given that it is clear that *šana* is the head nominal of the expression). In contrast, when *šana tova* means 'good year card', the plural regularizes, to *šan-ot tov-ot*. If the shift in interpretation from something referring to 'year' to something referring to 'card' reflects the inclusion of a null nominal or null derivational morpheme in the structure, such regularization is not surprising. Faust notes the possibility of such an analysis for the other case he discusses in (3), *raši* 'principal, primary', vs *roši*, 'head-like, head-ish' (fn. 4), but dismisses it as 'ad-hoc'. On the contrary, in my opinion the convergence of morphological and semantic evidence in such cases makes this type of conclusion anything but ad-hoc, particularly when the pattern is seen to recur cross-linguistically.¹⁵

Svenonius points out that an attractive consequence of the treatment of root suppletion provided here is that the theory can encompass the postulation

¹⁵ Faust takes my rebuttal of Arad 2003's position on the domain of noncompositionality to mean that I hold that compositional and noncompositional interpretations cannot be used as evidence to argue for distinct structural analyses for pairs like this. Although it is true I do not take noncompositionality as incontrovertible evidence for root-derivation, as Arad does, I hope it is clear that within the theory developed here, such interpretive differences can still indicate structural distinctions, especially when taken in concert with morphological differences which also indicate structural distinctions.

of phonologically null root elements, mentioning examples from Germanic and Koasati (examples 2, 3). Indeed, Kayne 2005 has provided extensive argumentation for a number of null lexical nouns in a variety of English constructions, including PLACE, THING, AGE, YEARS, HOUR, NUMBER, and AMOUNT, as well as null MANY, MUCH, GOOD, VERY, COLOR, SIZE, CITY, STATE. If the postulation of a null noun with content like CITY or STATE is plausible, I suggest that we consider the possibility that such elements can play a role in explaining the peculiar behavior of such variable suppletive patterns like those brought to light here. It is also worth noting that Svenonius’s examples directly contradict Borer’s flat assertion in her commentary that null roots do not exist; that assertion seems to be false. Null lexical formatives of this kind exist. They have a morphosyntactic presence and a semantic interpretation, but no phonological realization.

A related aside: As noted in both Faust’s and Anagnostopoulou’s commentary, a second nice consequence of the proposal is that the inverse case, elements having both a morphosyntactic presence and a phonological interpretation, but lacking a semantic interpretation, are equally predicted to exist, and do. Cases like *-it-* in English *compet-it-ive*, *compet-it-or*, from the verb *compete*, are clear examples.¹⁶ Anagnostopoulou argues that verbalizers without event implications in Greek *-tos* adjectives are also clear cases (ex. 21–22), and Faust highlights a category of denominal adjectives in Hebrew which contain a formative *-an-* that apparently contributes nothing but morphological well-formedness. This type of contentless morpheme might have been treated in past Distributed Morphology analyses as ‘dissociated’, inserted only on the PF side of the derivation, but if List 1 elements can lack a List-3 interpretation, as proposed here, such morphemes may in fact be present in the Numeration and throughout the syntax, but simply not get interpreted at LF. See Marantz (2013) for a fuller discussion of this point.

3 Idiomaticity redux: Multiple meanings for a single root

3.1 Polysemy, homophony and idiomaticity

Another strand of discussion that runs through the commentaries concerns the problem of distinguishing a single polysemous root from two or more

¹⁶ The extension of this formative to another Latinate form with a homophonous stem, *repeat-repet-it-ive*, suggests another source of evidence for the English learner for the independent status of the bound *cran-root -pete/-peat*.

homophonous roots, in a framework where the truth conditions assigned to a given root in different morphosyntactic contexts can vary almost without limit, as we see in *con-ceive* ‘come to be pregnant’ vs *de-ceive* ‘fool’ vs. *per-ceive* ‘apprehend via the senses’. This issue features in the commentaries of Acquaviva, Rappaport Hovav, Faust, Panagiotidis and de Belder, and is surely an important one. It is particularly important when acquisition is considered. What kinds of evidence are crucial to the LAD as it populates lists 1, 2 and 3? Under what conditions does the LAD posit two indices in list 1 with identical phonological exponence rules in list 2, but different truth-conditions in their interpretive rules in list 3? That would be the case of homophony. In contrast, when does the LAD create only one index in list 1, with a single phonological exponent in list 2, but include a disjunctive set of different truth conditions conditioned by different morphosyntactic contexts in list 3? That would be the case of polysemy (and, if I am right, most idiomaticity). This issue has been considered by many, and I am unlikely to say anything really new here. But let me try to articulate some thoughts on the matter.

The LAD needs to have criteria for postulating new roots. Rappaport Hovav is right to say that my index formalism is really a proposal about the *representation* of roots in the syntax, not a proposal about how roots are individuated in the first place. What are the *individuation* criteria that motivate an LAD to say, *aha!* I hereby posit a new index in list 1 with this realization in list 2 and this interpretation in list 3?

As discussed in the target article, it is uncontroversial that non-identical phonological exponence can prompt this effect; the ‘Mutual Exclusivity bias’ figures in all models of word learning (see, e.g., Guasti 2002 for an overview). When a child is presented with two phonologically distinct nonce words, the null hypothesis is that each has a distinct denotation, and thus the initial hypothesis space concerning the potential meanings of each string is demonstrably narrowed. In current terms, the null hypothesis is that two phonologically distinct vocabulary items in list 1 correspond to two different indices in list 2, and two distinct interpretations in list 3. Distinct phonological exponence, then, is a robust individuation criterion.

Correctly mastering a suppletive alternation thus represents a recovery from this initial hypothesis, where two indices are collapsed into a single item in list 1. De Belder is right to emphasize that identical semantic interpretation would be a key ingredient in such a recovery, but Borer is even more correct to emphasize the role of ‘paradigmatic’ contrast in motivating such a recovery. In order to force the reanalysis of two separate indices with phonologically dissimilar exponents but related List 3 interpretations – to a single index with two distinct List 2 realizations and a single List 3 interpretation – it seems to me that intragrammatical

force must be exerted. A clear morphosyntactic context must be defined for the distribution of each List 2 realization. What is crucial is that each of the two exponents can be identified as the complementary puzzle piece that completes the distribution of the other. When the LAD recognizes that two indices grammatically interlock in this manner, the process that De Belder terms 'conflation' occurs, and a single index in list 1, with a conflated single interpretation in list 3, but with distinct spell-out rules conditioned by morphosyntactic context in list 2 is the result. The idea is that the learner compares received input with predicted input. Suppletive conflation of two indices is motivated when predicted input and received input mismatch systematically in a morphosyntactically conditioned way. This should be unproblematic in cases like *go~went*, or Hiaki *vuite~tenne* etc, where the initial hypothesized interpretations for the two indices are likely to be close to identical and the grammatical space is completely exhausted by the two members of the pair. However, the problem of partially-overlapping distributions exemplified above by *person~people* or by the Dutch and Hebrew cases described by De Belder and Faust is the key challenge to this view, and will only be fully resolved in the context of an overall morphosyntactic analysis, as shown by Arregi and Nevins. If UG, or evidence from elsewhere in the language, provides the LAD with an array of morphosyntactic functors like the operators *SEP* and *EVAL*, then apparent 'partial-overlap' really isn't; the puzzle pieces really do still fit together perfectly, and the LAD will still arrive at the suppletion solution.

What about the opposite case, where the LAD encounters two items which are phonologically identical? It makes completely intuitive sense to assume that something like the *inverse* of Mutual Exclusivity must also be a reasonable bias guiding acquisition, such that the LAD adopts the preliminary hypothesis that two occurrences of phonologically identical strings represent a single index in list 1 and a single interpretive rule in list 3. When at some point the learner notices that sometimes a given string seems to have one meaning and other times it has another, the LAD has two options: a) make the interpretive rule in list 3 disjunctive (polysemy or idiomaticity) or b) split the index into two, and posit new interpretive rules in list 3 and a new realization rule in list 2 (homophony). Which route the LAD takes will depend at least partly upon whether there is evidence from other subsystems that suggest that one representation is more economical, thus generating the input better.

For example, when the string /tejk/ sometimes seems to be a verb meaning 'take', and other times seems to be a verb meaning 'ride' (as in *take the bus*) or 'study' (as in *take French*), the fact that the irregular verbal paradigm is used across all three meanings – *She took the bus*, *He took French* – provides evidence to the LAD that prompts it to maintain a single index in list 1 and a single pattern of realization and readjustment rules in list 2, while introducing disjunctive

truth conditions conditioned by the identity and content of *take*'s complement. Similarly, the fact that the string /owpən/ contributes the same meaning 'available for use' in *The store opened at 9* and *The store was often open late* suggests that a single index and single set of list 3 interpretations is at issue, despite the fact that in one case the root is in an adjectival context and the other a verbal context.

In contrast, when a given phonological string appears in two different morphosyntactic contexts with unrelated meanings and in only one meaning participates in an irregular paradigm, the LAD will be motivated to split it into two indices. This is the case of the string /ləj/ in *Lie down!* and *Don't lie!*, with interpretations 'move to a horizontal position' and 'speak falsely', respectively. The former has an irregular past tense *lay* and requires a Ground PP argument, while the latter takes the regular past tense *lied*, has a related zero-derived nominal *a lie* and takes no PP argument. Two indices are required to distinguish the distinct morphosyntactic patterns, and so we are here clearly looking at homophony. That is, morphological patterning can be an individuation criterion, in Rappaport Hovav's sense.¹⁷ The point of the English *√ceive* examples is that such morphological patterning can function as an individuation criterion even in the absence of a single identifying semantic interpretation across its various occurrences.

What about cases where there are *no* morphosyntactic grounds for either subdividing an index or maintaining index identity? Rappaport Hovav mentions the case of *bank*, whose full usage range is worth considering, beyond the usual two senses brought up in these discussions. A *bank* can be an institution for storing your money, and *to bank* can mean to use such an institution. Of course it can also be a gently sloping, longitudinally extended pile of material, as in a *river bank* or *cloud bank* and it can also mean to create such a pile, as in *to bank the turn* (when building a road), or *to bank the fire*. The former, money-related meaning, is involved in the verb *to bank* meaning 'bet' or even 'plan, commit' (*I'm banking on it*), and the latter, sloped-long-pile meaning is related to the verb meaning 'turn by tilting (as if on a curved bank)', as in *The plane banked* or *The skier must bank around the turn here* and, likely, also to the meaning 'turn a

¹⁷ Although it might seem far-fetched to suggest that orthographic patterns could affect this process, it would be interesting to ask if orthographically distinct homophones (*tier/tear, dear/deer, red/read*, etc.) pattern differently from orthographically identical ones (*bank/bank, bat/bat*, etc). Brewer (2007) demonstrated surprising effects of orthography on the phonetic production of consonantal phonemes, suggesting that orthographic representations of lexemes in the minds of literate speakers are relevant to other levels of grammatical organization. That is, just as morphological patterning, phonological identity, and semantic interpretation are potential individuation criteria, in Rappaport Hovav's terms, so too might orthographic representation be.

ballistically moving object by causing it to strike a vertical surface', as in *He banked the puck off the boards*. The long-pile meaning is probably also related to the nominal extension to an extended array of objects, as in *a bank of elevators*, and the monetary-institution meaning might be related to other storage-related extensions, as in *a memory bank*.

What does all of this suggest the LAD might do as it encounters the string /baŋk/ in these varied contexts? There's no morphological patterning evidence one way or another, as all the uses, both verbal and nominal, are regular. Some verbal uses seem related to one of the nominal meanings, and other verbal uses to another of the nominal meanings. In the framework described here, it is suggested that distinct morphosyntactic contexts can be appealed to in disjunctive truth condition specifications, and that even different encyclopedic content within the immediate argument-structural domain can be appealed to (distinguishing *kill a bottle* from *kill an hour*, e.g.). However, it is not currently part of the formalism to allow larger discourse considerations to condition allosemantic truth-condition choice, so the implication is that unrelated meanings for a given string that occur in morphosyntactically identical contexts, as in *He saw the bank*, should trigger index splitting, rather than conditional allosemy. The formalism thus might suggest that recognizing distinct senses of *bank* in identical morphosyntactic contexts would trigger the LAD to posit homophony. That is, perhaps independent semantic content is an individuation criterion also.

Or maybe not. Here we return to the point raised in section 1.1 above, recognizing that compositional and idiomatic interpretations of a single morphosyntactic structure are often simultaneously available. This may be because, as noted in the target article, the concept of an Elsewhere breaks down when applied to list 3. Consider, for example, the structure *keep tabs on X*. This can be built by a speaker with the intention of expressing 'stalk X', or with the intention of expressing the compositional (albeit unusual) 'keep tabs on X'. The fact that *keep* retains its irregular paradigm and argument structure on either interpretation makes it clear that we are dealing with one single index and a disjunctive list 3 in this case. That in turn must entail that during production, the speaker gets to *choose* between interpretations on list 3 in constructing the sentence. Given *that* conclusion, even *bank* could be treated as a single index with an extensive disjunctive list of polysemic interpretations in List 3, with both the 'long heap of material' meaning and the 'monetary institution' meaning treated as allosemantic interpretations attached to a single index.

What rides on this question? If a speaker represents *bank* as two separate indices, i.e. as representational homophones, the prediction might be that one of the two could be activated without the other (in production). The psycholinguistic literature in fact suggests otherwise. Consider for example, a production task

position, namely the fact that *kick the bucket* retains aspects of its literal meaning even in the idiomatic sense. *Kick the bucket*, both literally and idiomatically, describes a punctual event, as expected given the aspectual morphosyntax of this verb in combination with a singular definite count-noun object. As Labelle notes, Marantz concluded from this observation that the functional elements contained within the idiom continue to contribute their truth-conditional content to the whole, even as the encyclopedic content has shifted dramatically.

McGinnis (2002) developed this argument and extended it to a significant number of idiomatic expressions in English, showing that in each case, the aspectual properties of a verb-object idiom are those expected given the particular formal properties of the functional items included within the idiomatic constituent. Her results show that the constituent as a whole does not receive an idiomatic meaning which can drift arbitrarily. Rather, the formal-semantic aspectual contributions of the functional elements in the idiom *participate compositionally in the computation of the idiomatic meaning*. The same point can be made for nominal idioms. Svenonius brings up the idiom *the works*, glossing it as 'everything'. With that interpretation, it is no accident that *the works* includes a strong determiner rather than a weak one. Similarly it is no accident that the expression *the Big Apple*, functioning as a proper name, includes the definite determiner, rather than the indefinite one. A phrase like '*a Big Apple*' could not function as a proper name, since *a* would contribute its indefinite content to the whole phrase.¹⁸

The explanation for the persistence of the semantic contributions of functional material within idiomatic expressions must be that interpretation is proceeding normally, accessing and composing the interpretive content available in each of the terminal nodes of the tree. This hypothesis accounts for the empirical fact that in many idioms, there simply is no single constituent that receives the idiomatic interpretation. In verb-object idioms where the possessor of the object DP does not form part of the idiom, for example, it is hard to understand how a idiom-as-constituent approach can work: How is the vP in an expression like *John got Mary's goat* given an interpretation on such a view? The idiom requires both *get* and the possessive 's, as well as *goat*, but the argument of 's is not part of the idiom although it is contained within the vP constituent. There simply is no formalism I know of that can 'list' a meaning for the vP constituent as a whole yet permit that meaning to compose with an element contained within that very

¹⁸ These remarks do not apply to 'reified' phrasal constituents reintroduced as roots themselves, typically in nominal contexts. See discussion of the interpretation of phrasal compounds in Harley (2008).

constituent. The notion that idiomatic meaning involves composition from terminal nodes, however, can account for such idioms straightforwardly.

The corollary of this idea is that what the LAD does when it constructs interpretive rules for root elements is a kind of ‘factorization’ procedure.¹⁹ We know from the syntactic bootstrapping literature that sentential context constrains the child sharply in positing meanings for novel lexical items. Presumably the way that it does this involves recognizing the shape of the semantic hole left in an otherwise fully interpreted structure. The acquiring child has identified the formal-semantic interpretations of the functional items in the clause, likely partially given by UG, and is led to strong conclusions about the possible content of the placeholders whose interpretation is unfamiliar. These conclusions are driven by the type-theoretic and other restrictions that the surrounding functional superstructure imposes. Even about *Jabberwocky*, Alice was able to conclude “*Somebody* killed *something*, that’s clear, at any rate!” The idea of syntactic bootstrapping is that the LAD is solving for *x*, with the novel roots in the position of *x*.

In order to fully solve for *x*, as alluded to in the discussion of suppletion above, the learner must approximately know the target content of the proposition being expressed. A one-sided equation, like $9x = ??$ does not allow solution, but $9x = 27$ does. In deducing the context-dependent truth-conditional content of the root nodes in an idiom like *John kicked the bucket*, the learner must understand, from context or via explicit instruction, that the target meaning is ‘*John died*’. That’s what it means to be an idiom – you can’t use the interpretations you have deduced for these roots from other examples; you have to start again and deduce new ones. Of course, it’s exactly the same problem that the learning child faces for *non-idiomatic* sentences. Semantic factorization applied in the context of inferred propositional content is how we get to word meaning in the first place; that’s what syntactic bootstrapping is. In idioms as in non-idioms, it works all the way down. It accounts for the construction of independent, free-range meanings for words like *dog*, partially constrained, semi-idiomatic meanings for words like *Pyrrhic* (*victory*), and totally constrained, fully idiomatic meanings for *cran-morphs* like *caboodle* and *gamut*. It also permits the construction of alternative, constrained meanings for words like *dog* in particular contexts, whether totally idiomatic, as in *dog and pony show*, or merely figurative, as in *that movie was a dog*.

¹⁹ Thanks to Tom Bever for suggesting this term!

4 Conclusion: Roots are normal grammatical objects

As pointed out by Svenonius, my basic position seems to come down to the claim that roots are unexceptional, really. They are unexceptional morphological objects, subject to late insertion and competition for exponence just like functional categories are. They are unexceptional syntactic objects, subject to Merge and Move, able to select and project and head-move and so on.

They are also, if my reasoning above is correct, unexceptional semantic objects. The truth-conditions that fill the hole in the semantic equation solved by the LAD must be attached to a predicate which can compose with the content of the terminal nodes which it is in construction with. If my conclusion above that (at least some) roots select internal arguments is correct, they must often be predicates of entities. This, I think, permits me to suggest a solution to a puzzle concerning internal arguments highlighted by Alexiadou in her commentary. If verbal roots select for internal arguments, if they *require* Merger of an internal argument, how can we differentiate between Hebrew adjectival passives and verbal passives formed from the same root? The verbal passives behave as expected, exhibiting promotion of internal arguments and permitting possessor datives. In contrast, though, the adjectival passives require *external* arguments and permit reflexive datives. If the same argument-selecting root is involved in both adjectival and verbal passives, the prediction should be that both types should behave as if their argument were internally generated low down.

Borer, and Lohndal, lacking an explanation for the way in which adjectival passives seem to get by without merging an internal argument, conclude that all internal arguments must in fact be introduced externally to the root. In fact, Landau (2009) provides an extensive argument for a saturation operator and a reification operator which, when working together, produce the precise effect of 'externalization' in a number of other adjectival diatheses. If roots, as I argue, are normal semantic predicates of entities, subject to normal semantic operations, then Landau's operators are predicted to be able to apply freely, if desired. This derives the difference between the adjectival passives (involving saturation and reification, followed by external-argument merger) and verbal passives (involving normal internal argument merger and promotion).

So, the overall upshot of the position I have staked out is that there isn't an incommensurable difference in kind between roots and other terminal nodes. I look forward to talking and writing and wrangling about whether this is in fact true with everyone for a long time to come.

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