

Phases and Navajo verbal morphology*

Lisa Travis

McGill University

1 Introduction

Navajo verbal morphology is a complex system that raises important questions about the interaction of various grammatical modules. In this paper, I seek to explain some of the more puzzling facts about Navajo verbal morphology by specifically addressing the interactions of the phonology, morphology, syntax, and semantics and the domains defined by them. By having some notion of how the components of the grammar pass on information at the interfaces one can provide better explanations of complex data.

2 Background

I start with some background on the facts that we will cover and the issues that these facts raise with respect to each of the grammatical components. At the outset, I acknowledge that there are two issues that I describe but leave unresolved with the hope that these two problems are not fatal to the account but rather point to interesting extensions of it.

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2.1 The template

Traditionally, the verbal system of Navajo has been described using a template (e.g. Young and Morgan 1987, Young 2000). Below I give an example of such a template with a brief description of the positions, adapted from Speas (1990: 205).¹

(1) Navajo Verbal Morpheme Order

DISJUNCT PREFIXES			CONJUNCT PREFIXES					
<u>ADV</u>	<u>ITER</u>	<u>DIST-PL #</u>	<u>D-OBJ</u>	<u>DEIC-SBJ</u>	<u>ADV</u>	<u>MODE</u>	<u>SBJ</u>	<u>VOICE/TRNS STEM</u>
1	2	3	4	5	6	7	8	9√

1= ADVERBIAL: manner, direction ... also indirect object pronoun

2= ITERATIVE: aspectual/adverbial prefix

3= DISTRIBUTIVE PLURAL: plural and distributive, ‘each one separately’

4= DIRECT OBJECT: number and person of direct object

5= DEICTIC SUBJECT: indefinite (someone) or fourth person (people in general)

6= ADVERBIAL: adverbial/aspectual notions

7= MODE: core of tense system

8= SUBJECT: person and number of subject

9= voice/transitivity

¹ The problem of Navajo first came to my attention through Speas’s work. For this reason, I often point to her book as a reference but there are, of course, many other sources for similar observations (e.g. Kari 1975, McDonough 2000, 2003, Young 2000, Young and Morgan 1987).

2.2 The issues

Many generalizations about Navajo are embedded within this template — generalizations that span different modules of the grammar. I give a brief overview of some of these generalizations in order to set up subsequent sections of the paper where these are addressed in more detail.

2.2.1 Morphology issue

We first can observe that the morphemes seem to be in the reverse order of what would be predicted by Baker's (1985) Mirror Principle along with Cinque's (1999) universal functional hierarchy. Given the Mirror Principle, we expect heads that are lower in the tree to be represented by morphemes closer to the stem. For example, in the Huichol example given in (2a) below (taken from Baker 1985:389), object agreement appears closer to the root than subject agreement. In the Abkhaz example in (2b) below (taken from Cinque 1999:155), iterative/frequentative marking appears closer to the stem than tense.²

(2) a. Wan maria naa-ti me-meci-miene HUICHOL
Juan Maria and-subj 3pS-1sO-kill/sg
'Juan and Maria are killing me.'

b. ye-z-ba-ka-x'è-yt' ABKHAZ
it-I-see-FREQ-ANT-PRES
'I have already seen it several times.'

² Abbreviations: subj = subject; 3pS = third person plural subject; 1sS = first person singular object; sg = singular; FREQ = frequentative; ANT = anterior; PRES = present.

These orders are expected since objects are lower in the syntactic structure than subjects and Aspect is lower in the syntactic structure than Tense (see Cinque 1999 for details on the hierarchies of different types of aspect).

In Navajo, however, we get the reverse order in both cases. First, the subject (agreement) position (#8) is closer to the stem than the object (agreement) position (#4). Second, the tense position (#7) is closer to the stem than the aspect position (#2). #7 is labelled Mode but according to Speas (1990: 206) this position ‘marks the core of the tense system in Navajo’. #2 marks iterativity, i.e. a type of Aspect. These two pairs are shown schematically below.

(3) **ANTI-MIRROR PRINCIPLE**

Aspect	Object	Tense	Subject	Trans/Voice Stem
2 ...	4 ...	7	8	9√

In some sense, we want to attach the leftmost prefixes to the stem before we attach the rightmost prefixes given their syntactic position. An important task for the morphology, then, is to account for this reverse ordering of morphemes.

2.2.2 Phonological issue

Another generalization that is captured in this template involves a phonological distinction. Positions 1 to 3 are labelled disjunct prefixes and Positions 4 to 9 are conjunct prefixes. The difference in labelling encodes a difference in how these prefixes behave phonologically. Disjunct prefixes are “loosely bound” while conjunct prefixes are “tightly bound” based on “functional, phonological, and positional criteria” (Young 2000: 27). The phonological

information from the template now seems to be at odds with the morphological information. I suggested above that the leftmost morphemes are syntactically more closely related to the stem (i.e. need to be attached first). The phonology, however, suggests that the rightmost morphemes are attached first, accounting for why they are more tightly bound.

2.2.3 Semantic issue

There is also an interesting semantic issue embedded in the template. Note that positions 1 and 6 are both labelled Adverbial. These two positions house material that is often lexically and semantically idiosyncratic. Another way of looking at it is to say that lexical entries span positions 1, 6, and 9. We will see other examples later, but one is given in (4) below.

(4) *kée ... ha ... t'i* 'to reside' 1 ... 6 ... stem

One might want to say that these three positions form a semantic unit and therefore should be merged into the structure together. We would now have three bits of contradictory information. The Mirror Principle suggests that the leftmost elements are attached to the stem first, phonology tells us that the rightmost elements are attached first and semantics tells us that Positions 1 and 6 are attached first.

2.2.4 Syntactic issue

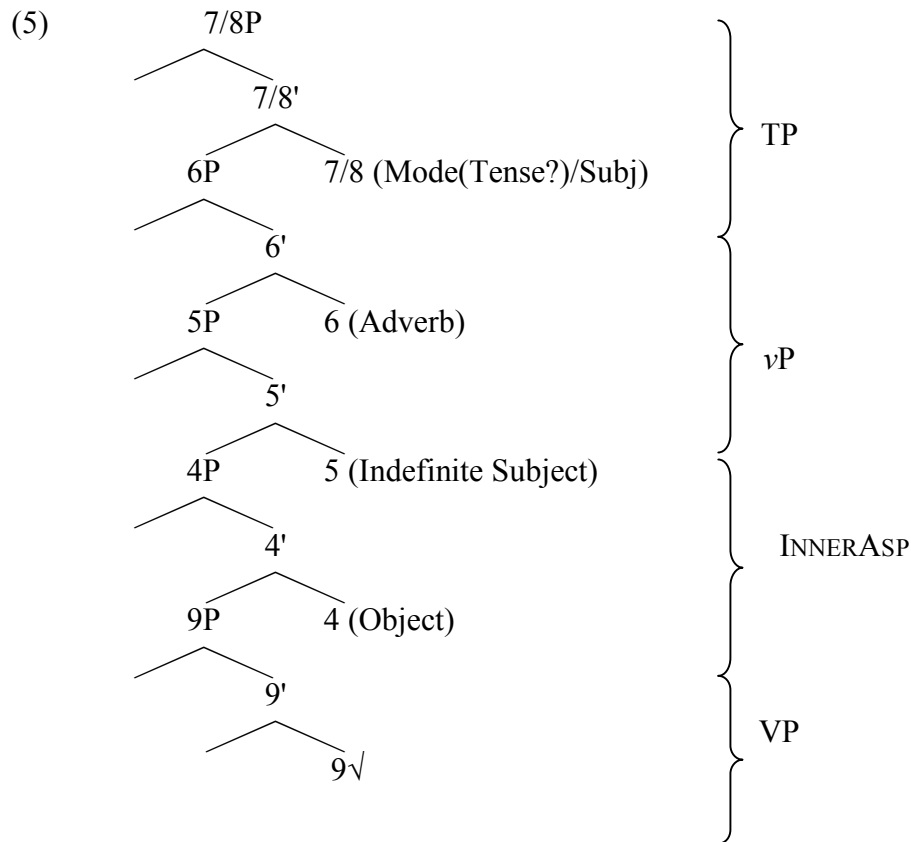
Syntax needs to create a structure that will produce the appropriate phonological and semantic representations at the interfaces. the main syntax issue is to find a structure that, when processed by the appropriate interface mechanisms, can account for the generalizations just discussed.

3 Syntax

We can start chipping away at this problem by examining the syntax, in particular, the phrase structure and head movement. Anticipating a solution, we will first leave aside the problem of the disjunct prefixes (positions 1 to 3) and represent the conjunct prefixes as heads on a syntactic tree.

3.1 The structure

In earlier work, I used the morpheme order within the verbal template of Navajo to support my proposal that there is an inflectional domain within the lexical domain of the vP (Travis 1992b). The structure below shows schematically how the conjunct prefixes line up with the domains I proposed.



I will, for the time being, assume that the mapping given in (5) above is justifiable. First, it is not a stretch to assume that the morphemes encoding subject and tense features are housed within the TP domain. Further, I have argued elsewhere (e.g. Travis 1992a) that Inner Aspect is involved in the licensing of objects so it would be no surprise that object features are found within the Inner Aspect domain. Also, having the stem (9√) within VP is not unexpected. Three issues remain. One is the positioning of #6 in vP. I support this decision below in Section 7. The remaining two have to do with the two questions mentioned at the outset of the paper. These are (i) the position of the indefinite subject features, and (ii) the clustering of morphemes (9+√) in V. I will discuss (i) in a bit more detail in Section 7 below but immediately address (ii) to the extent that I can.

The clustering of morphemes as one head in (5) is problematic for two reasons. First, the actual content of Position #9 suggests it should be higher in the phrase structure.³ We see in the template in (1) that the material of Position #9 encodes transitivity and voice. Given other analyses where this sort of information in languages like Japanese is in *v* (e.g. Harley 2008), one might, in fact, hypothesize a very different mapping to phrase structure with Position #9 being housed in *v*. However, because of the interactions of the other grammatical modules, I have not been able to make this mapping explain as many of the generalizations. For this reason, I am assuming that this material is attached directly to the root.

The second problem is that, as we will see in the next section, I will need this cluster to act as an indivisible unit. I propose that this cluster is in fact a phase, i.e. a part of the syntax that is passed to the phonology and transformed by the phonology into a single object. There are phonological reasons to believe that there is an edge of a phase between positions 8 and 9. Much has been written on what is called the d-effect in Navajo (see e.g. McDonough 2000). The boundary between 8 and 9 shows a special phonology. McDonough accounts for this special behaviour by positing a compound analysis of the Navajo verb form (inflection+V) where positions 1-8 are the first part of the compound and positions 9+√ are the second part of the compound. There are reasons to believe that the compound analysis cannot be the correct one (see Goad and Travis in preparation) but the direction of her proposal is right. I posit that 9+√ constitutes a phonological phase that has the maximal size of a syllable. This restriction on phonological size prevents vowel epenthesis from occurring.⁴ Since the root itself will be a

³ Heidi Harley pointed this out as a comment on my talk at OnLI.

⁴ McDonough (2000) accounts for the lack of epenthesis by positing that the verbal part of the compound must align the right edge of the verbal domain with the right edge of the stem.

syllable, the additional material added in position 9 (e.g. the morpheme *d-*) will be forced to coalesce with the onset of the stem. Because of this different sort of phonology, I am assuming that there is such a phase edge here, and that for further computation, the complex $9+\sqrt{\quad}$ acts as a unit.⁵

3.2 Head movement

If we now add head movement to the picture outlined above, we get the right order of morphemes except for the positioning of the $9\sqrt{\quad}$ complex, which will appear at the left edge of the word instead of the right edge. The resulting bracketting after head movement is given in (6) below.

(6) [[[[[[$9\sqrt{\quad}$] 4] 5] 6] 7] 8]

I will assume that this is the appropriate bracketing to be derived from the syntax. We now turn to the tools available to us at the PF interface to see how the needed surface order can be derived.

4 Morphology: Part I – Local Dislocation

There are a variety of ways that the order in (6) that has been produced by the syntactic component can be manipulated by the morphology at the PF interface to produce the correct order. I will choose from a group of analyses that all share a common mechanism that just varies

⁵ One way of looking at this is that there is a prosodic phase (VP), and event level phase (vP), and a proposition level phase (CP), but I leave this hypothesis for further research.

in minor details. In Travis (1992b) I proposed that the morphemes were added sequentially to the lowest grouping of $9\sqrt{\quad}$ but that each additional morpheme was prefixed to the left edge of that grouping. This has the effect that the last to attach (#8) ends up linearly adjacent to $9\sqrt{\quad}$ while the first to attach ends up the furthest from this grouping. The detail question is what defines this grouping. Speas (1990) noted that every position in the template can be phonologically defined. Therefore, rather than resorting to a template, one could say that each affix had a phonologically identifiable attachment site. This creates a very powerful system that does not explain why the morphemes appear to be in the reverse order. One could, however, iteratively use her phonological condition for position #8 which is $_ CV(C)\#$, in other words the final syllable. As each additional morpheme was added, it would attach to the final syllable pushing the previously attached morphemes to the left.

An alternative, which I use here, is iterative Local Dislocation (see Embick and Noyer 2001, and Embick to appear).⁶ Local Dislocation occurs after Vocabulary Insertion and has the effect, in this case, of attaching one Subword to a phonologically adjacent Subword. It is important to note that here the Subword that is attaching as a prefix.

In the bracketted structure in (6), every head is now a Subword. As such, Local Dislocation can apply to these heads. Local Dislocation would first apply to 4, which would dislocate with the adjacent subword $9\sqrt{\quad}$ (shown in (7b)). Next 5 would local dislocate with $9\sqrt{\quad}$ creating (7c), and so on. At the end of the computation, we have the appropriate order of morphemes shown in (7f).

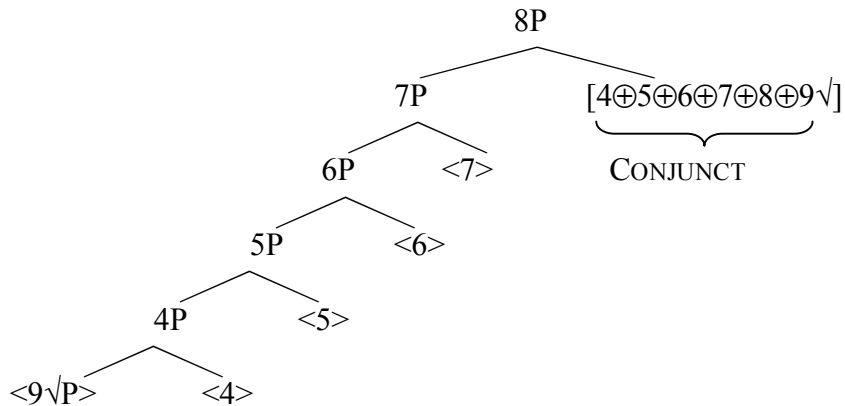
⁶ I owe much to Joey Sabbagh in helping me work this out. All mistakes and misunderstandings, however, are my own. David Embick (pc) has suggested that Local Dislocation can only occur once as a repair mechanism. If this is the case, I would return to the previous solution of having all prefixation attach to the edge of the domain containing $9+\sqrt{\quad}$.

- (7) a. [[[[[[9√] 4] 5] 6] 7] 8]
- b. [[[[[4⊕9√] 5] 6] 7] 8]
- c. [[[[4⊕5⊕9√] 6] 7] 8]
- d. [[[4⊕5⊕6⊕9√] 7] 8]
- e. [[4⊕5⊕6⊕7⊕9√] 8]
- f. [4⊕5⊕6⊕7⊕8⊕9√]

It is important to note the role of syntax in this account. First, the bracketing must be created by syntactic head movement. In other words, local dislocation is fed by the syntax which has created a complex structure of Subwords allowing iterative Local Dislocation of this type. Further, we will see below that the phonology of these forms suggests that all of the disjunct affixes are in the same phase – a surprising result given that the syntactic structure represents two phases (ν P internal and ν P external material). This is also explained through head movement as the ν P internal material will have moved, bleeding the spell-out of ν P. All of the conjunct material will be spelled out in the TP phase.

Post-syntax and post-morphology, we now have the following structure.

(8)



I am assuming (following Newell 2004) that syntactic structure is still available at this point for reasons that will become obvious in section 6 below. As we can see, all of the conjunct prefixes are part of a complex word. Now we turn to the issue of disjunct prefixes, starting with a phonological overview of the distinction. I then propose a morphological solution for the distinction.

5 Phonology

Disjunct and conjunct prefixes are phonologically distinguishable. Again we see below that the conjunct prefixes appear closer to the stem than do the disjunct prefixes.

(9) DISJUNCT vs. CONJUNCT prefixes

<u>ADV</u>	<u>ITER</u>	<u>DIST-PL</u>	<u>#</u>	<u>D-OBJ</u>	<u>DEIC-SBJ</u>	<u>ADV</u>	<u>MODE</u>	<u>SBJ</u>	<u>VOICE/TRNS</u>	<u>STEM</u>
1	2	3		4	5	6	7	8	9	
— DISJUNCT —				————— CONJUNCT —————						
“loose”				“tight”						

Before seeing how the phonology works, we need to have some basics. First, all stems are monosyllabic (Speas 1990: 208),⁷ and the minimal word is two syllables (Speas 1990: 257). Conjunct prefixes differ from disjunct prefixes in often being analyzed as just a C (less than stem size) while disjunct prefixes are always stem size (CV). We can see that the minimal word requirement of two syllables must be met at the edge of the conjunct prefix domain. To make this clear, let us look at the progressive paradigm. The apparent form of this morpheme varies depending on the shape (C or CV) and type (conjunct or disjunct) of prefixes that combine with it. The assumption is that, underlyingly, the progressive prefix is null, and its two alternates (V and *-yi*) appear to meet the requirement of being a minimal word. In (10a), where the conjunct prefix *ni-* is attached in position 8, we see a case where the progressive morpheme does not appear phonetically. At the edge of the conjunct prefix domain, there is sufficient phonological material to meet the two syllable requirement. In (10b), however, the conjunct prefix *sh-* is added in position 8, not adding enough material for the two syllable requirement, so an epenthetic

⁷ Speas mentions that there are a few regular exceptions to this (Speas 1990: 257). These will be examined in future work.

syllable is added. In a more extreme case shown in (10c), both conjunct prefixes are null and again we have syllable epenthesis (from Speas 1990: 209).⁸

(10) CONJUNCT prefixes

c. *nicha* 'You are crying.'

0+ni+cha

PROG+2SSG+cry

b. *yishcha* 'I am crying'

0+sh+cha

PROG+1SSG+cry

c. *yicha* 'S/he is crying'

0+0+cha

PROG+3SSG+cry

Next, we can see in (11a) below that disjunct prefixes cannot help satisfy the minimal word requirement, i.e. the requirement must be met before the addition of the disjunct prefixes. The conjunct prefix *na-* in position 1 does not behave the same way as the prefix *ni-* that we saw in (10a) above. In this case the vowel is lengthened showing that there has been vowel insertion at

⁸ Abbreviations: PROG = progressive; SSG = singular subject.

the edge of the conjunct domain in order to satisfy the minimal word requirement (from Kari 1975: 338).⁹ In (11b) we see this schematically where '[' marks the edge of the conjunct domain.

(11) DISJUNCT PREFIX

a. naashbé 'I am swimming around'

na+0+sh+bé

ADV+PROG+1SSG+swim

b. na + [V + sh + bé]

Following ideas from Newell and Piggott's (2006, to appear) analysis for Ojibwa, I assume that the distinct behaviour at this boundary also indicates a phase edge.

6 Morphology: Part II – Late Adjunction

Now we return to the problem of the disjunct prefixes — positions 1-3. I start by looking at the morphemes themselves with the goal of aligning them to the relevant syntactic heads. As we saw earlier, the material in Position 1 presents a particular problem. As described in section 2.2.3, this position often houses material that acts as an idiosyncratic part of a lexical item. However, as a disjunct prefix, it is outside the phase that houses the conjunct prefixes. We start by looking at what the material in this position can encode (keeping in mind that the semantics is often not productive). As we see in the lists below, the meaning is very similar to the meaning imparted by

⁹ Vowel insertion is sufficient in this case unlike the examples in (10) where there is CV insertion.

English particles (*throw out, toss in, take away*) or German separable prefixes (*ab, an, auf, aus, ein*).

(12) Position 1

a. BOUND POSTPOSITIONALS (Young 2000: 45)

-k'i-: onto (e.g. pour onto)

-i-: against (e.g. lap against)

-gha-: away from (e.g. take away from)

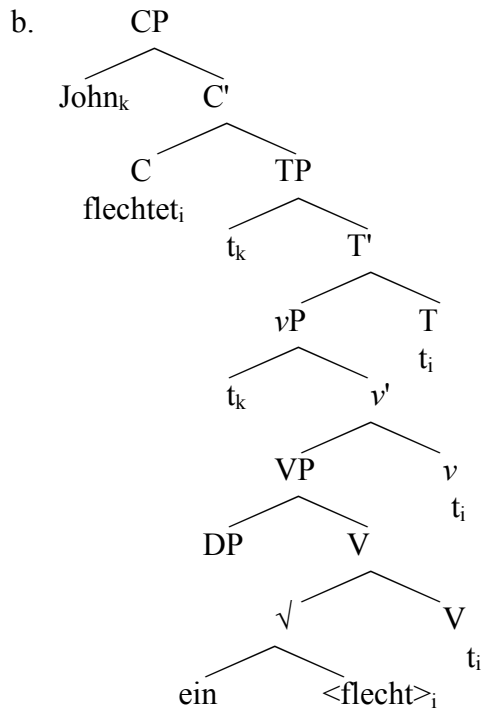
-ghá-: through (e.g. penetrate through)

b. SIMPLE ADVERBIALS

- 'a- 'e- 'i-: away, out of sight (e.g. the sun set, moves away out of sight)
- ha-: up, up out (e.g. climb up)
- 'ahá-: apart, in half (e.g. cut in two)
- 'ada-: downward from a height (e.g. descend)
- ch'i-: horizontally (e.g. carry outside)
- na¹-: around (e.g. walk around)
- na³-: downward (e.g. get down)
- na¹-: around (e.g. extend around)
- na⁴-: up from a surface (e.g. get up)

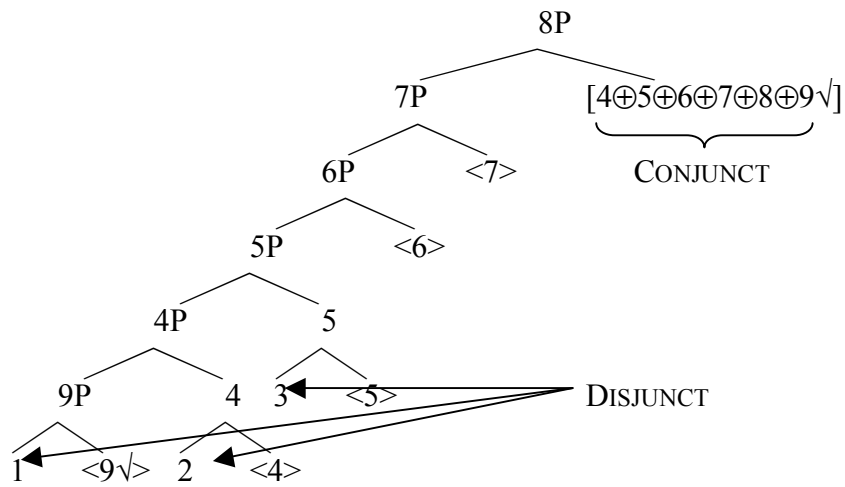
This parallel is interesting because both English particles and German separable prefixes are also connected to the stem semantically tightly and phonologically loosely, and, as such, present interesting problems for linguists. Newell (2005) presents an analysis of separable prefixes in German that accounts for this dual behaviour. As we see in the German example below (shown in (13a)), taken from Newell (2005), the German verb moves to some higher functional category (in the structure here it is in C), leaving its prefix behind. The structure in (13b) shows her account. Adapting ideas of Lebeaux (1991), Nissenbaum (2000), and Stepanov (1999), she posits late adjunction for these prefixes. After movement, the separable prefix is attached to the lowest copy of the verb.

- (13) a. [_{CP} John [_{TP} flechtet [_{VP} [_v ein <flechtet>]]]]
 John braid the letter in
 ‘John inserted the letter.’



The prefix is loosely attached phonologically because it is adjoined late, after movement. It is closely attached semantically because in the semantic component, it is adjoined to the root. The tree in (14) below shows how the same ideas can be applied for the material in Position 1 and reapplied for Positions 2 and 3 (I return later to my justifications for the attachment sites for these latter two).

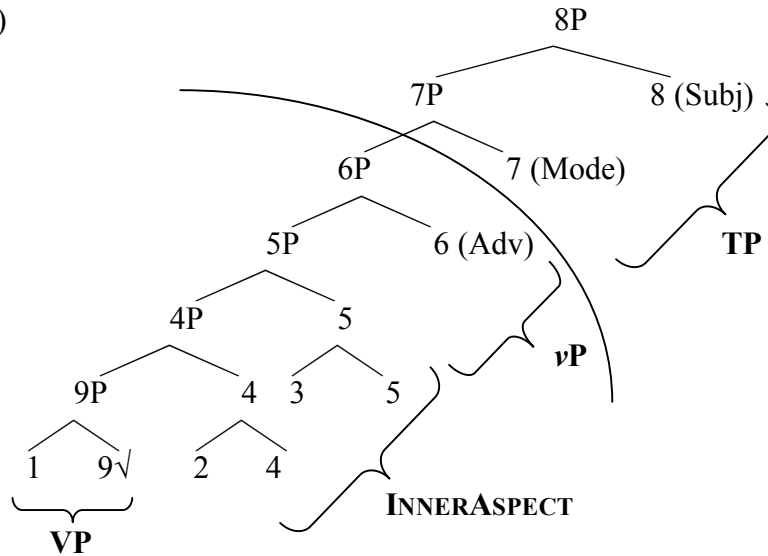
(14)



7 Syntax: Part II—More on phrase structure

Now let us look more closely at how more of the actual morphemes match up with syntactic heads. Here I look specifically at Positions 6, 2 and 4, and 3 and 5.

(15)



We begin by looking at the material that appears in Position 6, which I claim to be syntactically realized as *v*. This position is described as an adverbial element that is part of the lexical entry. I give some of the uses for this position (taken from Young 2000:32).

(16) Position 6

- (i) thematic elements
 - a. movement of arms/legs (e.g. reach with hand, step into)
 - b. fire/light (e.g. to burn something, light shines through)
 - c. stomach/food/oral noise (e.g. belch, say)
- (ii) co-occurs with Position 1 downward prefix and acts as a unit meaning ‘downward movement to a state of freedom’
- (iii) inchoative (e.g. start to paint)
- (iv) seriative (e.g. enter one after another)

This set of meanings is harder to characterize than those of Position 1 and at this point I can only make vague suggestions. These meanings clearly do not encode endpoints of events (which we earlier attached to V). The meanings we find here are either beginning points (inchoative) or manner/instrument (thematic elements). I claim that aligning these meanings with *v* is not unreasonable as they can be seen as ‘manner tags’ in the sense of Hale and Keyser (1993).

The two pairs of Positions 2 and 4 and Positions 3 and 5 I suggest are both part of an inflectional domain found within the *v*P (see Travis in press). The first pair, Positions 2 and 4 are fairly straightforward. I have argued elsewhere (Travis 1991, 1992a) that direct objects are licensed by a functional category merged below the external argument (see also Koizumi 1993). In my work, this functional category is Inner Aspect. That this category would encode object agreement (Positions 4) and be host for the late adjunction of the iterative morpheme (Position 2), then, is not surprising.

We are left with the more difficult problem of Position 5 (deictic subject) and Position 3 (distributive plural), which has late adjoined to it. This is the second unresolved issue that I leave for further research. Here I just suggest a direction of a solution. Given the rest of my analysis, I am forced to say that these two are also part of the inner inflectional domain. Now the question is: how defensible is this claim? At first it looks very surprising that a morpheme related to the subject would appear so low in the tree, below the position where the external argument is introduced. However, the use of this morpheme is to construct an impersonal passive (see Young 2000: 35) – a construction with an indefinite (someone) or fourth person (people in general) subject. This is less surprising, especially when thought of as a passive where external arguments are introduced differently. Perhaps this morpheme saturates the external argument before *v* is

merged giving the effect of something between an unaccusative (no external argument at all) and a passive (where an external argument can be realized with a *by*-phrase). The distributive plural (Position 3) late-adjoins to this position. Young (2000: 39-42) points out that the morpheme can be related to subjects or objects. Objects we know are licensed within this internal inflectional domain, and I have just proposed that external arguments may also be saturated here. However, much more work needs to be done to explain these relations satisfactorily.

8 Semantics: Lexical entries

The last issue that I address is the question of lexical entry. What does it mean to say that a lexical entry is spread over three positions? Young (2000: 27) makes a clear distinction between positions 1 and 6 on one hand and positions 2,3,4,7, and 8 on the other hand calling the former derivational (thematic-adverbial) prefixes while the latter are called inflectional affixes. Speas gives the following examples of non-productive prefixes.

- (17) a. *yá ... ti'* 'to talk' 1 ... stem
 b. *di ... lid* 'to burn something' 6 ... stem
 c. *so ... di ... zin* 'to pray' 1 ... 6 ... stem

She states “None of these prefixes is derivationally productive, nor may these stems (a,b,c) occur without these prefixes” (Speas 1990, 208). I claim that these positions along with the stem account for the three lexical heads within the $vP - v, V,$ and X . These are the three heads that we expect to contain idiosyncratic information.

We can see by looking at other languages that *v* can be idiosyncratic in morphological realization and in semantic composition. Starting with morphological shape, we can see in the table below that Japanese has a lexical causative that can be encoded by a variety of suffixes.

(18) Morphology for Japanese Lexical Causatives (from Harley 1996)

INTRANSITIVE	TRANSITIVE
-ar- (ag-ar-u <i>rise</i>)	-e- (ag-e-ru <i>raise</i>)
-re- (hazu-re-ru <i>come off</i>)	-s- (hasu-s-u <i>take off</i>)
-ri- (ta-ri-ru <i>suffice</i>)	-s- (ta-s-u <i>supplement</i>)
-e- (kog-e-ru <i>become scorched</i>)	-as- (kog-as-u <i>scorch</i>)
-i- (ok-i-ru <i>get up</i> (intr))	-os- (ok-os-u <i>get up</i> (tr))
-Ø- (nar-Ø-u <i>ring</i> (intr))	-as- (nar-as-u <i>ring</i> (tr))
-Ø- (ak-Ø-u <i>open</i> (intr))	-e- (ak-e-ru <i>open</i> (tr))
-e- (kir-e-ru <i>be cut</i>)	-Ø- (kir-Ø-u <i>cut</i>)
-ar- (matag-ar-u <i>sit astride</i>)	-Ø- (matag-Ø-u <i>straddle</i>)

We also know that the meaning of lexical causatives is not necessarily compositional. In English, transitive *red* does not mean *cause to red* as the sentence ‘The make-up artist reddened the clown’s cheeks’ shows. Another example, this time from Tagalog, is given below.¹⁰

¹⁰ Abbreviations: AT = Actor Topic (i.e. the Actor is the subject); PERF = perfective; NOM = nominative; ACC = accusative.

(19) Tagalog

a. Sumabog sa Boston ang bomba¹¹

AT-PERF-*SABOG* in Boston NOM bomb

‘The bomb exploded in Boston.’

b. # Nagsabog ng bomba sa Boston ang terorista

AT-PERF-*PAG-SABOG* ACC bomb in Boston NOM terrorist

can not mean: ‘The terrorist exploded the bomb in Boston.’

get odd reading: ‘The terrorist scattered the bomb in Boston.’

Just as *v* and *V* often do not have compositional meaning, *V* and *X* also combine unpredictably.

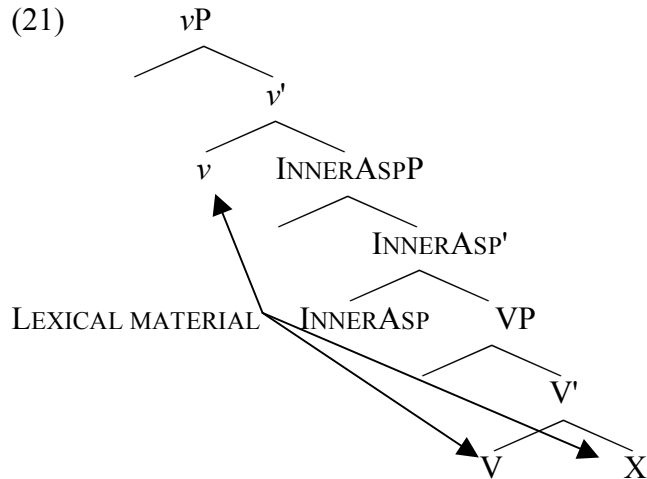
This is easily seen in the examples below with English particles. For example, the meaning of *look up* ‘to search for information’ cannot be predicted from the meanings of *look* and *up*.

¹¹ I use the Tagalog forms of *SABOG* and *PAG* here rather than glosses since the appropriate translation is part of the issue under discussion.

(20) English particles

- a. look up
- b. throw up
- c. take in
- d. take up
- e. make out

If v , V , and X can be shown in other languages to contribute in idiosyncratic ways – semantically and morphologically – to the predicate as indicated in (21) below, it should not be surprising that a language like Navajo would have idiosyncratic material in all three of these positions.



So far the three languages we have seen to support the claim that v , V , and X can be composed in idiosyncratic manners have all been agglutinating. This is not a necessary condition, however, as the same effects can be seen in extreme isolating languages, such as serial verb languages. Below we see that Yoruba predicates can be made up of two independent verbs. In (22) we see verbs that each have a meaning but which together form a distinct lexical item. In (23) we see an extreme case where neither of the two verbal forms have a distinguishable meaning and they can only be used with another form to create a complex lexical item.

(22) Serial verb constructions: Yoruba (taken from Sebba 1987: 199)

	V1	V2	V1...V2 gloss
a.	<i>fà</i> 'pull'	<i>ya</i> 'tear'	'tear up'
b.	<i>là</i> 'cut open'	<i>yé</i> 'understand'	'explain'
c.	<i>pá</i> 'hit'	<i>dé</i> 'cover up'	'close'
d.	<i>pá</i> 'hit'	<i>rún</i> 'crush'	'destroy'
e.	<i>tàn</i> 'trick'	<i>je</i> 'consume'	'trick'
f.	<i>rí</i> 'see'	<i>gbà</i> 'take'	'receive'
g.	<i>gbá</i> 'take, get'	<i>gbó</i> 'hear'	'believe'

(23) No identifiable meaning of the parts

omi ti bà á jé

water that ? it ?

'Water has spoilt it.'

I propose that parts of lexical items can be inserted into lexical heads within the *vP*, i.e. spanning *v*, *V*, and *X* and that these elements must be interpreted in their merged positions.¹²

¹² In Travis (2000a, 2000b) I discussed the difference between lexical causatives (idiosyncratic) and productive causatives (non-idiosyncratic) as characterizing syntactic domains. Goldberg (2005) uses data from VP ellipsis to argue that Vs must be interpreted in their merged positions.

9 Conclusions

While Navajo morphology is complex and presents apparent contradictions for any linguist, with a better understanding of the interfaces, we can begin to chip away at the problem. The contradictions lie in the fact that each module of the grammar appears to group the morphemes differently. Phonology sees positions 4-9 as one group and 1-3 as another (the conjunct/disjunct distinction). Syntax sees 1-6+9 as one grouping and 7 and 8 as another (ν P internal and ν P external). Semantics sees 1,6,9 as one grouping and 2-5, 7-8 as another (lexical entry vs. inflectional material). Using PF interface processes such as Local Dislocation and late adjunction and LF interface processes such as lexical category (lexical item) interpretation, these contradictions can be given an explanation.

Abbreviations

ACC	accusative
AT	Actor Topic (i.e. Actor=Subject)
NOM	nominative
PERF	perfective
SUBJ	subject

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lisa.travis@mcgill.ca

McGill University

Department of Linguistics

1085 Dr. Penfield Avenue

Montreal, Qc H3A 1A7