

The Phonological Phase*¹

Heather Newell
McGill University

ABSTRACT

I propose in this paper that the non-canonical stress patterns in two unrelated languages (Turkish and Cupeño) are caused by syntactic phases (Chomsky 1999). Within the realizational framework of Distributed Morphology (Halle & Marantz 1993), syntactic feature bundles (morphemes without phonological information) are the building blocks used by the syntactic derivational system. These feature bundles are given phonological form in a separate phonological component of the grammar. This proposal, combined with the claim that the syntactic derivation is constructed in multiple portions, or phases, is shown to account for the non-canonical stress patterns in these two languages. The combination of these two theories allows for a system wherein the phonological spell-out of a word is split by the derivational system. In such cases morphemes in a word that are dominated by a phase boundary will be interpreted by the morphological and phonological components separately from those morphemes sitting in or above said phase boundary. It is argued here that this does indeed occur, and that the stress patterns discussed here are therefore both regular, and expected.

1. INTRODUCTION

This paper discusses the stress systems of two unrelated languages, Cupeño (Uto-Aztecan) and Turkish (Altaic). It offers a unified account of the non-standard stress facts in these languages. Both Cupeño and Turkish have quite regular lexical stress patterns, where canonical word stress is on the initial syllable of the root in Cupeño and on the final syllable of the word in Turkish. In certain environments, however, the stress on verbal lexical items surfaces on a non-canonical syllable.² I propose here that the cause of this non-canonical

* I would like to thank Glyne Piggott, Heather Goad, Jon Nissenbaum, Jonathan Bobaljik, Luis Barragan, Jane Hill and Hitay Ykseker for helpful discussions in the course of researching this work. I would also like to thank Susi Wurmbrand for general funding, and Glyne Piggott for funding the presentation of part of this research at WECOL 2003. The sections on Cupeño are an extension of Barragan and Newell (to appear). All mistakes and inconsistencies are, of course, my own.

¹ It has, at the last moment, come to my attention that a recent thesis (Marvin 2002) may have also been written along the same lines as the analysis here. It analyses two languages not touched on here – English and Slovenian – and, if it offers an analysis consistent with the one here, it is a further indication that the data and analysis put forth here is on the right track.

² There are also instances of non-canonical stress in the nominal systems of these languages. These patterns will be discussed in future work.

stress is identical in both languages. These stress patterns can be explained with reference to the position of verbal morphemes in relation to phases, of which those that appear well motivated are vP and CP. The goal of this paper is to show that these stress patterns are not anomalous, but rather predicted within a theory that assumes a realizational morphological theory (such as Distributed Morphology) and the theory of phases. This paper offers an explanatory account of two exceptional stress patterns, and further evidence for both the claim that words are constructed in the syntax, and that the syntactic derivation of a clause is computed in portions, or phases.

I argue herein that the separation of phonological and morpho-syntactic theories within the field of linguistics has led to unnecessarily stipulative accounts of the stress patterns in both Turkish and Cupeño. Theories of word stress and the phonological word can be improved by reference to the morpho-syntactic structure of the word (cf. Selkirk 1984). I propose that it is not only the hierarchical structure of a syntactic word, but also the syntactic derivational system itself, that can affect the phonology of a related Prosodic Word (P-Word).

The phonological boundaries imposed by the syntax are argued here to account for both the Root-Affix stress asymmetry in Cupeño (Alderete 2001ab, Hill 2004), and for Turkish Exceptional Stress (Inkelas & Orgun 2003, Kabak & Vogel 2001, Kornfilt 1996, among others). I provide evidence that the phonological word normally cannot span a Phase boundary, and that any phonological word that appears to do so must have been subject to post-syntactic phonological rules. The non-canonical stress facts in the verbal systems of both Cupeño and Turkish are attributed to the position of morphemes in the syntactic structure, and the proximity of these positions to the edges delineated by phases. This account necessarily takes a realizational view of morphological concatenation, such as that of Distributed Morphology (Halle & Marantz 1993), where morphemes rather than words are syntactic primes.

Phrasal stress has been shown to be influenced by movement across phase boundaries (Bresnan 1971, Legate 2003, among others). I present in this paper an innovative approach in which the influence of phases is extended to the phonology of what are considered to be words. I will also discuss how the stress on these words is consistent with the theory of cyclic spell-out (Bobaljik 2000), where phonological realization of morphemes begins at the root and proceeds outwards. Contra Bobaljik however, I will propose that, for the data discussed here, phonological form is not subject to further morpho-phonological rules after spell-out.

This paper is organized as follows. In Section 2 the theories of Distributed Morphology and of phases, which I assume, are briefly introduced. Section 3 offers a preview of the analysis to be proposed herein. In Section 4 and 5, I offer an analysis of Cupeño stress that follows from a theory that assumes a realizational approach to morphology, as well as the theory of phases. Section 6 outlines Alderete's (2001ab) Optimality Theoretic account of Cupeño stress. There, I discuss the problems Alderete's analysis encounters given the data and argumentation in Section 5, and the implications of my analysis for the theory of root faithfulness. Section 7 summarizes the analysis of Cupeño. Section 8-12 demonstrate how a realizational and phase-based account also offers an explanation for the phenomenon known in the literature as Turkish Exceptional Stress (Kabak & Vogel 2001, Inkelas & Orgun 2003). Section 9 discusses and expands on the account of the complexity of the Turkish verbal word in Kornfilt 1996. In Section 13, I introduce various previous accounts of Turkish Exceptional Stress, and present the problems that these proposals encounter. Section 14 summarizes the

analysis of Turkish proposed here and Section 15 offers some concluding remarks on the syntax-phonology interface.

2. DISTRIBUTED MORPHOLOGY AND PHASES

The main premise of Distributed Morphology (DM) is that it is morphemes, not words, that are the building blocks used by the syntactic derivational system. Morphemes are treated as bundles of syntactic features (e.g. third person singular) that are assigned a phonological string by the phonological component of the grammar (e.g. *-s*, in *walks*). Words, then, are created in the same computational system that constructs phrases and clauses. The theory of phases (Chomsky 1999) holds that the syntactic derivation of a clause is divided, where sub-parts of the structure are separate inputs to Phonological and Logical Form. In this section, I show that the result of the combination of the preceding proposals is a system where it is possible for the construction of a single word to be interrupted by a phase boundary.

2.1 DISTRIBUTED MORPHOLOGY

I assume the following morpho-syntactic computational structure (to be modified slightly in Section 2.2), following Halle & Marantz (1993).

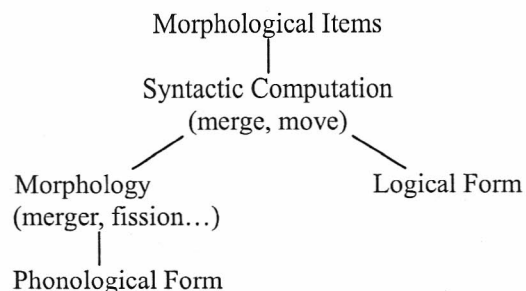


Figure 1: DM Derivational System

Within DM, no distinction is made between syntactic and morphological combination in the syntax. Morphemes are bundles of syntactic features. These bundles are merged into the computational system and project the syntactic structure. They then combine through operations such as merge and move to create the lexical and phrasal items of a surface utterance. At the end of the computation, the structure is sent to the morphological component of the grammar, where functions such as morphological merger, fusion, and possibly fission may occur. These functions will not be of concern in this work. This altered structure is then sent to the phonological component, where phonological form is determined for each lexical item, starting with the most embedded and working out to the least embedded. The phonological form of the outer lexical items can influence that of the inner lexical items (c.f. Bobaljik 2000). Although it is clear that there are instances where suffixation can alter previously determined stress patterns (e.g. *clarify*~*clarification*), this is not possible in the data examined here. For the present discussion, once an element has been spelt-out, it is no

longer susceptible to phonological rules (except for post-syntactic, across the board rules). Therefore the phonology of inner elements will never be influenced by the phonology of outer elements. The environments in which a previously spelt-out form may or may not be altered by a phonological rule triggered by suffixation will be the focus of future work. Data presented herein point to the division resting on whether elements that could shift stress are merged in the same phase.

2.2 PHASES

In recent work, Chomsky (1999) has proposed that the derivation of a sentence occurs in phases. This means that the computational system, where items from the lexicon undergo the operations merge and move, sends outputs to the interfaces (LF and PF) at multiple points, not only at the end of the derivation. Instead of the familiar T-model of the derivational system, phases force us to look at the system as antenna-shaped (Figure 2). The convergences of LF and PF may also occur in stages, but are depicted here as occurring all at once at the end of the derivation.

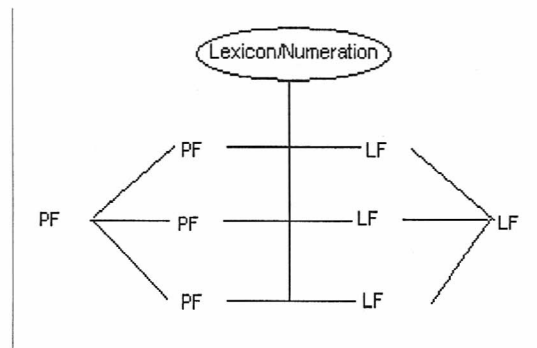


Figure 2: Derivation with Phases

These phases have been proposed to be propositions, or agentive vPs and CP, but Legate (2003) has argued that even unaccusative and passive vPs constitute phases as well. It has also been suggested that the phase is triggered by certain category-defining functional heads, including vP and CP, but not necessarily limited to those two (see Matushansky 2003 for discussion of determining whether there are nominal phases). Since only the status of vP and CP as phases seems secure, these will be the only candidates discussed. The effects of phases on the LF interface will not be touched upon here.

Much of the work on Phases has concentrated on the necessity of successive cyclic syntactic movement. Some of this work on movement has offered evidence for phases having effects on phrasal stress (Legate 2003, Kahnemuyipour 2003 among others), showing that the phonological system proceeds in steps (Multiple Spell-Out) that correspond to syntactic phase boundaries. In the following section, I discuss in more detail what this predicts for the phonology of words.

3. PREDICTIONS REGARDING THE PHONOLOGY OF WORDS

The focus of this paper is to examine whether the vP and CP phases can be shown to have effects not only on phrasal stress, but on word stress as well. Here, I outline the type of effects we expect to see on word stress, and the syntactic configuration that leads to the appearance of this effect. We see that both Cupeño and Turkish are examples of languages where word, or lexical, stress is affected by phase boundaries.

Consider verbs in a language with multiple affixes. Taking a DM-type view of the verbal word in this language, we propose that each affix projects a syntactic phrase, and that the phrases introduced by all morphemes are arranged hierarchically. The main verb sits in VP, or RootP, and this projection is at some point dominated by a vP projection.

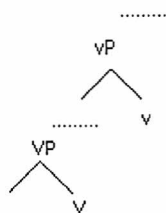


Figure 3: Brief Architecture of vP

Let us assume first that the morpheme in vP has a feature that needs to be checked by raising of the verb. If the main verb, and all affixes dominating it, were to raise to v^0 or higher, the verbal word (the main verb and its affixes) would then be sent to PF at the CP phase. When the vP phase is completed, both V^0 and v^0 will be sitting in vP. vP then sends its complement to PF, and no part of the verbal word remains in VP to be spelt-out. In contrast, in any case where v^0 has no features that require the main verb to raise, the main verb and all other affixes below vP are sent to PF. The morphemes spelt-out in this situation exclude all morphemes sitting in vP or above. Once the main verb and its affixes are sent to PF, the phonological component is unable to ‘look ahead’ to see if further affixation is to take place. The phonological component thus treats the main verb + affixes as a complete word. Any phonological rules applying to the word domain, such as stress, will apply.

The projections from vP to TP (the CP phasal complement) are subsequently sent to PF. This section of the derivation (putting aside specifiers) is also treated by PF as a word.

One might ask why we do not end up with two separate words at the end of the derivation. In many cases, this is what is predicted, and does happen. However, in the languages discussed here, these two sections of the derivation are indeed pronounced as a word. The fact that these cross-phasal words display exceptional phonological properties is a result of the step by step nature of the derivational system.

A concrete example may be of use here to situate the reader in the framework proposed above. The following is an example from Cupeño, and will be expanded upon in Section 5, at which point the justification for the assumptions made here are clear.

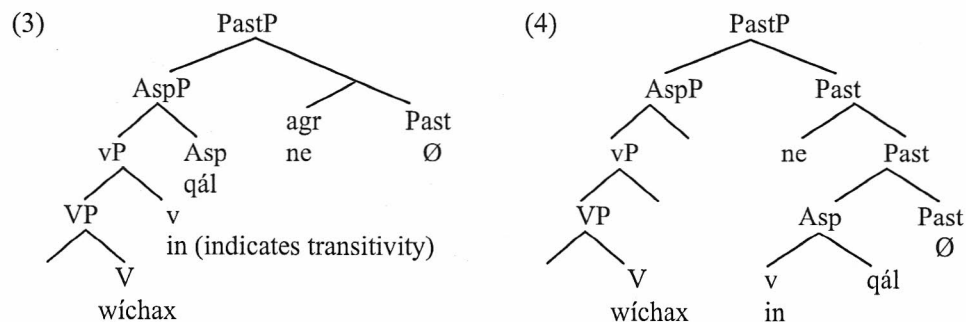
In Cupeño, there are two classes of verbs, those that appear in construction with light verbs (1), and those that do not (2).

- (1) **wíchax-ne-n-qal**
 throw-1SG-IN-IMPF.PAST.SG³
 'I was throwing it'
- (2) *pe-yax-qál*
 3.SG-say-IMPF.PAST.SG
 'S/he said'

The bolded morpheme *-n-* in (1) is a light verb, merged in vP, that indicates transitivity (Barragan 2003). The verb in (2) does not include a light verb, or more correctly put, includes only one verbal root, whether it is light or not is discussed in Section 4 and 5. If the light verb is present as in (1), it will raise and host both Tense/Aspect/Mood (TAM) affixes (*-qal* 'IMPF.PAST.SG'), and the subject agreement prefix (*ne-* '1SG', and *pe-* '3SG'). If a light verb is not present as in (2), the main verb root will raise to host these affixes.

Regarding the stress in the above examples, the TAM affix *-qal* bears stress when affixed to verbs not in construction with a light verb (2), but does not when affixed to a light verb (1). Default stress in the language is initial, yet initial stress is overridden by affixes such as *-qal* in particular environments. I assume *-qal* to be marked in the lexicon as bearing stress. This stress is subsequently referred to as inherent stress.

The position of stress in the above examples is determined by the position of each morpheme at the point it is sent to PF.

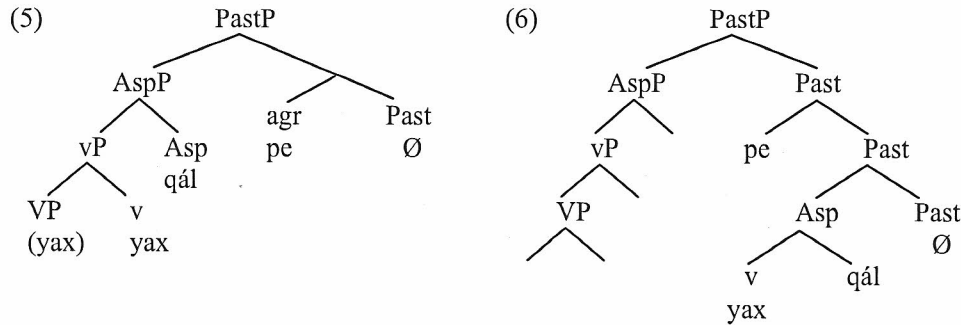


In (3) we see the initial merger sites of each of the morphemes in (1). The affixes *-qal* and *ne-* need to be affixed to a root morpheme. As the light verb *in* is the closest available root, it raises to AspectP (AspP) and PastP. The main verb root in VP has no motivation to raise,

³ List of Abbreviations: 1 – first person, 2 – second person, 3 – third person, ABIL – Abilitative, ABS – Absolutive, ACC – Accusative, AOR – Aorist, BEN – Benefactive, CAUS – causative, COMP – complementizer, COND – conditional, CONN – connective, COP – copula, DSS – different subject subordinator, EPI – epistemic, FUT – future, IMPR – imperative, IMPF – imperfective, IN – in-class thematic light verb, NEG – negative, NML – nominalizer, NPN – non-possessed noun marker, OB – object marker, PASS – passive, PERF – perfective, PL – plural, PRES – present tense, PROG – progressive, PRT – participle, Q – yes/no question marker, R – realis, RECIP – reciprocal, SG – singular, SUB – subordinator, VBL – verbalizing derivational morpheme.

and therefore remains in its initial merger position. (4) shows the structure of (3) after all movement has occurred. Notice that the main verb root is the only element in the scope of the vP phase. When vP sends its complement to PF, only *wichax* is sent. Since the phonological component of the grammar cannot ‘look ahead’ and see whether further affixation to this root will occur, it treats *wichax* as a phonological word, receiving default initial stress. Once the CP phase has been constructed, the remainder of the tree in (4) is sent to PF. Since these elements are pronounced with *wichax* as a single word, they must all be members of a single prosodic word. To achieve this, the system adjoins the output of the CP phase to that of the vP phase; giving the structure [[*wíchax*] *nenqal*]. This structure offers an explanation for the fact that stress does not shift from the verb root to the inherently stressed TAM affix. If it were to do so, the inner P-word, created in a previous phase, would have no main stress, violating the requirement that all P-words have main stress.

In (5) and (6) below, we see the initial merger and final movement sites for the morphemes in (2).



Here the verb root does not combine with a light verb in vP. In Section 5 I discuss in more detail the initial merger site of this root (and others like it). Whether *yax* is merged in VP or vP is immaterial to the discussion here. It is the only available root to host affixation, and therefore will have raised to vP when vP sends its complement to PF. It then raises further to host the TAM and agreement morphology. Importantly, the vP complement contains no verbal morphemes at PF. *pe-yax-qal* is sent to PF at the CP phase. Here it is treated as a single P-word. The inherent stress on *qál* surfaces, and therefore default stress rules do not apply, giving [peyaxqál].

I demonstrate in Section 5 that the analysis above captures all instances of non-standard stress within the verbal system of Cupeño. Section 8-12 go on to demonstrate that this phenomenon is not specific to Cupeño, but rather has cross-linguistic consequences. It is shown that non-standard stress in Turkish can also be accounted for within a phase-based theory of lexical stress.

4. CUPEÑO STRESS

Regular word stress in Cupeño falls on the first syllable of the root morpheme. Irregular word stress surfaces on an affix, or a non-initial syllable of the root. These two types of irregularity

come from different sources. The focus in this work will be the irregular stress pattern induced by affixation, but in the interest of completeness, irregular root stress will be discussed here.

As mentioned, regular stress in Cupeño falls on the root. This stress is generally initial, as initial stress is default in the language as a whole (see Section 4.1 through 5, since this is not obvious until further aspects of the language are discussed), but is sensitive to historical syllable weight. What I mean by this is that historically, long vowels attracted stress. This long/short vowel distinction was at some point lost in many lexical items, however, and therefore modern Cupeño stress appears to be unpredictable.

(7) *Regular Initial Stress*

ʔáyu
'want'

(8) *Irregular Stress on a historically long Vowel*

awál
*awá:l
'dog'

(Luis Barragan p.c.)

Since this stress is no longer predictable from the weight of root vowels, it is assumed here to be lexically specified, or inherent, if non-initial on the root.

The most relevant aspect of regular stress in Cupeño for the purposes of this work is that root stress is immobile, or fixed. It can not be shifted through affixation. That this stress is fixed is not dependent on whether this root stress is inherent or default initial. Verbal roots that display this property will be referred to as a class here as 'stressed'.

In addition to the cases of inherent root stress, certain affixes also display lexically specified, inherent stress, exemplified by *qá* 'pres.sg' in (9), below. These affixes surface as stressed when affixed to unstressed roots (10). This phenomenon is what concerns us here, and is called irregular, or exceptional, stress in Cupeño. It is discussed further in Section 4.1. For our discussion here, it is important to note that these stressed affixes have no effect when attached to a stressed root.

(9) /ʔáyu + qá / → [ʔáyu + qa]
want + PRES.SG
'...(He) wants'

(Alderete 2001a: 473)

In these constructions, stress, without exception, surfaces on either the root syllable lexically specified to take stress, or on the initial syllable of the root. This pattern is markedly different from Cupeño irregular stress, as seen in the following section.

4.1 CUPEÑO IRREGULAR STRESS

In Cupeño, the majority of roots are stressed, either inherently or initially, as in (9) above. There are, however, a few verb roots that are neither lexically specified for stress, nor do they bear default initial stress when affixed. There are less than 50 of these unstressed roots in Cupeño. The twelve of these that enter into verbal constructions are listed in the table below.

kusr 'get, take'	nganga 'weep'
max 'give'	tewa 'see'
neq 'come'	tuku 'carry with tumpline'
yax 'say/stative BE'	meq 'kill a single victim'
tava 'put down'	muh 'shoot with bow'
wen 'put in'	kwa 'eat'

Table 1: Stressless verbal roots in Cupeño

When inherently stressed morphemes are affixed to one of the above roots, stress surfaces on the affix.

- (10) /max + qá/ → [max-qá]
 give + pres.sg
 '...giving...'
 (Alderete 2001a: 470/1)

When no inherently stressed morphemes are affixed to a stressless root, default initial stress is assigned. (11c) shows that this is not the case for stressed roots.

- (11) a. /né + yax/ → [né-yax]
 1SG + say
 'I say'
 b. /yax + em/ → [yáx-em]
 say + clitic
 '(You.PL) say!'
 c. /ne-túl/ → [ne-túl]
 1SG-finish
 'I finished.'
 (Alderete 2001b:50)

4.1.1 STATUS OF THE PERSON-NUMBER PREFIXES

There are few inherently stressed affixes in Cupeño. Alderete (2001a,b) makes the claim that the subject Person-Number prefixes, as seen in (11a) above, have this property of being inherently stressed. He gives the following example as evidence that stress on the prefix is not default initial stress. If examples like (11) were instances of default stress, he claims, it would be expected to shift to the object marker *pi-* in (12), and we can see it does not.

- (12) /pi + pé + wen/ → [pi-pé-wen]
 3SG.OB + 3SG + put
 'He put it'
 (Alderete 2001b: 50)

It must be noted, however, that the above object marker is a clitic. It is not obligatory, and when it does appear, I claim, it is not integrated into the phonological word. This behaviour is predicted following Peperkamp (1997), as non-integration into the phonological word is a typical property of clitic groups. As the object prefix is external to the phonological word, it is therefore not a candidate for default initial stress.

Further evidence that these object markers are clitics comes from their behaviour in the imperative (Bachrach 2004). In Romance languages, like Spanish, object clitics are preverbal when the verb is tensed (13), but post-verbal in the imperative (14).⁴

- (13) **lo** necesito ver esta semana
 2.OB need-1SG.PRES see this week
 'I need to see it this week'
- (14) **míralos**
 look.IMPR-3PL.OB
 'Look at them!'

The same is true for the object clitics in Cupeño, as can be seen in (12) repeated here as (15), and in (16).

- (15) **pi-pé-wen**
 3SG.OB-3SG-put
 'He put it' (Alderete 2001b: 50)
- (16) **ela-ne-m=en**
 wait.for-IN-PL=1SG.ABS
 '(You.PL) wait for me!' (Hill 2003:112)

This has ramifications for the status of the subject prefixes. They are initial in the phonological word, even if an object clitic is present. Contra Alderete, I do not, therefore, include the subject Person-Number prefixes in the group of Cupeño affixes that have the property of being inherently stressed. Since stress falls on these prefixes only if stress is not assigned either to the root, or to an inherently stressed suffix, this stress will be analyzed here as default initial. The subject Person-Number prefixes in Cupeño are mandatory in the past tense, and are analyzed here as agreement markers, not clitics.

4.1.2 EXCEPTIONALLY STRESSED AFFIXES IN CUPEÑO

In this section I will introduce the exceptionally stressed morphemes in Cupeño. I then show (Section 5) that the surface occurrence of stress on these morphemes can be predicted assuming a DM and phase based analysis.

With the removal of Person-Number prefixes from the list of inherently stressed morphemes in Cupeño, we are left with the following four morphemes.

- (17) *Inherently stressed suffixes*
 -qá 'present tense'
 -qál 'past imperfective singular'
 -í 'nominal base i-ablaut suffix'
 -í 'different subject subordinator'

That these morphemes are inherently stressed can only be seen when they are affixed to a stressless root, as seen above in (10), repeated below. Default initial stress would be expected

⁴ Thank you to Asaf Bachrach for helpful exchanges.

if it were not for the inherent stress on the suffix.

- (10) /max + qá/ → [max-qá]
 give + pres.sg
 ‘...giving...’ (Alderete 2001a: 470/1)

These morphemes must be lexically specified to receive stress. They do not form a natural class, either phonologically or morpho-syntactically⁵ (but appear as though they may be able to be reduced to only two forms – where *-qa* is imperfective and the two ‘-i’s are collapsed), so I will have nothing further to add on this matter. What is important, however, is their behaviour when more than one of them is affixed to a root.

Before giving examples, though, there are two classes of stress-affecting affixes in the language that need to be introduced. The first is the group of pre-accenting affixes, seen below.

- (18) *Pre-accenting suffixes*
- | | |
|--------|-------------------------|
| -ʔaaw | ‘at’ |
| -či | ‘with/by means of’ |
| -yka | ‘to’ |
| -ŋa | ‘in’ |
| -pə | ‘place of’ |
| -ŋaʔaw | ‘on’ |
| -ŋax | ‘from’ |
| -nuukV | ‘punctual subordinator’ |
| -wi | ‘augmentative’ |
| -maa | ‘diminutive’ |

These suffixes, as the name entails, cause stress to be realized on the syllable to their left.⁶ As in the case of suffixes with inherent stress, the pre-accentuation affects a stressless root (19), but not a root with inherent stress (20).

- (19) /wena + nuk_{pre}/ → wená-nuk
 ‘having put in’
 (20) /méme + yeke_{pre}/ → méme-yke
 ‘to the ocean’ (Alderete 2001b: 244)

As can be seen in (18) the pre-accenting affixes seem to be limited to certain functional categories. What is important here is that aside from the placement of stress, these suffixes

⁵ But see arguments contra this statement in Bachrach (2004).

⁶ The pattern here is actually slightly more complex. Occasionally, when the pre-accenting suffix follows another affix, the stress will skip that affix to be realized on the root. I have no evidence as of yet as to how this process interacts with other stressed suffixes. This problem, along with an account of why only affixes can affect the stress on the root, and not vice versa, will be accounted for at a later date. It is of note that this root-affix asymmetry appears to come for free in a theory assuming cyclic spell-out.

behave on par with the inherently stressed suffixes seen above in that they surface as stressed only when affixed to stressless roots.

The second class has been called Ablauting in the literature. These affixes also attract stress in conjunction with stressless roots. They are also, in a way, pre-stressing affixes, in that these suffixes trigger insertion of a vowel (the exact nature of which is not important here) after the stem, and this vowel is where the stress is realized. These affixes are referred to here as epenthesizing.

(21) *Epenthesizing Affixes*

-qat	‘purposive/immediate future’
-ve	‘realis subordinator’
-vichu	‘desiderative’
-veʔesh	‘agentive(nominalizing)’
-veneq	‘coming along verbing.’
-sh	‘non-possessed noun’

(Hill 2004: Cupeño Phonology, 26)

The vowels introduced by these affixes, like the stressed and pre-stressing affixes seen above, do not surface as stressed when affixed to a stem containing a stressed root (22). These vowels do receive stress in construction with stressless roots (23).

(22) *Epenthesizing Affix, Stressed Root*⁷

kúta-ápi-ísh-em → kútapchem
bow-IRR.SUB-NPN-PL
‘bows’

(Hill 2004: Cupeño Phonology, 32)

(23) *Epenthesizing Affix, Stressless Root*

pem-tew-ápi → pemtewápi
3PL-see-IRR.SUB
‘them to see’

(Hill 2003: 58)

The exact nature of the behaviour of pre-stressing and epenthesizing affixes in Cupeño will not be discussed in detail here, but see Section 6 below for a discussion of how the behaviour of these affixes is integrated into the account of stress proposed here.

In Sections 5 and 6, the interactions of these affixes with each other, and with roots, are discussed in more detail, focusing on the inherently stressed affixes. In Section 5, I offer a morpho-syntactic account of Cupeño exceptional stress interactions, showing that the stress patterns in the data presented in this section are predictable. In Section 6, I summarize the Optimality Theoretic analysis of Cupeño stress offered in Alderete (2001a,b), taking into account the discussion in Section 5.

⁷ There is also a group of affixes that insert an a-ablaut vowel in the same manner as the i-ablaut suffixes shown. When these affixes appear stress sometimes becomes unpredictable. Why this occurs will be the subject of future research. These affixes are *-nuk* ‘same subject subordinator’, *-pi* ‘irrealis subordinator’, *-le/-lu* ‘to go to do’, seen in these examples.

5. THE MORPHO-SYNTAX OF STRESS IN CUPEÑO⁸

The main goal in the discussion below is to illustrate how morpho-syntactic operations affect the lexical stress system of Cupeño. What is novel here is that syntactic Phases are shown to interrupt the verbal morphology, leading to word-internal phase-effects on stress. This account captures the data more completely than does the Optimality Theoretic account offered in Alderete's (2001a,b), to be discussed in Section 6, and captures the fact that the stressed and stressless roots in Cupeño form morpho-syntactic natural classes. It is argued in Section 5.2 that stressless verbal roots in Cupeño are light verbs, heading vP (cf. Barragan 2003, Barragan & Newell to appear), while stressed roots are main verbs, heading VP. In Section 5.2 it is shown how this difference in syntactic position can explain the stress differences between the two classes, as well as explaining why root stress cannot be shifted upon affixation. Before discussing the Cupeño verbal roots, Section 5.1 discusses the position of stress when more than one inherently stressed affix enters into a construction with a stressless root.

5.1 ROOT ASYMMETRIES: EFFECTS OF THE MORPHO-SYNTAX

We saw in Section 4, that there are two groups of roots in Cupeño: those that surface with stress on the root (either inherent or default), and those that do not. These stressed roots always surface with stress, regardless of affixation. Even when default initial stress applies, it surfaces no further left than the initial syllable of the root. In contrast, stressless roots only surface as stressed if they are initial in the word and no inherently stressed morphemes are affixed to them. If they are prefixed, initial stress falls on the prefix, not on the initial syllable of the root.

The focus in this section is to identify the cause of this division. Alderete (2001a,b) proposes that the distinction between stressed and stressless roots is lexically specified. That claim presupposes that these two sets of verbal roots do not form natural classes that could explain this distinction. As it turns out, I argue, the opposite is true. The argumentation below is also partially presented in Barragan (2003) and Barragan and Newell (to appear).

Barragan (2003) shows that the position of the Person-Number prefixes in Cupeño is dependent on whether the verb is constructed solely of a main verb, or of both a main and a light verb.

⁸ This section is an extension of a talk given with Luis Barragan at WECOL 2003. I am indebted to him, and to Jane Hill, for much discussion on the content of this section. Parts of this section are also discussed in Barragan and Newell (to appear).

- (24) a. *ne-túl*
 1SG-finish
 'I finished.'
 b. *cem-tewásh*
 1PL-lose
 'We lost.'
- (25) a. *yút-ne-n*
 raise-1SG-IN
 'I raised.'
 b. *hét-pe-yax*
 crouch-3SG-YAX
 'He crouched.'

(Barragan 2003: 143)

As the examples above show, light verbs (to be discussed in Section 5.2) can act as hosts for affixation in Cupeño. In (24), agreement is prefixed to the main verbs *tul* and *tewash*, while in (25) it is not prefixed to the main verbs, but rather to the light verbs *in* and *yax*. Barragan assumes that affixal heads carry an [affix] feature that must be checked by the raising of a possible host for the affix. Here, I dispense with this affix feature, following Bobaljik (1995), as this type of feature appears to allow the syntax to access phonological information. This would be contra the theory of Distributed Morphology, where syntax and phonology are necessarily independent.⁹ I do not, however, discuss alternate motivations for verb raising here, as this would take us too far afield of the topic at hand. This does not affect the argument here that it is the highest verbal head that raises into the functional domain in Cupeño.

In (25), the light verbs are the closest possible verbal elements able to raise and host the inflectional affixes; the main verb does not raise. The Person-Number morphology is prefixed to the light verb root, causing the order [main verb - PN prefix - light verb - tense/aspect].¹⁰ When there is no light verb, as in (24), the main verb is the closest host for affixation, and therefore agreement must be affixed to the main verb,¹¹ causing the order [PN prefix-main verb- tense/aspect].

What is of great interest to us here is that the light verb */yax/*, seen in (22) above, is also one of our stressless verb roots, listed again below.

⁹ My thanks to Jonathan Bobaljik for bringing this to my attention.

¹⁰ For argumentation that the PN prefixes are adjoined to a Tense head (PastP) see Newell (2003).

¹¹ Here I take agreement affixation to occur in the morphological module of the derivation (see Figure 1). Agr will affix to the highest head in TP. If the light verb is null (as in (25)), as it is in unergative constructions, this Agr morpheme will be shifted to the main verb. Therefore I maintain that main verbs never raise in Cupeño. This will be important later.

kusr 'get, take'	nganga 'weep'
max 'give'	tewa 'see'
neq 'come'	tuku 'carry with tumpline'
yax 'say/stative BE'	meq 'kill a single victim'
tava 'put down'	muh 'shoot with bow'
wen 'put in'	kwa 'eat'

Table 1 (repeated)

An interesting fact about all of the stressless roots above is that they can be distinguished from the stressed roots in the language by more than just their phonological divergence. These stressless roots almost universally surface in constructions without light verbs, while the stressed roots undergo productive alternations with various light verbs in Cupeño. In the few cases that have been found where these roots are in constructions with light verbs, the root is stressed. Unfortunately, in these cases, this root stress is indistinguishable from default stress.

- (26) *téw-in*
'glance, take a quick look'
- (27) *qwá-in*
'eat a little'¹²

5.2 STRESSLESS ROOTS IN VP

Now, leaving these few examples aside, why would these verb roots not productively enter into constructions with light verbs? It seems unlikely, in fact, impossible, within a realizational theory of morphology, that being lexically specified as unstressed could have such a morpho-syntactic effect, and therefore we must look to the morpho-syntactic component for an explanation. What I propose here (see Barragan & Newell to appear) is that these stressless roots are in v^0 , the position in which light verbs are found.

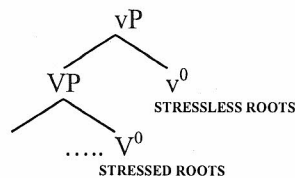


Figure 4: Structural Positions of Stressed and Unstressed Roots

¹² One exception has been found to this pattern: *wenin* 'hit a target' from *wen* 'put in'. I cannot explain this exception. Of note in the above examples, though, is the semantic shift undergone. It has been noted that phases are domains for special meaning. I will argue below that the roots in these examples must be interpreted in a different phase than if they were not in constructions with light verbs. If further examples such as those in (26) and (27) could be found it would constitute further evidence for these morphemes sitting variably in VP or vP.

If these verbs head vP, either because they project a vP, or because they have moved there, then we would expect constructions containing these verbs to lack light verbs. The verb /yax/ is shown above to alternate between being a light (stative) (25) and a main (2) verb. Additionally, the stressless verbs in Column 1 of the table can all be said to have ‘light semantics’.

A note on light verbs is appropriate here. What do I mean in saying that these verbs have light semantics? The semantic contribution of a light verb is hard to pin down, but all seem to “...further *structure* or *modulate* the event described by the main verb...” (Butt 2003). Typical light verbs are those such as *take*, *have*, or *give* (28) or, in Chinese, directional verbs such as *diao* ‘fall’ or *shang* ‘ascend’ (29) among others.

- | | | | | | |
|------|----|-------------|--------|-----------|------------------------|
| (28) | a. | <i>take</i> | a hike | ~to hike | |
| | b. | <i>have</i> | a cry | ~to cry | |
| | c. | <i>give</i> | a ring | ~to ring | |
| (29) | a. | guan | daio | shouyinji | ‘switch off the radio’ |
| | | shut | fall | radio | |
| | b. | guan | shang | men | ‘close the door’ |
| | | shut | ascend | door | |
- (Butt 2003: 7)

In both (28) and (29) the light verbs do not have the meaning they have when they act as main verbs – there is no taking that can be said to be involved when one takes a hike, and no falling when turning off the radio.

vP, the phrase projected by a light verb, is also the locus of merger for external arguments. The productive light verbs – those that enter into constructions with main verbs – in Cupeño affect transitivity as well as the semantics of the main verb, where \emptyset generally indicates unergativity, *in* transitivity, and *yax* unaccusativity.

- | | | | | |
|------|---|-------------|----------------------|--------------------------------------|
| (30) | <i>Three way alternations (\emptyset/in/yax)</i> | | | |
| | a. | chéx | chéx-in | chéx-yax |
| | | ‘to winnow’ | ‘to clean something’ | ‘to be clean, light, visible’ |
| | b. | chúx | chúx-in | chúx-yax |
| | | ‘to melt’ | ‘to spit’ | ‘to be spat out’ |
| | c. | ngey | ngey-in | ngey-yax |
| | | ‘be dizzy’ | ‘shake something’ | ‘shake (e.g. earthquake, or shimmy)’ |

The verbs in the second column of Table 1 though, do not have light semantics, and are not typical candidates for light verbs in any language I am aware of. Perhaps something in the historical development of these verbs can explain their behaviour, but this will not be pursued here.

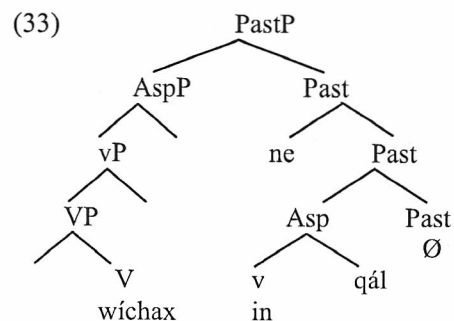
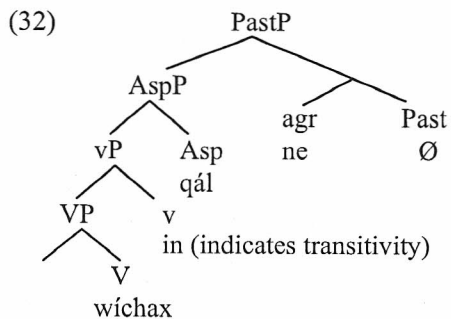
It is evident that all of the stressless verbs have the same phonological and morpho-syntactic (no light verbs) behaviour, and will therefore all be treated as heading the projection vP. In the next section, I show how this assumption regarding the syntactic position of roots in Cupeño can explain why V^0 roots are stressed, and v^0 roots are stressless.

5.3 THE CUPEÑO PHONOLOGICAL PHASE

Before going on to the explanation of Cupeño exceptional stress below, we should recap the relevant assumptions introduced in the above sections. Firstly, Cupeño verbs are created in the syntax, not in the lexicon. This is evidenced by the movement of both light and main verbs to host affixation. Secondly, main verbs in constructions with light verbs will not raise out of VP. This is due to the fact that light verbs, being closer to the inflectional domain, will raise to check any features on the tense and aspect heads. The main verbs in these cases have no motivation to move. Thirdly, all stressless verbs in the language are situated in v^0 (either by projection or through movement). This is argued to be the case because of the distributional nature of these roots. They almost never surface in construction with light verbs. This fact can be explained if the canonical position of these stressless roots is vP. And finally, I assume, following Chomsky (1999), that the syntactic derivation occurs in steps, or phases. At the strong phases, vP and CP, their complements, VP and TP, will be sent to PF. Assuming these four statements to be true, the nature of stressed and stressless roots in Cupeño falls out as follows (expanded from Section 3).

In the tree below, we see the structure of a verbal word containing a main verb (V^0). Main verbs are always dominated by a light verb in vP.

- (31) wíchax-ne-n-qal
 throw-1SG-IN-IMPF.PAST.SG
 ‘I was throwing it.’



The affixes /- qál/ and ‘past’ have features that need to be checked. What this means is that a suitable morpheme must raise into the heads containing the tense/aspect morphemes (the agreement morpheme is assumed here to be adjoined in the morphological component of the grammar). In (32) there are two root morphemes, *wíchax* and *in*, and therefore two possible hosts for affixation. Since it is the closer head, the light verb raises, and we end up with the configuration in (33).

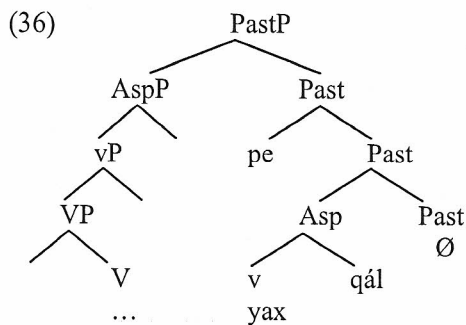
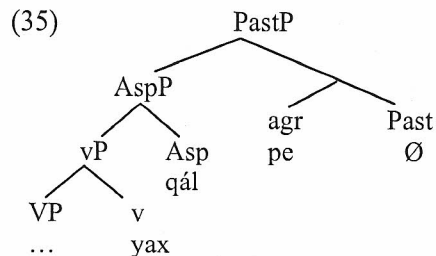
At the point where VP, as a phasal complement, is sent to PF, the main verb is isolated from the remainder of the verbal word.¹³ Now, the PF component cannot ‘look ahead’ to

¹³ The main verb, light verb, and verbal affixes are all pronounced as one unit, without pauses. This entire complex is what I mean by the verbal word.

determine if the main verb will be pronounced in isolation or as part of a larger whole. The only recourse for the phonological component is to treat the main verb root as a word in the language, and this involves assigning stress to it. Here, stress is default initial on the root, unless otherwise lexically specified. When the CP complement, including the PastP complex seen in (33), is sent to PF, two things must happen. The PastP complex must be cliticized, or adjoined, to the main verb, and stress must be assigned. If we assume that stress is assigned before cliticization, then the inherently stressed /qál/ will receive stress, giving us /wíchax/+/ne-n-qál/. The phonological system must then, after cliticization, eliminate one of these stresses. If we assume cyclic spell-out to be active in this component, then stress will surface on the root because it is the innermost stressed morpheme. If we assume a constraint-based system, Leftmost will be active here, again causing stress to be realized on the verb root. If we assume a P-Word adjunction structure then we have an embedding like [[wíchax]_{PW} ne-n-qál]_{PW}. As every P-Word must have exactly one head foot, or stress, stress must surface on the verb root. Main stress cannot surface on the affix or the inner P-Wd would not have stress. Regardless of how you account for it, stress must fall on the root. But as both the cyclic spell-out and P-Word adjunction structures give principled reasons for the stress to fall on the innermost affix, a constraint like Leftmost is unnecessary here.

In constructions with no main verb in V^0 , all morphemes are spelt-out in the same phase, as follows.

- (34) pe-yax-qál
3.SG-say-IMPF.PAST.SG
'S/he said'



(35) shows the initial merger sites of the morphemes in [pe-yax-qál]. Since the light verb is the only host available to check the features of the higher projections, it raises – creating the structure in (36). Here PastP will be sent to PF at the CP phase, and will be spelt-out from the innermost to the outermost morpheme. As /qál/ is the only inherently stressed morpheme, it will receive stress. Here we have only one P-Word, and therefore there is no further work for the phonological system (with regards to stress).

We, therefore, have a principled derivational analysis of the verbal stress patterns in Cupeño. Specifying the light verbs as stressless is unnecessary, as their stressless nature is a result of their position in the syntax.

6. AN ALTERNATE ANALYSIS

In this section I discuss Alderete's (2001a,b) Optimality Theoretic account of stress in Cupeño. What is of concern here is the question of at what point we decide that a property must be lexically specified. Lexical specification must be a last resort. I argue that the proposal I have put forth above captures a pattern that is not accounted for in Alderete's system, and we, therefore, can do away with the lexical specification of stress on V⁰ verb roots. In sections 8 through 12 I argue further that this phasal phenomenon can also account for verbal stress patterns in Turkish, arguing against lexical specification of stress there as well.

6.1 ALDERETE (2001A,B): AN OT ANALYSIS

The difference between those roots that always surface as stressed (main verbs above) and unstressed roots (light verbs above) in Cupeño is assumed in Alderete (2001a,b) to be due to the fact that stressed roots are specified in the lexicon as such. This lexical specification of stress implies that whether a root carries inherent stress or not is an idiosyncratic property of each root. In Section 5, I proposed a morpho-syntactic source of this stressed/stressless split, based on the fact that these two groups form syntactic natural classes. The position of these roots in the syntax is proposed to account for the Root-Affix asymmetry seen in the language. I offer a principled reason for the stressed/stressless root split in Cupeño. In this section, we examine how the analysis above improves on Alderete's account.

Alderete (2001a,b), along with the assumption that (most) root stress is lexically specified, uses the proposed universal ranking $\text{ROOT FAITH} \gg \text{AFFIX FAITH}$, to explain why inherent stress on a root always surfaces. In the tableau below MAX-PROM ($\text{MAXIMIZE PROMINENCE}$) entails realizing inherent stress. The fact that MAX-PROM ROOT outranks MAX-PROM AFFIX ensures that inherent Root stress will always surface.

(37) *Root controlled De-Accenting: /af + róot + áf/ → [af- róot-af]¹⁴*

	/pe + túl + qá/	MAX-PROM ROOT	MAX-PROM AFFIX
a.	pe-tul-qá	*!	
b.	pé-tul-qa	*!	*
c.	☞ pe-túl-qa		*

(Alderete 2001b: 53, slightly modified)

In (37) we have both a stressed root and a stressed affix in the input. In (37a) the stress is realized on the affix *-qa*. Since MAX-PROM ROOT dominates MAX-PROM AFFIX , this incurs a fatal violation of the former. Stress is not realized on either of the stressed morphemes in output (37b), but rather on the unstressed prefix. Again this violation of both constraints is non-optimal. The winning candidate violates only MAX-PROM AFFIX , and not the higher ranked MAX-PROM ROOT , and is therefore the optimal output.

For examples with stressless roots, Alderete utilizes alignment constraints, in addition to MAX-PROM AFFIX , to explain the position of stress. These constraints are proposed primarily

¹⁴ Alderete's analysis assumes that the agreement prefixes are also lexically stressed. As discussed above, this is not the case, and, therefore, will not be assumed here.

to account for the shifting of stress away from the Person-Number prefixes in the event of an inherently stressed suffix. As explained in Section 4.1.1, these prefixes are not inherently stressed, and therefore the work performed by alignment in Alderete's analysis does not cause stress to fall on the suffixes in the language.¹⁵ Stress falls on the suffixes in the environment of an unstressed root, if they are lexically marked for stress, because no prefixes are inherently stressed. Since this is the case, we only look here at the interactions that occur when multiple stressed suffixes are merged with a stressless root. Alderete proposes that the constraint ALIGN-RIGHT (ALIGN-R) outranks ALIGN-LEFT (ALIGN-L), predicting that the rightmost stressed suffix surfaces with stress in the output form.

- (38) /yax-qál-í/ → [yex-qel-í]
 say-PAST.IMPF.SG-DSS
 'while....was saying' (Alderete 2001b: 243)

- (39) *Rightmost Affix Stress*: /root + áf + áf/ → [root af-áf]

/yax + qál + í/	ALIGN-R	ALIGN-L
a. yax-qál-i	*!	*
b. ☞ yax-qal-í		*

(Alderete 2001b: 54, slightly modified)

Since main stress can only be realized on one of the two stressed affixes, each violates one alignment constraint. Output (39a) incurs a fatal violation of the high ranked ALIGN-R. Output (39b) violates ALIGN-L, but crucially not ALIGN-R and is therefore predicted, correctly, to be the optimal output form.

The different subject subordinator /-í/ (glossed DSS in (38)), when in construction with other inherently stressed affixes, always surfaces with stress. However, the stress on Cupeño verbs is not generally consistent with the above ranking of alignment constraints. In the following section, I show that the different subject subordinator suffix is the exception to the rule. It will be argued that the general pattern in Cupeño is for the leftmost, or innermost, stressed affix to surface as stressed.

6.2 THE DISPUTE, OR WHAT TO DO WITH A MISBEHAVING AFFIX

This section is a discussion of which of the following patterns exemplifies the general stress pattern of Cupeño verbs. It will be shown that (40), where the rightmost affix surfaces as stressed, is an exception, contra Alderete. In cases where there is an unstressed root and more than one stressed suffix, the general pattern is argued to be for the leftmost affix to surface as stressed (41).

- (40) *Different Subject Subordinator*
 /yax-qál-í/ → [yex-qel-í]
 say-PAST.IMPF.SG-DSS
 'while....was saying' (Alderete 2001b: 243)

¹⁵ See also McCarthy (2003) for arguments that alignment constraints (and all gradable constraints) must be ruled out as possible constraints in Optimality Theory.

- (41) *Nominalizer*
 /yax-í-qá-te/ → [yex-i-qe-t]
 say-NML-PRES.IMPF.SG-NPN
 ‘one who is going to say’ (Alderete 2001b:482)

In both examples above, the root verb is stressless. In (40), we see that, of two inherently stressed affixes, it is the different subject subordinator /-í/ that surfaces as stressed. In alignment terms, that rightmost relevant affix is stressed. In (41), however, of the two inherently stressed affixes, it is the nominalizer that surfaces as stressed. In this case, we can say that the leftmost relevant affix is stressed. The task of this section is to determine which of these examples constitutes an exception to the general pattern of stress assignment in Cupeño.

In Alderete’s (2001a,b) account, it is the nominalizing affix that is seen to be misbehaving. Alderete offers an alignment account of stress in constructions with unstressed roots. In constructions with stressed roots, as discussed in Section 6.1, the highly ranked constraint MAX-PROM ROOT ensures that stressed roots will always be realized as such. For constructions with unstressed roots, Alderete proposes the ranking ALIGN-R >>> ALIGN-L to account for the position of stress. This ranking ensures that the rightmost of two inherently stressed affixes surfaces with stress. Here, it is useful to mention that Alderete needs this ranking to explain why stressed suffixes always win out over stressed prefixes in Cupeño. Remember that Alderete assumes that the Person-Number subject prefixes in the language are inherently stressed. A tableau to this effect can be seen below.

- (42) *Rightmost Affix Stress: /áf + root + áf.../ → [af- root-áf...]*

	/pé + yax + qál/	MAX-PROM AFFIX	ALIGN-R
a.	pé-yax-qal	*	yax-qal!
b.	☞ pe-yax- qál	*	

To account for the anomalous behaviour of the nominalizing affix, Alderete appeals to the constraint STRESS-TO-*í*, ranked above ALIGN-R. This constraint causes stress to be realized on the nominalizer. This constraint is not meant to endow all suffixes containing /i/ with a special status, but is specific to the nominalizing morpheme. Alderete argues that there are a number of reasons that the nominalizer could be behaving this way. It could be due to the derivational status of the nominalizing morpheme, or it could be a dominant morpheme that triggers deletion of neighboring stress, or it could be due to the special status of noun faithfulness, but does not commit to any of these analyses.

As I pointed out above, there is no good reason to assume that the Person-Number prefixes in Cupeño are inherently stressed. If we assume that they are not stressed, then Alderete’s alignment constraints become almost unnecessary. ALIGN-R requires that stress fall on the different subject subordinator -*í*, rather than on a suffix to its left, while Stress-to-*í* is responsible for causing stress to fall on the nominalizer, rather than on a suffix to its right. The only cases Alderete discusses that involve more than one stressed affix each contain either the different subject subordinator or the nominalizer. Thus, we end up with two morpheme specific constraints, with one ranked arbitrarily over the other (STRESS-TO- *í* >>> ALIGN-R).

Now, let us look at this pattern from a cyclic spell-out point of view. Assuming affixes to be spelt-out from the innermost to the outermost morpheme, we can propose that the first inherently stressed morpheme will realize stress. Assuming only one stress per word, and that stressed morphemes cannot override existing stress, no other stressed morphemes will be able to surface as stressed. The second is a contentious assumption. Examples of further affixation shifting the position of stress are not hard to find (e.g. *ó*origin→origin-al→originál-ity). The environments in which stress shifting is permitted will be the subject of future work. Options to be explored include whether the position of an affix in the syntax affects its ability to alter stress patterns, or whether affixes which are lexically marked for stress behave differently from those that are not. Only suffixes have exceptional stress in Cupeño, and therefore this stress pattern can also be captured by a constraint such as LEFTMOST. This would predict, using Optimality Theoretic constraints, that the different subject subordinator is the exception to the rule here, giving the ranking STRESS-TO-DSS >> INNERMOST/LEFTMOST. The question here is how to decide between the two analyses.

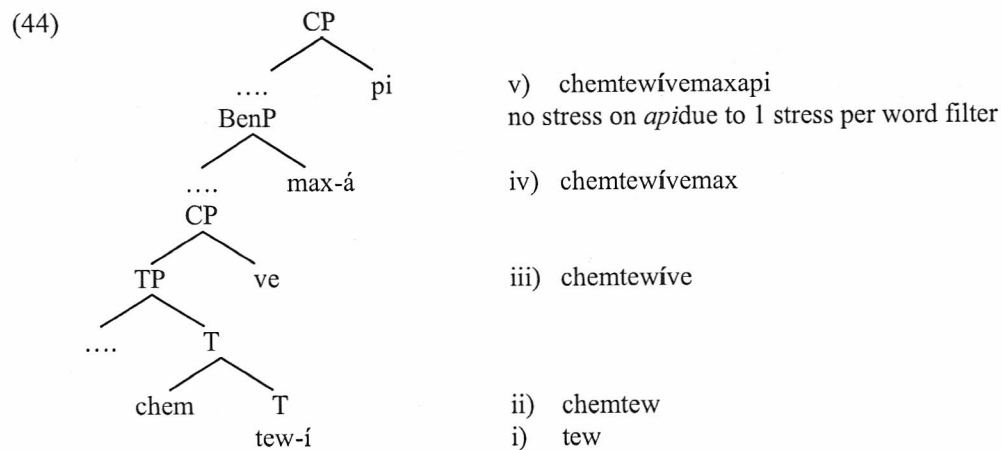
6.2.1 EVIDENCE FOR LEFTMOST/INNERMOST

At this point, it would be nice to have an example containing both the nominalizer and the different subject subordinator both affixed to the same verb. Unfortunately, I have come across no such examples. It seems we will have to look to indirect evidence for the correct analysis of these two morphemes. In Section 4.1.2, a set of epenthesis affixes were introduced. These affixes ‘pre-stress’ the preceding epenthetic vowel. Whether these vowels are truly epenthetic, or are part of the epenthesis morpheme will not be discussed here (but see Footnote 16). What is important for the task at hand is how these affixes behave when more than one of them is attached to a verb. Below, we see a construction with both the realis subordinator /-íve/ and the irrealis subordinator / ápi/.

- (43) *Innermost/Leftmost wins*
 chem-tew-íve-max-ápi → chem-tew-íve-max-api
 IPL-see-R.SUB-BEN-IRR.SU.
 ‘to look ahead for ourselves’ (Hill 2004: 51)

The example above shows that it is not only the nominalizer that is a problem for Alderete’s ALIGN-R constraint.

Example (43) is, however, consistent with a cyclic spell-out account of stress in Cupeño. What I propose here is that, at PF, the first morpheme with lexical stress to be spelt-out surfaces as stressed. A phonological filter must then be introduced to disallow multiple word stress. As proposed above, this filter recognizes that the word has stress, and prevent further stress from surfacing. Spell-out will begin with the root, and progress upwards through the tree.



In line with the phase analysis above, if we assume that a form such as the example in (20) has the structure $[[[[\text{chem-tew-í}]_{PW}\text{ve-max-a}]_{pi}]_{PW}]_{PW}$ ¹⁶ then this filter follows from the fact that main stress must fall on a syllable within the innermost P-Word. If it were to surface in the outermost P-Word, $*[[\text{chem-tew-í}]_{PW}\text{ve-max-á}]_{pi}]_{PW}$, then the innermost P-Word would have no main stress. A cyclic spell-out account such as this allows us to account for all instances of stress in the language, except for constructions involving the different subject subordinator */-i/*. The behaviour of this morpheme will have to be stipulated, but this leaves us with only one ‘misbehaving’ affix in the language, while Alderete’s ALIGN-R, assuming the pattern in (44) to be representative of epenthesizing affixes, would have to include many.

6.3 STRESSED AFFIXES AND CYCLIC SPELL-OUT

Any theory of cyclic-spell-out (Mohanan 1986, Bobaljik 2000 and others) proposes that affixes are given phonological form (or that phonological rules apply) in a cyclic fashion. This entails that more embedded affixes will undergo phonological processes before those that are less embedded. I follow the DM tenet that lexical items in the syntax (including affixes) have no phonological form, but rather receive phonological form when sent to PF. PF then, can see, and is constrained by, the structures it receives. Optimality Theoretic accounts assume that the input to the phonological component of the grammar is a string of sound, and whether this string is accompanied by a structural (non-linear) representation, or whatever the

¹⁶ This structure is based on (a) the stressed suffixes *ive* and *api* being analysed as CP heads, as they are subordinators, and (b) the assumption that the epenthetic vowel can be attached either to the previous consonant, or to the complementizer itself. When the epenthetic vowel is inside the CP complement (attached to the root) it will be spelled out in the same phase as the root, and will therefore surface as stressed. That either case is possible is evidenced by alternations like the one below.

(i) *pétewapi* ‘for him to see’

(ii) *petewápi* ‘for him to see’

This stress alternation can be explained if the epenthetic vowel can fall on either side of the phase-induced P-Word boundary \rightarrow $[[pétew]api]$ vs. $[[petewá]pi]$. These examples pose problems for a theory assuming no look-ahead in the phonology, and therefore a detailed analysis will be left to future work. It seems that the stress pattern in (i) is the more common, making examples with the pattern like that in (ii) and (21) difficult to find.

structure would be if there were one, is not agreed upon in the literature (but see Kiparsky 2000, for a cyclic implementation of Optimality Theory). Because of this, the phonological constraints are designed not to refer to structure, but rather can only refer to edges or specific morphemes. Within the phonological system I am assuming, reference to edges of words can only occur after linearization – after PF has spelt-out the terminal nodes of a structure, that structure is no longer available (cf. Chomsky’s Phase Impenetrability Condition) - and only a flat linear phonological string remains. In Section 6, I contrasted the current Optimality Theory analysis of Cupeño stress (Alderete 2001a,b) with the derivational analysis presented in Section 5. The affixes surfacing as stressed in Cupeño are almost invariably the innermost affix structurally. I believe such a generalization, along with a cyclic spell-out view of the phonological system, can explain the position of stress on exceptionally stressed verbal words in Cupeño. The fact that a phonological string such as *wichaxnenqal* (31) has the complex phonological structure $[[w\acute{ic}hax]_{PW} \text{ nenqal}]_{PW}$, which mirrors the syntactic structure $[[w\acute{ic}hax]_{VP} \text{ nenqal}]_{PASTP/TP}$ cannot be readily captured in Optimality Theoretic terms.

7. SUMMING UP

In the sections above, I have argued that the Root-Affix asymmetry evidenced in the Cupeño stress system stems not from the idiosyncratic nature of root phonology in the language, but rather from the principled organization of the derivational system as a whole. That main verb root morphemes have what appears to be inherent, immobile stress is a result of the fact that, at the point where they are assigned phonological form, they are isolated derivationally from the rest of the verbal word. This isolation is brought about through the independently motivated mechanism of the phase. This stress pattern is of interest as it shows a novel effect of phase theory, where ‘word’ construction is interrupted by a phase. Post syntactic cliticization must occur to ensure that the sections of a word separated by a phase boundary are uttered as a cohesive entity. This cliticization shows effects of cyclic spell-out, or phonological word adjunction, as discussed in Section 3 and 6.

This account of Cupeño stress is of interest on its own, but I argue below that this is not an isolated instance of the phonological phase, or word-internal phase-effects. In the following sections, I argue that what is known in the literature as Turkish Exceptional Stress is also the result of the phonological phase. As Turkish and Cupeño are unrelated, the argumentation below offers evidence of the cross-linguistics significance of the theory proposed in this work.

8. TURKISH STRESS

In this and the following sections, I will discuss Turkish Exceptional Stress and offer a phase based analysis like the one seen above for Cupeño that avoids stipulating special stress properties to specific morphemes. This analysis follows Kornfilt’s (1996) analysis of Turkish ‘small words’, but adds to it a unification of all Turkish verbal inflectional morphemes that cause exceptional stress to surface. The data is also consistent with a cyclic spell-out analysis, as noted previously by Inkelas & Orgun (2003) with their INNERMOST rule. First, let us look at regular Turkish lexical stress. Turkish stress is almost invariably word-final, as seen below.

(45) *Regular Turkish Stress*

- | | | |
|-----------------------|----------------------|---------------------------|
| a. kitap | ‘book’ | |
| b. kitaplík | ‘bookcase’ | |
| c. kitaplíklár | ‘bookcases’ | |
| d. kitaplíklarím | ‘my bookcases’ | |
| e. kitaplíklarímíz | ‘our bookcases’ | |
| f. kitaplíklarímízdán | ‘from our bookcases’ | (Kabak & Vogel 2001: 316) |

Exceptional stress is defined as those cases where stress appears in non-final position within the word.

- (46) a. kabá-y-di-lar
rude-COP-PAST-3PL
‘They were rude.’
- b. kal-dí-y-sa-níz
stay-PAST-COP-COND(high)-2PL
‘If you have stayed, ...’
- c. gél-me-di-niz
come-NEG-PAST-2PL
‘You didn’t come.’
- d. sakla-n-di-lár-da
hide-RECIP-PAST-3PL-CONN
‘They also hid (themselves).’

(Kabak & Vogel 2001)

The following affixes,¹⁷ seen in (47), which trigger the exceptional stress pattern seen above, have been alternately analysed as ‘pre-stressing’ (Inkelas & Orgun 2003), as ‘prosodic word adjoining’ (Kabak & Vogel 2001) or as unstressable (van der Hulst & van de Weijer 1991). The one non-phonological account in the literature, Kornfilt (1996), discusses the copular pre-stressing morphemes, and their effect on stress, and touches on the question marker and the negator, but does not discuss the morphemes *-ki*, *-dA* or *-(y)ken*. In the following sections, I expand on Kornfilt’s analysis of the copular morphemes and offer a unified analysis of the entire list of pre-stressing morphemes below.

(47) Turkish pre-stressing verbal inflectional morphemes

- | | |
|------------|---------------------------------|
| a. -Dir | epistemic copula |
| b. -y | copular clitic (full form: i) |
| c. -mI | yes/no question marker |
| d. -dA | clausal coordinator |
| e. -ki | complementizer |
| f. -mA | negative |
| g. -(y)ken | ‘when-adverbial complementizer’ |

¹⁷ Nominal affixes will be discussed in future work.

9. KORNFILT (1996)

Kornfilt (1996) argues for the existence of the copular clitic seen in (47b). In doing so, she gives arguments for complex Turkish verbs having two separate morpho-syntactic domains; the root+low aspect markings (participles) and the copula+high tense/aspect markings, as seen in (48). These are separate domains for stress assignment.

- (48) [kal-dí] [y-sa-niz]
 [stay-PAST] [COP-COND(high)-2PL]
 ‘If you have stayed, ...’

In this section, I briefly review Kornfilt’s argumentation, but before I do, a few comments are in order, differentiating the scope of this work from that of Kornfilt (1996). Kornfilt’s argument focuses on providing evidence for the complexity of the Turkish verbal word. She offers both syntactic and phonological evidence, as we will see below. I argue that the verbal word in Turkish, like in Cupeño, is cyclically assigned a phonological form, and that the relevant cycles correspond to syntactic phases. This allows us to unify the facts given by Kornfilt regarding the placement of the copula, *-y*, the epistemic copula, *-Dir*, the negative copula, *değil*, and the question marker, *-mi*, with the behaviour of the complementizers, *-ki* and *-(y)ken*, and the clausal co-ordinator, *-dA*.

9.1 EXCEPTIONAL STRESS ~ PHRASAL STRESS

I review here the arguments given in Kornfilt (1996) for the separation of the complex Turkish verbal word into participial+inflected copula. In Section 10 and 11, I relate the data introduced by Kornfilt to the analysis offered here, namely that these stress facts are caused by phases in the syntax. In her conclusion, Kornfilt briefly notes that Turkish exceptional stress behaves like phrasal stress. Phrasal stress in Turkish falls on the leftmost element in a domain. As the complex verbal word in Turkish has multiple stress domains, it is therefore unexceptional that the leftmost (participial) domain receives main stress.

9.1.2 PHONOLOGICAL EVIDENCE

In informal speech, the complex verbal constructions under investigation here are uttered as one ‘word’. These constructions have often been analyzed as having a non-standard stress pattern in that stress is not word-final. Kornfilt argues that these verbal complexes are made up of more than one syntactic word, and should therefore be treated on a par with phonological phrases, containing more than one phonological word. Exceptional stress is therefore expected in these constructions, as they consist of two (or more, see Section 10.2) stress domains, or phonological words. All of the examples in the following sections, unless stated otherwise, are taken from Kornfilt (1996).

- (49) /gid-ecék i-ti-m/ [gidecéktim]
 go-FUT COP-PAST-1SG
 ‘I will have gone.’

The first stress domain, consisting of all elements preceding the copula, is a participle. The second stress domain consists of the copula and its suffixes. Kornfilt notes that stress here is,

in fact, word final in slow formal speech, as the participial and copula complex are pronounced separately. These constructions demonstrate that the verbal complex consists of two separate phonological words, which may be pronounced as two words (50) or as one phonological word with the second cliticized to it (49).

- (50) /gid-ecek i-ti-m/ [gidecék idím]
 go-FUT COP-PAST-1SG
 'I will have gone.'

The epistemic copula *-Dir*, and the negative copula, *değil*, are in complementary distribution with the copula *-y*. *-Dir* is also pre-stressing. The negative copula, on the other hand, is never cliticized to the participial domain, and, therefore, negative copular constructions do not pose a problem for the generalization that stress is word-final in Turkish.

- (51) *-Dir*
 /gid-ecek-tir/ [gidecékítir]
 go-FUT-EPI.COP
 'She will definitely leave'
- (52) *değil*
 /gid-ecek değil-im/ [gidecék değilím]
 go-FUT NEG.COP-1SG
 'I will not go'

As we can see, the complex verbal word consists of two phonological words, and therefore the fact that stress falls on the leftmost P-Word must be accounted for. In Turkish, phrasal stress falls on the leftmost P-Word as seen below in (53). In (49) above, stress is predicted to fall before the copula, if the verbal complex is treated as a phonological phrase.

- (53) Hasan bugün [_{VP} istakóz ye-di]
 Hasan today lobster eat-PAST
 'Hasan ate (a) lobster(s) today' (Kornfilt 1997: 505)

Therefore, at PF, the complex Turkish verb is treated, not as a phonological word, but as a phonological phrase. The fact that stress is final in the first stress domain of the phrase is fully consistent with the Turkish phrasal stress system.

9.1.3 SYNTACTIC EVIDENCE

Kornfilt also offers syntactic evidence that the participial and inflected copula of the complex verb in Turkish are separate words. This evidence comes in two forms. Firstly, the domain of exceptional stress and the domain singled out by suspended affixation constructions are identical. Secondly, the pre-copular forms can stand alone as participial predicates.

Suspended affixation in Turkish¹⁸ is a conjunction of two forms, where inflection surfaces only on the rightmost form, as below. In the (b) examples we can see that this suspension of affixation is optional – as both forms may be inflected

¹⁸ See also Kabak (2000) for a discussion of Turkish suspended affixation as conjoined AspPs.

- (54) a. hasta ve yorgun-du-m
sick and tired-PAST-1SG
'I was sick and tired.'
- b. hasta-di-m ve yorgun-du-m
sick-PAST-1SG and tired-PAST-1SG
'I was sick and tired.'
- (55) a. gel-miş ve git-miş-tir-Ø
come-PERF and go-PERF-EPI.COP-3SG
'She has definitely/most probably come and gone'
- b. gel-miş-tir-Ø ve git-miş-tir-Ø
come-PERF-EPI.COP-3SG and go-PERF-EPI.COP-3SG
'She has definitely/most probably come and gone'

This construction is illicit when trying to conjoin all verbal forms that do not correspond to the pre-copular/adjectival stress domain seen above. In (55), the first conjunct is a participial, or pre-copular, verb form. In (56), however, the first conjunct is not a participle. The simple past tense verbal paradigm is not constructed with a copular verb, but rather the tense marker *-Di* is affixed directly to the verb root. The juncture between the tense marker and the agreement affix *-k* is not a licit target for the suspended affixation construction.

- (56) *yap-ti ve sat-ti-k
make-PAST and sell-PAST-1PL
For 'We make (them) and sell (them)' (Kabak 2000: 3)

Participial predicates can also stand on their own, as nominal modifiers, while forms that do not correspond to the pre-copular morphological domain may not.

- (57) kitab-i oku-yacak kız
book-ACC Read-FUT girl
'The girl who will read the book'
- (58) *oku-du kişi
Read-PAST person
'The person who read'

In (57) above, the affix, *-yacak* 'future', falls in the pre-copular domain when in a verbal construction. The affix, *-du* 'past', on the other hand, when in a complex verbal construction in Turkish, is affixed to the copula. */-du/*, then, is not a participial affix and when affixed to a verbal root, is not able to modify a noun.

10. TURKISH EXCEPTIONAL STRESS IS PHASAL

In this section, I offer an analysis of Turkish Exceptional Stress that accounts for not only the copular affixes seen in the discussion of Kornfilt (1996) above, but also accounts for the behaviour of the complementizers, *-ki* and *-(y)ken*, and the co-ordinator, *-da*. I show that what unifies the copular 'pre-stressing' morphemes with *-ki*, *-(y)ken* and *-da* is that each of these morphemes is sitting in the head of either vP or CP, Chomsky's strong phases. It is this

common syntactic position that causes the exceptional stress facts in Turkish. It is of interest here that the pre-stressing and epenthesis affixes in Cupeño also seem to be fairly unified as to the syntactic positions that house them, indicating possible additional phases, but this similarity will be left for further research.

One of the basic claims of Kornfilt (1996), that the pre-copular domain in exceptional stress systems is an adjectival participial, largely anticipates the analysis in this section. The focus here, differentiating this work from that of Kornfilt, is on why the copula surfaces, and what causes the participial form to be realized as a separate domain for stress. Certain verbal paradigms in Turkish, such as the conditional and the past, differ from the participle+copular domain forms discussed in Section 9 in that they constitute a single domain for stress. In this section the cause of this division among verbal paradigms is explored. In addition, the analysis herein is able to unify Kornfilt's proposal with the fact that it is almost universally morphemes in v^0 and C^0 that affect the stress system of Turkish in an exceptional way. The behaviour of the negative morpheme, *-mA*, and the question marker, *-mi*, will be proposed to be consistent with the analysis of the v^0 and C^0 morphemes in Section 12.

10.1 LOW VS. HIGH VERBAL MORPHOLOGY

We have seen above that there appears to be two separate domains for verbal morphology in Turkish. The lower domain attaches to roots and produces participles, and the higher domain attaches to copulas and is followed by agreement morphology. Here, I discuss the reason for this split. In Cinque (2001), it is noted that some verbal affixes appear to attach in two different places. In these positions, the affixes are attached to either the participle or to the copula, as seen with *-(y)abil* below.

- (59) a. *Low reading : root modal 'ability or permission'*
 oku-ya-ma-m
 read-ABIL-NEG-1SG
 'I am unable to/not permitted to read'
- b. *High reading: alethic modal 'possibility'*
 oku-ma-yabil-ir-im
 read-NEG-ABIL-AOR-1SG
 'I might not read; it is possible that I do not read'
- c. *High and low reading*
 oku-ya-ma-yabil-ir-im
 read-ABIL-NEG-ABIL-AOR-1SG
 'I might be unable to read; It is possible that I shall be unable to read'
- (Cinque 2001:48, from Kornfilt 1997:375)

Cinque argues that this pattern is only apparent, and that these morphemes are in fact heading different syntactic projections depending on whether they are being attached in a low position (to the participle) or in a high position (to the copula), although he does not make reference to either the copula or the participle, but rather to the cross-linguistic positions of the projections headed by these affixes.

Of note here is the fact that the affixes that can appear more than once within the same form generally appear once in the pre-copular domain and once in the post-copular domain. Cinque does not include the position of the copula in his hierarchy, but once this is done, a

distributional pattern begins to emerge. This pattern is also the focus of Sezer (2001), who argues for three different hierarchical positions for Tense/Aspect morphology in Turkish.

Further evidence for this distributional pattern comes from the affixation of adjectival roots, and the copular verb, *-ol* 'be, become'. As seen in (54) above, and in the examples below, adjectival roots are affixed on a par with the participial forms in a verbal complex.

- (60) *adjective*
 kabá-y-di-lar
 rude-COP-PAST-3PL
 'They were rude'
- (61) *participle*
 kal-dí-y-sa-niz
 stay-PAST-COP-COND(high)-2PL
 'If you have stayed, ...'

In both of these constructions, the Tense/Aspect/Mood morphemes may not be directly affixed to the adjectival or participial root, but rather must be mediated by the copula. There are, however, some forms to which these 'high' morphemes may be directly affixed. In these constructions, the TAM morphology is affixed directly to a verbal root.

- (62) git-tí-m
 go-PAST-1SG
 'I went.'
- (63) git-sé-m
 go-COND-1SG
 'I would go.'

Kornfilt, among others (e.g. Good & Yu 1999) notes the dichotomy between the past and conditional paradigms and the participial-copula constructions. What is not discussed is why it is these simple verbal words that are the ones that do not require a copula to intervene when the Tense morphology is affixed. This is discussed further in the following section.

10.2 TURKISH VPS

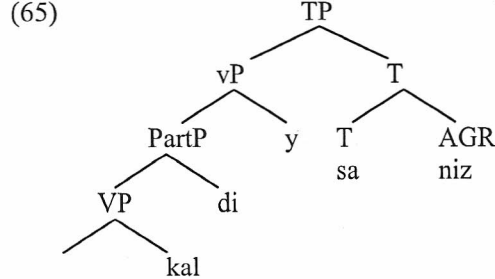
Let us recap the distributional nature of the two classes of Turkish morphology under consideration here. The low, participial morphology can only affix to a participial root. It cannot affix to the copulas, *-y* or *-Dir*, or to an adjectival root. The high, copular morphology can only attach either to the copulas, *-y* and *-Dir*, or to a verbal root with no participial morphology. It cannot affix to an adjective or to the participial morphology.

I would like to suggest that this split can be explained by appealing to the selectional restrictions of the affixes in question. The participial morphemes have the selectional restriction that they may only attach to a bare root, or to another participial morpheme. Kabak (2000) proposes that these participial morphemes project an Aspect Phrase, and I use this term here. AspP may not attach to an adjective, or to a verbal element. The projection that is the complement of AspP, then, must be either unspecified (Root) or AspP.^{19,20}

¹⁹ These morphemes may attach to passive/causative morphology. This may pose a problem for the

The high morphemes, on the other hand, select for a verbal complement, or vP. There is evidence that each non-participial inflectional morpheme in the verbal domain is hosted by a copula (Sezer 2001). I assume that high morphology, which I will call Tense, can select for vP or TP. If it is the case that each Tense morpheme is affixed to a copula, then the selectional restriction is even tighter, where Tense morphemes select for a vP complement only. This type of analysis would not affect the main stress facts presented here, so in the interest of space it will not be discussed. Under the assumptions put forth here, the copulas, *-y* and *-Dir*, are light verbs, projecting a vP. This is illustrated in (61), repeated here as (64) where PartP is a cover term for the position of any participial morphology, and TP is the position of any high verbal inflection.

- (64) kal-dí-y-sa-niz
 stay-PAST-COP-COND(high)-2PL
 ‘If you have stayed, ...’



At this point, I have proposed that the ‘pre-stressing’ morphemes, *-y* and *-Dir*, are light verbs. There are still five of the ‘pre-stressing’ verbal inflectional morphemes to be discussed. In the next section, I show that the morphemes, *-(y)ken*, *-ki* and *-dA*, can be linked to a single syntactic position. In Section 11, I demonstrate how exceptional stress in Turkish follows from a theory of spell-out that assumes syntactic phases, and that, because of these phases, the morphemes that have been proposed to pre-stress are each in a separate phonological domain from their complements. Following that, I return to a discussion of the yes/no question clitic, *-mI*, and the negative morpheme, *-mA*.

10.3 TURKISH CPs

The complementizer, *-ki* ‘that’, introduces subordinate clauses. It takes a clause as its complement, but surfaces as an affix to the verbal complex. If there is a copula (vP) morpheme to its left, or the negative or yes/no question markers, the exceptional stress properties of the complementizer is not evident, as shown in (66a). If there is no vP morpheme though, stress will fall to the left of the complementizer, as in (66b).

analysis here, but this will be left for further research.

²⁰ See also Sezer (2001) for a detailed proposal regarding the selectional restrictions of Turkish verbal morphology.

- (66) a. Ahmet bıl-**mi**-yor-du-**ki**
 Ahmet know-NEG-PROG-PAST-COMP
 ‘Ahmet didn’t know that...’ (Jaklin Kornfilt p.c.)
- b. duy-dú-k-**ki**
 hear-PAST-1PL-COMP
 ‘We heard that...’ (Kornfilt 1997: 439)²¹

This behaviour is also true of the co-ordinator, *-da*. The function of this morpheme is to co-ordinate two clauses, and like *-ki* surfaces as a suffix on the verbal construction to its left.

- (67) sakla-n-di-lár-**da**
 hide-RECIP-PAST-3PL-CONN
 ‘They also hid (themselves)’ (Kabak & Vogel 2001: 317)

The morpheme, *-(y)ken*, is labeled by Sezer as an adverbial complementizer. When affixed to the verb it means ‘while’. I assume *-(y)ken* to be sitting in CP, but this may not be the case, as it only attaches to adjectives and participals. It does not, however allow further suffixation. For a more complete discussion of the distribution of *-(y)ken* see Sezer (2001). If this form is not a CP, but rather a copula-affix sequence (*i-ken*) then it is not problematic, and falls under the discussion in Section 10.2.

- (68) kalk-mış-**ken**
 rise-PERF-while
 ‘While you are up....’ (Sezer 2001: 9, slightly modified)

These three morphemes can be unified syntactically in that they are either heading a CP projection, in the case of the complementizers, *-ki* and *-(y)ken*, or possibly sitting just above the clause, in the case of the conjoining morpheme, *-da*. The fact that agreement morphology (linked to TP) cannot be suffixed to these forms is further evidence that these morphemes are not lower in the clause. The exact projection in which the clausal co-ordinator is sitting may be CP, or may be adjoined to CP. Determining this will not be of direct concern here, and must await further research. For the purposes of this section, I assume *-da* to be projecting a CP, but if it is adjoined to a null CP then the stress facts will follow just as well. What is important here is that the complement of CP, the highest TP, is the domain in which stress is determined, as will be shown in the following section.

11. THE PHASAL NATURE OF EXCEPTIONAL STRESS IN TURKISH

Kornfilt (1996) argued that stress is computed at the word level, and that the participles are ‘small words’ that constitute a separate syntactic and phonological domain in Turkish. This successfully accounted for the distribution of stress in these constructions, but not for the behaviour of the CP morphemes in the previous section, which do not constitute separate words. The analyses of Kabak & Vogel (2001), Inkelas & Orgun (2003) and van der Hulst &

²¹ Example slightly modified, Kornfilt does not commit to the affixal nature of *-ki*, but does indicate stress.

van de Weijer (1991), to be discussed in Section 12, attempt to account for Turkish Exceptional Stress within the Phonological component of the grammar alone. Each of these accounts offers a complete analysis of the verbal inflectional morphology herein, yet does not address the question of why these morphemes, and not others, are responsible for exceptional stress.

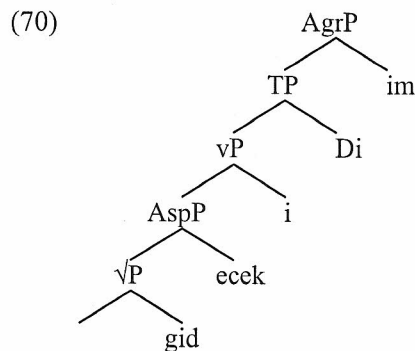
In this section, I present an explanation for Turkish exceptional stress that accounts for the distribution of verbal ‘pre-stressing’ morphemes in the language, as well as an account of why the participial forms must be separate from the copular domain, and therefore have to constitute a separate domain for stress. I then compare this analysis to the proposals of Kabak & Vogel, Inkelas & Orgun and van der Hulst & van de Weijer.

To do this, I first go through a derivation of the participle-copula construction, and then go through a construction without the copula, but including a CP morpheme. Afterwards, I examine the clitic-like nature of the copular complex.

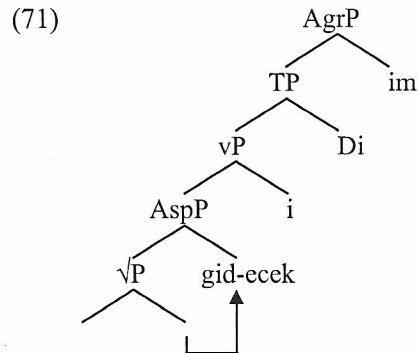
Let us take the following example as a starting point.

- (69) gid-ecék-i-ti-m
 go-FUT-COP-PAST-1SG
 ‘I will have gone.’

Here, we see that stress is exceptional in that it falls in the middle of the ‘word’, rather than at the end. To explain this phenomenon, we must look to the structure of the ‘word’ in question. Below is a tree diagram depicting the original projection sites of each affix. As discussed above, the participial morphemes project an AspP, while the copular morphemes project a Tense Phrase (TP). These are merely labels to differentiate the two classes (see Cinque 2001 for a more detailed discussion of the nature of the projections that may be involved).



Now, as each of the morphemes heading either AspP or TP never surface as free-standing items, I assume that each is affixed to a root via raising of this root into the head projected by each AspP or TP morpheme. As discussed above, each morpheme imposes selectional restrictions on its complement, thereby restricting the type of host that may raise to it. The AspP affixes select for AspP, or a root (V^0), and therefore the root and the low affixes may raise successive cyclically to the highest AspP, as seen below.



We now are faced with a problem. Let us assume that no little *v* morpheme has been selected in the numeration. We would have a structure like the one above, except the participle would be directly dominated by a TP morpheme. In this case, the participle cannot raise to TP, since it violates the selectional restrictions of */-Di/*. If it were to raise at the end of the derivation (or at some point during), the derivation would crash. If, on the other hand, the participle does not raise the features of the TP affix checked through raising will not be deleted, and the derivation will still crash.²²

To save this derivation, a numeration must be selected that includes a *vP* lexical item, resulting in the tree above in (71).

Here, the derivation has culminated in a phase, *vP*. This causes the complement of *vP*, *AspP*, to be sent to the phonological and logical interfaces, *PF* and *LF*. We do not concern ourselves with the *LF* component here. At this point, the *PF* component receives the form */git-ecek/*, and assigns it final stress according to the lexical stress rule of Turkish, which assigns stress to the final syllable of the word. If we go back to the tree, the light verb, */-i/* may now raise to *TP*, satisfying the selectional restrictions of the *TP* head. At the end of the derivation, the copular construction will also be sent to *PF*, and will receive final stress.

(72) $[[\text{gid-ecék}]_{\text{PW}} \text{ i-tí-m}]_{\text{PW}}$

What happens to this second stress, and the clitic-like nature of the *vP+TP* domain, is discussed in Section 8.1, below.

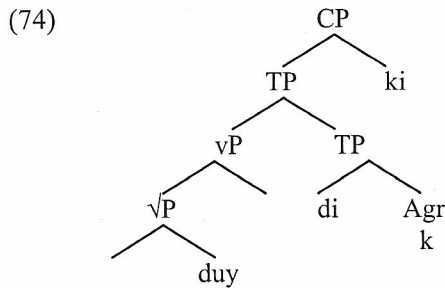
We now turn to a derivation in which there is no copula, but where there is a complementizer, here */-ki/*.

(73) *duy-dú-k-ki*
 hear-PAST-1PL-comp
 ‘We heard that...’

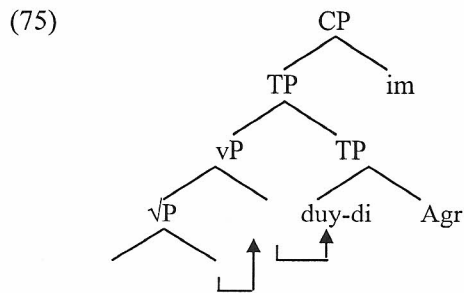
Again, in the example above, stress is exceptional in that it is non-final. In this case, however, there are no participial morphemes in the construction, and therefore there are no *AspP*

²² It must also be the case that the participle cannot raise through *vP*, becoming verbal and therefore being able to host *TP* affixes. This will be assumed here to be due to the selectional restrictions of v^0 , barring raising of a non-root head into *vP*.

projections in the structure. The tree below indicates the original merger sites for each of the lexical items involved.



Here the first innermost lexical item is the root /duy/, and it is dominated by vP. This root may not be dominated by TP directly, because then the syntactic category of /duy/ will not be determined, and the selectional restrictions of TP will not be met. Since vP in this case is empty (or phonologically null with an affix feature), the root raises into v⁰. At this point, vP sends its complement to PF, but the root has ‘escaped’ spell-out in this phase through raising. The root v⁰ then raises to TP. Now, why does the T⁰ not continue raising into CP? If /-ki/ has no features to check, then raising is not motivated – I assume this to be the case. At this point, another phase has been constructed, and the complement of CP (i.e. TP) is sent to PF.



The phonological component then assigns final word stress to /duydík/. At the end of the derivation, /-kí/ is also sent to PF, and assuming it to be treated by the system as a word as well, it also receives stress.

(76) [[duy-dú-k]_{PW} kí]_{PW}

The two forms discussed here in (69-72) and (73-76) then enter the post-syntactic system as /gidecék-itím / and /duydík-kí/, respectively.

11.1 POST-SYNTACTIC PF: P-WORD ADJUNCTION AND STRESS

Neither of the forms in (72) and (76) above surface with the two stresses indicated, except in one instance. When the participle and copula constructions in examples like (72) are pronounced as separate phonological words, they each receive final stress in the positions indicated. When the copula construction in (72), as is always the case with the complementizer *-ki* in (76), is pronounced together with the participle or the verb, only the leftmost stress surfaces. In these instances, I propose, following Kabak & Vogel (2001) (henceforth K&V), that the phonological structure created involves prosodic word adjunction, just like in the discussion for Cupeño.

The crucial difference between the two analyses is that K&V propose that this P-Word adjunction is due to the idiosyncratic nature of the pre-stressing affixes (see Section 12), while this analysis offers a unified and principled account of the constructions, where the syntactic position of these affixes is the cause of the exceptional stress facts. The cause of P-Word adjunction is not well understood, and I do not have much to say about it here. The adjunction of *-ki* (or *-dA*) could be due to the small size of the morpheme; it may be too small to be a phonological word on its own, but this is not necessarily true of *-(y)ken*. The adjunction of the copula and its affixes to the participle however is optional, and therefore cannot be forced by phonological constraints.

Whatever the reason for this adjunction, the entire P-Word created, like any P-Word, can only have one main stress. That stress cannot surface on the rightmost position is because this would result in there being no main stress on the leftmost/innermost P-Word. This stress is consistent with an analysis that assumes spell-out from the inside-out, with the stress on the inner P-word essentially blocking the stress on the outer P-Word. These two accounts mirror each other, and, therefore, I follow Inkelas & Orgun (2003) in assuming that it must be the innermost, not the leftmost, stress that surfaces.

Regardless of the choice of innermost over leftmost, we must assume a second phonological computation that is responsible for both adjunction and the subsequent choice of main stress placement in Turkish, and since this stress placement is consistent with the stress in phrases, it may be computed at the same time. In the derivational schema in Figure 2 (Section 2.2), the convergence point of the multiple PF components would be the locus for these operations.

12. *-mI* (Q) AND *-mA* (NEG)

I have now accounted for the behaviour of all of the pre-stressing morphemes listed in (47), except two. Neither the yes/no question marker, *-mI*, nor the negative morpheme, *-mA*, are heads of vP or CP, yet stress on the verbal word invariably falls to their left. I do not assume the yes/no question marker to be in CP, since it can surface between the participle and the copula, while the CP affixes discussed in Section 10 only appear dominating TP. All that I have to say here about these morphemes is brief but is, I believe, the correct direction to follow.

The analysis in Kornfilt (1996) of the question marker is sketched out and adopted here. The yes/no question marker, *-mI*, may surface in two verbal positions, at the left edge of AspP in (77a), or TP (77b).

- (77) a. gid-ecék-mi-siniz
 go-FUT-Q-2PL
 ‘Will you go?’ (Kornfilt 1996)
- b. gel-di-niz-mi
 come-PAST-2PL-Q
 ‘Did you come?’ (Kabak & Vogel 2001: 317)

It may also be affixed to an adjective (78a), or a noun (78b).

- (78) a. hastá-mi-siniz
 sick-Q-2PL
 ‘Are you sick?’
- b. adám-mi
 man-Q
 ‘A man?’

It is apparent that the question marker is parasitic on domains that are treated as independent stress domains regardless of whether *-mI* is present. Kornfilt argues that this morpheme cliticizes to the smallest domain available. The smallest domain in (77a) is the complement of a null copula (AspP); the smallest domain in (77b) is TP. In (77a), *-mI* cannot be affixed outside the agreement morpheme at TP, since the smaller copular domain is available. In (77b), the verb has raised to TP, and, therefore, the smallest spell-out domain is TP. In (78a), a null copula must again be present to mediate the agreement affixation on the adjective, and, in (78b), the noun, as seen in the regular stress examples in (45), is an independent stress domain. The question marker, therefore, seems to behave as a true clitic, with its distribution dependent on a phonological rather than a syntactic domain. How exactly this is accomplished by the derivational system is beyond the scope of this paper.

The negative morpheme, *-mA*, attaches to an even lower domain than the domain imposed by the vP copula. It can attach to the verbal root,

- (79) gít-**me**-yeceğ-im
 go-NEG-FUT-1SG
 ‘I will not go.’

to the passive morpheme,

- (80) at-íl-**ma**-di-lar
 throw-PASS-NEG-PAST-3PL
 ‘They were not thrown away.’ (Kabak & Vogel 2001: 320)

or to a verbal derivational morpheme.

- (81) kara-lá-**ma**-di-niz
 black-VBL-NEG-PAST-2PL
 ‘You didn’t blacken it.’ (Kabak & Vogel 2001: 326)

When the entire participial domain is negated, the negative copula *değil* is used. As *değil* heads a vP projection, I propose that *-mA* does as well. If we assume that the complement of NEG does not raise, then the phonological independence of the pre-negative domain follows the discussion above in Section 10. As a vP phase, NEG will send its complement to PF and LF. That negation should do this does not, to me, seem odd. *-mA*, like *değil*, must negate its complement. Chomsky (1999) proposes that phases are propositions. Negation is of the semantic type that reverses the truth value of a proposition, and therefore takes a proposition (or rather its truth value) as its complement. It may well be then that, if this truth value is syntactically represented as dominating the proposition, the phase is a null position below the negative head. Either way NEG will be the first affix dominating a spell-out domain.

These proposals are obviously preliminary, and need more rigorous semantic investigation, but seem to me to point to the direction to take here.

The exception to the pattern above, where the pre-AspP domain is the complement of *-mA*, is that this negator may also appear affixed to the low abilitative affix *-(y)abil*.

- (82) oku-ya-**ma**-yabil-ir-im
 read-ABIL-NEG-ABIL-AOR-1SG
 'I might be unable to read.' (Cinque 2001: 48)

This low abilitative, as can be seen above, is followed by the aorist affix *-ir*. This affix is one that is considered to be part of the participial morphology. As this is the case, I must assume either that *-mA* can attach anywhere in the participial domain, or that the low *-(y)abil* is sitting in the lower domain, where the passive is included.

In this section, I have argued that neither the yes/no question marker *-mI* nor the negative morpheme, *-mA*, constitute counter-examples to the phase-based approach to Turkish exceptional stress proposed herein. Recognizing that the behaviour of these affixes needs further research, I have argued that the question marker cliticizes to the lowest spell-out domain available, while the negative marker is another instance of vP and therefore compels its complement to surface as an independent stress domain.

13. PREVIOUS PHONOLOGICAL ACCOUNTS

Section 11 alluded to previous phonological accounts of Turkish Exceptional Stress. The proposals of Kabak & Vogel (2001), Inkelas & Orgun (2003) and van der Hulst & van de Weijer (1991) are all able to account for the Turkish Exceptional Stress patterns, but each involves certain stipulations that are, by nature, non-optimal solutions to the problem at hand. In light of the discussion above, the problems encountered by these accounts are discussed below.

Inkelas and Orgun (2003) (henceforth I&O) analyze the affixes in (47), repeated here as (83), as pre-stressing.

(83) *Turkish pre-stressing verbal inflectional morphemes*

- a. -Dir epistemic copula
- b. -y copular clitic (full form: i)
- c. -mI yes/no question marker
- d. -dA clausal coordinator
- e. -ki complementizer
- f. -mA negative
- g. -(y)ken 'when-adverbial complementizer'

This property is stipulated as part of the lexical entry for these affixes. These affixes are proposed to have a trochaic foot structure, that is wider than the morphemes themselves, and it therefore hangs over by one syllable on the left edge. This 'extra' syllable carries stress.²³

(84) *Inherent Trochaic Foot*

(*)
 σ σ
 -ki

When a Pre-Stressing affix like the one above is affixed to a stem, this pre-specified foot dominates the preceding syllable and causes it to surface as stressed.

There are two problems with this account. The first, as mentioned, is that these affixes constitute a natural class. Like for Cupeño, I have argued that the pre-stressing property of these affixes can be derived from the computational system. Therefore idiosyncratic lexical specification is not necessary here. The second problem has to do with what occurs when two pre-stressing morphemes are adjacent. If they are both assigned a trochaic foot, then these feet will overlap. I&O do not mention what recourse the phonology has to remedy such a situation.

I&O's account is, however, consistent with the cyclic spell-out view discussed herein. I&O introduce the rule INNERMOST or INPUT WINS, to account for the fact that the most deeply embedded morpheme with exceptional stress will decide the position of stress in the entire word.

- (85) /güzel-leş-tir-me-di-y-se-ler-de/ → güzel-leş-tír-me-di-y-se-ler-de
 beautiful-VBL-CAUS-NEG-PAST-COP-COND-PL-PRT

The second account to be reviewed here, that of van der Hulst & van de Weijer (1991) (henceforth vdH&vdW), proposes that the morphemes in (83) are unstressable. In their account stress is assigned cyclically to each affix that is attached to the stem. After each cycle of stress assignment, a stress clash avoidance rule deletes the leftmost stress. This procedure pushes the word stress to the right edge of the word. Unstressable morphemes interrupt this process. There is no clash resolution, and the stress to their left is not deleted.

²³ I&O propose that all non-standard stress in Turkish involves a pre-specified trochaic foot. This is taken to explain the fact that exceptional stress in Turkish is never final. It is unclear to me why this fact needs accounting for. As regular stress in Turkish is final, any final stress should be interpreted by the speaker as regular, based on the overwhelmingly regular stress pattern of the language.

- (86) *stepwise stress* (kal-dí-y-sa-niz)
- | | | | |
|----|-----------------|-------------------------|-------------------|
| 1- | kál | | |
| 2- | kál-dí | stress clash resolution | → kal-dí |
| 3- | kal-dí-y | no resolution | |
| 4- | kal-dí-y-sá | no resolution | |
| 5- | kal-dí-y-sá-níz | stress clash resolution | → kal-dí-y-sa-níz |
| 6- | | delete rightmost stress | → kal-dí-y-sa-niz |

Stress continues to be assigned to all morphemes following the unstressable morpheme, until the word is completed. vdH&vdW therefore need, like my analysis in Section 10, a post-lexical rule that deletes the rightmost of two word stresses. The problematic aspect here is, like I&O, for vdH&vdW, the pre-specified stressless nature of the affixes in (83) is arbitrary, rather than following from syntax.

The third account, offered by K&V, has this problem as well, although they get, in my opinion, closest to the correct analysis. K&V stipulate that the affixes in (83) are Prosodic Word Adjoiners (PWAs).²⁴ Unlike in Peperkamp (1997), who proposes that clitic groups adjoin to the phonological word, these affixes are not assumed in K&V's account to constitute a natural class. These PWAs cannot attach inside the phonological word, but rather must adjoin to it. Since, in Turkish, default stress is assigned to the final syllable of the phonological word, K&V capture the distribution of Turkish Exceptional Stress.

- (87) [[sakla-n-ír]_{PW}-Ø-di-niz]
 hide-RECIP-AOR-COP-PAST-2PL
 'You used to hide (yourselves).'

Again, the main flaw here is that these PWAs are stipulated as such, without any suggestion as to why this should be so.²⁵ In fact, K&V state explicitly that PWAs do not form a morpho-syntactic natural class.

It has previously seemed problematic that certain suffixes and clitics have similar types of idiosyncratic stress properties since they do not form a natural class either morphologically or syntactically. By considering these items in terms of a single phonological property, however, we are now able to identify a natural class, albeit one that is independent of their morphological and/or syntactic properties. The crucial property, as we have demonstrated, is that the set of suffixes and clitics in question attaches by adjunction to a Phonological Word. (Kabak & Vogel 2001: 332)

It is assumed, in all of the previous accounts briefly discussed above, and stated explicitly in K&V, that the group of pre-stressing morphemes in Turkish are a morpho-syntactically random group of affixes with idiosyncratic phonological properties. In Sections 10-12, I showed that these affixes are expected to be exceptional within the theory proposed in this

²⁴ Piggott (2004) motivates Prosodic Word Adjunction on purely phonological grounds. His account however, is tied to the nature of extrametricality, and cannot be extended to the Turkish data.

²⁵ Kabak (2000) alludes very briefly to the fact that possibly something more morpho-syntactic may be affecting the Turkish stress patterns discussed here.

paper. No lexical pre-specification of phonological features is needed to account for Turkish Exceptional Stress since these affixes do form a morpho-syntactic class. They are those morphemes that, like the light verbs in Cupeño, fall just outside of a spell-out domain. The principled reason for the affixes in (84) to be ‘prosodic word adjoining’ is that each sits in either vP or CP.²⁶

14. SUMMING UP

In the previous section I have argued for a phase-based account of Turkish Exceptional Stress. The ‘pre-stressing’ morphemes in the verbal inflectional system are not a morpho-syntactically random selection of morphemes with non-canonical phonological behaviour, as suggested in previous phonological literature, but rather form the natural class of those morphemes that (with the possible exception of the question marker - argued to be a true clitic) head Chomsky’s strong phases, vP and CP. Since the complements of vP and CP are sent to the phonological interface system separately from their heads, it is unsurprising that there should be a word-internal phonological boundary preceding the suffixes in question. The fact that there is more than one phonological domain in complex Turkish verbs has been argued previously by Kornfilt (1996). In this work, I have expanded on this observation, showing a previously unreported distributional pattern, where these phonological domains occur only where predicted by the theory of phases.

This fact, unified with the analysis of Cupeño in Section 4-7, offers a unique and principled view of how the derivational system of language can explain non-canonical lexical stress.

15. CONCLUDING REMARKS

In the introduction to this work, it was noticed that previous phonological accounts of stress in both Turkish and Cupeño involved unnecessary stipulations. In both cases these came in the form of assigning unique phonological properties to specific morphemes in the lexicon. I am not proposing here that the solution to all phonological irregularities however, can be found in the syntax, since there are many places in the derivational system –including the lexicon- where exceptional phenomena may occur. What can be taken from this work, I hope, is that when a property, such as stress, appears to lend itself to such an unprincipled account we must explore every alternative, for we will find explanations to patterns in unexpected areas of the field. That phases can affect the phonology of words is perhaps unexpected at first glance, but I hope I have shown here that this phenomenon is predicted within a theory assuming morphological and syntactic concatenation to occur in the same derivational system. I am optimistic that the account proposed herein will be able to be applied to other systems displaying unexpected phonological behavior, adding another aspect to the growing field of the syntax-phonology interface.

²⁶ Except for possibly the negative and yes/no question morphemes in Section 12.

REFERENCES

- Alderete, John. 2001a. Root-Controlled Accent in Cupeño. *Natural Language and Linguistic Theory* 19: 455-502.
- Alderete, John. 2001b. *Morphologically Governed Accent in Optimality Theory*. London: Routledge.
- Bachrach, Asaf. 2004. Accent in Cupeño. ms. MIT.
- Barragan, Luis. 2003. Movement and allomorphy in the Cupeño verb construction. In Luis M. Barragan & Jason D. Haugen, eds., *Studies in Uto-Aztecan: MIT Working Papers on Endangered and Less Familiar Languages #5*, 141-161. Cambridge, MA: MITWPL.
- Barragan, Luis & Heather Newell. to appear. Cupeño morphology is inherently stressful. In *Proceedings of WECOL 2003*.
- Bobaljik, Jonathan D. 1995. Morphosyntax: The Syntax of Verbal Inflection. PhD dissertation, MIT.
- Bobaljik, Jonathan D. 2000. The Ins and Outs of Contextual Allomorphy. *University of Maryland Working Papers in Linguistics* 10, 35-71.
- Bresnan, Joan. 1971. Sentence stress and syntactic transformations. *Language* 47(2): 257-281.
- Butt, Miriam. 2003. The light verb jungle. Paper presented at Workshop on Multi-Verb constructions. Paper presented at Multi-Verb Constructions, the Trondheim Summer School in Linguistics, Norwegian University of Science and Technology, Norway.
- Chomsky, Noam. 1999. Derivation by Phase. *MIT Occasional Papers in Linguistics* 18. Cambridge, MA: MITWPL.
- Cinque, Guglielmo. 2001. A note on mood, modality, tense and aspect affixes in Turkish. In Eser E. Taylan, ed., *The Verb in Turkish*, 47-60. Amsterdam: John Benjamins.
- Good, Jeff & Alan C. L. Yu. 1999. Suffix ordering variability in Turkish. In Jeff Good & Alan C. L. Yu, eds., *Special Session on Caucasian, Dravidian and Turkic Linguistics: Proceedings of the Twenty-Fifth Annual Meeting of the Berkeley Linguistics Society* 25: 63-74. Berkeley, CA: Berkeley Linguistics Society.
- Hill, Jane. 2003. Working drafts of 'A grammar of Cupeño'. ms. University of Arizona, Tucson.
- Hill, Jane. 2004. A grammar of Cupeño. ms. University of Arizona, Tucson.
- van der Hulst, Harry. & Joost van de Weijer. 1991. Topics in Turkish phonology. In Hendrik Boeschoten & Ludo Verhoeven, eds., *Turkish Linguistics Today*, 11-59. Leiden: Brill.
- Inkelas, Sharon & C. Orhan Orgun. 2003. Turkish stress: a review. *Phonology* 20.1: 139-161.
- Kabak, Baris. 2000. Suspended affixation in verbal co-ordinate structures in Turkish. ms. University of Konstanz.
- Kabak, Baris & Irene Vogel. 2001. The phonological word and stress assignment in Turkish. *Phonology* 18: 315-360
- Kahnemuyipour, Arsalan. 2003. Syntactic categories and Persian stress. *Natural Language and Linguistic Theory* 21:333-379.
- Kornfilt, Jaklin. 1996. On some copular clitics in Turkish. In Artemis Alexiadou, Nanna Fuhrop, Paul Law & Sylvia Löhken, eds., *ZAS Papers in Linguistics: Papers on the conference 'The word as a phonetic unit'*, 96-114. Berlin: Zentrum für Allgemeine Sprachwissenschaft.
- Kornfilt, Jaklin. 1997. *Turkish*. London: Routledge

- Legate, Julie. 2003. Some interface properties of the phase. *Linguistic Inquiry* 34(3): 506-516.
- Marvin, Tatjana. 2002. Topics in the Stress and Syntax of Words. PhD dissertation, MIT.
- Matushansky, Ora. 2003. Going through a phase. ms. CNRS/Université Paris-8.
- McCarthy, John. 2003. OT constraints are categorical. *Phonology* 20. 75-138.
- Mohanan, K. P. 1986. *The Theory of Lexical Phonology*. Dordrecht: Reidel.
- Newell, Heather. 2003. Root-Affix asymmetries: the morpho-syntax of stress in Cupeño. ms. McGill University.
- Peperkamp, Sharon. 1997. *Prosodic Words*. HIL dissertations 34, The Hague: Holland Academic Graphics.
- Piggott, Glyne. 2004. The representation of extrametricality. In Heather Newell & Yukio Furukawa, eds., *McGill Working Paper in Linguistics* 18(2), 45-88. McGill University.
- Selkirk, Elisabeth. 1984. *Phonology and Syntax: The Relation between Sound and Structure*. Cambridge, MA: MIT Press.
- Sezer, Engin. 2001. Finite inflection in Turkish. In Eser E. Taylan, ed., *The Verb in Turkish*, 1-46. Amsterdam: John Benjamins.

Heather Newell
Department of Linguistics
McGill University
1085 Dr. Penfield
Montreal, PQ H3A 1A7
Canada

heather.newell@mail.mcgill.ca

RÉSUMÉ

Dans cet article, on propose que les patrons d'accent non canoniques dans deux langues non apparentées (turc et *cupeño*) sont causés par des syntagmes syntaxiques (Chomsky 1999). Dans le cadre réalisationnel de la morphologie distribuée (Halle & Marantz 1993), les faisceaux de traits (morphèmes sans information phonologique) sont des blocs de construction utilisés par le système de dérivation syntaxique. Ces faisceaux de traits reçoivent une forme phonologique dans une composante phonologique indépendante de la grammaire. On montre que cette proposition, combinée à l'assertion que la dérivation syntaxique est construite en portions multiples, ou phases, explique les patrons d'accent non canoniques dans ces deux langues. La combinaison de ces deux théories permet l'élaboration d'un système dans lequel l'épel d'un mot est sectionné par le système dérivationnel. Dans de tels cas, les morphèmes d'un mot qui sont dominés par une frontière de syntagme seront interprétés par les composantes morphologique et phonologique indépendamment des morphèmes situés à cette frontière de syntagme ou au-dessus. On argumente que de tels phénomènes se présentent en effet, et que les patrons d'accent présentés ici sont par conséquent réguliers et attendus.