

## Root categorizers don't lexicalize

### *Introduction*

Distributed Morphology / DM (Marantz 1995, 1997, Harley 2005 *et seq*) and exoskeletal approaches (Borer 2005a,b *et seq*) to lexical categories famously embrace the idea that roots are categoryless and that their categorization takes place within syntax. This is in contrast with more traditional approaches to morphology that take lexical categories to stem directly from the lexicon itself (e.g. Chomsky 1965: chapter 2; Baker 2003). However, these approaches differ with respect to how these roots become categorial elements. Under the DM-proposal, a given root contextually obtains its categorial identity as, e.g., verbal or nominal by functional heads like *v*, *n* and the like, which in some local fashion join the root (cf. Alexiadou & Lohndal 2017 for a survey of different proposals regarding the configurations of roots). By contrast, according to Borer they merge directly with functional heads that are part of the extended verbal or nominal projection (like T or D), which render them verbal/nominal as these functional heads can only select verbal/nominal elements.

These approaches raise interesting and different empirical issues with important theoretical ramifications: Are there languages which have category-defining morphology -- morphology signals that a given root is a verb or a noun-- which agglutinates to the root rather than having fusional/synthetic morphology? Going further, are there languages which encode such category-signaling differences in an analytical way? Should such a language *not* exist, an obvious question is why. A good theory of roots and root categorizers should provide answers to these questions.

As far as we can see, Borer's exoskeletal theory of roots gives a rather straightforward answer to this question: Since root categorizers like *n* or *v* are not postulated, agglutinating categorizing morphology is not predicted. In fact, and on the face of it, categorizing morphology is not predicted at all. In her approach, the category of a given root is purely contextually

retrieved by the environment provided by functional heads, which serve independent grammatical purposes and by virtue of their inherent properties determine the root's category as e.g. nominal or verbal (thanks to, e.g., D or T). Should agglutinating categorizing morphology turn out to be universally absent, this is at least compatible with tenets of the exoskeletal approach, insofar as pure root categorizers do not exist as lexical items. It follows that if empirically, a language happens to exhibit categorizing morphology, this must be a concomitant of a grammatical entity which next to morphological categorization of the root encodes independent grammatical information (for example, *n* hosting gender). From this perspective a universal absence of agglutinating categorizing morphology would not be too surprising -- after all, root categorizers do not figure as lexical formatives in the architecture of the grammar.

Things differ within DM, though, where lexical categorizers are crucial for the determination of a given root as nominal or verbal. Should agglutinating categorizing morphology be absent universally, this would be at least curious from a DM-perspective. After all, functional heads (like T or D) other than categorizing ones frequently surface in agglutinating fashion. So why shouldn't categorizing heads?

In this short article, we will entertain the following hypothesis (1):

**(1) The agglutinative categorizer absence hypothesis (ACAH)**

Root categorizing morphology (realizing *n*, *v* or *a*) is never agglutinative (let alone periphrastic), but if anything, synthetic or fusional.

We hasten to say that what we do not hypothesize is that agglutinative languages lack categorizing elements, such as verbalizing or nominalizing morphology. What we hypothesize is that a functional head that takes a root and projects a verb, noun or adjective cannot realize its morphology in an agglutinating way.

Before moving on, we would like to add a note of caution. Agglutinative morphology is not so clearly defined as one would hope, although it has a few prototypical properties. For

example, in agglutinative languages an affix generally realizes only one grammatical category. Moreover, agglutinating languages are for the most part characterized by a high degree of regularity. For instance, in agglutinative languages like Japanese, Turkish, Mongolian, or Finnish, irregular verbs are very rare, for example, the only two putatively irregular Japanese verbs are *suru*, ('do') and *kuru* ('come').

To the best of our knowledge, category-signaling affixes are generally quite rare typologically, and analytical strategies of categorizing roots do not exist. The latter would be instantiated, e.g., by a language in which generally, roots are verbalized by auxiliaries or in which free-standing nominalizers must accompany roots. As for agglutinating strategies, the literature reports no cases of languages with agglutinating categorizing morphemes for verbs and for nouns. We have been notified of one language that might have separate affixes that are root categorizers in the sense discussed above. This language is Classical Nahuatl/CN.<sup>1</sup> The morphological characteristics of the determiner phrase (DP) in CN might come closest to the described scenario where nominal roots appear to be categorized by an agglutinative marker. Launey (1999, fn. 3) notes that the suffix *-tl* (allomorphs *-tli* or *-li*) is attached to every singular, non-possessed noun. (2) exemplifies the case where *-tl* is affixed to a singular noun:

(2) Ni-k-itta      in      kone-**tl**  
 1SG-3SG-see    DET    baby-TL

'I see the baby.'

(Launey 1999: 348)

Given the ACAH as a backdrop, the logical space of argumentation is that the CN element *-tl* (a) is an agglutinating root categorizer, (b) is a root categorizer which is not agglutinative, (c) is not a root categorizer but agglutinative, and (d) is neither a root categorizer nor agglutinative. As we will show, even these CN markers do not count as nominal

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<sup>1</sup> In his overview of noun classification Greenberg (1878/1990: 251-252) remarks: "There are also some instances of what appears to be the last stages of a non-generic non-classifying article, e.g. the *-s* of Klamath and other Plateau Penutian languages of Oregon, which appears on most nouns and in most constructions. The 'absolute' of Uto Aztecan and other Amerind languages possibly also belong here." We focus on the latter (CN). The former has gone extinct and is currently in the process of being revitalized.

categorizers but are best analyzed as exponents of the number value singular and therefore do not form evidence against the ACAH, i.e., we will show that there are thus reasons to believe (c). But, even if one were to treat the suffix as a nominal categorizer, its agglutinating nature is not settled, i.e., there are indications for (b) or even (d). Hence, we conclude that the CN facts do not compellingly argue against the ACAH, the ACAH can be defended and thus requires an explanation. Theories employing roots should provide one.

*CN -tl is not a root categorizer*

But let us now turn to CN in more detail. The language exhibits VSO order and has agglutinating morphology. Negation, referencing of grammatical function/agreement, etc. all are added to the stem in an agglutinating way. With these considerations in mind, let us dive into the distribution of this alleged root categorizer *-tl* in CN. Here, we provide five arguments that CN *-tl* is actually not a root categorizer.

The first argument concerns the absence of *-tl* on plurals. As shown in (3), *-tl* does not show up on plurals. Instead *-meh* (3) or the glottal stop *-h* (4) mark plural in the absence of *-tl*. Occasionally, plural affixation is accompanied by reduplication of the initial two or three segments of the host as in (5). Finally, *-tin* shows up on some nouns, as shown in (6). The example also illustrates that reduplication is not triggered by one particular plural suffix only.

(3) *ichca-meh*

sheep-PL

‘(multiple) sheep’

(4) *Ni-kim-itta in kone-h*

1SG-3PL-see DET baby-PL

‘I see the babies.’

(5) *cō-cōā-h*

RED-snake-PL

‘snakes’

(6) *tē-tēuc-tin*

RED-lord-PL

‘lords’ (Karttunen 1983: xxviii)

Several analytical possibilities are consistent with the observation. For this, one needs to address the following question: Is number a feature on the categorizer or not? Only if that is the

case, *-ti* could be a serious candidate for a number bearing categorizer. Let us address this question, assuming that number feature has the values singular and plural. If the number feature is part of the categorizer, the structure would be as in (7). If, on the other hand, the categorizer is a head distinct from number (Num) the structure should be like (8).

$$(7) [{}_{nP} R n_{[Num]}]$$

$$(8) [{}_{NumP} [{}_{nP} R n] Num]$$

It seems straightforward to take the observed alternation at face value: *-tl* on singular nouns and *-h* on plurals indicates that *-tl* is an exponent of the value singular itself, alternating with the exponent of the plural value, *-h*. This can be easily implemented by (7). But if so, *-tl* is not (uniquely) a categorizer but an exponent of singular number. In turn, there is no unambiguous support for agglutinative categorizing morphology. It should be noted that this analysis, though, runs again the agglutinative character of the language where a single exponent of two features is generally barred. Instead, it would be more likely that, in line with ACAH, *-tl* is a pure (singular) number marker.

Under the analysis (8), the problem concerning agglutinativity would not emerge. *-tl* could realize *n* and singular number would be a null-ending. Plural then amounts to silencing *n* since *kone-tl-h* is not attested.<sup>2</sup> This could be achieved e.g. by means of impoverishment (*i.a.* Bonet 1991; Halle 1997) and realizing Num as either of the plural affixes:

$$(9) [{}_{NumP} [{}_{nP} R n=tl] Num=\emptyset]$$

$$(10) [{}_{NumP} [{}_{nP} R n=\emptyset] Num=\{-meh/-h/-tin\}]$$

Such an approach raises at least a question: If *-tl* expones a pure categorizer and gets silenced under some view of impoverishment within DM, what feature is impoverished? If the only structural purpose of *n* is to categorize the root and if *-tl* is the phonological form of the Vocabulary Item, which feature remains postsyntactically at the level of Morphological

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<sup>2</sup> One could invoke a phonological condition which bans clustering codas, excluding the unattested output. The analysis effectively amounts to the one mentioned in the main text with the additional aspect that the phonological condition kicks in after postsyntactic operations have finished their duty -- in line with general considerations of the architecture of the grammar.

Structure when the categorical feature *n* itself is deleted? Impoverishment generally targets morphemes with more than one feature.

To summarize, under the view that number in CN is a feature with the values singular and plural, the simplest approach would be (11) with no categorizer present, which in turn means that *-tl* is not a nominal categorizer but a manifestation of singular (in the spirit of Borer 2005a,b).

(11) [NumP R Num]

A second argument that *-tl* is not a complementizer comes from the observation is that, when an object incorporates into the verb, *-tl* is absent:

(12) Ni-tana-chi:wa

s1-basket-make

‘I make baskets.’

(13) ni-tlakwalis-ka:wa

s1-food-leave

‘I fast.’

(14) n-ista-namaka

s1-salt-sell

‘I sell salt.’ (Launey 1999: 352)

Assuming that *-tl* realizes *n*, this could either mean that *n* has a null-allomorph under incorporation or that it is not a nominal that gets incorporated but a bare root. While conceptually problematic, the latter possibility can plausibly be ruled out on independent empirical grounds by observations in Baker (2003). When discussing whether there are languages that have words which are exclusively nouns, he (i) observes in (Baker 2003: 175-175) that CN allows adjectives to figure in nominal environments, cf. (15), and (ii) shows that only nouns can undergo the type of incorporation that saturates the argumental requirements of the predicate,<sup>3</sup> while adjectives cannot cf. the contrast between (16) and (17), cf Baker (2003:

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<sup>3</sup> Launey (1999) distinguishes saturating incorporation from modifying incorporation, where the nominal specifies the manner of the verb. If present, the object is encoded by object agreement as in (ii), meaning that the incorporated *tla'to:l* (‘words’) is a modifier, not an object. The translations are taken from Launey’s work.

ii) ni-mitz-tla'to:l-kaki

178) who cites Kenneth Hale, p.c., for (17). If incorporation involves roots instead of nouns/adjectives these facts cannot be unaccounted for.

(15) in cual-li

the good-N S F

‘a beautiful or good person’

Launey (1981)

(16) Ni-c-chīhua in cual-li.

1sS-3sO-make the good-N S F

‘I make the good one.’

(17) \*Ni-cual-chīhua.

1sS-good-make

‘I make good ones.’

We thus have good reason to believe that CN noun incorporation is what it looks like -- incorporation of a noun rather than a root. This, in turn, suggests that noun incorporation amounts to silencing of the nominalizer *-tl*.

The other possibility here, then, in line with the conjecture that *-tl* is a root categorizer would be to assume that *n* has a null-allomorph under incorporation. However, this assumption would be problematic on its own, as the contexts in which this null-allomorph of *-tl* would realize *n* do not form a natural class (plural and object incorporation).

A third argument deals with possessives. As shown below, *-tl* alternates with special morphology on possessives (possessor agreement) -- that is, it never shows up on possessives.

(18) i:-tlakwal in kone:-tl

POSS.3.SG-food DET baby-TL

‘the baby’s food’

(19) i:n-tlakwal in ko:-kone-h

POSS.3.PL-food DET RED-baby-PL

‘the babies’ food’

Why would overt *-tl* be suppressed in the presence of a possessor and the concomitant possessor agreement? This suggests that the possessive head and *-tl* are in complementary distribution

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S1-O2-words-hear  
‘I understand you.’

(a possibility raised by Mark Baker, p.c.). If so, *-tl* is not a nominal categorizer, in line with possibilities (c) and (d) above -- confirming the ACAH.

Notice that even if *-tl* were an instance of D, problems would arise. First, take the element *in*, which precedes the nouns in (2), (18), and (19). Some works classify it as a determiner and give a translation with the definite article: “a general purpose article [...] somewhat analogous to English THE” yet “evidently not inherently definite” (Langacker 1972: 174). If that is correct and if *in* in (18) instantiates D, *-tl* cannot be an instance of D and should be more plausibly treated as an instance of *n* instead. That *in* is an instance of D is supported by another observation: The element can precede VPs in constructions where the object is fronted:

(20) Kone:tl **in** ni-k-itta

baby-TL DET 1SG-3SG-see

‘I see a baby’, ‘It is a baby whom I see.’

(Launey 1999: 349)

If this line of argumentation is correct, *-tl* would not be a determiner. But then, the absence of *-tl* on possessives no longer receives a principled explanation.

Our final argument goes back to an observation by Karttunen (1983: xxix) with respect to what she calls compounding elements in diminutives.

(21) Ichca-tl

sheep-TLI

‘sheep’

(23) Ichca-tzitzin-tin

sheep-RED-DIM-PL

(multiple) ‘sheep’

(22) Ichca-tzin-tli

sheep-DIM-TLI

‘sheep’

As a starting point, take (22). In (22), *-tli* does not attach to the noun *ichca* (‘sheep’) but to the diminutive *-tzin-*. Can *-tli* in these contexts be a nominal categorizer? After all, it follows the



diminutive and thus does not structurally attach to the root. A strong indication that the affix structurally attaches to the diminutive suffix comes from the fact that the latter reduplicates in the plural while the root does not, cf. (23). But then, the host of the suffix *-tl* is the diminutive suffix, not the root. But that also makes *-tli* not a categorizer, as a diminutive is already nominal.

An indirect argument that supports the same conclusion comes from Balsas Nahuatl (Flores Farfán 1999: 105 in Chamoreau 2012: 77), where nouns can exhibit two plural suffixes -- one attaching to the root, and another one attaching to the diminutive suffix:

- (24)      Ø-tlaxcal-**tsi-tsiin-teh**  
             3-tortilla-PL-DIM-PL  
             ‘There are small tortillas’

These observations lend credence again to the idea that *-tl* expones singular number and is thus a number marker, not a root categorizer. After all, it shows up in (22), where it transparently fulfills no function of categorizing the root. Possibly, (22), (23) and (24) have the same underlying structure, *modulo* value of number. If so, the difference between the two languages boils down to the availability of contextual allomorphy in CN, which determines the linearly first instance of NUM to be silent in the context of the diminutive – a rule which is absent in Balsas Nahuatl. For concreteness, we illustrate the contrast in (25) and (26), and assume that the diminutive and the rightmost number affix form a constituent:

- (25)      CN, SG:              [[[R=*ichca*]  $n_{[NUM: SG]=\emptyset}$ ] [DIM=*-tzin* [NUM: SG=*-tli*]]]  
             CN, PL:              [[[R=*ichca*]  $n_{[NUM: PL]=\emptyset}$ ] [DIM=*-titzin* [NUM: PL=*-tin*]]]  
             (26)      Balsas Nahuatl:      [[[R=*tlaxcal*]  $n_{[DIM: PL]=\textit{tsi}}$ ] [DIM=*-tsiin* [NUM: PL=*-teh*]]]

As the observations and the sketchy analysis suggests, *-tl*'s function cannot be reduced to just that of a root categorizer. It also acts as a number marker. The force of an argument against ACAH based on CN *-tl* is thus seriously weakened.

A fifth problem argument against a DM-expectation that *-tl* realizes *n* is that if roots are truly categorless and *-tl* is a little *n*, one might expect it to go on virtually any root to form a noun – including examples that correspond to nominalizations in English (Mark Baker, p.c.). The facts do not bear out the prediction: *-tl* does not directly attach to verbal roots in nominalizations. Taking event nominals to be representative, a nominalizer *-lis-* separates the verbal root from *-tl* in (27):

- (27)      te:-teki-**lis**-tli  
                  U.H-cut-NOML-TL  
                  act of cutting someone/surgery      (Andrews 1975: 228 in Stiebels 1999: 810)

Let us take stock. Given that *-tl* occurs in every singular, non-possessed, and non-incorporated noun, this suggests that if it were the exponent of a root categorizer it would be the default exponent.<sup>4</sup> As such, it makes for a rather poor agglutinative root categorizer insofar as agglutinating morphology is associated with regularity and predictability. Moreover, if *-tl* were a root categorizer it would not attach to a diminutive marker but to the stem of a diminutive itself and it should be possible to attach to virtually every root that could be nominalized, contrary to fact. While this assessment might hinge on terminology and analytical options, the evidence for treating CN *-tl* as an agglutinative root categorizer does not strike us as unequivocal. To make a case against the ACAH, much stronger and compelling evidence is called for. Short of such evidence and given the absence of agglutinating strategies of categorizing outside CN, we take the ACAH to hold.

### *Theoretical consequences*

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<sup>4</sup> In addition to the productive/predictable cases some irregular nouns exist where *-tl* does not occur. Andrews (1975: 109) differentiates four noun stem classes: next to the *-tl*-class there are the affixes *-tli*, *-in* and 0 (zero) attaching to nominal roots. In effect, there are categorizing allomorphs, e.g. *-in* as in *pah-tli* ‘medicine’, *mich-in*, ‘fish’ and *chichi-0* ‘dog’. Secondly, *-tli* and *-in* show up after consonants, which assimilates to a final /l/ (*tōch-tli*, ‘rabbit’, but *cal-li*, ‘house’).

We end this squib with a theoretical discussion. If ACAH holds, what does it tell us about existing theories of roots in syntax? Within DM, the question arises why root categorizers like *v*, *n* and *a* cannot be realized if they are functional heads in the clausal or nominal spine. One possible way to account for the absence of agglutinating categorizing morphology would be to say that any “root is necessarily in the domain for root-conditioned allomorphy,” so “it might not be surprising if there aren't any non-irregular such suffixes” (Heidi Harley, p.c.). The argument appears to be couched within certain tenets of DM (cf. Embick 2021 for discussion): Consider a structure with root categorizer *x* and the root as in (28) and (29). (28) and (29) differ in that higher *y* is phasal while *Y* is not. The general idea is that the root can induce irregular morphology realized by a Vocabulary Item in structure (29), but not in structure (28).

$$(28) \quad [_{yP} y [_{xP} x \sqrt{R}]] \qquad (29) \quad [_{YP} Y [_{xP} x \sqrt{R} ]]$$

The reason, according to Embick (2003), is that Late Insertion accesses distinct lists of Vocabulary Items within different cycles of syntactic derivation:

- (30) LISTEDNESS: Listed information is cycle-dependent. Whether a list is accessed for insertion, and the particular contents of that list, are determined by whether or not the node to be spelled out is in the Root or Outer Cycle. (Embick 2003: 163)

Thus, phase-based locality is responsible for the cut between irregular (non-predictable) and regular (predictable) morphological realization. The generalization (31), mentioned in Embick (2021: 82), is pertinent:<sup>5</sup>

- (31) Allomorphy: For Root-attached *x*, special allomorphy for *x* may be determined by properties of the Root. A head *x* in the outer domain is not in a local relationship with the Root and thus cannot have its allomorphy determined by the Root.

We presume that the restriction (31) is intended to be applicable to (28) in that the phase head *y* is part of the “outer domain” of the root. Irregular morphology of *y* induced by the root is then

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<sup>5</sup> He discusses Embick & Marantz (2008: 11) and mentions ramifications for semantic interpretation as well, which we abstract away from here.

predicted to be impossible. The same is not true in (29) in that Y is non-phasal and thus fails to qualify as the “outer domain” of the root. It follows that root-induced irregular morphology of Y is possible. Embick (2021: 83) mentions irregular past tense of English like in the verb *ben-t* and *brok-en*, whose underlying structure is abstractly (29) and cannot be (28), and is plausibly  $[_{TP} T [_{vP} v [_{RP} R (...)] ]]$  more concretely. It is likewise plausible that verbs like *hit*, *fly*, etc. fall into a similar category: verbs which could be classified as exhibiting fusional tense morphology.

Returning to Harley’s argument, the logic seems to be that root categorizers by definition are within the “inner domain” of the root (i.e. belong to the analytical paradigm embodied by (29) rather than (28)). It follows that there is no way from structurally severing a categorizer from the influence of the root for irregular (i.e. fusional/synthetic) categorizing morphology.

However, notice a weakness of the argument: Saying that the configuration (29) gives rise to the *possibility* of irregular, root-induced morphology on Y is one thing. Saying that the configuration (29) virtually universally *prevents* regular morphology on Y is quite another. And the explanatory burden of such an account is aggravated by the simple empirical fact that e.g. in English the vast bulk of lexical verbs take the regular past tense ending *-ed* -- which is agglutinative. For a cogent account of the ACAH, a much stronger and more restrictive and predictive condition is needed than such a sketch of a DM-account.

Hence, as things stand, ACAH is not directly compatible with the DM hypothesis that roots are either directly (à la Marantz) or indirectly selected (à la Harley) by categorizing heads like *v*, *n* or *a*, unless additional assumptions are made. By contrast, Borer’s exoskeletal approach is fully compatible ACAH as that approach crucially lacks such categorizing heads (as they are taken to be redundant in this system). As things stand currently, this seems to us like an argument in favor of Borer’s approach to roots. Yet another interpretation of the facts discussed in this squib is, of course, that the traditional theory for roots might be correct, which takes them to be categorized inherently rather than contextually (Chomsky 1965; Baker 2003).

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