On the Taxonomy of Root Suppletion
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0. Introduction

Proposal: I propose a standard by which we can determine whether a putatively suppletive phonology-semantics covariance constitutes counterevidence to the *Phonological Individuation Hypothesis* (PIH).

- This standard synthesizes classic arguments from Borer (2014) and Marantz (1995, 1997).

- I then test this standard against familiar suppletion data from:

    o English
    o Uto-Aztecan (Hiaki and Hopi)
    o Algonquian (Ojibwe (Nishnaabemwin)).

- I show that **most of the familiar data** indeed **fails** to meet this standard.

BUT!

- I will show that Root suppletion in Ojibwe verb ***amw-miiji* 'eat' does meet the standard!**

- Thus, it provides the empirical counterevidence to the PIH.

1. The Phonological Individuation of Roots

Context: For the last decade we have been debating the nature of Roots.

- "We" in this case is **lexical-realizational models of morphology** (to use Stump 2001's typology)—especially Distributed Morphology (DM: Halle & Marantz 1993, 1994), Exoskeletal Syntax (ESS: Borer 2003), Nanosyntax (Starke 2009), and Lexical Realizational Functional Grammar (LrFG: Melchin, Asudeh, & Siddiqi 2020a,b).

- One such hypothesis I call here the **Phonological Individuation Hypothesis.**

  Note: This was called the *Early Root Insertion* hypothesis by Haugen & Siddiqi (2013).

  o The PIH has many proponents. I especially point to the commentary in the 2014 issue of *Theoretical Linguistics*. In the domain of DM, this hypothesis is most strongly argued for in the various work of David Embick (see for example Embick 2000, Embick & Halle 2005, Embick & Noyer 2007). In ESS, this hypothesis is default (Borer 2003) and notably defended in Borer (2014).

I am here on behalf of **one particular empirical argument** against the PIH: the existence of **Root suppletion.**

- Haugen & Siddiqi (2013) and Harley (2011, 2014) argue that Root suppletion provides an empirical counterevidence to the PIH:

- **If Root suppletion exists, then Roots do not have consistent phonology, and thus phonology cannot be what identifies or individuates them.**

- The key counterargument here is simple: **"true" Root suppletion does not exist.**

- The somewhat obvious outcome: this debate has become **taxonomical**.

  o **What are the properties of a particular phonology-semantics covariance such that we would all accept it as "true" Root suppletion?**

2. Root Suppletion

The specific data under discussion in 2014 was Uto-Aztecan.

Haugen & Siddiqi (2013) and Harley (2014) discuss relevant alternations in Uto-Aztecan suppletive verbs (see Hill & Black 1998; Haugen & Everdell 2015)

- suppletive pairs contrast for number agreement with one of their arguments (subject for intransitives and object for transitives).

- For example, in Hopi (Hill & Black 1998):

    'die.SG':   *mooki*
    'die.PL':   *so'a*

- I show in Table 1, reproduced from Haugen & Siddiqi (2013), the transitives.

    Table 1: Suppletive Verbs in Hopi and Hiaki – Object Agreement for Number (Hill & Black 1998 , via Haugen & Siddiqi 2013).

Gloss	Hopi		Hiaki	
	SG/DL OBJ	PL OBJ	SG OBJ	PL OBJ
'bring along'	*wiiki*	*tsaama*	--	--
'bring in, put into'	*pana*	*tangata*	*kivacha*	*kiima*
'kill'	*niina*	*qöya*	*me'a*	*sua*
'put, place'	*tavi*	*oya*	*yecha*	*hoa*
'put on top'	*tsokya*	*kwapta*	--	--
'stand (s.t.) up'	--	--	*kecha*	*ha'abwa*

Back then, we had two criteria for what would constitute Root suppletion. Both of which the Uto-Aztecan met:

(A)   Textbook definition of "strong" suppletion: **there is no phonological overlap between the alternants**. (i.e. the two forms are not cognate)[2]

(B)   Standard DM criterion (Marantz 1995, 1997): **they involve clear semantic content that cannot be analyzed as bleached or grammaticalized forms that realize purely functional information**.

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[2] I have never loved this criterion but stipulate it here. See Haugen & Siddiqi (2016) for further discussion about this distinction.

Borer (2014) (in the same volume as Harley 2014) defends the PIH against the putative Uto-Aztecan counterevidence, making two key arguments (as well as an argument from rarity discussed in Section 6).

- These arguments serve as further criteria that a covariance must satisfy:

    (C)   For any putative case of suppletion, **we must exclude the hypothesis that the forms are simply run-of-the-mill synonyms**

    - alternations like *so'a/mooki* in Uto-Aztecan are not agreement-driven suppletion of a single Root

    - instead are two nearly-synonymous Roots with distinct selection patterns (see for example Durie 1986, Mithun 1988, Corbett 2000, Bliss 2004)

    - a la the English pair *murder* and *massacre*

    (D)   If the Uto-Aztecan data involved true suppletion, **we would expect other Roots to show the same semantic distinction with a regular morphological alternation**.

    - In unambiguous cases of irregular allomorphy, it is precisely the fact that the unpredictable form appears to **<u>block an expected regular</u>** form that leads us to analyze the irregular morpheme as an allomorph.

Together A through D **represent a reasonable standard for what evidence would be required to conclusively falsify the PIH**.

- After all, the standards we apply to empirical evidence in order to conclusively reject a hypothesis must be unambiguously high.

3. Irregular Covariance

Here is some prose recapitulating some of Borer's (2014) discussion because I am not going over this part.

- It is worth a moment to remember how we identify regular morphological alternations (something we have gotten really good at).

- In the case of regular affixal morphology, we identify a systematic phonological alternation covarying with a systematic semantic/formal alternation (these are commonplace).

- In the case of unambiguously accepted irregular allomorphy, we use the existence of that regular covariance to justify our assumption that a different phonological alternation is an irregular covariance with the same semantics. **The systematic meaning change is present, and the normal systematic phonological change is unavailable.**

- It helps that both sides of the irregular phonological alternation are usually cognate forms. It also helps when there is an identifiable pattern to irregularity in a language. Compare in English for example umlaut (*foot-feet, old-elder*), final denominal voicing (*teeth-teethe, house(n)-house(v)*), and rhyme replacement with /ɔt/ (*buy-bought, think-thought*).

- In short, **we accept a proposed irregular covariance because it blocks the regular covariance.**

- We know that a particular irregular allomorphy exists because there is a corresponding regular paradigm with the same meaning alternation that the stem is excluded (or blocked) from.

- Blocking of the regular form tells us that the irregular form is truly an irregular expression. This is why Borer (2014) argues that we should look for Root supletion in inflectional paradigms. This is where we see regular paradigms.

- There's no prima facia reason that we would expect suppletion to be limited to inflection. Indeed, Harley (2014) responds that we see derivational Root suppletion frequently, using as an example (among others) the English inchoative-causative (which is regularly expressed with a zero but also irregularly expressed with ablaut: *fall-fell, lie-lay, rise-raise*) pairs that are non-cognates: *learn-teach, come-bring,* and *die-kill.*

- Rather, in inflection we are provided with the key tools that we can use to be confident that we have truly found a covariance relationship because there is a regular paradigm and the relevant Root is excluded from that paradigm. That is: the English causative-inchoative alternation would be more convincing if there were a regular overt causative morpheme that was blocked.

- If putative root suppletion belonged to a regular paradigmatic covariance (regardless of whether that paradigm is "inflectional", we would have falsifiable predictions about that covariance: **We predict that the covariance is elsewhere regularly expressed and that the relevant root is excluded (blocked) from it.**

4. The Taxonomy of Root Suppletion

Proposal: I adopt Borer's and Martantz's arguments, outlined above, as **the standard that putative cases of root suppletion *must* meet in order to constitute counterevidence to the PIH.**

I argue that this is the highest possible standard which a phonological-semantic covariance must meet to be unambiguously considered root suppletion.

(1)   *The Taxonomy of Root Suppletion*

To be unambiguously considered "true" Root suppletion, a phonology-semantics covariance must:

   a.   Employ an unpredictable, irregular, non-cognate phonological alternation.

   b.   Express clearly contentful Root semantics.

   c.   Conditioned by a semantic contrast that is otherwise expressed in the language by regular morphology.

   d.   Block the regular expression of the Root with the conditioning contrast.

   e.   Conditioned by a semantic contrast that is clearly grammatical.

Note: This doesn't mean that a pattern that fails to meet one of these criteria is necessarily non-suppletive, only that such patterns cannot be decisive to the question of how Roots are individuated.

5. Testing the Standard

In this section, I test this standard against familiar putative examples of Root suppletion.[3]

5.1 English

Root suppletion in English has long been the standard of what ***should not*** count as "true" root suppletion for a variety of reasons.

If this standard works, it should eliminate all the cases of English Root suppletion that the literature has already eliminated as insufficient for falsifying the PIH (2).

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[3] Well, they're familiar to me at least—I admit this section charts a course through my career from English major to Arizona grad student to Ottawa linguist!

(2)   **a. *go-went, bad-worse*:** As a high frequency words with almost no semantic content, these violate **(1b).** These could be a case of functional words.

b. ***person-people*:** The regular form of this covariance, *persons*, is not blocked. This violates **(1d).** [4]

c. ***seek-sought, think-thought, buy-bought, teach-taught*:** Both members of the alternation are cognates and the output forms are predictable, so these violate **(1a).**

d. ***die-kill, come-bring, learn-teach:*** There is no regular alternation to be blocked here. So these violate **(1c).**

Also, it is not clear that causativization is a grammatical meaning in English. This could indicate that causatives in English could be a function of Root semantics. This violates **(1e).**

As expected, the standard shows in (2a-d) why the English cases of Root suppletion have been insufficient to falsify the PIH.

5.2 Uto-Aztecan

This standard was designed with defeating the Uto-Aztecan in mind (see C and D above), so… the Uto-Aztecan does not satisfy the standard.

- As argued by Borer (2014), the Uto-Aztecan alternations do not express a covariance (object number agreement) that is otherwise expressed regularly, thus violating **(1c).**

- There is also no evidence that the semantic alternation is not a function of Root semantics (a la *murder-massacre*), thus violating **(1e).**

5.3 Algonquian

There are two patterns of suppletion that will be familiar to those of us who think about Algonquian a lot (see for example Thevierge in the poster session), but will be unfamiliar to others, so I will take a second to describe it.

5.3.1   Suppletion triggered by possession

Simple possessive constructions in Ojibwe are formed by a noun stem affixed by a person prefix indexing the possessor (such as *ni-* for first person) and sometimes a possessive suffix (often *-im*).

- In (3), the possessive construction is formed by adding the first-person prefix *ni-* and optionally the possessive suffix *-im* to the noun *jiimaan* `canoe' (all examples from Valentine 2001).

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[4] It is worth stating that this alternation is an exceptional case: It is typical in cases where blocking fails that the irregular form has the specialized meaning and the regular form is entirely compositional (Aronoff 1976), but in this case, for many dialects *persons* has specialized meaning.

(3)   *njiimaan(im)*
        ni-jiimaan-im
        1-canoe poss
        `my canoe'

- In some cases, however, the noun that appears as a possessum has a different form than its independent counterpart.

  o   In examples (4a), (5a), and (6a), the nouns appear independently (i.e., for our purposes, not in a possessive construction).

  o   In examples (4b), (5b), and (6b), the nouns appear as possessa.

(4) a.   *nimosh*   b.   *nday*
           animosh   ni-day
           dog   1-dog
           'dog'   'my dog'

(5) a.   *bnoojiinh*   b.   *nniijaanis*
           abinoojiinh   ni-niijaanis
           child   1-child
           'child'   `my child'

(6) a.   *nini*   b.   *nnaabem*
           ininiw   ni-naabem
           man   1-man
           `man'                    `my husband'

So let's assess these against the standard:

- These forms are not cognates **(1a).**

- The nouns here are clearly contentful **(1b).**

- The trigger for these is regularly expressed (*-im*) **(1c).**

However, there is no blocking effect in these cases.

- Valentine (2001) observes that alongside (5b) and (6b), the non-suppletive forms (5c) and (6c) also exist.

(5) c.   ndabnoojiinh   (6) c.   ndinniim
           nid-abinoojiinh   nid-ininiw-im
           1-child   1-man-poss
           `my child'                    `my husband'

- They fail condition **(1d.)**

The Ojibwe nouns then appear to be root suppletion, but they fail to meet the proposed standards for falsifying the PIH. [5]

5.3.2   Suppletion triggered by object animacy

In Ojibwe, verbs bear particular transitive derivational morphology depending on the animacy of their arguments.

- In (7), the VTA (transitive animate) affix -*am* indexes that the object (*kwe* `woman') is animate.[6]

  (7)   *nwaabmaa*   *kwe*
         ni-   waab-   **-am**   -aa   ikwew
         1-   see-   **-VTA**   3.obj   woman(an)
         `I see the woman.'

- In (8), the VTI (transitive inanimate) affix -*and* indexes that the object (*jiimaan* 'canoe') is inanimate.

  (8)   *nwaabndan*   *jiimaan*
         ni-   waab   **-and**   -aa   -n   jiimaan
         1-   see-   **-VTI**   -in.obj -1sg   canoe(in)
         `I see the canoe.'

- As seen in (7) and (8), verbs in Ojibwe show **a paradigmatic opposition** for the object animacy.

This opposition **suppletes** in the case of the verb -*amw* / -*miiji* 'eat' (9 and 10).

- Note that in both cases, the suppletive form expresses the transitive marker as well as the Root (portmanteaux indicated with parentheses).

  (9)   *ndamwaa*   *waabmin*
         nid-   **amw**   -aa   waabimin
         1   **-eat(VTA)**   -3.obj   apple(**an**)
         `I eat the apple.'

  (10)   *nmiijin*   *wiiyaas*
         ni   **-miiji**   -n   wiiyaas
         1   **-eat(VTI)**   -1sg   meat(**inan**)
         `I eat the meat.'

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[5] Further, it is debatable whether there is a contentful distinction expressed by the suppletive forms. In example (6), the non-possessed form (6a) is translated as `man' whereas the possessed form (6b) is translated as `husband'. This might just be the meaning of a possessed man, and in fact that seems likely, but if not these, then, would appear to not be cases of root suppletion because they would rather be very close synonyms. They then fail condition (**1e).** This is an empirical question, but not a pressing one given that this data otherwise doesn't meet the standard.

[6] Morpheme by morpheme glosses are contributed by Will Oxford, whom I thank. If I messed this up, that's on me.

We can now test this against the standard for "true" root suppletion (11)

(11)   Ojibwe verbal suppletion.

    a.   Employ an unpredictable, irregular, non-cognate phonological alternation.

    These forms have completely different, unpredictable phonology.

    b.   Express clearly contentful Root semantics.

    The verb meaning 'eat' is never argued to be functional.

    c.   Conditioned by a semantic contrast that is otherwise expressed in the language by regular morphology.

    The trigger for verb suppletion, namely the animacy (gender) of the internal argument, is otherwise expressed regularly in the language (see 7 and 8).

    d.   Block the regular expression of the Root with the conditioning contrast.

    The regular expression is blocked with these roots—a regular VTI form, *amw-dan*[7], does not exist.

    f.   Conditioned by a semantic contrast that is clearly grammatical.

    The animacy contrast is strictly formal, not contentful.

- Animacy is clearly grammatical in Ojibwe (12).

(12) | **Animate** | **Inanimate** |
| --- | --- |
| *waabmin* `apple', | *miin* `blueberry' |
| *bookdoonsh* `pear' | *dewmin* `strawberry' |
| *mskomin* `raspberry' | *wiigwaasmin* `cherry' |

To Sum:

- The Ojibwe verbs simultaneously satisfy all five conditions we have put on putative "true" Root suppletion.

The *amw-miiji* alternation in Ojibwe is unambiguously Root suppletion, therefore Root suppletion exists, therefore the PIH is falsified.

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[7] Since there are various derivational patterns, it's not obvious what the regular TI partner of TA *amw-* ought to look like, but another good candidate would be just *am- (Wiil Oxford, p.c.)

6. On the Argument from Rarity.

Borer (2014) makes a third argument which I don't have the space to recapitulate here: putative "strong" Root suppletion is exceedingly rare. I point you to her paper for the evidence. I'll recognize here that that is **absolutely true** and offer no counter argument. Instead, I want to take a moment to think about what we ought to do with that fact.

"How small is too small?" is of course consistently a valid concern in every scientific endeavor. There will always be exceptional data, especially in the behavioral sciences, which abound in confounds. Very rare data historically gets put into two categories based on theoretical distinctions: *counterexamples* versus *data that require exceptional explanations*. Unfortunately, science doesn't come with an easy set of criteria for us to determine the difference between the two. I argue here that in this context we have already determined the criterion by which to assess this sorting: **parsimony**.

The main appeal of the *lexical-realizational* models in discussion here, as opposed to *inferential-realizational* approaches to morphology (exemplified contemporaneously by Word-And-Paradigm models such as PFM) is that they are *parsimonious, elegant,* and *restrictive*. They treat morphology as underlyingly concatenative and thus underlyingly syntactic. This means that they treat non-concatenative processes, such as stem allomorphy or defectiveness, as requiring exceptional explanations because it is *overall* more parsimonious to treat them as such.

Since what is and isn't parsimonious is model-specific, the answer to **whether Root suppletion is rare enough to be considered exceptional is also model-specific**.

In Exeoskeletal Syntax:

- Roots are individuated phonologically but are underspecified for their phonological content. A suppletive alternation with no shared phonology **cannot** be accounted for with underspecification.

- This means that true suppletive Root allomorphy must be individuated through **some other mechanism** that is unique to suppletive roots.

- Thus, there is a **significant metatheoretic cost** to accounting for Root suppletion (a very small number of forms) with grammatical architecture: the model requires an entirely different means for individuating this small set of roots.

- Therefore, the concerns of economy and elegance in ESS demand that the larger set of irregular verbs be treated with underspecification while a small number of putative suppletive verb be treated as literally a coincidence (i.e. two nearly synonymous Roots with coincidentally complimentary defective paradigms rather than one covariance; Borer 2014).

- **Therefore, in ESS, the argument from rarity is compelling.**

In Distributed Morphology, the concerns are reversed:

- Non-suppletive root allomorphy accounts employ a **distinct mechanism** (readjustment) from the default mechanism used for allomorphy (competition).

- Putative root suppletion accounts **do not**. They employ competition.

- Thus, the **cost of distinguishing between suppletive and non-suppletive allomorphy** comes from **adding a generative mechanism** (readjustment) that is unique to non-suppletive irregular Roots.

- If we deny the PIH and treat Root suppletion as a prediction of the grammar and not exceptional, competition can be the only mechanism employed for allomorphy and **DM is more parsimonious**.

- **Therefore, in DM, the argument from rarity is *not* compelling.**

In Nanosyntax:

- Because Roots are always overridden by cyclic override, if the PIH were true, root phonology would be unlearnable absent some other device, so **Nanosyntax is more parsimonious** with a falsified PIH.

In Lexical Realizational Functional Grammar:

- Roots are necessarily individuated semantically and there is no mechanism through which the PIH could be upheld, absent some additional mechanism, so **LrFG is more parsimonious** with a falsified PIH.

Conclusions

Here are the two things I set out to do with this talk:

1. Propose a very high standard against which to test putative "true" Root suppletion for the purposes of the *Phonological Individuation Hypothesis*.

2. Test that standard against familiar Root suppletion patterns.

- Given that I set the standard very very high, it is unsurprising that most of the patterns we are familiar with failed.

- But Ojibwe **amw-miiji** did not fail. It is just one example, but it sure seems like counterevidence.

References

Bliss, H. 2004. "Constructing dual number in Hopi." In *Proceedings of the 2004 annual conference of the Canadian Linguistic Association.*

Borer, H. 2003. "Exo-skeletal vs. Endo-skeletal explanations: syntactic projections and the lexicon." In Polinsky, M. and J. Moore (eds.) *The Nature of Explanation.* Chicago: Chicago University Press, (CSLI)

Borer, H. 2014. "Wherefore roots?" Theoretical Linguistics 40:343-359.

Corbett, G. 2000. *Number.* Cambridge: Cambridge University Press

Durie, M. 1986. "The grammaticalization of number as a verbal category." In *Proceedings of the Twelfth Annual Meeting of the Berkeley Linguistics Society.*

Embick, D. 2000. Features, syntax, and categories in the Latin perfect. *Linguistic Inquiry* 31.2: 185-230.

Embick, D, & M. Halle. 2005. "On the status of stems in morphological theory." In *Romance Languages and Linguistic Theory 2003* ed. by Twan Geerts et al., 59-88. Amsterdam: John Benjamins.

Embick, D. & R. Noyer. 2007. Distributed Morphology and the syntax/morphology interface. In The *Oxford handbook of linguistic interfaces*, ed. Gillian Ramchand and Charles Reiss, 289-324. Oxford: Oxford University Press

Halle, M. & A. Marantz. 1993. Distributed Morphology and the pieces of inflection. In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, eds. K Hale, SJ Keyser. 111-176

Halle, M. & A. Marantz 1994. 'Some key features of Distributed Morphology.' In *Papers on phonology and morphology,* ed. Andrew Carnie and Heidi Harley, 275-288. Cambridge, MA: MIT Working Papers in Linguistics 21.

Harley H. 2014. "On the identity of roots." *Theoretical Linguistics* 40:225-276. (Originally cited as a 2011 ms).

Haugen, J. & M. Everdell. 2015. "'To Kill' and 'To Die' (and Other Suppletive Verbs) in Uto-Aztecan." *Language Dynamics and Change.* 5. 227-281.

Haugen, J. & D. Siddiqi. 2013. Roots and the derivation. Linguistic Inquiry 44:493-517

Haugen, J. & D. Siddiqi. 2016. "Towards a Restricted Realization Theory: Mul-timorphemic monolistemicity, portmanteaux and post-linearization spanning" in Siddiqi, D. & Harley H. *Morphological Metatheory.* John Benjamins Publishing.

Hill, Kenneth C., and Mary E. Black. 1998. "A sketch of Hopi grammar." In *Hopi dictionary: Hopìikwa Lavàytutuveni: A Hopi-English dictionary of the third Mesa dialect*, 861-900. Tucson, AZ: University of Arizona Press.

Marantz, A. 1995. "Cat" as a phrasal idiom. Ms., MIT

Marantz, A. 1997. No escape from syntax: don't try morphological analysis in the privacy of your own lexicon. In Penn Working Papers in Linguistics, eds. A Dimitriadis, L Siegel, Curek-Clark, A Williams.

Melchin, P., A. Asudeh, & D. Siddiqi 2020a. "Ojibwe agreement in a representational, morpheme-based framework". *Proceedings for the 2020 Canadian Linguistics Association Annual Meeting.*

Melchin, P., A. Asudeh, & D. Siddiqi 2020b. "Ojibwe Agreement in Lexical Realizational Functional Grammar." *Proceedings for Lexical Functional Gram-mar 2020.*

Mithun, M. 1988. "Lexical categories and the evolution of number marking." In Theoretical Morphology, eds. Michael Hammond and Michael Noonan, 211–234. San Diego: Academic Press.

Starke, M. 2009. "Nanosyntax: A short primer on a new approach to language." In Svenonius P. (ed). *Nordlyd: Tromsø University working papers on language and linguistics* 36, 1-6. Tromsø: University of Tromsø.

Stump, G. 2001. *Inflectional Morphology: A Theory of Paradigm Structure.* Cambridge: CUP.

Valentine, JR. 2001. *Nishnaabemwin Reference Grammar.* Toronto: University of Toronto Press.