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## ROOT-CONTROLLED ACCENT IN CUPEÑO\*

**ABSTRACT.** Recent work on the nature of faithfulness constraints in Optimality Theory (Prince and Smolensky 1993) has proposed distinct faithfulness constraints for roots and affixes. The distinction between root and affix faithfulness has been employed in the analysis of the privileged status of roots in a variety of phonological systems, such as root-controlled vowel harmony. In this article, I argue that this distinction is equally important in explaining the observation in Cupeño that inherent accent in roots takes precedence over inherent accent in affixes. In addition, morphologically dispersed faithfulness is shown to be instrumental in extending the analysis beyond previous accounts, providing the right tools for the analysis of pre-accentuation and the special phonology of the nominalizer suffix.

### 1. INTRODUCTION

A fundamental observation about the accent system of Cupeño<sup>1</sup> (Uto-Aztecan) is that inherent accent in roots overrides inherent accent in affixes (Hill and Hill 1968). That is, inherently accented roots cause the deletion of accent in inherently accented prefixes and suffixes, as illustrated below.

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<sup>1</sup> Cupeño, thought to be extinct, is an Uto-Aztecan language of Southern California closely related to Cahuilla and Luiseño. The data examined in this article are drawn from Hill (1967) (H), Hill and Hill (1968) (H&H), Hill and Nolasquez (1973) (given with page.sentence number), Crowhurst (1994) (C), and a set of unpublished fieldnotes made available to me by Jane Hill (JH).



- (1) Accented Roots with Accented Affixes
- a. pə-míʔaw-lu /pə + √míʔaw + lu/  
 'He came' 3sg + COME + MOTION
- b. ʔáyu-qa /√ʔáyu + qá/  
 'He wants' WANT + PRES.SING
- (2) Unaccented Root √yax with Accented Affixes
- a. pə-yax /pə + √yax/  
 'He says' 3sg + SAY
- b. nəʔən ya-qáʔ /nəʔən √yax + qáʔ/  
 'I say' 1sg + SAY + PRES.SING

The accented roots in (1) win out over the person marker, *pə-*, and the singular present tense suffix, *-qá*, because root accent takes precedence over affix accent. Inherent accent in affixes only emerges in words containing unaccented roots, as shown in (2).

This 'predominating' nature of roots, where the features of a root take precedence over those of affixes, is not unique to accent systems. One clear parallel to the case of Cupeño is root-controlled vowel harmony. These systems require that there be a single specification for a harmonic feature; in situations where word formation brings together a root and affix with conflicting feature values, the features of the root override all others, as with root-controlled accent (see Ringen 1975 [1988] and Clements 1981). Another well-documented class of examples involves root privilege in dissimilatory processes. Rather on a par with accentual root-control, dissimilation is driven by constraints which prohibit the multiple occurrence of some feature. Interestingly, when a lexical form supplies the same feature in both a root and an affix, it is often the affix that undergoes a structural change (see for example Selkirk 1995 on Tashlhiyt Berber, Blake 1998 on St'át'imcets (Lillooet Salish), and Suzuki 1998 for a host of examples). What these cases all have in common is that a phonological process systematically distinguishes roots from affixes, favoring retention of the properties of roots over affixes.

In this paper, the connection between predominant root accent and the privileged status of roots in other phonological systems is explained as the interaction of faithfulness constraints in Optimality Theory (Prince and Smolensky 1991, 1993). In particular, the cross-linguistic trend for the properties of roots to take precedence over those of affixes motivates the introduction of distinct root and affix faithfulness constraints, with Root

Faith ranked above Affix Faith (McCarthy and Prince 1995; Beckman 1998 [1999]). With this inherent ranking, predominant root accent in Cupeño is explained as a straightforward case of constraint conflict: inherent root accent overrides affixal accent because the constraint responsible for realizing accent in roots is top-ranked. In sum, the observation that root accent overrides affix accent in Cupeño is explained with the same tools needed to account for the privileged status of roots in other phonological systems.

The rest of this paper is structured as follows. The next section lays out the theoretical and linguistic background necessary for the analysis of Cupeño accent. Section 3 then examines stress in isolated roots and gives the constraint rankings necessary for the accentual inventory in roots. In section 4, these rankings are incorporated in the larger analysis of accent in fully formed words, including the interaction between roots and several distinct affix types. Two alternatives to the faithfulness-based account are subsequently considered and argued to be inferior to the proposed account on empirical and theoretical grounds. A residual pattern of default-to-opposite edge accent is presented and analyzed in section 5, and the results of the previous sections are then summarized. Lastly, the larger theoretical conclusions of the study are discussed in section 6.

## 2. BACKGROUND

### 2.1. *Representational Assumptions*

In this article, the term ‘accent’ refers to the property of a morpheme that encodes its likelihood to surface with a suprasegmental. In generative linguistics, this likelihood is modelled through lexical specification of a phonological category representing a suprasegmental, e.g., an associated tone or some kind of metrical structure. As such, accent is both a lexical property and one that is manifest in surface forms. Stress, on the other hand, is used here to describe the surface realization of inherent accent in particular languages. The characterization of Cupeño as a ‘stress accent’ system therefore entails a lexical marking for accent which is realized as stress at the surface. The assumptions motivated in this subsection provide the structures which define this type of stress accent.

While these assumptions are not crucial to the theory of root-controlled accent, I assume that stress accent in Cupeño is represented with the bracketed grid structures of Hayes (1995).<sup>2</sup> In particular, metrical constituent

<sup>2</sup> See also Prince (1983), Selkirk (1984), Hammond (1984, 1989), Halle and Vergnaud (1987), Idsardi (1992), Hung (1994), Halle and Idsardi (1995) for background discussion on the role of grids and grid-based constituent structure in phonology.

structure is enclosed in brackets, with grid marks identifying the head positions of this structure. If surface forms are represented as such, a natural way to encode lexical accent is with the same notion of prominence on the grid (Prince 1983, section 5). Lexical accent in Cupeño may thus be marked with a grid prominence, which, if faithfully maintained at the surface, is associated with its lexical sponsor and corresponds to a surface grid mark that occupies the head of its prosodic constituent. Under this view, the stress peak in the output form below is faithful to the first lexical accent, but not the second one.

### (3) Lexical Accent as Prominence on the Grid

$x_{Wd}$	$x_{Wd}$	(	$x_{Wd}$	)	Prosodic Word
$x_F$	$x_F$	(	$x_F$	)	Prosodic Foot
mi + k <sup>w</sup> áw + pó + qál/	→	mi-k <sup>w</sup> áw-pə-qal			
3pl CALL 3sgm PAST.DUR		‘He was calling them’			

Throughout, syllabic heads of stress feet, i.e., ‘ $x_F$ ’ in the above structure, will be referred to as stress prominences, and syllabic heads of the head foot of the prosodic word (‘ $x_{Wd}$ ’ above) will be referred to as stress peaks.

These bracketed grid structures are crucial to the analysis of two important properties of Cupeño stress accent. First, these structures provide a means of encoding contrastive stress. Lexical specification for a stress peak accounts for both the accented/unaccented contrast which cross-classifies morphemes, as well as the contrast in the position of accent relative to the segmental string (see section 3 for the details).<sup>3</sup> Second, bracketed grid structures account for the observation that there is exactly one stress peak per word, i.e., that stress accent in Cupeño is ‘culminative’.<sup>4</sup> Culminativity follows from certain widely accepted principles of prosodic organization. Concretely, parsing of phonological material is hierarchical; it is organized into units in the Prosodic Hierarchy (Selkirk 1980). Moreover, this procedure of prosodic organization obeys ‘Strict Layering’, which entails

<sup>3</sup> Lexical accent in Cupeño is a specification for primary stress, but this approach is equally capable of marking lexical secondary stress. See Alderete (1999) for discussion and examples.

<sup>4</sup> Bright and Hill (1967: 355–356) mention in passing a pattern of alternating stress counting from the primary stress, but unfortunately do not give any examples. This statement appears to run counter to most work on Cupeño which explicitly denies the existence of secondary stresses (e.g., Hill and Hill 1968: 236), a point which is also consistent with my analysis of a tape of Cupeño provided to me by Jane Hill. If it turns out that Cupeño does in fact have secondary stresses, this finding does not confound the generalization that stress is culminative because the hierarchical relationship between primary and secondary stress yields a single peak in stress in every word.

that prosodic categories of type  $x$  are always parsed by categories of type  $x + 1$ , i.e., an immediately higher prosodic category. Previously thought to be a rigid requirement on prosodic organization (see Selkirk 1984 and Nespor and Vogel 1986), recent research has characterized Strict Layering with a set of ranked and violable constraints (Itô and Mester 1992 and Selkirk 1996):

- (4) Constraints on Prosodic Domination (PROS-DOM; Selkirk 1996)<sup>5</sup>
- a. LAYEREDNESS: No  $C^i$  dominates a  $C^j$ ,  $j > i$ , e.g., ‘No  $\sigma$  dominates F.’
  - b. HEADEDNESS: Any  $C^i$  must dominate a  $C^{i-1}$  (except if  $C^i = \sigma$  or  $\mu$  in some cases), e.g., ‘A PrWd must dominate a F.’
  - c. EXHAUSTIVITY: No  $C^i$  immediately dominates a constituent  $C^j$ ,  $j < i - 1$ , e.g., ‘No PrWd immediately dominates a  $\sigma$ .’

The above constraints, together with the prominence relations inherent to the bracketed grid, derive culminative accent. As stated in Hayes (1995: 30), ‘since prominence relations are obligatorily defined on all layers, then no matter how many layers there are, there will always be a topmost layer with just one grid mark’. This property of the representation of accent will be crucial in the analysis of the interaction between root and affix accent (section 4), a context where two inherently accented morphemes compete for a unique word level accent.

Bracketed grids also nicely account for the typological features which characterize the accentual system of Cupeño. These features require both grid structure and prosodic constituent structure. In support of the grid, an important morpho-accentual process of pre-accentuation requires reference to grid structure because it cannot be satisfactorily accounted for with prosodic feet alone (see section 4.3 for analysis).<sup>6</sup> On the other hand, the evidence for metrical constituency in surface representations is abundant.

<sup>5</sup> In these constraints, ‘C’ ranges over the set of prosodic categories, e.g., moras, syllables, feet, etc. See Selkirk (1996) for discussion of the role of these constraints in prosodic Layering above the prosodic word.

<sup>6</sup> While a prosodic analysis of pre-accentuation (along the lines of Inkelas (1999), Halle and Kenstowicz (1991), and Idsardi (1992)) is also possible, the details of such an analysis are inconsistent with some necessary assumptions made on the basis of other facts in the language. The pre-accenting suffixes must be pre-specified as the weak member of a trochaic foot, but several properties of the prosodic system require iambic foot structure, producing a foot type mismatch. See Kager (1996) for a similar conclusion made on the basis of data from Dutch.

First, Crowhurst (1994) argues that restrictions on the root stress inventory should be characterized as restrictions on metrical stress feet (see discussion below in section 3.2). A second type of evidence comes from the relationship between the accentual system and the prosodic morphology of the habitative construction, as studied in detail in Hill (1970), McCarthy (1979, 2000b), McCarthy and Prince (1986, 1990), and Crowhurst (1994). The finding that emerges from this work is that the iambic foot structure employed in the stress system is referred to directly by the morphology, providing independent evidence for its existence. Lastly, Crowhurst (1994) argues that a bimoraic requirement on word size is explained as a requirement on metrical constituency, providing further evidence for the assumed metrical structures. Considerations such as these lead to the conclusion that surface prosody has rhythmically distributed grid structure which is aligned with metrical constituent structure in the prosodic hierarchy; this structure is the bracketed grid.

## 2.2. *Correspondence Theory and Prosodic Faithfulness*

We require a set of constraints to govern the relation between lexical and surface accent, which I will dub the ‘Prosodic Faithfulness’ constraints. Prosodic Faithfulness must therefore make reference to the assumed prominence structure, which requires the notion of Correspondence developed in McCarthy and Prince (1995, 1999):

- (5) Correspondence  
 Given two strings  $S_1$  and  $S_2$ , correspondence is a relation  $R$  from the elements of  $S_1$  to those of  $S_2$ . Elements  $\alpha \in S_1$  and  $\beta \in S_2$  are referred to as correspondents of one another if  $\alpha R \beta$ .

As McCarthy and Prince make clear, the set of correspondent elements that can be referred to by the faithfulness constraints is not limited to segments; these elements may also include autosegmental features like moras, tone, and importantly, grid prominence. As discussed above, accent is encoded as a lexical prominence, i.e., a grid mark over an accented unit in the underlying representation. The Prosodic Faithfulness constraints given below make reference to lexical and surface prominence, and require related strings to ‘match’ in this prominence structure.

- (6) Prosodic Faithfulness (PROS-FAITH)
- a. MAX-PROM:  
For  $x$  a prominence,  $\forall x \exists x' [x \in S_1 \rightarrow x' \in S_2 \ \& \ xRx']$   
'Every prominence in  $S_1$  must have a corresponding prominence in  $S_2$ .'
  - b. DEP-PROM:  
For  $x$  a prominence,  $\forall x \exists x' [x \in S_2 \rightarrow x' \in S_1 \ \& \ xRx']$   
'Every prominence in  $S_2$  must have a corresponding prominence in  $S_1$ .'
  - c. NO-FLOP-PROM:  
For  $x$  a prominence,  $y$  a sponsor, and  $z$  an autosegmental link,  
 $\forall x \forall y \forall z [x \text{ and } y \text{ are associated via } z \text{ in } S_1 \rightarrow \exists x' \exists y' \exists z' \text{ such}$   
that  $(x, y, z)R(x', y', z')$  and  $x'$  and  $y'$  are associated via  $z'$  in  $S_2$ .  
'Corresponding prominences must have corresponding sponsors and links.'

The above constraints distinguish between two forms of faithfulness to underlying prosody, which in turn, are responsible for the range of accentual contrasts commonly found in accent systems (on which see McCawley 1968, 1978; Hyman 1978; Beckman 1986; Pulleyblank 1986; and Odden 1995). The first two constraints, MAX-PROM and DEP-PROM, govern faithfulness to the presence or absence of accent. When properly ranked, these constraints account for the contrast between accented and unaccented morphemes. A different form of faithfulness concerns the position of prominence in related forms. Unless otherwise motivated, the position of prominence does not change in the mapping from one structure to another, and faithfulness to the position of accent is governed by NO-FLOP-PROM. Thus, if NO-FLOP-PROM is high-ranking in the grammar, specifically ranked above constraints which assert a fixed position for accent, then a word with  $n$ -numbered syllables or moras will have  $n$  number of accentual contrasts because the lexical position for accent must be maintained. Since MAX-PROM (and DEP-PROM) bring about an additional contrast, i.e., the presence or absence of an accent, these constraints together yield the set of contrasts characteristic of accent systems, namely  $n + 1$ , where  $n$  is equal to the number of sponsors for accent in a given form.

In this characterization of Prosodic Faithfulness, accent is understood as an autosegmental unit, namely a grid mark, instead of an inherent property of a segment itself (which would simply require an IDENT-type constraint for stress), or the result of underlying foot structure, as some-

times assumed (see Inkelas 1999; Kenstowicz 1995; McCarthy 2000a, b; Benua 1997; Itô et al. 1996; Pater 2000). That is, the constraints which militate against the deletion (MAX), insertion (DEP), and migration (NO-FLOP) of accent are more like the faithfulness constraints employed in the treatment of other autosegmental objects like moras (McCarthy 2000b) or tone (Bickmore 1996; Zoll 1996, 1997; Yip 1999; Myers 1997). Based on the conclusions made in Alderete (1999), I will assume without argument that this approach is the correct one, but it is important to emphasize that the results derived here are equally compatible with other theories of faithfulness to lexical prosody. If it turns out that a different form of faithfulness is required to account for lexical prosody in Cupeño, the analysis of root-controlled accent presented in section 4 does not substantively change. This is because the analysis is based on the assumption that roots have a privileged faithfulness status; it is not tied to a particular representation of accent. Indeed, all that is necessary for this analysis is that there be a lexically specified accent, which is an assumption shared by all of the theories listed above.<sup>7</sup>

### 2.3. *Root and Affix Faithfulness*

Recent work in Optimality Theory has argued for the privileged faithfulness status of roots over affixes (McCarthy and Prince 1995; Selkirk 1995; Urbanczyk 1996; Beckman 1998 [1999]; see also Beckman 1995, 1997; and Lombardi 1999 for related work). In particular, it is argued that the constraints governing the faithfulness properties of roots are distinct from those governing affixes. Furthermore, any constraint for roots always outranks the analogous constraint for affixes, as expressed by the meta-constraint on constraint rankings given below.<sup>8</sup>

- (7) Meta-Constraint on Constraint Rankings (McCarthy and Prince 1995, 1999)  
 Root Faith(*P*)  $\gg$  Affix Faith(*P*)

<sup>7</sup> See Alderete (1996) for arguments that contrastive stress in Cupeño should indeed be represented with a lexical specification for accent, and not, for example, a set of minor rules which produce different stress patterns for each word category.

<sup>8</sup> An alternative theory of the privileged status of roots is to define a set of root faithfulness constraints that is distinct from context-free faithfulness, which of course obviates the need for a fixed ranking (see e.g., Prince (1997) and Beckman (1998)[1999]). As the present paper does not address any issues which would distinguish the two theories, the original proposal is assumed. However, see Prince (1997) for important discussion concerning the empirical and theoretical consequences of this theory, and Alderete (1999) on how it applies to accentual systems in particular.

The privileged faithfulness status of roots embodied in this ranking is at the heart of the analysis of root-controlled accent. To see how this ranking applies to root-controlled accent systems, however, it is necessary to see how it has been motivated on non-accentual grounds, which is briefly reviewed below.

The first form of evidence for (7) comes from static effects in phonological inventories. In many inventories, roots license a wider range of contrasts than affixes, allowing marked structures that are not found in affixes. For example, Arabic verb roots may contain a variety of pharyngeal consonants, and yet these same sounds are categorically excluded in affixes.<sup>9</sup> Static effects such as these follow from interleaving a phonological well-formedness constraint between root and affix faithfulness. Since such a ranking results in domination over affix faithfulness, the structures found in affixes are restricted in the correct way (see especially McCarthy and Prince 1995: 364; Parker 1997; Beckman 1998 [1999]: 193 ff. for examples and analysis, and Willerman 1994 for related discussion).

The second form of evidence is that roots tend to have privileged faithfulness properties in alternations, favoring retention of information in roots over information in affixes. A case in point is so-called root-controlled vowel harmony, where a given feature is distinctively specified for roots, and neighboring affixes harmonize to the root's featural specification. For example, in Igbo, roots are contrastively specified for [ATR] and this feature specification spreads to neighboring prefixes and suffixes, in effect neutralizing any possible [ATR] contrast in these affix types (see Ringen 1975 [1988] and references therein). In root-controlled vowel harmony systems, therefore, an overriding constraint requires a single feature specification in a given harmony domain, and the features of the root are preserved over features in affixes.<sup>10</sup>

The analysis of dynamic effects such as these also follows from the privileged faithfulness status of roots over affixes, in addition to a specific ranking for a well-motivated class of constraints that enforce CULMINATIVITY for a given phonological property. Observationally, it is often the case that phonological categories are prohibited from appearing more than once in some domain. This class of constraints has particular instantiations in several different types of phonological systems, and it is fundamental to

<sup>9</sup> As pointed out in McCarthy and Prince (1995: 364), inventory effects such as these cannot be statistical effects because one finds the markedness differential in systems with relatively rich affixal systems and impoverished root systems.

<sup>10</sup> Note that this pattern of root privilege cannot simply be due to the assumption that affixes are always lexically specified [0ATR]. Such an analysis runs counter to the Richness of the Base, and consequently, undermines several important results in OT, for example its explanation of the Duplication Problem (see McCarthy 2000c for discussion).

the characterization of harmony domains, prosodic systems with stress and tone, and also the domain of application for dissimilation. Let us call the class of constraints which account for this type of observation,  $\mathbb{C}_{\text{Culmin}}$ , because they regulate culminativity for a given property. If such a constraint outranks the affix faithfulness constraint(s) governing the realization of  $P$ , as shown below, the effect is a root-controlled alternation.<sup>11</sup>

- (8) Dynamic Effects in Alternations  
 Root Faith( $P$ ) ...  $\mathbb{C}_{\text{Culmin}}(P) \gg$  Affix Faith( $P$ )

The ranking above predicts that more than one occurrence of  $P$  is not allowed if one of these occurrences is in an affix. If an affix lexically specified for  $P$  combines with a root that also contains  $P$ , this ranking predicts the loss of  $P$  in the affix. A number of researchers have applied this basic ranking to the analysis of root-controlled vowel harmony, where high-ranking root faithfulness induces alternations in affixes (McCarthy and Prince 1995; Ringen and Vago 1998; Ringen and Heinämäki 1999).<sup>12</sup> Morphologically dispersed faithfulness also plays a crucial role in the analysis of the retention of root features in dissimilation (Selkirk 1995; Blake 1998; Suzuki 1998), resolution of vowel hiatus (Casali 1997) and other syllable-related motivated processes where root segments are given special status (McCarthy and Prince 1995; Adisasmito-Smith 1998), the reluctance of the linear order to be disrupted in root segments (Pater 1999), and patterns of featural shifts which encourage the realization of root features over affix features (Walker 1998b; Alderete 1999; see also Struijke 1998 for a parallel result in reduplication).

While the static and dynamic patterns discussed above clearly represent separate phonological phenomena, the analysis of both crucially depends on the privileged status of roots. That is, this status does double duty in the analysis of the phonological behavior of roots, extending to both inventories and alternations. The distinction between root and affix faithfulness

<sup>11</sup> The relative rank of the culminativity constraint and Root Faith determines whether or not a given property is culminative within roots, e.g., the presence or absence of disharmonic roots. However, this inventory effect is orthogonal to the dynamic effect sketched here.

<sup>12</sup> Recently, Baković (2000) has argued against this type of analysis, claiming instead that root-controlled vowel harmony is best treated as a 'cyclic effect' via output-to-output faithfulness. This tack, however, involves a significant extension of Transderivational Correspondence Theory (Benua 1997), where the base for OO-correspondence is not an independently occurring form. The further implications of this move, which is at odds with most work in cyclic phonology (see e.g., Brame 1974; Kiparsky 1982; and Benua 1997 for relevant discussion), has yet to be explored. In any case, a 'cyclic' analysis will not work for Cupeño (see section 4.4).

is crucial in describing both the immunity of roots to certain restrictions in inventories, and the inertia of the phonological properties of roots in alternations. The nature of the explanation is thus that the distinct patterns of root privilege receive a unified account through morphologically dispersed faithfulness.<sup>13</sup>

The rest of this paper demonstrates the generality of the privileged faithfulness status of roots by showing that the basic principles which are at work in non-accentual systems are in fact crucial to the analysis of accent in Cupeño. The first part of this analysis is presented in the next section, with an account of the inventory of stress patterns found in roots, a context where Prosodic Faithfulness for roots has a critical role in accounting for contrastive stress. In section 4, the role of root and affix faithfulness is further illustrated in the analysis of the morphological influences on accent, showing that the schematic ranking for dynamic effects given above in (8) directly explains the interaction between root and affix accent.

### 3. ROOT STRESS INVENTORY

#### 3.1. *The Data*

While earlier work on Cupeño assumed that surface stress in roots was unpredictable, more recent research has shown that the observed root stress patterns are not completely irregular (Munro 1990; Crowhurst 1994). Stress is contrastive in certain contexts to be described below, but if a root has a long vowel, that vowel is stressed. The examples below are typical, showing long vowel stress in bare roots (9) and conjugated verbs (10). Most of the roots in these examples are not longer than two syllables, which apparently reflects the canonical pattern.<sup>14</sup>

<sup>13</sup> Although the meta-constraint Root Faith  $\gg$  Affix Faith is motivated on purely linguistic grounds, there appears to be a functional basis for this ordering which is rooted in psycholinguistic studies in word recognition (see Beckman (1998) [1999] for a review and discussion).

<sup>14</sup> It is rare to find roots composed of three or four syllables with post-peninitial stress. This observation has prompted Crowhurst (1994) to invoke an initial two syllable window for stress in roots. The observations on canonical morpheme shape in Hill (1967: 184 ff.), however, strongly suggest that such a constraint is in fact unnecessary because of the rarity of simplex roots greater than two syllables. Also, a cursory inspection of the lexical resources uncovers some exceptions to the two syllable window: *išmivíy* 'things', *tukumáy* 'tomorrow', and *pišʔəmáy* 'just then'.

- |        |                |  |
|--------|----------------|--|
| (9)a.  | máasivə(-t)    | ‘grass’ C 185                            |
|        | xəənə          | ‘blow (wind)’ C 185                      |
|        | pəəxwən        | ‘only’ 10.57                             |
|        | náači          | ‘soon, quick’ 38.4                       |
|        | híimaʔay       | ‘donate goods to burning ceremony’ C 185 |
| b.     | təvxáa(-qa)    | ‘... is working’ C 185                   |
|        | ʔiyúunə        | ‘fast’ C 185                             |
|        | muháan         | ‘shoot with bow’ C 185                   |
| (10)a. | pəm-təəčiŋ-wən | ‘They ordered’ 41.7                      |
|        | čəm-náaxčín    | ‘We passed on’ 21.9                      |
| b.     | pəʔ-ičáay-wən  | ‘They did ...’ 24.51                     |
|        | taváan-pə-qal  | ‘He put him ...’ 58.13                   |

Long vowel stress also has the effect of precluding stress on a short vowel in the same word. That is, there are no roots with long vowels where stress falls on a syllable with a short vowel. The historical developments leading up to Cupeño stress, as described in Munro (1990), supports this observation. Pre-Cupeño stressed the root-initial vowel, or the second vowel if it was long; otherwise default stress fell on the initial syllable. Subsequently, contrastive vowel length was lost in unstressed syllables. Thus, the fact that vowel length was only preserved in stressed syllables effectively rules out the possibility of short-vowel stress in forms with long vowels. Summarizing the above discussion in synchronic terms, one key observation governing the distribution of stress in roots is that long vowels attract stress.<sup>15</sup>

In contrast to this predictable part of the stress system, stress is contrastive in roots which do not contain long vowels: stress may fall on either the first or second syllable, as shown by the nouns in (11) and the conjugated verbs in (12).

<sup>15</sup> Stress in Spanish loans, e.g., *váaka-ʔam* ‘cattle’ and *kaváayu-ʔum* ‘horses’, also conforms to this pattern of long vowel stress. Interestingly, stressed vowels in both Spanish and English loans tend to be long in Cupeño, suggesting that vowel length in these forms is phonological. Considering the role of duration in signaling stress in these languages, however, the most sensible approach to this observation is that stressed vowels in the source languages are perceived as long, and hence represented as such lexically.

- (11)a. súʔi-š 'jackrabbits' 10.63  
 púki-yka 'by (to) the door' 9.25  
 máxiʔč-am 'greens' 9.4  
 kúpa-ŋax 'from Cupa' 29.1  
 kʷíni-lʸ 'acorns' 29.1
- b. təmá-l 'ground' 29.4  
 atáxʔ-am 'the people' 29.1  
 savá-l 'grass' 29.4  
 kawí-š 'rock' 29.4  
 səvó-l 'wind' 9.16  
 siʔáyi-š 'cracked acorns' 29.7
- (12)a. pə-míʔawlu 'He came' 9.1  
 čəm-yáyax 'We try to ...' 9.7  
 pəm-híwəŋ 'They stopped' 21.9  
 pəm-náyxi 'They fought' 1.15
- b. pə-pulín-qal '... gives birth' 43.5  
 čəm-təwáš 'We lost' 125

While there may be a historical account of these patterns (see Munro 1990), the initial-peninitial stress contrast is synchronically unpredictable. This fact has led Hill and Hill (1968) and Munro (1977) to classify Cupeño as a 'lexical stress' language, i.e., a language in which stress alone may introduce contrast among roots.

To summarize, the inventory of accentual patterns observed in roots (excluding monosyllables) is given in (13).

- (13) Root Stress Inventory
- a. Predictable Long Vowel Stress  
 C'VCV CVCC'V  
 xóəŋə təvxáa
- b. Contrastive Stress Elsewhere  
 C'VCV CVC'V  
 súʔiš təmál

Any analysis of the root stress inventory must account for the fact that long vowels are always stressed, and at the same time, it must allow for lexically determined initial and peninitial stress in forms with no long vowels.

### 3.2. *The Analysis*

I assume essentially the same foot structures proposed in Crowhurst (1994) to account for the inventory of stress patterns and the observed correspondences between the accent system and the prosodic morphology of the habitative construction (see also Hill 1970; McCarthy 1979, 2000b; McCarthy and Prince 1986, 1990). In particular, roots are consistently parsed into right-headed feet in the output, even if this results in a monomoraic foot, as illustrated below.

- (14) Uniform Right-Headed Feet
- |        |         |       |         |
|--------|---------|-------|---------|
| ( x )  | ( . x ) | ( x ) | ( . x ) |
| xáə̀nə | tə̀vxáá | súʔiš | təmál   |

This foot inventory may be characterized by ranking the well-formedness constraints in (15) with the relevant faithfulness constraints on prosody and vowel length.

- (15) Prosodic Well-Formedness Constraints
- a. Foot Binariness (FTBIN; McCarthy and Prince 1986): Feet are binary at some level of analysis ( $\mu$ ,  $\sigma$ ).
  - b. Rhythm Type (Iamb/Trochee) (RHTYPE = I/T; Prince and Smolensky 1993): syllabic heads of feet coincide with right (I)/left(T) edge of the foot that contains them.
  - c. Weight-to-Stress Principle (WSP; Prince 1990): if heavy, then stressed.

In particular, ranking RHTYPE = I above RHTYPE = T produces iambs as the default foot structure. Further, Foot Binariness must be ranked below the Prosodic Faithfulness constraints for roots (see section 2.2 for definitions), because the iambic requirement may have the effect of creating non-binary feet in cases like [(sú)ʔiš], as depicted in the following tableau.

(16) Emergence of Lexical Initial Stress

$\bar{x}$ /súʔiʃ/	PROS-FAITH <sub>Root</sub>	FTBIN
a. $(\bar{x})$ suʔiʃ	*!	
b. → $(x)$ súʔiʃ		*

The losing candidate is the unfaithful one, because the first vowel in the input has a prominence, but the related vowel in the output has no corresponding prominence, hence violating PROS-FAITH. The constraint violations in the first candidate can be due to deletion of an accent, i.e., a MAX-PROM<sub>Root</sub> violation, or, if the grid mark in the input stands in correspondence with the surface prominence, then a violation of NO-FLOP-PROM<sub>Root</sub> is incurred. Either scenario is sufficient to motivate the domination of FTBIN. The winner, therefore, is the candidate which matches the input prosody exactly, at the expense of a FTBIN violation.

As for the observation that long vowels are always stressed, this fact is best treated as a consequence of the larger distribution of length. Recall from section 2.1 that long vowels always appear in stressed syllables. Assuming that only CVV(C) syllables, and not CV(C), count as heavy (Crowhurst 1994), this fact can be treated as an effect of the WSP (following the leading ideas of Prince 1990). In particular, if the WSP dominates the faithfulness constraints regulating vowel length (on which see Urbanczyk 1996; McCarthy 2000b), then all unstressed syllables will shorten to avoid WSP violations, e.g., /CVVCV́VV/ → CVCV́V.<sup>16</sup> Of course there is no reason to shorten long vowels in stressed syllables because such output structures do not violate the WSP. To summarize, all long vowels are stressed in Cupeño because stressed syllables are the only contexts where long vowels fail to shorten.

<sup>16</sup> As for extending this result outside of roots, such an endeavor is impossible because it appears that there are no affixes with long vowels. There is only one affix with a long vowel in Hill and Nolasquez's (1973) list of affixes, namely *-kwáani* 'for the sake of'. However, this suffix is probably derived historically from the bare noun root *-kwaan* 'worth, value', a claim which is supported by the fact that *-kwaani* still acts like a root in that it may take person markers and prevails over prefix stress, e.g., /nət pó + kwáani/ → nót pə-kwáani 'for the sake of the chief'.

## 4. ROOT-CONTROLLED ACCENT

4.1. *Data and Observations*

Inherent accent in roots overrides accent in affixes (Hill and Hill 1968). This is shown by the behavior of accented affixes when they combine with different classes of roots. When an accented prefix or suffix is attached to an unaccented root, inherent accent in the affix surfaces. However, when these same affixes attach to an accented root, the root accent prevails. The behavior of these two classes of roots is illustrated below, starting with unaccented roots.

The accented affixes of which I am able to find good examples are listed below. The accented prefixes are the person prefixes listed in (17), which are used to mark the person and number of subjects and possessors. The accented suffixes are listed in (18).

## (17) Accented Prefixes

1	nó-	čóm-
2	?ó-	?óm-
3	pó-	póm-
	Singular	Plural

## (18) Accented Suffixes

-qál	‘past durative marker’ (PAST.DUR)
-qá	‘present singular marker’ (PRES.SING)
-í	‘object marker’ (OBJECT)
-í	‘durative subordinator’ (DUR.SUB)

When one of these accented prefixes or suffixes combines with an unaccented root, inherent accent in the affix surfaces, as shown below for three roots classified in Hill and Hill 1968 as unaccented, namely  $\sqrt{yax}$  ‘say’,  $\sqrt{max}$  ‘give’, and  $\sqrt{wən}$  ‘to put in’.

## (19)a. Accented Prefix Wins

/nó + yax/	→ nó-yax	‘I say’ JH
/pó + yax/	→ pó-yax	‘He says’ 1.15
/čóm + yax/	→ čóm-yax	‘We say’ 21.6
/póm + yax + wən/	→ póm-yax-wən	‘They said’ 42.28

## b. Accented Suffix Wins

/nəʔəp nɔ́ + yax + qál/	→	nɔ́ʔəp nə-ya-qál	‘I was saying’ JH
/nəʔən yax + qál/	→	nəʔən ya-qáʔ	‘I say’ JH
/pɔ́ + yax + qál/	→	pə-ya-qál	‘He was saying’ 1.9
/mi + yax + qál/	→	mi-ya-qáʔ	‘He tells them 38.49

## (20)a. Accented Prefix Wins

/nɔ́ + max + ʔə/	→	nɔ́-max-ʔə	‘(I) to give ...’ JH
/čɔ́m + max + ʔə/	→	čɔ́ʔ-max-ʔə	‘(We) to give ...’ JH
/ʔi + pɔ́m + max/	→	ʔi-pɔ́ʔ-max	‘They gave you ...’ JH

## b. Accented Suffix Wins

/max + qál/	→	max-qáʔ	‘... giving ...’ JH
/ʔi + nɔ́ + max + qál/	→	ʔi-nɔ́-max-qál	‘I was giving you’ JH
/čim + pɔ́ + max + qál/	→	čim-pə-max-qál	‘He was giving us’ JH

## (21)a. Accented Prefix Wins

/nɔ́ + wən/	→	nɔ́-wən	‘I put’ JH
/čɔ́m + wən/	→	čɔ́m-wən	‘We put’ JH
/nɔ́ + wən + pi/	→	nɔ́-wənə-pi	‘(I) to put it in’ JH
/čɔ́m + wən + pi/	→	čɔ́m-wənə-pi	‘(We) to put it in’ JH

## b. Accented Suffix Wins

/nɔ́ + wən + qál/	→	nə-wən-qál	‘I was putting’ JH
/wən + qál/	→	wən-qáʔ	‘... put (it) ...’ JH

As is evident from the examples above, when a word has more than one accented affix, it is the rightmost one in the word which surfaces with stress, e.g., /nɔ́ + wən + qál/ → nə-wən-qál. This pattern also holds when the competition is between two accented suffixes, as shown by the following examples.

## (22) Rightmost Accented Suffix Wins

a. yax-qəl-í	/yax + qál + í/
‘While ... was saying’ H&H 236	SAY + PAST.DUR + DUR.SUB
b. ʔə-ya-qal-í	/ʔə + yax + qál + í/
‘... what you said’ JH	2sg + SAY + PAST.DUR + OBJECT

When an unaccented root combines with an unaccented affix, however, the word is assigned default initial stress, as exemplified below.

## (23) Default Initial Stress

a.	/yax + əm/	→	yáx-ə́m	‘(You Pl) say!’ JH
	/čə́m + čə́mə yax + wə/	→	čə́m-čə́mə yáx-wə	‘We say’ JH
	/nəʔq <sup>w</sup> ən ya + ʔa/	→	nəʔq <sup>w</sup> ən yá-ʔa	‘I can say’ JH
b.	/max + əm/	→	máx-ə́m	‘Give! (Pl)’ C 186
	/max + an/	→	máx-an	‘Give it to me’ JH
	/max + aʔəš/	→	máx-aʔəš	‘Give it to us’ JH
c.	/wən + əm/	→	wə́n-ə́m	‘Put it in (Pl subj)’ JH
	/wən + a/	→	wə́n-a	‘Put it in (Sg)’ JH

While many of the examples above with emergent prefix stress also have initial stress, as noted in Hill and Hill (1968: 235), stressed prefixes may surface with non-initial stress. In the examples below, an object marker prefix separates the stressed prefix from the beginning of the word, yielding prefix stress on the second syllable of the word.<sup>17</sup>

## (24) Non-Initial Prefix Stress

a.	mi-nə́-təw	‘I saw them’
	mi-pə́-təw	‘He saw them’
	mi-čə́m-təw	‘We saw them’
b.	pi-pú-kuş	/pi + pú + kuş/
	‘He ... took it’	3sg + 3sg + TOOK
c.	pi-pə́-wən	/pi + pə́ + wən/
	‘He put it’	3sg + 3sg + PUT
d.	ʔi-pə́ʔ-max	/ʔi+ pə́m + max/
	‘They gave you ...’	2sg + 3pl + GIVE
	mi-pə́ʔ-max-wən	/mi + pə́m + max + wən/
	‘They were giving ...’	3pl + 3pl + GIVE + PRES.IMPER

This fact shows that emergent lexical accent in prefixes is independent of the basic pattern of default initial stress in words with no inherent accent.

<sup>17</sup> The object markers preceding the stressed prefixes here cannot form stress domains apart from the following stem because they do not take the form of the stand-alone pronouns described in Hill and Nolasquez (1973: 122 ff).

In contrast to the forms above containing unaccented roots, when an inherently accented affix combines with an accented root, root accent always prevails. This is shown below for each affix type individually (25), and with accented roots which combine with both accented prefixes and suffixes (26).

## (25) Root Accent Overrides Affix Accent

## a. Root-Controlled De-Accenting in Prefixes

/pó + √ŋíy + pi/	→ pə-ŋíy-pi	'He would go away' 1.15
/pó + √ŋóyə + yax/	→ pə-ŋóyə-yax	'It shakes' 1.17
/pó + √míʔaw + lu/	→ pə-míʔaw-lu	'He came' 9.1
/čóm + √náačín/	→ čəm-náačín	'We passed on' 21.9
/póm + √ŋíy + wəŋ/	→ pəm-ŋíy-wəŋ	'They went out' 29.2
/póm + √čájnu/	→ pəm-čájnu	'They got angry' 1.15
/póm + √číʔ + lʷu + wəŋ/	→ pəm-číʔ-lʷu-wəŋ	'They went gathering' 29.1

## b. Root-Controlled De-Accenting in Suffixes

/√píq + pə + qál/	→ píq-pə-qal	'... touched him' 43.31
/mi + √k <sup>w</sup> áw + pə + qál/	→ mi-k <sup>w</sup> áw-pə-qal	'He was calling them' 44.1
/√nánva + ya + qál/	→ nánva-ya-qa	'... is done' 44.9
/√ʔáyu + qál/	→ ʔáyu-qa	'... (He) wants' 23.31

## (26) Root-Controlled De-Accenting

/pó + √ʔáyu + qál/	→ pə-ʔáyu-qal	'He was wanting' 1.14
/pó + √túl + qál/	→ pə-túl-qa	'He finished' 42.22
/pó + √háw + pə + qál/	→ pə-háw-pə-qal	'He sang' 42.22
/pó + √pulín + qál/	→ pə-pulín-qal	'She gave birth' 43.5
/nó + √ŋíy + qál + í + pə/	→ nə-ŋíy-qal-i-pə	'When I go away' 1.16

Examples like *nánva-ya-qa* 'He was calling them' in (25) and *pə-pulín-qal* 'She gave birth' in (26) show that root-controlled deletion cannot be reduced to an effect of Stress Clash (as in Prince 1983): the two inherently accented syllables are nonadjacent, and yet there is still a loss of accent.

To summarize, the interaction between root and affix accent may be described as follows.

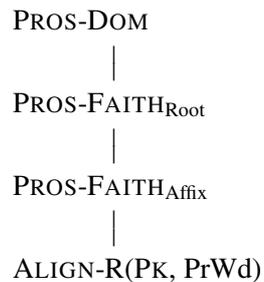
(27) Summary of Cupeño Accent

- If the root contains an inherently accented vowel, that vowel receives primary stress:  
 $/ \dots \text{róot} \dots / \rightarrow [ \dots \text{róot} \dots ]$   
 $/ \text{p}^{\acute{o}} + \sqrt{\text{túl}} + \text{qá}/ \rightarrow [ \text{pə-túl-qa} ]$
- In words with unaccented roots, the rightmost accented vowel in an affix bears the primary stress:  
 $/ \dots \text{áf} + \dots + \text{áf} / \rightarrow [ \dots \text{af} + \dots + \text{áf} ]$   
 $/ \text{p}^{\acute{o}} + \sqrt{\text{yax}} + \text{qá}/ \rightarrow [ \text{pə-ya-qá}/ ]$   
 $/ \sqrt{\text{yax}} + \text{qá}/ + \text{í}/ \rightarrow [ \text{yəx-qəl-í} ]$
- If the word does not contain an inherently accented morpheme, the first vowel of the word receives the primary stress:  
 $/ \sigma \sigma \dots / \rightarrow [ \acute{\sigma} \sigma \dots ]$   
 $/ \sqrt{\text{yax}} + \text{ə} \text{m} / \rightarrow [ \text{yáx-ə} \text{m} ]$

4.2. *The Analysis*

The observations presented above show that Cupeño has the type of dynamic effects in alternations described in section 2.3. Following the schematic ranking in (8), the basic property of predominant root accent is analyzed as follows.

(28) Root-Controlled Accent in Cupeño



The constraints on Prosodic Domination from section 2.1 are ranked above both of the Prosodic Faithfulness constraints, ensuring that stress-accent is culminative (even in roots). Therefore, when an underlying form supplies

both an accented root and an accented affix, only one may surface. The ordering  $\text{PROS-FAITH}_{\text{Root}} \gg \text{PROS-FAITH}_{\text{Affix}}$ , which by hypothesis holds in all languages, resolves this conflict, favoring retention of the root accent. The pattern of rightward edge orientation observed in affixes shows a role for the alignment constraint,  $\text{ALIGN-R}(\text{PK}, \text{PrWd})$ , which, in the right context, accounts for the pattern of ‘rightmost affix accent wins’. As the pattern of default-to-opposite edge accent is governed by a different set of constraint interactions, its treatment is postponed to section 5.1.

The following tableaux illustrate the results of the above ranking. As shown in (29), when the competition for the unique word accent is between an accented prefix and an accented root, the accented root wins. Likewise, when the competition is between an accented root and an accented suffix, the root will again prevail with the word stress (30).<sup>18</sup>

- (29) Root-Controlled De-Accenting in Prefixes: /áf + róot .../ → [af-róot ...]

	$x_1$ $x_2$ /pʔ + √míʔaw + lu/	MAX-PROM <sub>Root</sub>	MAX-PROM <sub>Affix</sub>
a.	( $x_1$ ) pʔ-míʔaw-lu	*!	
b. →	( . $x_2$ ) pə-míʔaw-lu		*

- (30) Root-Controlled De-Accenting in Suffixes: /... róot + áf/ → [... róot-af]

	$x_1$ $x_2$ /√ʔáyu + qá/	MAX-PROM <sub>Root</sub>	MAX-PROM <sub>Affix</sub>
a.	( . $x_2$ ) ʔayu-qá	*!	
b. →	( $x_1$ ) ʔáyu-qa		*

The same result obtains when an accented root combines with both an accented prefix and an accented suffix, as depicted in (31). Here again,

<sup>18</sup> The indices in the lexical and surface forms here and throughout indicate corresponding prominences in related strings.

the outcome is predominant root accent because of the universal ordering between root and affix faithfulness.

- (31) Root-Controlled De-Accenting: /áf + róot + áf/ → [af-róot-af]

$x_1$ /pə + √tul + qál/	MAX-PROM <sub>Root</sub>	MAX-PROM <sub>Affix</sub>
a. ( . $x_3$ ) pə-tul-qá	*!	*
b. ( $x_1$ ) pə-tul-qa	*!	*
c. ( . $x_2$ ) → pə-túl-qa		**

When the competition is instead between two accented affixes, the faithfulness constraints cannot be decisive, as the MAX-PROM violations are equal in such a case. The decision therefore falls to the lower ranked alignment constraint, ALIGN-R(PK, PrWd), which favors right-aligned stress peaks. This constraint thus picks the candidate with the rightmost affix stress, as shown below, for a word with an accented prefix and suffix.<sup>19</sup>

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

$x_1$ /pə + √yax + qál/	MAX-PROM <sub>Affix</sub>	ALIGN-R(PK, PrWd)
a. ( $x_1$ ) pə-yax-qal	*	yax-qal !
b. ( . $x_2$ ) → pə-yax-qál	*	

This result also obtains in words with two stressed suffixes, e.g., /yax + qál + í/ → yax-qəl-í. The correct outcome here is more harmonic than a form which stresses the penultimate suffix, e.g., yax-qál-i, because the former better satisfies ALIGN-R(PK, PrWd).

The fact that inherent accent can be realized non-finally in Cupeño shows that MAX-PROM<sub>Affix</sub> dominates ALIGN-R(PK, PrWd). If the opposite ranking held, then inherent accent in affixes could only surface word-finally, which is not true for Cupeño. In the tableau below, lexical

<sup>19</sup> The degree of violation for an Alignment constraint is represented here and throughout by the segments of the misaligned syllables, though this is by no means crucial.

accent emerges in a non-final vowel, despite the resulting violation of ALIGN-R(PK, PrWd).

(33) Non-Final Prefix Stress: /áf .../ → [áf ...]

$x_1$ /pó + ·yax/	MAX-PROM <sub>Affix</sub>	ALIGN-R(PK, PrWd)
a. ( · x <sub>2</sub> ) pə-yáx	*!	
b. ( x <sub>1</sub> ) → pó-yax		yax

To give an interim summary of the results, the inherent ordering between root and affix faithfulness explains each pattern of root retention depicted above. That is, regardless of affix type, if an inherently accented root combines with an inherently accented affix, the accent of the root prevails because of the inherent ranking of MAX-PROM<sub>Root</sub> above MAX-PROM<sub>Affix</sub>. Affixal accent only emerges in words with unaccented roots because in such cases there is no root accent to realize. In words with more than one accented affix, the rightmost affix accent wins because of the role of ALIGN-R(PK, PrWd) in the system.

4.3. *Extending the Analysis*

The discussion so far has focussed squarely on the interaction between root and affix stress where the affixes are themselves accented. A good number of affixes in Cupeño, however, may contribute an accent, but do not themselves surface with stress.<sup>20</sup> These are the pre-accenting suffixes, which typically cause accent to fall on the root-final vowel. Any analysis of Cupeño accent must account for these cases, and as will be shown directly below, the ideas developed so far provide a clear line of analysis for pre-accentuation. The analysis will also be extended to account for the unique phonology of the nominalizer suffix -í.

<sup>20</sup> The absence of pre-accenting roots may lead one to the conclusion that affixes in Cupeño have a greater number of contrasts than roots, contrary to the predictions of morphologically dispersed faithfulness. However, diacritic properties of affixes such as pre-accentuation are not typically treated as accentual contrasts (see e.g., Poser 1984; Halle and Kenstowicz 1991; Idsardi 1992; Harris 1995; Inkelas 1999; Kager 1996; and Alderete 1999). Rather, pre-accentuation is assumed to be a morpho-accentual process triggered by certain morphemes. As such, pre-accentuation does not counter-exemplify the privileged status of roots because it is not analyzed as a contrast which is licensed by faithfulness constraints.

A list of the pre-accenting suffixes in Cupeño is given below.

- (34) Pre-Accenting Suffixes (see Hill 1967, H&H, and Hill and Nolasquez 1973)<sup>21</sup>
- |         |                                 |
|---------|---------------------------------|
| -ʔaaw   | ‘at’                            |
| -či     | ‘with, by means of’ (WITH)      |
| -maa    | ‘diminutive’ (DIM)              |
| -nuukV  | ‘punctual subordinator’ (PUNCT) |
| -ɪja    | ‘in’                            |
| -ɪjaʔaw | ‘on’                            |
| -ɪjax   | ‘from’                          |
| -pó     | ‘place of’                      |
| -wi     | ‘augmentative’ (AUG)            |
| -yka    | ‘to’                            |

One basic fact about these suffixes is that the accent contributed by the pre-accenting suffix generally surfaces on the root-final syllable, as shown by the input-output mapping  $/\sqrt{wəna} + nuk_{pre}/ \rightarrow wəná-nuk$  ‘having put it’ (H: 192).<sup>22</sup> As illustrated in the data below, the accent contributed by the pre-accenting suffix always wins out over an accented prefix, producing root-final stress, as shown in (35)–(36). The forms in (37) exemplify the same pattern, except the roots are disyllabic, which shows that pre-accenting suffixes yield root-final stress, and not for example root-initial stress.<sup>23</sup>

<sup>21</sup> A distinction is made in Hill and Hill (1968) between the suffixes given here and ones which are claimed to yield root-initial stress in unaccented forms, e.g.,  $-wə$  ‘present imperfect (plural subject)’,  $-wəwə$  ‘past imperfect’. The evidence given for this two-way distinction is largely based on theory-internal assumptions with regard to syncope, and for this reason I will only discuss the root-final accenting suffixes.

<sup>22</sup> Pre-accentuation is subject to certain locality conditions, and when these are not met, it appears that stress may fall on a immediately preceding suffix (though the evidence for this is rather unclear). See Hill and Hill (1968: 236) for the empirical details, and Alderete (1999) for a sketch of an analysis.

<sup>23</sup> Unfortunately it is impossible at this time to determine if the accent contributed by a pre-accenting suffix also takes precedence over an inherent suffix accent. The indeterminacy of the data, however, will not have crucial implications for the analysis presented here.

- (35) Accented Prefix + Unaccented Root  $\sqrt{ma}$  'hand' + Pre-Accenting Suffix  
 /nó + ma + čī<sub>pre</sub>/ → nə-má-či 'with my hands' H: 192  
 /pó + ma + čī<sub>pre</sub>/ → pə-má-či 'by the hand' 10.52  
 cf. /póm + ma/ → póʔ-ma 'their hands' 8.130
- (36) Accented Prefix + Unaccented Root  $\sqrt{ki}$  'house' + Pre-Accenting Suffix  
 /pó + ki + yka<sub>pre</sub>/ → pə-kí-yka 'to his house' 10.49  
 /čóm + ki + ʔaw<sub>pre</sub>/ → čəm-kí-ʔaw 'in our homes' 21.1
- (37) Accented Prefix + Unaccented Root (Disyllabic) + Pre-Accenting Suffix  
 /pó +  $\sqrt{tama}$  + ɲa<sub>pre</sub>/ → pə-tamá-ɲa 'in his mouth' 1.37  
 /pó +  $\sqrt{qəwi}$  + ʔaw<sub>pre</sub>/ → pə-qəwí-ʔaw 'at (on) its forehead' 11.108  
 /pó +  $\sqrt{qilyi}$  + ʔaw<sub>pre</sub>/ → pə-qilyí-ʔaw 'on nape of his neck' 15.240

A significant and important fact of pre-accentuation in Cupeño is that it is blocked in words that have inherently accented roots (Hill and Hill 1968). That is, when a pre-accenting suffix attaches to an accented root, no accent is inserted by the suffix and the root accent is realized, as exemplified below.

- (38) Accented Root + Pre-Accenting Suffix
- a. mómə-ykə                      / $\sqrt{mómə}$  + ykə<sub>pre</sub>/  
 'to the ocean'                      OCEAN + TO
- b. tíviʔ-ma-l                      / $\sqrt{tíviʔ}$  + ma<sub>pre</sub> + lə/  
 'small round basket'              BASKET + DIM + INFL

To summarize the main features of pre-accentuation, pre-accenting morphemes cause root-final stress. Further, pre-accenting morphemes win out over accent in a prefix, but lose to a root accent. The analysis given below builds on the ideas developed in section 4.2 in accounting for these facts.

In order to study the interaction between pre-accenting suffixes and inherent accent in roots and affixes, it is necessary to have a concrete analysis of pre-accentuation. While at present there is no 'standard' theory of pre-accentuation, a specific analysis will be given as a means of illustrating the

role of the privileged faithfulness status of roots in the analysis. This role is in no way diminished in other theories of pre-accentuation, however, as different theories still need to reckon with the blocking effects of accented roots (see Alderete (1999) for discussion and a different analysis).

Observationally, pre-accenting suffixes directly follow a stressed syllable. Following Kager (1996), this subcategorization-like requirement is treated as an alignment property, formalized within Generalized Alignment Theory (McCarthy and Prince 1993).

(39) PRE-ACCENT  $\equiv$  ALIGN(Affix<sub>pre</sub>, L, PEAK, R)

The left edge of pre-accented suffixes (a lexically marked affix class) must coincide with the right edge of a syllable dominated by a stress peak.

According to the above constraint, pre-accenting suffixes must be left-aligned to the right edge of a syllable with a stress peak.<sup>24</sup> PRE-ACCENT must therefore be ranked above ALIGN-R(PK, PrWd), as words with an unaccented root and a pre-accenting suffix receive non-final stress, in contrast to the general pattern of rightward edge orientation observed in words with accented affixes (see section 4.1 and section 4.2 for data and analysis). The role of PRE-ACCENT is thus to ensure that pre-accenting suffixes are properly aligned with a stressed syllable, which may be non-final in the word, as illustrated below.

(40) Root-Final Stress in Pre-Accentuation: /... root + af<sub>pre</sub>/ → [... róot-af<sub>pre</sub>]

/-wəna   nuk <sub>pre</sub> /	PRE-ACCENT	ALIGN-R(PK, PrWd)
a. ( . x ) wəna   nuk <sub>pre</sub>	*!	
b. → ( . x ) wəná   nuk <sub>pre</sub>		*

The two candidates above differ in their obedience to the prominence subcategorization requirement. The losing candidate has final stress, and while this pattern leads to satisfaction of ALIGN-R(PK, PrWd), it is fatal because

<sup>24</sup> This prosodic subcategorization constraint is functionally independent of morphological subcategorization, which is not dealt with here. The latter type of constraint is responsible for precluding infixation, where the pre-accenting affix aligns with a non-final stressed syllable in the root (as in McCarthy and Prince's (1990) analysis of Ulwa possessives), in addition to the basic ordering properties of these affixes.

the pre-accenting suffix is not properly aligned with the stressed syllable. The winner is thus the form with root-final stress because such a pattern satisfies PRE-ACCENT.

Concerning the interaction between roots and pre-accenting suffixes, root accent overrides pre-accentuation, as it does with accented suffixes. The explanation of this fact is very much on a par with the explanation of predominant root accent given above. The competition for word stress is again determined by top-ranked root faithfulness.

- (41) Blocking Effect with Accented Roots: /... róot + af<sub>pre</sub>/ → [... róot-af<sub>pre</sub>]

<sup>x<sub>1</sub></sup> /·tíviʔə   maa <sub>pre</sub> + lə/	MAX-PROM <sub>Root</sub>	PRE-ACCENT
a. ( <sup>x<sub>2</sub></sup> ) tíviʔə   maa <sub>pre</sub> -lə	*!	
b. ( <sup>x<sub>1</sub></sup> ) → tíviʔə   maa <sub>pre</sub> -lə		*

This result truly shows the importance of Prosodic Faithfulness in the analysis. The competition here is between two morphemes, both of which yield stress on the root. Therefore, it is only by considering the lexical sources of accent, and their morphological affiliation, that the correct outcome is arrived at. In particular, inherent accent in the root wins not because stress surfaces within the root; the accent contributed by the pre-accenting suffix surfaces in this position as well. Rather, it is the affiliation with the root which leads to satisfaction of top-ranked MAX-PROM<sub>Root</sub>.<sup>25</sup>

As a final puzzle, let us examine the special phonology of the nominalizer -í, which is characterized by Hill and Hill (1968: 236) as being intermediate between a root accent and an affix accent. The nominalizer is ‘weaker’ than a root accent because it is not stressed when it combines with an accented root, as shown in (42). But it is stronger than a suffix accent, as shown by the fact that it can cause deletion of a subsequent accent (43), going against the general pattern of retaining of the rightmost affix accent.

- (42) Intermediate Behavior of the Nominalizer -í

wíw-i-š	/wíwə + i + čə/
‘acorn mush’	COOK.ACORN.MUSH + NOM + ABSO
páčik-i-š	/páčikə + i + čə/
‘leached acorn meal’	LEACH.ACORN.FLOUR + NOM + ABSO

<sup>25</sup> See Alderete (1999) for discussion and analysis of this same pattern of root Privilege in pre-accentuation in Tokyo Japanese, Modern Russian, and Getxo Basque.

- (43) Intermediate Behavior of the Nominalizer *-í*
- |    |                            |  |
|----|----------------------------|--|
| a. | yəx-í-qə-t                 | /yax+ i + qá + tə/                         |
|    | ‘one who is going to say’  | SAY + NOM + PRES + ABSO                    |
| b. | k <sup>w</sup> aʔ-í-qa-t   | /k <sup>w</sup> a + i + qá + tə/           |
|    | ‘I’m gonna eat ...’        | EAT + NOM + PRES + ABSO                    |
|    | k <sup>w</sup> a-ʔí-q-tə-m | /k <sup>w</sup> a + i + qá + tə + m/       |
|    | ‘we’re gonna eat ...’      | EAT + NOM + PRES + ABSO + PLUR             |
| c. | max-í-qa-t                 | /max + i + qá + tə/                        |
|    | ‘(I’m) gonna give’         | GIVE + NOM + PRES + ABSO                   |
|    | nə-max-í-və-ɪjax           | /nə + max + i + və + ɪjax <sub>pre</sub> / |
|    | ‘(the way) I always do’    | 1sg + GIVE + NOM + SUBORD + FROM           |

When compared to other known morpho-accentual phenomena, the behavior of the nominalizer suggests several possible analyses. For example, as a stem-forming suffix, *-í* may be ascribed the special faithfulness properties characteristic of derivational affixes to account for the retention of its accent over an affix accent (see especially Revithiadou 1999).<sup>26</sup> Alternatively, the nominalizer could be approached as another well-known accentual class, namely dominant morphemes, which trigger a deletion of a neighboring accent (see Inkelas (1998) and Alderete (1999, 2000) for extensive discussion), and in turn allow the suffix to realize its own inherent accent. Third, as a noun-forming affix, the intermediate status of *-í* may also be a faithfulness effect due to its membership in the class of nouns, providing further support for the notion of noun faithfulness proposed in Smith (1998, 2000). For the matters at hand, however, the specific details of the analysis are not directly relevant, and so I will generalize across these proposals by assuming that there is a rankable constraint, STRESS-TO-*í*, which specifically requires stress on the nominalizer.

The importance of the nominalizer is that it has an intermediate status among the accentual types of morphemes in Cupeño, e.g., roots and affixes, and thus, it must be distinguished from these types in a formal way. Consistent with the line of analysis pursued in this paper, morphemes of

<sup>26</sup> Though such an analysis would require recognizing the notion of root faithfulness which is distinct from faithfulness to derivational affixes to account for the blocking effects observed in words with accented roots.

different inherent strengths are distinguished through constraint ranking. Thus, if STRESS-TO-*í* is ranked above MAX-PROM<sub>Affix</sub>, the fact that the nominalizer takes precedence over affix accent is directly accounted for, as show below.

(44) Special Behavior of Nominalizer -*í*: /... *i* + *áf*/ → [... *í*-af]

<sup>x<sub>1</sub></sup> /·yax + <i>i</i> + qát/	STRESS-TO- <i>í</i>	MAX-PROM <sub>Affix</sub>
a. ( <sup>x<sub>1</sub></sup> ) yax- <i>i</i> -qát	*!	
b. ( <sup>x<sub>2</sub></sup> ) → yax- <i>í</i> -qat		*

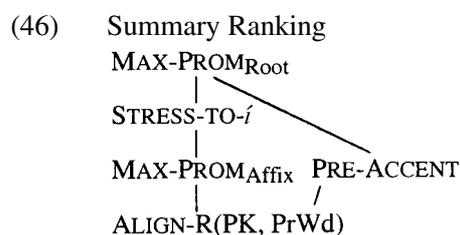
The nominalizer loses to a root accent, however, which shows that STRESS-TO-*í* is dominated by MAX-PROM<sub>Root</sub>:

(45) Root-Controlled Accent in Derived Nominals: /... *róot* + *i*/ → [... *róot*-*i*]

<sup>x<sub>1</sub></sup> /·páčikə + <i>i</i> + čə/	MAX-PROM <sub>Root</sub>	STRESS-TO- <i>í</i>	MAX-PROM <sub>Affix</sub>
a. ( <sup>x<sub>2</sub></sup> ) pačikə- <i>í</i> -čə	*!		
b. ( <sup>x<sub>1</sub></sup> ·) → páčikə- <i>i</i> -čə		*	

The up-shot is thus that the behavior of the nominalizer further substantiates the distinction between root and affix faithfulness in the analysis. The intermediate status of the nominalizer is directly characterized by ranking STRESS-TO-*í* between root and affix faithfulness.

To summarize the results of this section, the rankings shown below build on the constraint system of section 4.2 to account for pre-accentuation and the behavior of the nominalizer -*í*.



Distinguished lexically from the accented suffixes, the pre-accenting suffixes preferably appear to the right of a stressed syllable. This subcategorization requirement, embodied in PRE-ACCENT, is ranked above the alignment constraint because it may bring non-final stress. However, PRE-ACCENT is ranked below MAX-PROM<sub>Root</sub> because the presence of a root accent precludes pre-accentuation. Finally, the intrinsic ordering between MAX-PROM<sub>Root</sub> and MAX-PROM<sub>Affix</sub> is crucial to the characterization of the intermediate strength of the nominalizer, providing the right slot for the ranking of STRESS-TO-*í* in the system.

In conclusion, the distinction between root and affix faithfulness has two important functions in the analysis. First, it explains the fundamental property of predominant root accent, even in subtle cases involving the morpho-accentual process of pre-accentuation. Second, it is instrumental in the analysis of the intermediate rank of the nominalizer. These two independently established ranking arguments converge on the same result, providing strong evidence for the privileged faithfulness status of roots over affixes.

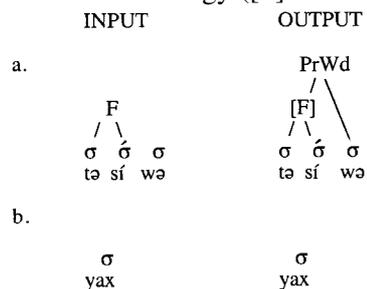
#### 4.4. *Discussion of Alternatives*

In this section, two alternatives to the faithfulness-based analysis of predominant root stress are considered: the level-ordering analysis proposed in Crowhurst (1994) (section 4.4.1), and a cyclic account along the lines of Halle and Vergnaud (1987) (section 4.4.2).

##### 4.4.1. *A Level-Ordering Account*

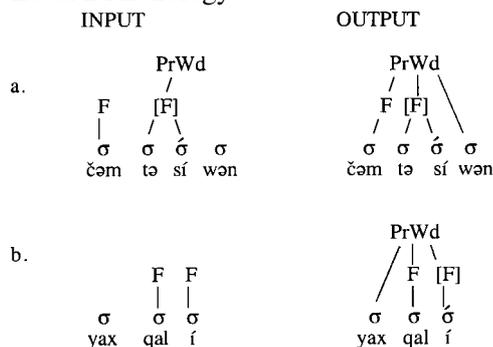
Crowhurst (1994) gives a level-ordering account of predominant root accent. The crux of the analysis centers on a lexical distinction between accented and unaccented roots: accented roots have a lexical foot, and unaccented roots do not, as depicted in (47) below. The inputs to the Level 1 phonology differ in the presence of a lexical foot, and they are also distinguished in the output by the presence of a word-level category. The root syllable in (47b) cannot be parsed directly by the prosodic word because this option violates the principle of Strict Layering (Selkirk 1984; see section 2.1 for a recent constraint-based characterization of this principle), and furthermore, this form cannot be supplied with an epenthetic foot because this strategy is not available.

(47) Level 1 Phonology ([F] = a main stress foot)



When these outputs are then subjected to the Level 2 phonology, the difference between accented and unaccented roots is exploited in the following way. Words with accented roots already have word-level structure, which in turn determines the position of the main stress foot (48a). On the other hand, words with unaccented roots will be devoid of such structure, and can therefore be assigned rightmost affix stress with a different set of stress rules (48b).

(48) Level 2 Phonology



The level-ordering analysis accounts for predominant root stress by defining a root cycle prior to affixation in which certain principles of prosodic organization apply, effectively distinguishing accented and unaccented roots in the relevant way. Crucial to this analysis, therefore, is the assumption that the grammar cycles on bound roots. This claim, however, has been argued against extensively in the literature (see e.g., Kiparsky (1982) and Inkelas (1989) and references therein). The empirical finding in these works is that bare bound roots do not form domains for cyclic rules. It would seem, therefore, that the level-ordering account bases its analysis on an assumption for which there is little cross-linguistic support.

There is an additional empirical problem with this analysis, stemming from the distinction made between accented and unaccented roots. The

Level 1 phonology distinguishes between accented roots and unaccented roots by the presence of word-level prosodic structure. In effect, unaccented roots are like clitics when they leave the Level 1 phonology. As it happens, Cupeño's Level 2 phonology supplies a word tree, so unaccented roots do not retain their clitic-like status. However, there is nothing inherent to the level-ordering analysis that ensures that this necessary step would take place. So the typological prediction is made that there should be some language where unaccented roots behave like clitics post-lexically. To my knowledge, however, no such language exists. For example, in Tokyo Japanese, unaccented roots have no specific prosodic properties other than their lack of tone structure. It seems, therefore, that the core idea of the level-ordering analysis has little empirical support outside of Cupeño.

#### 4.4.2. *A Cyclic Analysis*

A different approach to predominant root stress can be modelled in the multi-stratal framework given in Halle and Vergnaud (1987) (see also Melvold 1990; Idsardi 1992; Czaykowska-Higgins 1993 for further developments). In this work, so-called dominant morphemes are distinguished from recessive ones through cyclicity. In particular, dominant affixes are cyclic morphemes which are represented on a metrical plane that is distinct from that of other morphemes. Thus, in the examples from Vedic Sanskrit below, the accent of the dominant suffix *-íṇ* is represented on a different autosegmental plane from the one for the roots and noncyclic suffixes.

- (49) /ráth+*íṇ* + e/    rath-*íṇ*-e    'charioteer' (dative singular)  
       /mitr+*íṇ* + e/    mitr-*íṇ*-e    'befriended' (dative singular)

Furthermore, cyclic affixation triggers a copying process from one metrical plane to the plane of the cyclic affix. This copying is governed by the Stress Erasure Convention (SEC), which essentially states that information about stress generated on previous cycles is carried over only if the affixed constituent is not a domain for the cyclic stress rules. Thus, as depicted below, the accented/unaccented contrast in roots is lost when they combine with dominant (cyclic) suffixes.

(50) Dominant Affixes in Vedic Sanskrit (Halle and Vergnaud 1987)

Cyclic Stratum	(Accented)	(Unaccented)	
Cycle 1	* ráth	mitr	
Cycle 2	* ráth-ín *	mitr-ín *	
OUTPUT	rath-ín *	mitr-ín *	Root accent deleted by SEC

In this illustration, accented and unaccented roots are distinguished by the presence of stress above the root. This information is represented on a metrical plane apart from the one marking stress on cyclic affixes, which is placed directly below the form. When root stress is copied at Cycle 2, this information is lost because the larger constituent forms a domain for the cyclic stress rules, in effect neutralizing the accentual contrast in roots.

Consider next the application of the basic proposal to Cupeño. Suppose that the direction of copying can be parameterized on a language-particular basis. That is, suppose that instead of copying from the root stress plane to the cyclic plane, as in Vedic, stress information for affixes is copied to the root stress plane. Assuming that the affixed constituents form cyclic domains effectively accounts for predominant root stress with the SEC. This result is illustrated in the chart below.

(51) Predominant Root Accent in Cupeño

Cyclic Stratum	(Accented)	(Unaccented)	
Cycle 1	* təsíwə	yax	
Cycle 2	* čəm-təsíwə *	yax-qál-í * *	
OUTPUT	* čəm-təsíwə	* yáx-qal-i	Affix stress deleted by SEC

With accented roots, it is clear how the SEC applies to give the correct result: when copying from the affix plane to the root plane, information specified for affixes is lost because the larger constituent forms a cyclic

domain. This same principle, however, gives an incorrect result for words with unaccented roots. On a par with the accented roots, affix stress is lost with cyclic affixation, yielding a metrical plane with no stress information whatsoever, and which therefore receives a default initial stress. In sum, just as dominant affixes neutralize the accentual contrast in the roots they attach to, roots in Cupeño would neutralize the accentual contrast in affixes, leading to the incorrect outcome above with \**yáx-qal-i*.

The only way around this descriptive problem is to posit a feature [cyclic], which governs the possibility of copying from the affix plane when applied to roots. That is, accented roots must be marked [+cyclic] in order to require copying, which results in deletion of affix stress, while unaccented roots must be marked [–cyclic] to preclude this copying. Going beyond the lack of explanatory insight, this approach leads to a more serious empirical problem. By introducing cyclicity as a marker of predominance which is independent of the accentedness contrast, the cyclic approach essentially claims that these two features will cross-classify roots in some language. However, recent work (Inkelas 1998; Alderete 1999, to appear) has surveyed effects such as these in a variety of languages, and found that the dominant/recessive distinction is not used in any language to classify roots. The application of such a feature to account for the behavior of roots in Cupeño, therefore, seems to make an empirical prediction for which there is no cross-linguistic support.

## 5. THE LARGER SYSTEM

This section picks up where we left off in section 4.3, providing an analysis of default-to-opposite edge stress. The next subsection presents an analysis that is consistent with the findings made thus far, which is then followed by a summary of the larger system.

### 5.1. *Default-to-Opposite Edge Accent*

Recall from section 4.1 that words which do not have a lexical accent receive initial stress. Alongside the rightward orientation of affix accent, Crowhurst (1994) compares this pattern of conflicting directionality to default-to-opposite edge orientation in unbounded stress systems. Naturally, it is desirable to account for this pattern of ‘rightmost lexical accent/otherwise default initial stress’ with the same basic toolbox em-

ployed in the analysis of default-to-opposite stress, and this is the spirit in which the following analysis is proposed.<sup>27</sup>

At the heart of most recent approaches to default-to-opposite stress is a ranking of conflicting alignment constraints. Thus, Zoll (1997) and Walker (1998a) employ opposing alignment constraints formulated to contrast different syllable types, i.e., heavy versus light; Baković (1998) approaches the problem in terms of constraint conflict between alignment constraints defined at different levels of metrical structure (cf. Prince 1983); and similar constraint rankings are used in Kenstowicz (1995), and Crowhurst and Hewitt (1997). For concreteness, I follow Baković (1998) in distinguishing among levels of metrical structure, exploiting the distinction between stress peaks (heads of PrWds) and stress prominences (heads of stress feet) explained in section 2.1. In particular, stress peaks are properly aligned with the right edge of the word, while stress prominences are left-aligned, preferably coinciding with the left edge of the word, as depicted below.

(52) Default-to-Opposite Stress in Cupeño

a. Rightmost Stress Peak Wins

$$\begin{array}{ccccccc} x & & x & ( & & x) \\ x & & x & & ( & . & x) \\ x & x & x & x & x & x & \\ /pó + yax + qál/ & \rightarrow & pə-yax-qál \end{array}$$

b. Leftmost Stress Prominence

$$\begin{array}{ccccccc} & & & & ( & . & ) \\ & & & & (x & . & ) \\ x & & x & & x & x & \\ /yax + əm/ & \rightarrow & yáx-əmə \end{array}$$

While the distinction between different grid levels does not appear to have any direct phonetic consequences for stress, it is crucial to the analysis. The rightmost stress peak (= lexical accent) wins in a word with more than one accented affix, but in the absence of a lexical accent, the most prominent syllable is leftmost in the word.<sup>28</sup> This result is very much on a par with the treatment of default-to-opposite edge stress in the aforementioned

<sup>27</sup> Recent work (Herrick 2000) has proposed an interesting alternative to the analysis of default-to-opposite edge pattern given here, arguing that the distinction between alignment and anchoring constraints brings about the observed conflicting directionality.

<sup>28</sup> See Anttila and Bodomo (1996) for a parallel result in Dagaare where lexical accent is likewise argued to be more prominent than non-lexical accent.

analyses, except the pattern of default initial stress does not have a grid mark equated with a stress peak. The generalization governing the non-uniform set of structures above is thus that a stress peak is not inserted if it is not needed to distinguish the most prominent syllable from all others. The constraint interaction giving this result involves ranking DEP-PROM above the constraint requiring a head of the prosodic word (= stress peak), namely HEADEDNESS(PrWd) (see section 2.1 for the definition of this constraint).<sup>29</sup> Because of this ranking, stress peaks will only be present in the output if they are also present in the input, correctly predicting the input-output mappings given above.

The alignment constraints which are responsible for the conflicting directionality effects are given below.

(53) Alignment Constraints for Conflicting Directionality

- a. INIT-PROM  $\equiv$  ALIGN (PROM, L, PrWd, L): the left edge of every stress prominence must coincide with the left edge of some PrWd.
- b. ALIGN-R(PK, PrWd)  $\equiv$  ALIGN (PEAK, R, PrWd, R): the right edge of every stress peak must coincide with the right edge of some PrWd.

INIT-PROM refers to stress prominences and characterizes the imperative for prominence on the initial syllable, as illustrated in the tableau below.

(54) Default Initial Stress: / $\sigma \sigma \dots$ /  $\rightarrow$  [ $\acute{\sigma} \sigma \dots$ ]

	/yax + əm/	ALIGN-R(PK, PrWd)	INIT-PROM
a.	$\begin{array}{l} ( \cdot )_{\text{PrWd}} \\ ( \cdot \ x )_{\text{Ft}} \\ yax-\acute{\sigma}m \end{array}$		yax!
b.	$\begin{array}{l} ( \cdot )_{\text{PrWd}} \\ ( x )_{\text{Ft}} \\ \rightarrow y\acute{a}x-\acute{\sigma}m \end{array}$		

A word-level stress peak cannot be inserted because of the rank of DEP-PROM. As a result, words with no inherent accent receive initial stress

<sup>29</sup> This ranking does not entail that words with no lexical accent will surface fully unaccented since DEP-PROM only dominates the headedness constraint for the prosodic word; the parallel constraint requiring syllabic heads of feet ensures that all words have a stress prominence.

because the left edge is the preferred edge for grid marks equated with stress prominence. On the other hand, stress peaks are oriented to the right edge of the word. Therefore, in words with more than one inherently accented affix, the rightmost inherent accent wins as an effect of ALIGN-R(PK, PrWd). As illustrated below, this result requires ranking ALIGN-R(PK, PrWd) above INIT-PROM, because the presence of a stress peak entails a subordinate stress prominence, which by INIT-PROM should be properly aligned at the left edge of the word.

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

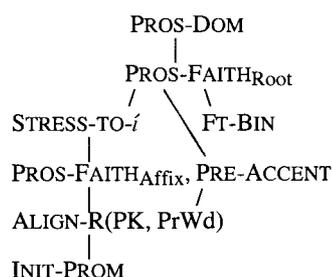
	<sup>x1</sup> /pɔ̃ + yax + qál/ <sup>x2</sup>	ALIGN-R(PK, PrWd)	INIT-PROM
a.	(x <sub>1</sub> )PrWd (x)Ft pɔ̃-yax-qal	yax-qal!	
b.	(. x <sub>2</sub> )PrWd (. x)Ft → pə-yax-qál		pə-yax

In sum, the divergent patterns of directionality are handled as conflicting alignment constraints which refer to different levels of prominence structure. When these constraints conflict, rightmost inherent accent prevails because of the ranking of ALIGN-R(PK, PrWd) above INIT-PROM.

5.2. Summary Ranking

The rankings below summarize the argumentation dealing with the interaction between root and affix accent.

(56) Root and Affix Accent in Cupeño



A high ranking set of constraints, PROS-DOM, ensures that only one lexical accent can be realized as stress in the output. The universal ordering of root and affix faithfulness correctly predicts that lexical accent in a root will override lexical accent elsewhere in the word. Further, the privileged faithfulness status of roots derived from this ordering provides a direct avenue of analysis for two additional facts in the system. Through the domination of PRE-ACCENT and STRESS-TO-í, root faithfulness successfully explains the blocking effects of accented roots in pre-accentuation and the peculiar behavior of the nominalizer suffix.

When the interaction of root and affix faithfulness is not enough, i.e., in words with unaccented roots, the low ranking alignment constraint ALIGN-R(PK, PrWd) becomes active and accounts for the observed rightward orientation of lexical accent by specifically referring to this level of the grid, namely stress peaks. Words with no lexical accent are not supplied with stress peaks at the surface, because of the ranking DEP-PROM  $\gg$  HEADEDNESS(PrWd), and as a result they are subject to a different alignment constraint, INIT-PROM, which produces initial stress in just this context.

In sum, the hierarchical relations explicit in these three basic patterns are analyzed as a constraint hierarchy in OT. A language particular ranking of alignment constraints negotiates the ‘rightmost affix accent, otherwise initial stress’ pattern, and the ordering of root and affix faithfulness constraints, superordinate to these constraints, explains the basic preference for realizing a root accent.

## 6. CONCLUSION

### 6.1. *Generality of Privileged Status of Roots*

A fundamental goal of linguistic theory is to make sense of language particular facts with universal principles. This paper achieves this goal by relating the interaction between root and affix accent in Cupeño to more general patterns of root privilege in phonological inventories and alternations. The observation that an inherent root accent generally overrides inherent accent in affixes is compared in a formal way to several distinct phonological systems, including root-controlled vowel harmony systems and dissimilatory processes. The parallels observed between these accentual and non-accentual processes are explained as the result of a general ordering among morphologically dispersed faithfulness constraints.<sup>30</sup>

<sup>30</sup> An important difference between vowel harmony and accentual systems is that only the former exhibits blocking effects from opaque vowels. The analysis of this difference

In addition, I have argued for the root-controlled analysis of Cupeño by contrasting it with the plausible alternatives. It was shown that, in contrast to the proposed analysis, the alternatives employing phonological levels of various types lead to descriptive problems and loss of generalization. First, the level-ordering account was shown to rely on the assumption that bare bound roots form cyclic domains, and this assumption was challenged on empirical grounds. Second, the cyclic alternative was shown to have a descriptive problem with predominant root stress, and the fix-up to this problem led to a feature system which was also challenged. Moreover, in appealing to mechanisms specific to a theory of accent, e.g., the specification or erasure of prosodic structure, the alternatives fail to make connections to non-accentual phenomena like root-controlled vowel harmony, and as a result, the ideas inherent to these alternatives do not have the same generality as the analysis given here.

### 6.2. *An Alternative to Phonological Directionality*

This study also contributes to linguistic typology by introducing the notion of root-controlled accent (RCA) as a new descriptive category in the study of stress and accent. In RCA systems, the resolution of multiply accented structures favors retention of an inherent root accent over inherent accent elsewhere in the word. An interesting feature of this approach, therefore, is that it assigns a role to morphological structure in the description of a pattern that has formerly been treated in terms of phonological directionality. For example, in an influential paper, Kiparsky and Halle (1977) describe accent resolution in a variety of Indo-European languages in terms of a principle of edge orientation, according to which accent is lost in all but the first inherently accented morpheme of a word (see also Halle 1997 for recent developments). Poser (1984) likewise employs a principle of edge orientation to describe accent resolution in minor phrases in Tokyo Japanese. The evidence from Cupeño shows that phonological directionality is not enough as a cross-linguistic theory of accent resolution. Moreover, as I discuss below, the notion of root-control can shed new light on properties of languages which have formerly been treated in terms of directionality.

It is helpful to return to the analogy of vowel harmony systems once again as a way of making this point explicit. The well-known cases of back (and round) harmony in Finnish and Turkish show alternations in

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stems from the theory of autosegmental spreading: because root-control in vowel harmony systems is achieved through linking of a feature, substantive constraints on these linkages can prohibit spreading across or through an opaque vowel. Since grid marks cannot spread, such blocking effects are not possible in accentual systems described in terms of prominence on the grid.

suffixes which are amenable to a left-to-right spreading rule, an analysis which also involves a principle of directionality (see e.g., Bach (1968) and Lightner (1972)). Considered alongside root-controlled [ATR] harmony in Igbo, however, an equally coherent analysis of Finnish and Turkish is that the specification for vowel features in suffixes is root-controlled. In this analysis, the suffixing preference in these languages only gives the appearance of a directionality effect, but it is the vowel specifications in the root that have the formal role in the analysis (see Clements (1981) et seq, Lightner (1965), and Ringen (1975) [1988] for discussion and analysis of root-controlled vowel harmony).

In a similar way, the analysis of root-controlled accent in Cupeño suggests a new analysis of other accentual systems formerly described in terms of directionality. In this analogy, Cupeño is like Igbo because it shows a pattern of root retention in both prefixed and suffixed structures. Russian and Japanese are like Finnish and Turkish: both languages show a preference for suffixing morphology, which allows them to be analyzed either as root-controlled accent systems, or in terms of directionality (see Alderete 1999 for the evidence showing that it is not possible to distinguish the two analyses empirically). Considered alongside Cupeño, these cases are consistent with an analysis in terms of root-control, and therefore may be explained in terms of the same universal principles of root privilege.<sup>31</sup>

The treatment of languages like Russian and Japanese in these terms has at least two advantages, one theoretical and one descriptive. First, if the root-controlled hypothesis is correct, and accent resolution in Russian and Japanese is governed by the interaction of root and affix faithfulness, then these patterns derive from an intrinsic ordering which, as argued above, has a very general explanation. The interaction between root and affix accent in these languages establishes a formal parallel to other root-controlled alternations. Second, as discussed in detail in Cupeño, the root-controlled accent hypothesis clarifies a role for root accentedness in blocking the application of other morpho-accentual processes. Russian and Japanese likewise have processes of pre- and post-accentuation and accentual shifts which show blocking effects in words with accented roots (see Alderete 1999 for details of the analysis). Thus, root retention is also found in the morpho-accentuation processes which provide crucial evidence for the root-controlled analysis.

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<sup>31</sup> For further accentual examples where the notion of root privilege has some currency, see Revithiadou (1997, 1998) for an application of these same ideas to columnar stress and so-called post-accenting stems in Modern Greek, and Bar-el and Watt (1998) and Shaw et al. (1999) on the implications of this inherent ordering for lexical suffixes in two Salishian languages.

At the very least, the present study shows that the phonological principle of directionality is not enough as a cross-linguistic theory of accent resolution. The principle of root-controlled accent must be recognized for cases like Cupeño which cannot be cogently described with phonological directionality. Beyond this, the root-controlled accent hypothesis has some currency outside of Cupeño because it provides a deeper explanation of the observed pattern of root retention and clarifies a role for root accentedness in blocking effects in other languages.

### 6.3. *Implications for Dominance Effects*

Many accentual systems have a set of so-called dominant affixes whose chief characteristic is that they trigger a deletion of accent in a neighboring morpheme. Interestingly, dominant affixes may cause the root to lose an inherent accent and allow accent to surface on the affix. For example, the adjective forming suffix *-ppó* in Tokyo Japanese causes a deletion of the root accent, which gives the affix the chance to realize its own accent, e.g., / $\sqrt{\text{adá}}$  + *ppó* + *i* /  $\rightarrow$  *ada-ppó-i* ‘coquettish’ (Poser 1984). At first glance, cases such as this look like outright counter-examples to the analysis that accent is root-controlled and the basic predictions of the meta-constraint *Root Faith*  $\gg$  *Affix Faith*.<sup>32</sup> I will show below, however, that affixal dominance is not a counter-example, and that it is in fact an entirely different phenomenon involving a lexically idiosyncratic specification for deletion.<sup>33</sup>

An important and significant fact in the analysis of dominant affixes is that the ability to cause a deletion of accent is independent of accentedness (Poser 1984; Inkelas 1998; Alderete 1999). A case in point is the behavior of the suffix *-kko* in Japanese. This suffix attaches to place names and produces a word meaning ‘native of X’, where X stands for the base toponym. As with several other affixes and particles in the language, this suffix causes a deletion of accent in the base with which it combines, as shown by the neutralization of accented/unaccented contrast in the place names below. Because this suffix is itself unaccented, the words given below are fully unaccented, meaning that they lack the pitch excursions

<sup>32</sup> I am indebted to Michael Kenstowicz and two anonymous reviewers for their challenges on this point.

<sup>33</sup> This argument applies with equal force when apparent affixal dominance derives from affixes which are lexically specified to trigger harmony with a root, as in certain morphologically governed dominant/recessive harmony systems (though see Noske 2000 for a different point of view).

characteristic of words with lexical pitch accent (see Pierrehumbert and Beckman 1988 and references therein for the phonetic details).

- (57) Dominant Suffix *-kko* in Tokyo Japanese (Poser 1984)
- |    |                   |   |               |                      |
|----|-------------------|---|---------------|----------------------|
| a. | /edo + kko/       | → | edo-kko       | ‘Native of Tokyo’    |
|    | /niigata + kko/   | → | niigata-kko   | ‘Native of Nigata’   |
| b. | /kóobe + kko/     | → | koobe-kko     | ‘Native of Kobe’     |
|    | /nyuuyóoku + kko/ | → | nyuuyooku-kko | ‘Native of New York’ |

The ability to cause a deletion is surely an idiosyncratic property of *-kko*, as other suffixes in the language, both derivational and inflectional, do not cause a deletion. Dominant affixes in Japanese are therefore like several other accentual systems in showing a contrast in accentedness: there are both dominant accented affixes like the adjective-forming suffix *-ppó* mentioned above, and dominant unaccented affixes like *-kko*, yet both trigger a deletion. The important point here is that the deletion triggered by dominant affixes cannot be correlated with accentedness because dominant unaccented affixes may also trigger a deletion.

This finding is significant because it shows that the analysis of dominant affixes must be different from the analysis of root-controlled accent. In RCA, two or more lexically specified accents compete for a unique word accent. The resulting deletion is therefore driven by the requirement that accent is culminative. Dominance effects, on the other hand, are not driven by culminativity because dominant morphemes are not properly understood as being in competition with another morpheme for a word-level prominence. This assertion follows from the simple fact that dominant morphemes, such as *-kko* in Japanese, may be themselves unaccented and still bring about a deletion. At both an observational and analytical level, therefore, it is clear that RCA and dominance effects are really different animals altogether. RCA is driven by culminativity and applies to all words with accented roots, while dominance effects are not an effect of culminativity and are triggered by individual affixes.

The view that dominance effects are due to an idiosyncratic property of affixes, independent of accentedness, is widely accepted in contemporary theories of the morphology-phonology interface. In Halle and Vergnaud (1987), for example, dominant affixes are distinguished from other affixes by being marked [+cyclic], which has the effect of triggering a deletion when the material of the immediate derivational predecessor is copied from another phonological tier. Inkelas (1998) likewise ascribes diacritic properties to dominant affixes by assigning them to a separate ‘co-phonology’,

or subgrammar, distinct from that of other affixes and the stems to which dominant morphemes attach. This analytical move is also taken in Alderete (1999, to appear), where certain idiosyncratically marked affixes activate a new type of constraint, anti-faithfulness, which also induces an accent deletion.

It is clear from these proposals that dominant affixes require lexically idiosyncratic markings which distinguish them from other morphemes in that they bring about deletion. This analysis is fundamentally different from the analysis of root-controlled accent in Cupeño and other languages. The deletions caused by dominant morphemes are lexical markings for affixes, not roots, which shows that the divergent behavior is allocated to distinct morphological domains. Moreover, accent resolution by root-control happens across-the-board, in all words which have accented roots; root-controlled accent is therefore not independent of accentedness. Dominance effects, on the other hand, are lexically specified deletions which are distinct from the lexical specifications for accent. The analysis of root-controlled accent in Cupeño therefore identifies a morpho-accentual process which must be distinct from the deletion process involved in dominance effects, and it has the advantage of clarifying the properties which distinguish these two types of morpho-accentual phenomena.

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