

“In the beginning, there was the Word. . .”

---

*John 1:1*

“The underlying suspicion behind the leading idea of lexicalism is this: we know things about words that we don’t know about phrases and sentences. . . This paper brings the reader the following news: Lexicalism is dead, deceased, demised, no more, passed on. . . The underlying suspicion was wrong and the leading idea didn’t work out. This failure is not generally known because no one listens to morphologists.”

---

*No Escape From Syntax, 1997*

ALEC MARANTZ

# Chapter 4

## Where (Chol) words come from

In this chapter I hope to provide a new account of root classification and stem formation in Chol. In so doing, I support an anti-lexicalist, Distributed Morphology (see §4.3) approach to word formation, by rejecting the idea that all idiosyncracies must be housed in the Lexicon. To do this I will argue that roots in Chol are *underspecified bundles of features*. Contrary to previous works on Mayan classification (cf. Lois and Vapnarsky 2003, Haviland 1994), I hope to demonstrate that bare roots in Chol do not belong to any particular grammatical category prior to entering into the syntax.

As a point of departure, most of the conclusions reached in this chapter stem from an attempt to answer the following question: what are the bold-face suffixes in examples (4.1a) and (4.2a) doing, and why don't the corresponding imperfective sentences in (4.1b) and (4.2b) take them?

(4.1) a. *tyi*      'uk'-**i**-y-ety  
          PERF cry-?-EPN-2A  
          'You cried.'

          b. *mi*      aw-uk'-el  
                  IMPF 2E-cry-NOM  
          'You cry.'

(4.2) a. *tyi*      k-wuts'-**u**-Ø      a-pislel  
          PERF 1E-wash-?-3A 2E-clothes  
          'I washed your clothes.'

- b. *mi*      *k-wuts'-Ø*      *a-pislel*  
 IMPF 1E-wash-3A 2E-clothes  
 ‘I wash your clothes.’

These suffixes have previously been labeled “thematic vowels”, though no attempt has been made to explain their distribution. I will argue that these suffixes, and others like them, provide overt phonological evidence for a process of stem formation in which the under-specified root merges with a head in order to fix its interpretation, following Marantz (2000).

In §4.1 I claim that verb stems in Chol’s non-perfective aspects are formally nominal (cf. Coon to appear). I will claim that a correlation may be drawn between the nominality of these stems and their lack of a post-root suffix. Verbal predicates in Chol require an overt suffix to form a stem, while nominal predicates (non-perfectives, nouns, and adjectives) do not.

After arguing for the nominality of non-perfective verb stems, I will discuss in §4.2 the under-specified nature of Chol roots and examine different processes by which stems may be formed. In §4.3 I will examine the framework of Distributed Morphology and describe how this theory can account for word-formation from under-specified roots in Chol. To conclude, I will argue that this framework provides Mayan linguistics with a neater account of word-formation, which relies neither on an overly-large lexicon, nor on unexplained zero-derivational morphemes.

## 4.1 Nominality

In this section I will examine non-perfective verb stems, first intransitives and then transitives. As we see in examples (4.3) and (4.4), Chol has two possibilities, by all accounts semantically equal, for expressing an intransitive construction in the imperfective aspect. In the first type of construction, which I will call the *muk'* form, person is marked on the aspectual auxiliary and verbal information appears in a subordinated nominal form. In the second, or *mi* form, aspect is expressed as a proclitic and person is marked directly on the verb. When we contrast these two

possibilities with the transitive form in (4.5) we find that, with respect to the *mi* form, Chol is not a strictly ergative-absolutive language.

(4.3) *muk'-oñ tyi wäy-el*  
 IMPF-1A PREP sleep-NOM  
 'I sleep.'

(4.4) *mi k-wäy-el*  
 IMPF 1E-sleep-NOM  
 'I sleep.'

(4.5) *mi k-jats'-ety*  
 IMPF 1E-hit-2A  
 'I hit you.'

In this section I hope to explain the discrepancy between these two types of single-argument imperfective constructions. The source of the split in Chol, I will argue, stems from the fact that the “verb” in the construction in example (4.4), like the subordinated form in example (4.3), is formally nominal.

### 4.1.1 Intransitives

#### *muk'* forms

In the *muk'* type of imperfective, another example of which is shown in (4.6), the auxiliary *muk'* marks for person and the root (here *'uk'* or ‘cry’) appears in a nominal form subordinated by Chol’s preposition *tyi*.

(4.6) *muk'-ety tyi 'uk'-el*  
 IMPF-2A PREP cry-NOM  
 'You cry.'

Previous authors (cf. Aulie and Aulie 1978, Vásquez Alvarez 2002) have called forms such as *'uk'el* in example (4.6) infinitives, based on the fact that *-el* forms frequently occupy positions analogous to English infinitival complements, as shown in (4.7).

- (4.7) *tyi majl-i-Ø tyi 'uch'-el*  
 PERF go-VI-3A PREP eat-NOM  
 ‘She went to eat.’

Though the label “infinitive” seems potentially applicable, these authors have failed to note that infinitives, by definition, have nominal characteristics. This is evidenced in Chol by the fact that *-el* forms occur only in NP positions, as I will demonstrate here. First, like other nominals, *-el* forms may serve as the argument of a verb, as shown in example (4.8). When not serving as the argument of a verb, these forms must follow the preposition *tyi*, as in (4.7) above.

- (4.8) *mi a-mulañ-Ø wäy-el*  
 IMPF 2E-like-3A sleep-NOM  
 ‘Do you like sleeping?’

Additionally, compare the *muk'* construction in (4.9) with the locative construction in (4.10), which uses the existential auxiliary, *'añ*. These two constructions are formally identical, and there is no question as to the grammatical category of ‘house’, which fulfills all the requirements of a typical noun.

- (4.9) *muk'-oñ tyi wäy-el*  
 IMPF-1A PREP sleep-NOM  
 ‘I sleep.’

- (4.10) *'añ-oñ tyi 'otyoty*  
 EXT-1A PREP house  
 ‘I’m in the house.’

Furthermore, we see in example (4.11) that some *-el* forms, like nouns, may take determiners and serve as the subject of a sentence.<sup>1</sup>

- (4.11) *jiñi 'uch'-el mach sumuk*  
 DET eat-NOM NEG tasty  
 ‘This food isn’t good.’

---

<sup>1</sup>This type of construction, however, is marginal in Chol and not entirely productive.

Our next piece of evidence comes from constructions involving the set of so-called “nominal” or “unergative” verbs. As we saw in §3.2.1, these are in fact simply nouns used to express what in English might be considered verbal information. In (4.12), for example, the English ‘You sing’ is conveyed using the inflected aspectual auxiliary and the noun *k’ay* ‘song’.

- (4.12) *muk’-ety tyi k’ay*  
 IMPF-2A PERP song  
 ‘You sing.’

In (4.13) the nominal form *k’ay* appears as an argument preceded by the determiner *jiñi*; inflecting *k’ay* as a regular intransitive verb stem results in ungrammaticality, as shown in (4.14). Not only is *k’ay* a noun, but based on the fact that it exhibits the basic CVC root shape, there is no reason to suppose that it has been derived from some underlying verb.

- (4.13) *mi k-mulañ-Ø jiñi k’ay*  
 IMPF 1E-like-3A DET song  
 ‘I like that song.’

- (4.14) \**mi a-k’ay-el*  
 IMPF 2E-song-NOM  
 ‘You sing.’

We thus have three types of words that may appear immediately after the preposition *tyi*: what have been called “nominal verbs” like *k’ay* ‘song’ and *soñ* ‘dance’, uncontroversial nouns like *’otyoty* ‘house’ and *ja* ‘water’, and finally, *-el* forms like *wäyel* ‘sleep’ and *julel* ‘arrive’. Since in all other cases, these *-el* forms behave like nouns (i.e. by taking determiners, serving as subjects, and appearing as verbal arguments) there is no good formal reason to treat *’uk’el* as anything but nominal.

### ***mi* forms**

We now return to second type of imperfective construction, involving the clitic *mi*, repeated here in example (4.15).

- (4.15) *mi k-jul-el*  
 IMPF 1E-arrive-NOM  
 ‘I arrive.’

In this form, the stem takes an ergative prefix to mark person, rather than the absolutive expected for intransitives in ergative-absolutive languages. This form seems to represent an innovation in Chol.<sup>2</sup> For example, Chol’s nearby cousin Tzeltal, which shows no ergative split, also uses constructions similar to our *muk*’ forms to express intransitives in the progressive aspect as in example (4.16). Constructions analogous to our *mi* forms are not available, as shown by the ungrammaticality of (4.17).

**Tzeltal<sup>3</sup>**

- (4.16) *yakal-on ta cham-el*  
 PROG-1A PREP die-NOM  
 ‘I am sick.’ (lit.: ‘I am dying.’)

- (4.17) *\*yakal k-cham-el*  
 PROG 1E-die-NOM  
 ‘I am sick.’ (lit.: ‘I am dying.’)

The ergative split in Chol, I argue, may be explained based on the nominality of the *-el* forms. Because stems like *julel* are nominal, they may, like other nouns, be marked for possession using one of the ergative prefixes. Perhaps a more appropriate translation of these forms would thus be something like ‘do my *x*-ing’. This is further supported by the fact that some *-el* forms have taken on non-eventive meanings. The intransitive form *kuch’el*, for instance, can mean not just ‘I eat’, when coupled with the aspectual clitic *mi*, but may also stand on its own to mean ‘my food’. This is illustrated in example (4.18).

- (4.18) *mach sumuk jiñi k-uch’-el*  
 NEG tasty DET 1E-eat-NOM  
 ‘My food isn’t good.’

<sup>2</sup>Due to insufficient publications on Chortí and Chontal, it is unclear whether this phenomenon is present in other members of the Cholan sub-family.

<sup>3</sup>These examples are from the Petalcingo variety of Tzeltal, courtesy of Kirill Shklovsky; glosses are my own.

Note as a comparison that it is not particularly surprising that this “possessed-nominal” intransitive form is available only to the non-perfective aspects in Chol. In many other languages, English for example, we also find similarities between verbs marked for progressive aspect and nominals. Progressive *-ing* verb forms like *dancing* in *I am dancing* live double lives as nominal gerunds and may, as such, be possessed. For example, we may say *Her dancing was good last night* but not *\*Her danced was good last night*. Additionally, progressives, like other nominals, predicate with the auxiliary *be* so we have *I am running* and *I am a student* but not *\*I am ran*.

The relationship between nominality and split-ergativity has been previously argued for members of the Yucatecan sub-family (cf. Bricker 1983). Lois and Vapnarsky (2003, 110) have recently dismissed Bricker’s claims. They write that “in Chol, a language close to the Yucatecan branch, split ergativity exists without there being any overt sign of nominalization.” I hope to demonstrate throughout this chapter that non-perfectives in Chol *are* nominal. Furthermore, in a language like Tzeltal with no ergative-split, this nominality does not appear to be present (Shklovsky, p.c.) The correlation between nominality and split-ergativity, I claim, warrants further investigation (cf. Coon to appear).

### 4.1.2 Transitives

Transitive stems in the non-perfective aspects also share formal properties with nominal stems. Like nominal stems, transitive imperfective stems inflect for person and number with no “status suffix” or “thematic vowel” following the root, as shown in example (4.19).

- (4.19) *mi*      ***k-mek'-ety***  
           IMPF 1E-hug-2A  
           ‘I hug you.’

As we saw from similar forms above (see §3.3.2), the “verb” form *kmek'ety* is structurally identical to the noun form in example (4.20), where the ergative prefix



marks the possessor and the absolutive suffix marks the subject of the nominal predicate.

- (4.20) *k-chich-ety*  
 1E-older.sister-2A  
 ‘You’re my older sister.’

An analogous construction appears as the nominal complement of Chol’s only underived ditransitive verb *’ak’eñ* ‘give’, used in lexical causative constructions as in example (4.21), from Vásquez Alvarez (2002, 314).

- (4.21) *mi aw-äk’eñ-oñ k-mos-ety*  
 IMPF 2A-give-1A 1E-cover-2A  
 ‘You make me cover you.’ (lit.: ‘You give me my covering you.’)

Imperfective transitive stems such as *kmek’ety* in example (4.19) are identical in form to the nominal complement of the verb *’ak’eñ* in (4.21): *kmosey* ‘my covering you’, where the action, as claimed by the traditionalists discussed in §3.3.2 above, may be considered experienced by a theme and possessed by an agent. Compare (4.21) with the example in (4.22), where the direct object of the verb ‘give’ is unproblematically a noun.

- (4.22) *mi y-äk’eñ-oñ waj*  
 IMPF 3E-give-1A tortilla  
 ‘She gives me tortillas.’

Unlike intransitive stems, however, transitive forms may not serve as the subject of sentences, nor do they appear to be able to take determiners, as shown by the ungrammaticality of (4.23a). It’s possible that the form in (4.23b) is simply preferred, as for example the difference between English *It’s not good that you hug me* compared with the more marginal *Your hugging of me is not good*. In any case, the evidence from above suggests that there is good reason to believe that transitive non-perfective verb stems are nominal as well.

- (4.23) a. *\*mach weñ (jiñi) a-mek’-oñ*  
 NEG good (DET) 2E-good-1A  
 ‘It’s not good that you hug me.’

- b. *mach weñ che' mi a-mek'-oñ*  
 NEG good that IMPF 2E-hug-1A  
 'It's not good that you hug me.'

Note that there is nothing inconsistent with the claim that a nominal stem may mark for aspect using the aspectual clitic *mi*. In §3.3.3 above we found reason to believe that roots in Chol come with features which specify whether the stem they form requires aspect in order to form a predicate. A stem that requires aspect we called a verb stem, though we made no claim to its formal grammatical status, which we now know is nominal.

In the section that follows I will return to our initial question of what the mysterious suffixes are doing on perfective verb stems. I will argue that all lexical roots in Chol come under-specified with respect to their argument structure. Non-nominal surface stems (verbs) are the result of a morphosyntactic process, of which these suffixes are overt phonological evidence. Nominal verb stems, on the other hand, like nouns and adjectives, do not take an overt suffix. We may consider “nominal” to be the default form into which a root may enter. Since roots, like many nominal stems, do not have an argument structure, this is the simplest transformation for them to undergo.

## 4.2 Roots and stems in Chol

In this section I will elaborate on the nature of roots and the processes of stem formation in Chol. I argue that the suffixes on the roots in examples like (4.24) and (4.25) are best analyzed as *specificational suffixes*, used to specify the grammatical category of the root.

- (4.24) *wajali p'ump'um ta' kol-i-y-oñ*  
 before poor PERF grow-VI-EPN-1A  
 'Back then, I grew up poor.'

- (4.25) *ta' j-käy-ä-Ø k-bä tyi ts'ub*  
 PERF 1E-leave-VT-3A 1E-self PREP lazy  
 'I didn't let myself get lazy.'



Figure 4.1: *Lakotyoty*

Note that I am purposefully avoiding the problematic term “derivational” which is frequently taken to describe the process of changing from one grammatical category to another. By “specificational” I wish to convey the notion that these roots do not have a grammatical category prior to entry into the syntax, and thus cannot be said to be “derived” in the traditional sense of the word. These suffixes *specify* the argument structure and thematic grid of the previously under-specified root, as well as fix its meaning.

This gives us an account of root classification and stem derivation which does not force us to posit a number of homophonous root entries for semantically related surface stems. Furthermore, if we choose to represent the transformation from under-specified nominal root to specified nominal surface form with a zero morpheme, such a claim no longer seems entirely ad hoc. If there is a zero-suffix found on nominal stems, it may be explained as the *default* form; roots are perhaps most like many nominals in that they do not have an argument structure. Thus, creating

an active nominal stem does not require an overt suffix.

This proposal was foreshadowed by Attinasi (1973, 108), who recognizes that the semantic multiplicity of roots in Chol and other Mayan languages does not lend itself easily to a strict system of classification:

It is best, then, not to class lexical roots as any one part of speech, and not to class certain notions or concepts as intrinsically and a priori nominal, verbal, or adjectival. As with the distinction between lexical and grammatical meaning, the criterion of function in utterances is to be taken as the main determinant for the part of speech (and proper gloss) of any lexical item. *As much as possible, the reference of the lexical root should be considered truly infinitive, belonging to no specific form class, such as “noun.”* For the definition of a root no limitation need be imposed on the most general concept of the topic encoded in the phonological sequence which is the root (Attinasi 1973, 108)(emphasis my own).

I concur with Attinasi insofar as the appearance of the root in any given stem form (the “function” of the root) seems to be the main determinant of its meaning and grammatical category. However, as we have seen, certain restrictions *do* obtain. That is, while many roots are semantically and syntactically flexible, no root that I have encountered may appear in just *any* stem form. Limitations do need to be imposed, and this can be accomplished in the form of features, discussed further in §4.3.4.

### 4.2.1 A reanalysis of root suffixes

Here I will attempt to provide a thorough analysis of the various suffixes that appear immediately following the root in Chol, all of which, I claim, serve to *specify* the under-specified root. Not only do the “thematic vowels” and “status suffixes” perform this function, but recall from §2.4.2 that what has been called valence-changing morphology in Chol also appears immediately following the root. Take for

example the causative construction in example (4.26) and the passive construction in (4.27). These “valence-changing” suffixes are in complementary distribution with the transitive and intransitive suffixes found on active perfective verbs.

(4.26) *mi'*            *jub-sañ-oñ-la*        *tyi*        *wokol*  
 IMPF.3E fall-CAUS-1A-PL PREP problem  
 ‘It makes us fall into problems.’

(4.27) *tyi*        *k'ux-le-y-oñ*            (*tyi*        *jiñi*        *ts'i'*)  
 PERF bite-PASS-EPN-1A (PREP DET dog)  
 ‘I was bitten (by that dog).’

These previously distinct classes of “status suffixes”, “thematic vowels”, and “derivational suffixes” are all listed in Table 4.1 below.

	Perfective	Non-perfective	
Nouns and adjectives	(n/a)	(none)	“ <i>status suffixes</i> ”
Inchoative adjectives	-ä	-Vñ	and “ <i>thematic</i>
Intransitives	-i	-el	<i>vowels</i> ”
Transitives	-v	(none)	
“-Vñ” verbs	-ä	-Vñ	
Positional nouns	(n/a)	-vl	
Positional verbs	-le	-tyäl	
Passives	-le	-tyäl	“ <i>derivational</i>
Causatives	-sä	-sañ	<i>suffixes</i> ”
Applicatives	-be	-beñ	

Table 4.1: Post-root suffixes in Chol

Note that all of the perfective forms are either of the form -V or -CV, whereas imperfective suffixes are all -VC or -CVC. Not only may all of these suffixes appear in the immediately post-root slot, but there are clear cases of functional overlap between forms previously considered to be two homophonous suffixes (cf. Vásquez Alvarez 2002). Compare, for example, the “passive” construction in example (4.28) with the verbal positional construction in (4.29) below.

- (4.28) *tyi mos-le-y-oñ*  
 PERF cover-PASS-EPN-1A  
 ‘I was covered.’

- (4.29) *tyi wa'-le-y-oñ*  
 PERF standing-POS-EPN-1A  
 ‘I was standing.’

In both forms, the CVC root receives the suffix *-le*. Both forms also contain a single argument with a similar thematic role: theme. Why should we call one suffix a “passivizer” and the other a “status suffix” when their uses are so clearly related? Instead, the suffix *-le* takes the under-specified lexical root and assigns it an argument structure and a thematic grid. This type of proposal will provide us with a neater account of the suffixes, as well as an explanation of where argument structure comes from.

In the sections that follow, I will analyze each row of the Table 4.1 in turn, conflating the previously homophonous sets (e.g. positional and passive *-le*) and explaining their similarities. All of the suffixes in the non-perfective column, I claim, are nominalized suffixes, the -CVC forms being internally complex.

### Nouns and adjectives (-Ø)

Nouns and adjectives in Chol require no suffix to form a stem, as shown by the examples in (4.30) and (4.31). In the first, the noun *me'* serves as the argument of the existential auxiliary *'añ*. In the second, the adjective *chañ* predicates (presumably) with a third person absolutive suffix.

- (4.30) *ta' majl-i-Ø k'el-oñ baki 'añ jñi me'*  
 PERF go-VI-3A see-1A where EXT DET deer  
 ‘We went to see where the deer was.’

- (4.31) *ma'añ mi' mejl-el tyi lets-el porke*  
 NEG.EXT IMPF.3E be.able.to-NOM PREP ascend-NOM SP.because  
*chañ-Ø*  
 high-3A  
 ‘It can’t get out because it’s high.’

**Inchoatives and “-*Vñ*” verbs (-*ä* / -*Vñ*)**

Both inchoatives and the majority of “-*Vñ*” verbs (see §3.2.1) take the suffix -*ä* in the perfective aspect, as shown in examples (4.32) and (4.33).

- (4.32) *tyi säk-ä-y-oñ*  
 PERF white-INCH-EPN-1A  
 ‘I became white.’

- (4.33) *ta’ k-wiñ koty-ä-Ø tyi ’e’tyel*  
 PERF 1E-lot help-VT-3A PREP work  
 ‘I helped him work a lot.’

The non-perfective analogs of these forms take a -*Vñ* suffix.

- (4.34) *mi k-säk-añ*  
 IMPF 1E-white-INCH  
 ‘I turn white.’

- (4.35) *choñkol k-ilañ-Ø wokol*  
 PROG 1E-see-3A problem  
 ‘Because it’s difficult.’ (lit.: ‘Because I’m seeing problems.’)

Note that this -*Vñ* suffix creates a nominal stem. For example, in (4.36) the form *k’amañ* (sick-INCH) serves as the nominal direct object of the verb.

- (4.36) *wego mi’ tyaj-oñ-la k’am-añ*  
 SP.later IMPF.3E find-1A-PL sick-INCH  
 ‘Later it makes us sick.’ (lit.: ‘Later we find sickness.’)

**Intransitives and -*j*- passives (-*i* / -*el*)**

Both intransitive stems, as well as CVCs which have formed “passives” through a process of vowel lengthening (-*j*-), take the suffix -*i* in the perfective aspect and -*el* in the non-perfective aspects, as shown in examples (4.37) through (4.40).

- (4.37) *tyi chäm-i-Ø-y-ob jiñi cha’-kojty chityam*  
 PERF die-VI-3A-EPN-PL DET two-NC.animal pig  
 ‘The two pigs died.’

(4.38) *tyi mejk'-i-y-oñ*  
 PERF hug.PASS-VI-EPN-1A  
 'I was hugged.'

(4.39) *mi a-majl-el*  
 IMPF 2E-go-NOM  
 'You go.'

(4.40) *choñkol k-mejk'-el*  
 PROG 1E-hug.PASS-NOM  
 'I'm being hugged.'

As I argued in detail in §4.1, the *-el* forms in the non-perfectives are nominal.

### Transitives (-*v* / - $\emptyset$ )

Perfective transitive stems are formed with a copy of the root vowel, as shown in example (4.41). No overt suffix is present, however, on non-perfective transitive stems, as shown in example (4.42). Again, we saw in §4.1 that the latter type of stem possesses nominal characteristics, for example, the ability to serve as the argument of a verb.

(4.41) *tyi k-pok'-o- $\emptyset$  ch'ejew*  
 PERF 1E-wash-VT-3A dishes  
 'I washed dishes.'

(4.42) *mi' jats'-( $\emptyset$ )-ety*  
 IMPF.3E hit-2A  
 'He hits you.'

### Positional nouns (-*vl*)

Like nouns and adjectives, positional nouns may not mark directly for aspect. They are formed with a harmonic *-vl* suffix, as illustrated in examples (4.43) and (4.44).

(4.43) *alomejor 'añ-ix ba' wäy-äl tyi matye'el*  
 SP.probably EXT-ALR where sleep-POS PREP jungle  
 'Probably he's there asleep in the jungle.'

(4.44) *buch-ul-oñ*  
 sit-POS-1A  
 'I'm seated.'



### Positional verbs and passives (*-le* / *-tyäl*)

The suffix *-le* is used in the perfective aspect to form an intransitive stem with a single patient-like argument (e.g. a passive or a positional stem), as shown in examples (4.45) and (4.46).

- (4.45) *ta'*      *koty-le-Ø*      *jiñi*    *me'*  
 PERF stand-POS-3A DET deer  
 'The deer was standing.'

- (4.46) *tyi*      *mos-le-y-oñ*  
 PERF cover-PASS-EPN-1A  
 'I was covered.'

The suffix *-tyäl* is found on the non-perfective counterparts, shown in examples (4.52) and (4.48). As with other non-perfectives, these stems are nominal. For example, in (4.49) the positional form *kotyäl* (*koty-tyäl* → *kotyäl*) follows the preposition *tyi*, a position reserved for nominals.

- (4.47) *mi*      *k-buch-tyäl*  
 IMPF 1E-sit-POS  
 'I'm seated.'

- (4.48) *mi'*      *ch'äx-tyäl*  
 IMPF.3E boil-PASS  
 'It is boiled.'

- (4.49) *ta'*      *k'oty-i-Ø*      *tyi*      *ko(ty)-tyäl*    *che'bä*    *weñ*    *dyes*    *metro*  
 PERF arrive-VI-3A PREP stay-POS like good SP.ten SP.meter  
 'It came and was standing about ten meters away.'

Note that this is the first suffix we have seen of the form -CVC. This may be explained, I suggest, by supposing that this suffix is (or was historically) in fact morphologically complex. The suffix *-tyi*, used to form passives, has combined with some sort of nominalizing *-Vl* suffix: *-tyi* + *-Vl* → *-tyäl*.<sup>4</sup>

<sup>4</sup>Thanks to Matt Pearson for this suggestion.

The suffix *-tyi* is used to form perfectives with a single patient argument from causatives or *-Vñ* stems, as shown in examples (4.50) and (4.51).<sup>5</sup> As shown by the example (4.52) the imperfective version of this form, *-tyel* is also -CVC in shape and nominal, as it follows the preposition *tyi*

- (4.50) *tyi lok'-sä-ñ-tyi-y-ety tyi x-'ixik*  
 PERF go.out-CAUS-EPN-PASS-EPN-2A PREP CL-woman  
 'You were taken out by the woman.'

- (4.51) *tyi 'il-ä-ñ-tyi-y-oñ tyi wiñik*  
 PERF see-VT-EPN-PASS-EPN-1A PREP man  
 'I was seen by the man.'

- (4.52) *poreso jin-äch mas mejor yubi tyi 'ubiñ-tyel*  
 SP.and.so DET-AFF SP.more SP.better I.think PREP listen-PASS  
 'That's why it's better to listen.'

In the imperfective, stems with the passive + nominal *-tyäl* suffix have the same distribution as other nominal stems with *-Vl* suffixes. That is, when not serving as the argument of a verb, the stems must follow the preposition *tyi*. Compare, for example (4.53) with (4.55) below.

- (4.53) *mi k-majl-el tyi buch-tyäl*  
 IMPF 1E-go-NOM PREP sit-POS  
 'I'm going to sit.'

- (4.54) *mi k-majl-el tyi lets-el*  
 IMPF 1E-go-NOM PREP ascend-NOM  
 'I'm going to go up.'

Alternatively, like other *-Vl* forms, *-tyäl* stems may be possessed by an ergative prefix and appear with the imperfective clitic *mi* as shown in examples (4.55) and (4.56). Non-perfective positionals, like other non-perfectives we have seen, are formally nominal.

---

<sup>5</sup>The palatal /ñ/ is inserted between a vowel final suffix and the passive *-tyi* in both of these examples.

(4.55) *mi k-buch-tyäl*  
 IMPF 1E-sit-POS  
 ‘I’m seated.’

(4.56) *mi k-lets-el*  
 IMPF 1E-ascend-NOM  
 ‘I go up.’



Figure 4.2: Orlando and Nena

### Causatives

Perfective causative stems are formed with the suffix *-sä*,<sup>6</sup> as shown in example (4.57).

<sup>6</sup>Frequently this is realized as *-isä*, though it is unclear whether this vowel is simply inserted to separate adjacent consonants, or whether it is a part of the suffix. Since there are no other examples of -VCV suffixes, I will assume the former.

- (4.57) *tyi*      *y-uch'-i-sä-Ø*                      *i-y-alobil*      *x-'ixik*  
 PERF 3E-eat-EPN-CAUS-3A 3E-EPN-child CL-woman  
 ‘The woman fed her child.’ (lit.: ‘... caused her child to eat.’)

Causative stems in the non-perfective aspects are formed with the suffix *-sañ*, as shown in example (4.58).

- (4.58) *eske*              *mi'*              *jub-sañ-oñ-la*      *tyi*      *wokol*  
 SP.it's.that IMPF.3E fall-CAUS-1A-PL PREP problem  
 ‘It makes us fall into problems.’

Like the -CVC *-tyäl* above, this suffix should also be considered morphologically complex, a combination of the causative *-sä* and some *-Vñ* nominalizer. As we saw above in §2.5, the suffix *-eñ* is frequently used to form an adjectival resultative stem, as seen in the examples below:<sup>7</sup>

<i>kol</i>	‘grow’		<i>kol-eñ</i>	‘big’
<i>tyik</i>	‘dry’		<i>tyik-iñ</i>	‘dried’
<i>chäm</i>	‘die’		<i>chäm-eñ</i>	‘dead’

### Applicatives

Applicative stems in Chol are formed in the perfective aspect with the suffix *-be*, as shown in example (4.59).

- (4.59) *poreso*      *jiñ*      *cha'añ ta'*      *k-ña'tyä-be-Ø*      *i-ty'añ*      *jiñi*  
 SP.and.so DET for PERF 1E-know-APP-3A 3E-word DET  
*la-k-yum*  
 PL-1E-lord  
 ‘That’s why I learned the word of God.’

As with the causatives discussed in the previous section, the non-perfective suffix *-beñ* should be analyzed as *-be* + *-Vñ*, where the result is also a formally nominal stem.

<sup>7</sup>Recall that in Chol both nouns and adjectives are subsumed under the category “nominal”.

- (4.60) *mi*    *i-tsep-beñ-Ø*    *i-y-ak'*    *cha'añ*    *mi*  
 IMPF   3E-cut-APP-3A   3E-EPN-tongue   for   IMPF  
*i-ch'äm-beñ-Ø*    *majl-el*    *i-rey*  
 3E-receive-APP-3A   go-NOM   3E-SP.king  
 'He cuts out tongues to give to his king.'

### 4.2.2 Summary of suffixes

In Chol, I claimed at the beginning of this section, the suffixes that appear immediately following the root serve to specify the argument structure and thematic roles of the root. I also argued in §4.1 that non-perfective stems in Chol are formally nominal even though, like other verbs, they require aspect. Now, after examining each suffix in detail, we have a more unified account of this process. In Table 4.2 I have summarized the suffixes, their possible morphological histories, as well as how many and what types of arguments they specify. Though it should be noted that this is a simplification as not all examples will conform exactly to this pattern, it appears to account well for most constructions.

Perfective	Non-perfective (Nominalizations)	Properties
<i>-i</i>	<i>-el</i>	Single agent-like argument
<i>-le</i>	<i>-tyäl</i> ( <i>-tyi</i> + <i>-el</i> )	Single theme-like argument
<i>-ä</i>	<i>-Vñ</i>	Single patient-like argument
<i>-v</i>	<i>-Ø</i>	Two arguments: one agent and one patient
<i>-sä</i>	<i>-sañ</i> ( <i>-sä</i> + <i>-Vñ</i> )	Two arguments: one causer and one causee
<i>-be</i>	<i>-beñ</i> ( <i>-be</i> + <i>-Vñ</i> )	Two arguments: one agent and one recipient/benefactee

Table 4.2: Reanalysis of root suffixes

In the section that follows, I will examine the process of how roots may come to form a variety of stems, using the recently developed framework of Distributed Morphology.

## 4.3 Distributed Morphology

In this section I begin with a description of Distributed Morphology (DM) in §4.3.1. In §4.3.2 I examine a DM approach to roots and stems in Hebrew proposed by Arad (2003). Next, in §4.3.3 I discuss how DM might be used to explain Chol word formation and finally, in §4.3.4 I examine further motivations for this type of an analysis.

### 4.3.1 Distributed Morphology

The framework of Distributed Morphology was developed at MIT in the mid 1990's, articulated most notably in Halle and Marantz (1993). Distributed Morphology abandons the lexicalist assumption that “words” are created in the Lexicon and then enter the syntax as fully formed units (cf. Lieber 1992). This is done by rejecting the idea that there is something special about “word-sized units” (Marantz 1998). If nothing is special about words, then there is no reason to form them in a special component of the grammar. Instead of splitting the generative power of language between the syntax and the lexicon, DM takes a “single engine” approach to computation: “grammar constructs all words in the syntax by the same general mechanisms (‘merge and move’; see Chomsky 1995) that it constructs phrases” (Marantz 1998).

Under this theory, the Lexicon as we knew it is no longer associated with any generative abilities; it no longer has the power to form words. According to DM, the former Lexicon has been “exploded” and the morphological processes that had previously been attributed to it are now *distributed* throughout different parts of the grammar. Instead of words, the syntax operates with “atomic bundles of grammatical features” from the “narrow lexicon”. The Vocabulary then provides the connections between phonological features and grammatical features. Vocabulary items are *under-specified* and must compete for insertion at the terminal nodes, the winner being “the most highly specified item that doesn’t conflict in features with the terminal node” (Marantz 1998). Crucially, phonological features are inserted

after the syntax. Finally, the Encyclopedia houses the special meanings of roots “relative to the syntactic context of the roots, within locality domains” (Marantz 1998), which will be discussed presently.

### 4.3.2 Roots and stems in Hebrew

In a 2003 article on Hebrew denominal verbs, Maya Arad clearly articulates the motivation behind many lexicalist theories of morphology:

One of the main reasons why word formation is often taken to be distinct from syntactic computation is its “double nature”: while some aspects of word formation are morphologically productive and semantically transparent, others exhibit paradigmatic gaps and non-compositional meaning. To account for this double nature, many theories postulate “two places” for word formation: one for the regular, productive processes, another for the non-productive ones (Arad 2003, 737).

Arad addresses this problem in an analysis of Hebrew roots and stem formation. Following the tradition of Distributed Morphology, she argues for a “single engine” approach to word formation wherein all computation is syntactic. Citing Marantz (2000), Arad identifies two different ways of building words in the syntax using the same syntactic procedure: a category head  $x$  merges either with a *root*, as shown in Figure 4.3, or with an already existing *word* of a specific grammatical category, as in Figure 4.4 (Arad 2003, 738).

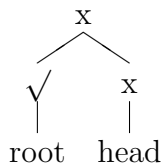


Figure 4.3: Word formation from roots

Prior to the first merge, the root does not belong to any particular grammatical category (noun, adjective, verb...). Rather, as I have claimed for Chol, the root is under-specified. When a head merges with a root, the root’s meaning and

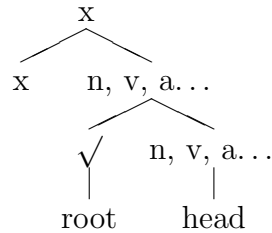


Figure 4.4: Word formation from words

grammatical category are fixed by the head. We might consider this head to be another bundle of features, containing, among other things, features for an argument structure.

Idiosyncratic or non-predictable meanings may be assigned in this first “lower” type of merge. Also, roots may be non-productive. That is, “roots may select for their category forming heads arbitrarily” through feature requirements (Arad 2003, 739). That is, idiosyncratic features of the root determine what types of heads may merge with it.<sup>8</sup> Once this lower merge has taken place, further applications of merge no longer have access to the root; they cannot “see” through the structure. Arad illustrates how this works for Hebrew.

## Hebrew

Hebrew roots are tri-consonantal (CCC) and, like Chol roots, they do not have semantically fixed meanings (Arad 2003, 741). Unlike Chol roots, however, Hebrew roots are not pronounceable on their own, but instead must be associated to a particular morpho-phonological pattern, called a *binyan*. For example, the Hebrew root  $\sqrt{q\ell t}$  forms the following semantically related though not necessarily predictable words (Arad 2003, 744):

---

<sup>8</sup>As Matt Pearson (p.c.) aptly notes, this does not initially seem like much of an improvement: “Instead of ‘lexically specified as being of category x’, we have ‘lexically specified as merging with a head of type x’. Essentially, we are reducing category membership to the notion of selection.” Strengths and weaknesses of such an approach will be discussed in §4.3.4



$\sqrt{\text{qlt}}$		
Binyan	Hebrew	English
CaCaC (v)	<i>qalat</i>	‘absorb, receive’
hiCCiC (v)	<i>hiqlit</i>	‘record’
miCCaC (n)	<i>miqlat</i>	‘a shelter’
maCCeC (n)	<i>maqlet</i>	‘a receiver’
taCCiC (n)	<i>taqlit</i>	‘a record’
CaCCeCet (n)	<i>qaletet</i>	‘a cassette’
CeCeC (n)	<i>qelet</i>	‘input’

Arad calls the ability of a particular root to acquire multiple meanings in each of these different patterns “multiple contextualized meaning” (Arad 2003, 742). The meanings acquired are, to some degree, arbitrary. That is:

[W]hile all the words made of the root  $\sqrt{\text{qlt}}$  may have some common semantic core of taking in or absorption, the words themselves are semantically varied. . . nothing forces the root  $\sqrt{\text{qlt}}$  to be interpreted as *shelter* in the environment of miCCaC and *receiver* in the environment of maCCeC. . . It could have been the other way around (Arad 2003, 745).

This semantic flexibility, however, is available *only* to words that are formed from roots. Here Arad presents her argument for a separation between root-derived verbs and noun-derived verbs in Hebrew. While a given root may produce a number of semantically related verbs in different verbal environments (like *qalat* and *hiqlit* from above), verbs formed from *nouns* (roots that have already merged with a noun head) “must share an interpretation with the noun from which they are derived” (Arad 2003, 745). The root  $\sqrt{\text{sgr}}$ , for instance, has a general meaning of enclosure, and may form the words listed below, including the noun *misgeret* ‘a frame’.

$\sqrt{\text{sgr}}$		
Binyan	Hebrew	English
CaCaC (v)	<i>sagar</i>	‘close’
hiCCiC (v)	<i>hisgir</i>	‘extradite’
hitCaCCeC (v)	<i>histager</i>	‘cocoon oneself’
CeCeC (n)	<i>seger</i>	‘closure’
CoCCayim (n)	<i>sograyim</i>	‘parentheses’
miCCeCet (n)	<i>misgeret</i>	‘a frame’

The noun *misgeret* may then (through truncation) derive a verb *misger* ‘to frame’. The fact that the verb still carries the nominal element *mi-* indicates that it is derived from the noun. However, although the verb *misger* still contains all three of the root consonants ( $\sqrt{\text{sgr}}$ ), it no longer has access to the root itself. Arad notes that although it may seem trivial that the Hebrew verb ‘to frame’ contains the meaning of the noun from which it derives, this is a crucial property of noun-derived verbs. Since the root’s meaning was fixed in the first application of merge, the derived form *misger* in Hebrew could not mean something like ‘to enclose in parentheses’.

Arad generalizes this claim, following Marantz (2000), in the constraint below:

(4.61) **Locality constraint on the interpretation of roots:** (LCIR)

Roots are assigned an interpretation in the environment of the first category-assigning head with which they are merged. Once this interpretation is assigned, it is carried along throughout the derivation.

Thus, while English speakers must generally learn a number of different roots to form the variety of stems which may be created from a single Hebrew (or Chol) root, Hebrew speakers must acquire the various idiosyncratic ways in which words may be formed from this single root.

Arad goes into further detail of the nature and justification for this locality constraint, but what is important for this thesis is the following: By positing this locality

constraint we may account for idiosyncratic and often non-productive properties of a single root, without having to construct two different computational procedures for processes which seem to be subject to the same types of constraints (cf. Marantz 1998).<sup>9</sup> That is, word formation (derivation and inflection) *and* phrase formation may both be handled by regular syntactic operations.

### 4.3.3 DM and Chol word formation

To illustrate this process in Chol, let's revisit the root *wäy*, which may form, among other things, a causative verbal stem (*wäyisä-* 'cause to sleep') or a noun (*wäy* 'sleeping spirit'), illustrated in Figures 4.5 and 4.6. Though the meanings of these two forms are both clearly related to the notion of sleeping, the meaning of one is not predictable from the meaning of the other. This idiosyncratic assignment of meaning (rather than being tossed into the lexicon) may be accounted for with Arad's locality constraint on the interpretation of roots (LCIR).

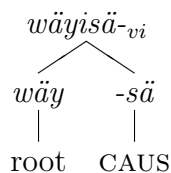


Figure 4.5: Formation of 'cause to sleep'

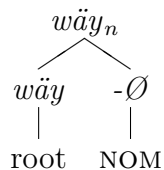


Figure 4.6: Formation of 'sleeping spirit'

These stems may now undergo further derivations. However, as predicted by the LCIR, the root's interpretation has already been fixed and further applications of merge no longer have access to the various meanings of the root. The transitive verbal stem *wäyisä-*, for example, may form an intransitive verb through passivization, as shown in (4.62) and Figure 4.7.

<sup>9</sup>Examples of constraints that hold over words and phrases will be provided in §4.3.4.

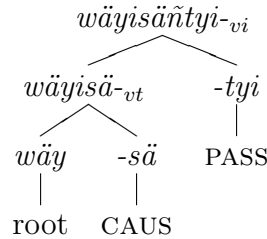


Figure 4.7: Formation of ‘be caused to sleep’

But this form no longer has access to the meaning ‘sleeping spirit’ also associated with the root *wäy*. (4.62) could not, for example, mean something like ‘My child was turned into a *wäy*.’

- (4.62) *tyi*      *k-wäy-i-sä-ñ-tyi-Ø*      *k-alobil*  
 PERF 1E-sleep-EPN-CAUS-EPN-PASS-3A 1E-child  
 ‘My child was put to sleep.’  
 \*‘My child was turned into a *wäy*.’

Finally, note that if we choose to represent the noun stem *wäy* as containing a null morpheme (*wäy-Ø*), as in Figure 4.6 above, it no longer appears entirely ad hoc. Merge with a head is necessary to fix the semantic meaning of the root, but since the root, like many nominals, does not have an argument structure, a nominal stem may be produced with a null suffix. That is, “nominal” should be considered the default form into which a root may enter, since like many nominal stems, roots do not have an inherent argument structure.

#### 4.3.4 Why DM?

At this point it is worthwhile to address a number of potential objections or confusions regarding a Distributed Morphology account of word formation. In this section I will discuss some of the misgivings that have been raised to me regarding this framework and explain why I think that DM is still the most efficient way to account for both the Chol data at hand and language in general.

### Why do we want a “single-engine” approach to word formation?

Marantz (1998) argues that to achieve efficient representation of grammar, if we *can* build words and phrases with the same mechanism, then we ought to: “[T]here is no reason not to build words in the syntax via ‘merger’ (simple binary combination) as long as there are no special principles of composition that separate the combining of words into phrases from the combining of morphemes into words” (Marantz 1998, 205). The question is now *whether* all types of word and phrase formation are subject to the same constraints and operate under the same principles. Below I will outline some of the reasons why this seems to indeed be the case.

Under Lexicalist theories of grammar, the Lexicon, the traditional repository for idiosyncratic meanings, is thought to be where words get their meaning. The syntax, on the other hand, is responsible for regular formation of phrases and perhaps predictable inflectional morphology. If this is the case, we would not expect phrase-level units to be susceptible to “special meanings”. However, Marantz writes, “there is no sharp divide between the special meanings of words and the special meanings of phrases, nor has there been any systematic attempt to argue otherwise” (Marantz 1998, 207). Take for example idiomatic phrases like *The cat is out of the bag* and *kick the bucket*, or the light verb constructions in (4.63).

(4.63) Take a hike

Take a leak

Take a piss

Take a break

Take five

Take cover

Take issue

Take heart . . .

Clearly it is not just word-sized units which are subject to special meaning, though it is unlikely that we would want to house *all* such cases in a Lexicon.

Furthermore, it is not just any type of word or phrase that can have a special meaning, but rather special meanings of both words and phrases are subject to *locality constraints*. We saw one such constraint for word-formation in §4.3.2 in Arad's (2003) LCIR. This domain has been recognized at the level of both word and phrase formation: "The syntactic head that projects agents defines a locality domain for special meanings. Nothing above this head may serve as the context for the special meaning of any root below this head, and vice versa" (Marantz 1998, 208). Essentially this predicts that agents, causers, and the like cannot be part of the special meaning of either words or phrases. Empirical support for this constraint has been found cross-linguistically. For example, such a constraint predicts that there should be no idioms with fixed agents. This indeed seems to be the case (Marantz 1998, 209). It also predicts that VP-external subjects should be unable to incorporate into the verb, which does in fact appear to be universally impossible (Uriagereka 1998, 422).

Additionally, it would predict that the meaning of a word could not include the meaning of a causer or agent. For example, Uriagereka (1998) notes that we could invent an English verb *wug*, and have it mean 'x causes that y smiles'. We could then imagine a sentence like *Puns wug linguists*, that is, puns cause linguists to smile. However, English speakers would have a much more difficult time with a verb like *wog*, which we could say means 'that x smiles causes y'. With such a meaning we should then be able to say *People wog happiness*, which would mean 'That people smile causes happiness.' This verb, however, is much more difficult for most speakers to parse, and indeed, none like it is thought to exist in any language. As the Linguist in Juan Uriagereka's Minimalist dialogue remarks: "I don't think one can honestly imagine a child learning the verb *to wog*. *My child wogged a family commotion*. That should mean something like 'the fact that my child smiled caused a family commotion'. But it doesn't work. One can't avoid taking *my child* as *subject*" (Uriagereka 1998, 420). That is, the agentive subject cannot be interpreted as contained within the meaning of the verb.

### **Aren't we just moving idiosyncracies somewhere else?**

In the above section I gave some empirical motivation for why a “single engine” approach to generation in language is desirable. Namely, since words and phrases are subject to many of the same constraints, we could most simply account for both with the same process. One might now ask: If we take idiosyncracies out of the Lexicon, don't we have to just move them somewhere else? Or: aren't we just giving an old idea a new name?

The answer is yes and no. That is, we do still need idiosyncracies. No theory of grammar can eradicate idiosyncratic knowledge. There are pieces of language—words, phrases, etc.—that have meanings which are not predictable from simply the combinations of their parts.

In Distributed Morphology this knowledge is stored in the Encyclopedia. By moving idiosyncracies out of the Lexicon, and into a component to which *all* levels of the grammar have access, we may simplify the computational mechanism. Idiosyncracies are all subject to locality constraints in the *syntax*: “[T]he combination of root and little x is shipped off to LF and PF for phonological and semantic interpretation, and the meaning of the root in the context of little x is negotiated, using ‘Encyclopedic’ knowledge” (Marantz 2000, 7).

### **What do we gain by claiming that roots do not themselves have a grammatical category, but instead specify for what categories of stems they may form?**

A valid question to raise for a language like Chol is: What do we gain by saying that roots themselves do not belong to any particular grammatical category, but instead are just under-specified bundles of features which *select* for a grammatical-category forming head? One motivation for Chol (and perhaps for other Mayan languages as well), is this: If we assign each root to a grammatical category based on the type of stem it forms, given that a given root in Chol often forms a variety of different stems, we would be required to posit a number of lexical entries for the same root. One drawback of this is an unnecessary number of roots. Another is that we would

fail to capture the semantic similarities between such roots.

Alternatively, we could put roots into classes based on the various stems they form. For example, we could have a class of roots that form verbs and nouns, another class that form only nouns, and another that form nouns, verbs, and adjectives. This is the approach taken by Lois and Vapnarsky (2003) in their recent book *Polyvalence of Root Classes in Yucatekan Mayan Languages*. These authors begin their work with an acknowledgement of some of the same problems I have discussed in the previous two chapters:

Root classifications proposed so far tend to be too rigid. They hide polyvalence and the great flexibility of roots. Zero derivation is then needed to account for categorial change. They also give rise to a large number of roots being classified as unknown, defective and irregular roots (Lois and Vapnarsky 2003, 1).

The solution that these two authors propose is the following: roots in Yucatecan are divided into two major classes, verbo-nominal and nominal. “[V]erbo-nominal roots,” they write, “may or may not be associated to TAM [Tense Aspect Mode] particles, whereas nominal roots are unable to associate with TAM particles” (Lois and Vapnarsky 2003, 23). Verbo-nominal roots are further divided into three categories: polyvalent roots, and two types of divalent roots. This division is shown below (from Lois and Vapnarsky 2003, 24).

- Verbo-nominal roots** (may or may not be associated with TAM)
- 1) polyvalent roots [agent-patient; agent salient; patient salient]
  - 2) divalent roots [agent salient]
  - 3) divalent roots [patient salient]
- Nominal roots** (cannot be associated with TAM)
- 4) monovalent roots [relator-theme]

Their class of polyvalent roots forms transitives, intransitives, as well as nominals. Their fourth category, monovalent roots, on the other hand, may form only



nominals. Under their analysis, these roots may, based on their class, enter into one of a set of phonological profiles through a process they label *instantiation*. Once a root has been *instantiated* it may then undergo further *derivational* processes (Lois and Vapnarsky 2003, 22).

Their analysis of Yucatecan languages, I claim, lends itself especially well to a DM account of word formation. What they mean by *instantiation* is in fact what in DM we could call ‘merge of a head *x* with a given root’ under a locality constraint. Once this merge has taken place, the stem could then be further derived. Indeed, through calling their root classes “polyvalent”, Lois and Vapnarsky (2003) already acknowledge the under-specificity of roots. However, by grouping these roots into strict classes, they lose the ability to account for many cases. In Chol, for example, there are a number of roots which *must* take aspect; a number which may not; and a number for which either option is available. This first possibility is not recognized in the class of “verbo-nominals” proposed by Lois and Vapnarsky (2003).

By moving the notion of “grammatical category” from a *property* of the root to something contained in *features* of the root, we may account for semantic and grammatical properties of roots in an efficient manner.

### What else does DM give us?

Another benefit that languages like Hebrew, Yucatec and Chol gain from DM is an ability to account for non-concatenative word formation. Lexicalist theories, which suppose that roots and morphemes are stored and combined in the Lexicon, have a difficult time accounting for languages where morphemes seem to be more like *rules* than *units*. In Chol we saw in §2.4.2 that passive-type stems may be formed by lengthening the root vowel. In (4.64) the root *mek* ‘hug’ creates an intransitive stem with a single patient argument.

- (4.64) *tyi mejk'-i-y-ety*  
 PERF hug.PASS-VI-EPN-2A  
 ‘You were hugged.’

Similarly, Yucatecan languages make transitivity distinctions through qualities of the root vowel such as length and height. Since DM analyzes “morphemes” not as distinct chunks of sound and meaning, but rather as morpho-syntactic features which will correspond with phonological features *after* other processes have taken place (more like the “rules” of a-morphous morphology (Anderson 1992)), non-concatenative morphology does not present a problem.

### **Is this a useful approach for a language like English?**

A final question to address in this section is whether DM is a useful approach for a language like English, where roots do not at first glance seem to be quite as variable as roots in the languages discussed above. Evidence from English denominal verbs (verbs derived from nouns) suggests that it is. Following Kiparsky (1982), Arad (2003, 755) argues that words which can appear as both nouns and verbs in English are not a homogenous group. In line with her analysis of Hebrew, she claims that the verbs in these pairs are either derived from roots or derived from nouns. Take the English list of words in (4.65), each of which can function as either a noun or a verb:

- (4.65) paddle  
tape  
anchor  
string  
hammer  
chain  
button  
screw

The verb-forms of the words in (4.65) fall into two categories, shown in (4.66) and (4.67) (from Kiparsky 1982, his examples (14) and (16)).

- (4.66) a. I paddled the canoe with a copy of the New York Times.  
 b. String him up with a rope!  
 c. She anchored the ship with a rock.  
 d. He hammered the nail with a rock.
- (4.67) a. \*She taped the picture to the wall with pushpins.  
 b. \*They chained the prisoner with a rope.  
 c. \*Jim buttoned up his pants with a zipper.  
 d. \*Screw the fixture into the wall with nails!

The distinction here is that the verbs in (4.67) *contain* the meaning of the noun, whereas the verbs in (4.66) do not. While the verb *chain* means something like ‘confine with a chain’, the verb *anchor* does not necessarily mean ‘hold down with an anchor’; rather, things can be anchored with rocks, for example.

For Arad this means that the verbs in (4.66) are derived from *roots*, whereas the verbs in (4.67) are derived from *nouns* and are thus dependent on the meaning of the noun, as shown in Figures (4.8) and (4.9).

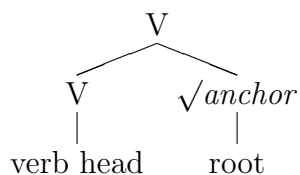


Figure 4.8: Formation of ‘anchor’

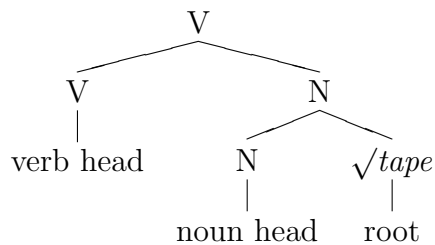


Figure 4.9: Formation of ‘tape’

## 4.4 Conclusions

In this chapter I have proposed a new analysis of the nature of roots and the processes of word formation in Chol. Beginning with the question of how to characterize the suffixes found immediately following the root of most Chol verb stems, I argued that roots should be considered under-specified with respect to semantic, phonological, and morpho-syntactic information. These post-root suffixes, I claimed, should be considered phonological evidence for a process of stem formation by which an under-specified root merges with a categorical head to form a stem. Distributed Morphology, I propose, is the framework best equipped to handle these processes. Below I have summarized some of the major points to be taken from this chapter.

- All non-perfective verb stems in Chol are formally nominal. Although they require aspect, they behave formally like nouns.
- A correlation may be drawn, following Bricker (1983), between the nominality of non-perfectives and a split-ergative agreement system.
- Roots in Chol are specified through a process of merge with a category head  $x$ . A root's meaning and grammatical category are fixed in this domain. Subsequent applications of merge no longer have access to the various meanings associated with a single root.
- The suffixes that appear immediately following the root in Chol should all be considered "specificational" suffixes, which serve to specify the semantic and grammatical properties of a root.
- Both words and phrases are subject to the many of the same constraints, and should thus be accounted for with the same processes.
- Adopting a Distributed Morphology approach to language allows us to simplify the computational mechanism. Rather than splitting formation between the Lexicon and the syntax, we are able to account for all types of formation with different applications of the same process of merge.

“We have not succeeded in answering all of your problems. The answers we have found only serve to raise a whole set of new questions. In some ways we feel we are as confused as ever, but we believe we are confused on a higher level and about more important things.”

---

*Repair shop in Bend, Oregon*

“It really is a nice theory. The only defect I think it has is probably common to all philosophical theories. It’s wrong. You may suspect me of proposing another theory in its place; but I hope not, because I’m sure it’s wrong too if it is a theory.”

---

*Naming and Necessity, 1980*

SAUL KRIPKE

# Chapter 5

## Conclusions

This brings us to the end of our journey through Chol grammar and Mayan theoretical issues. In this thesis I have attempted a number of goals, and succeeded in all of them perhaps only partially. In so doing, however, I hope first to have provided a foundation upon which the study of Chol may be built, as well as to have raised a number of questions, not only about Chol and the Mayan family, but about language in general.

In the first chapter I began with the story of my entry into the Chol-speaking world. Since no instance of language occurs without a context, I felt it important to describe the situation not only of where this language is spoken, but how I came to acquire the data presented throughout this thesis.

In the chapter that followed I laid out a basic sketch of Chol phonology, morphology, syntax, and other typological characteristics. Many theories of grammar have been constructed with reference to more familiar and well-described languages such as English. A theory of grammar, however, should be able to account for all natural language variation, and thus the description and incorporation of previously undescribed languages like Chol into the discipline could shed light on new problems and possibilities to be addressed. Though much work remains to be done in Chol phonology, morphology, and especially in syntax, I hope at least to have raised a number of interesting issues.

In Chapter 3 I discussed problems of root classification in languages of the Mayan family. Mayan roots (like roots in Hebrew and other Semitic languages) may form a variety of different stems with related though unpredictable meanings. For this reason, attempts to classify roots into rigid grammatical categories have proved to be problematic. The best way to account for Mayan roots, I argued, is to consider them under-specified bundles of features; “semantic portmanteaus”.

In the fourth chapter I began with an attempt to account for the suffixes found immediately following the root in Chol verb stems. Non-perfective verb stems in Chol, I argued, are formally nominal. Like other nominals, some of these non-perfective forms require no post-root suffix. Furthermore, a correlation may be drawn between the nominality of non-perfective verb stems and Chol’s split-ergative agreement system.

Next I presented the framework of Distributed Morphology. Through a recognition of similar constraints that operate across *all* components of the grammar, DM proposes to simplify the theory through a single computational mechanism. Rather than spreading word and phrase formation across the Lexicon and the syntax, DM proposes that all computation is syntactic and performed through applications of merge. “Special meanings” of words and phrases may be acquired only under specified locality domains.

In Chol, I argued, an under-specified root merges with a categorical head in order to fix its meaning and grammatical category. I demonstrated that further applications of merge no longer have access to the multiple meanings of the root. Evidence for this process is found in the set of post-root suffixes found on Chol verb stems. These suffixes, previously categorized as “status suffixes”, “thematic vowels”, and “valence-changing morphology”, may now all be unified under the same category and their appearance is no longer mysterious.

With this thesis I hope to have begun to fill the gap created by the absence of Mayan languages in contemporary theories of language and linguistics.



Figure 5.1: John Haviland and me, Salto de Agua



