MORPHOLOGY/PROSODY INTERFACE

5.1 Introduction

At issue in this chapter is the nature of interaction between prosody and certain types of allomorphy. Allomorphy that is rooted in segmental alternations like the ones we discuss in this thesis, gives support to the main proposal of this dissertation concerning the relationship between stress and foot structure.

It is well known that there are types of allomorphy that depend on phonology rather than on morphosyntactic information or arbitrary classes in the lexicon. The most commonly cited example, of course, is English *an ~ a* allomorphy of the indefinite determiner. Even though the phonology of the language in general does not include an [n] deletion or an [n] insertion requirement, the indefinite determiner appears as either *an* (if the following word begins with a vowel), or *a* if the following word begins with a consonant[1].

In Italian, there are (at least) two suppleted allomorphs for the prefix that negates an adjective, *s-* and *in-* (Scalise 1984), whose distribution depends on segmental phonology. The s- allomorph attaches to stems beginning in a consonant, as in:

(1)

       fortunato 'lucky'
       s-fortunato 'unlucky'

However, *s-* does not attach to vowel-initial adjectives[2], in which case the allomorph *in-* is used, as in:

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[1] This rule is subject to lexical exceptions and dialectal and stylistic variation.

[2] It is curious to note that this distribution does not seem to be governed by Output Optimization, since the reverse would be expected, i.e. the *s-* allomorph attaching to vowel-initial adjectives creating an onset, and not attaching to the consonant-initial stems, because of the resulting complex coda.

(2)

       utile 'useful'
       *s-utile 'not useful'
       in-utile 'not useful'

The allomorph *s-* is also never concatenated with adjectives whose initial segment cannot be preceded by s- by normal phonotactic rules of the language, i.e. the prefix allomorph that seems to be the preferred one for negative adjectives is blocked from attaching to stems when the result is unacceptable by regular phonology of Italian:

(3)

       giusto 'right'
       *sgiusto 'not right'
       ingiusto 'not right'

All kinds of phonological environments can serve as conditioning allomorphy, and prosodic information is no exception. In English, to take another well-known example, the suffix /-ful/ that turns nouns into adjectives only attaches to stems ending in stressed syllables; and it also cannot attach to stems ending in /v f/, presumably following regular phonotactics of the language (Siegel 1974: 164-174, Brown 1958, Chapin 1970).

Similarly, in Dutch (Booij & Lieber 1993), there are two allomorphs of the suffix that turns nouns into adjectives, *-isch* and *-ief*. The allomorph *-ief* is selected when the final syllable is stressed in the underived base and ends in *-ie*, while the other allomorph, *-isch*, is chosen elsewhere.

Another Dutch adjectivizing suffix, *-ig*, according to Trommelen & Zonneveld (1989) and Kager (1996) only attaches to stems ending in stressed syllables and may cause both blocking and stress shift.

The German deverbal adjectivizing suffix *-ei ~ -erei* surfaces with the allomoph *-erei* if the stem ends in a stressed syllable, while *-ei* is concatenated with stems ending in an unstressed final syllable (Hargus 1993, Hall 1990). For examples of this and other examples of German affixation that depend on the position of stress, see Hall (1990).

Examples where it is foot structure rather than stress that is responsible for allomorphy are somewhat more difficult to find, but they exist nevertheless. In chapter 2, we mentioned a case of foot structure-conditioned allomorphy in Northern Sámi (Saami, Lapp, Lappish) described and analyzed in Dolbey (1997), repeated here for convenience:

(4)

	jearra- 'ask'	veahkehea- 'help'	'even'	'odd'
1du	je:r.re.-ø	veah.ke.he:-t.ne	ø	-tne
2du	jear.ra.-beaht.ti	veah.ke.hea-hp.pi	-beahtti	-hppi
2pl	jear.ra.-beh.tet	veah.ke.he:-h.pet	-behtet	-hpet
3pl pret	je:r.re.-ø	veah.ke.he:-d.je	ø	-d.je

As Dolbey (1997) argues, the allomorphy in all cases in (4) above is sensitive to the foot structure of the language (trochaic, quantity-insensitive, first foot is aligned with the left edge of a Prosodic Word). If the stem contains an even number of syllables, an allomorph that creates a fully footed word is attached, i.e. an allomorph with either no phonological material (1st person dual and 3rd person preterite forms), or with two syllables that create a foot by themselves (2nd dual and 2nd plural forms of the verb *jearra-* 'ask'). If, on the other hand, a stem contains an odd number of syllables, as the stem *veahkehea-* 'help', monosyllabic allomorphs are the ones that attach to such stems (*-tne* for 1st person dual forms; *-hppi* for 2nd person dual; *-hpet* for 2nd person plural; and *-dje* for the 3rd person plural forms), all of which result, once again, in forms fully parsed into disyllabic feet. Note that the position of the stress does not play a part in the allomorph selection under question, since the stress in this Sámi language always falls on the initial syllable, without any secondary stress reported.

Hargus (1993) and Bergsland (1976) mention another example of allomorphy in Northern Sámi that depends on the foot structure of the stem, though not on the complete/incomplete parsing on the resulting form, since the allomorphs in this case are both disyllabic. The Illative plural suffix has two allomorphs, *-ide* and *-ida*. The allomorph of the suffix that has a higher (and hence less sonorous) vowel, *-ide*, attaches

when stem has an even number of syllables, and the allomorph that has the low vowel, -*ida*, is selected when stem has an odd number of syllables. Therefore, even though the resulting forms might not be completely parsed into binary feet, as in a case where an the disyllabic allomorph *-ida* is concatenated with a stem that has an odd number of syllables, the driving force of this allomorphy still seems to be output optimization, since the second syllable of the allomorph in this case ends up being parsed into a degenerate (monosyllabic) foot by itself, and its more sonorous vowel in the strong (head) position in a foot. On the other hand, when the allomorph *-ide* is selected as the one to attach to a stem with an even number of syllables, the suffix constitutes its own foot, with the second syllable containing a less sonorous [e] parsed into the weak second part of a trochaic foot.

Probably the most renowned example of the foot structure-sensitive allomorphy is found in Estonian, and is discussed in Prince (1980), Mürk (1991), and most recently in Kager (1995) and Blevins (2004). In Estonian, both nominal and verbal inflections have allomorphy that depends on the foot structure of the language.

In the nominal domain, Kager (1995) brings up the Partitive plural and Genitive plural suffixes that have more than one underlying form, and the choice between allomorphs is made on the basis of foot structure. The Partitive plural alternates between *-it* and *-sit*, and genitive plural, between *-te* and *-tte*. When suffixed to the stem *paraja-* 'clock, watch', the allomorph *-it* is selected for the Partitive plural form, and the allomorph *-tte* is selected over *-te* for the Genitive plural[3]. Blevins (2004) gives examples of similar distribution for the Adessive allomorphs *-tetta ~ -ttetta*, without providing an analysis for this alternation, since his paper is primarily concerned with generating the distribution computationally[4].

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[3] The stems given as underlying here are so-called Genitive stems, that are used for most of the case inflection; however, other stems (usually with different grades of consonants and/or vowels) exist for almost all the nouns mentioned here. For more see, for example, Kask (1966) or Viitso (1998).

[4] My sincerest thanks go to Andres Kivimäe (p.c.) who was kind enough to go over the Estonian examples with me, provide additional examples and glosses where they are missing in Kager (1995), as well as to clarify some points of pronunciation where they differ from orthography.

(5)

(a) /paraja-/ + /-it/ ~ /-sit/   párajà-it   *párajà-sit   'clock, watch' Part pl
     /paraja-/ + /-te/ ~ /-tte/   párajà-tte   * párajà-te   'clock, watch' Gen pl
     /paraja-/ + /-tetta/ ~ /-ttetta/   párajà-ttetta   * párajà-tetta   'clock, watch' Ades pl

(b) /raamattu/ + /-it/ ~ /-sit/   ráamattù-it   * ráamattù-sit   'book' Part pl
     /raamattu/ + /-te/ ~ /-tte/   ráamattù-tte   * ráamattù-te   'book' Gen pl
     /raamattu/ + /-tetta/ ~ /-ttetta/   ráamattù-ttetta   * ráamattù-tetta   'book' Ades pl

(c) /sisalikku/ + /-it/ ~ /-sit/   sísaĺikku-sit   *sísaĺikku-it   'lizard' Part pl
     /sisalikku/ + /-te/ ~ /-tte/   sísaĺikku-te   * sísaĺikku-tte   'lizard' Gen pl
     /sisalikku/ + /-tetta/ ~ /-ttetta/   sísaĺikku-tètta   * sísaĺikku-ttètta   'lizard' Ades pl

(d) /telefoni/ + /-it/ ~ /-sit/   télefòni-sit   * télefòni-it   'telephone' Part pl
     /telefoni/ + /-te/ ~ /-tte/   télefòni-te   * télefòni-tte   'telephone' Gen pl
     /telefoni/ + /-tetta/ ~ /-ttetta/   télefòni-tètta   * télefòni-ttètta   'telephone' Ades pl

(e) /pesa/ + /-it/ ~ /-sit/   pésa-sit   * pésa-it   'nest' Part pl
     /pesa/ + /-te/ ~ /-tte/   pésa-te   *pésa-tte   'nest' Gen pl
     /pesa/ + /-tetta/ ~ /-ttetta/   pésa-tètta   * pésa-ttètta   'nest' Ades pl

(f) /mäge/ + /it/ ~ /-sit/   máge-sit   *máge-it   'mountain' Part pl
     /mäge/ + /-te/ ~ /-tte/   máge-te   *máge-tte   'mountain' Gen pl
     /mäge/ + /-tetta/ ~ /-ttetta/   máge-tètta   * máge-ttètta   'mountain' Ades pl

(g) /kone/ + /-it/ ~ /-sit/   kóne-sit   * kóne-it   'speech' Part pl
     /kone/ + /-te/ ~ /-tte/   kóne-te   * kóne-tte   'speech' Gen pl
     /kone/ + /-tetta/ ~ /-ttetta/   kóne-tètta   * kóne-ttètta   'speech' Ades pl

Kager's (1995) analysis of the distribution of the allomorphs relies on a TETU effect, where the right edge of the stem is ideally aligned with the right edge of a disyllabic foot (as in stems with an even number of syllables); in this case, the final syllable of the stem does not need any material from the suffix to conform to the TETU requirement. In cases where the stem cannot be parsed into binary feet by itself (i.e. stems with an odd number of syllables), the final CV syllable of such a stem requires some minimal segmental material from the suffix to form a binary foot that is just minimally misaligned with the right edge of the stem. That is precisely the reason why trisyllabic stems take allomorphs that either begin with a geminate (in Adessive and Genitive plural), or with a vowel (in

Partitive plural)[5]. The bottom line of Kager's analysis remains that the allomorphy in Estonian is conditioned by the foot structure of the language.

As is illustrated above, Estonian and Northern Sámi present an almost identical pattern: the choice of an allomorph depends on the footing of the stem. In Estonian, however, the evidence of persistent footing in the language is not only the allomorphy, but stress marking as well, as each foot is marked by initial stress. In Northern Sámi, on the other hand, though we also have to postulate persistent left-aligned footing, there is no secondary stress, and feet that are not word-initial surface without prominence. In other words, the two languages (with respect to this kind of allomorph selection) differ only in whether or not the foot structure is marked with stress. The choice of an allomorph that is at the end of the word depends on binary footing throughout the word, but that footing is unmarked with stress. Thus, according to our scheme, it is the constraint on secondary stress ($*\text{Lev}_2\text{Grid}$) that is ranked higher than Prominence Alignment constraint in Northern Sámi that accounts for the difference between this language and Estonian:

Tableau 1

/jearra/-/behtet/ ~ / hpet/ 'ask' (2pl)	ALIGN-L (FT, PWD)	$*\text{Lev}_2\text{Grid}$	ALIGN-L (Lev_nGrid, FT)
☞ a. (jéarra)-(behtet)			*
b. (jéarra)-(bèhtet)		*!	

As Tableau 1 above illustrates, it is the ban on Level_2 gridmarks that outranks the Prominence Alignment constraint and is thus responsible for feet not marked by prominence. The constraint that aligns feet with the left edge of the Prosodic Word (as well as constraints like FTBIN and PARSE) is inactive here, as both of our candidates satisfy it. The losing candidate (b) is eliminated by the $*\text{Lev}_2$ GRID constraint, since it shows secondary stress on the second foot, allowing for Level_2 gridmark, and candidate (a) wins despite it violating the constraint that requires that there are gridmarks aligned with the left edge of a foot. Estonian, of course, will have a similar set of constraints accounting for its prosody, but the $*\text{Lev}_2$ GRID constraint will be outranked by the

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[5] For analysis of stems containing overlong syllables, and for a formal analysis outlined here, see Kager (1994, 1995).

ALIGN-L (LEV$_n$GRID, FT) constraint, causing all the feet to have a prominent syllable, i.e. having no mismatch between footing and prominence placement.

It is precisely the sensitivity of morphology to prosody, in one way or another, that we address in the case studies in this chapter. However, the cases that we are concerned with here are somewhat more puzzling than the examples given in the present introduction, since they show what I argue is disparity between the stress pattern and the foot structure.

We start with the case of another Uralic language, Maŋşi (Vogul), particularly with the Upper Loz'va dialect of the language. There are several phenomena that are of interest to us in this chapter: the pattern of stress placement, and two types of allomorphy that I analyze as sensitive to foot structure.

First, I show that the stress pattern in the language is trochaic, where the primary stress goes to the first syllable, and secondary stress is assigned to all subsequent odd syllables. It is shown with a multitude of examples that stress placement does not take into account the weight of syllables. The only restriction to this pattern is that final syllables are never stressed in the language. It is also demonstrated that some borrowings have exceptional stress patterns, though not even borrowed words are allowed to be stressed on the last syllable.

Having established that the stress pattern is weight-insensitive, we proceed to the description and partial analysis of two types of relevant allomorphy the language has. In this subsection, we will deal with several types of Maŋşi morphemes; I summarize some of their properties in the table below:

Table 1

Examples of affixes / Properties of affixes	-t (Locative singular); -nəl (Ablative); -təl (Instrum); -kʷɛ (diminutive), -paal(diminutive); -axt (intransitive); -lt (inchoative)	-t/-ət (Loc pl); **-ɣ/-iɣ/-jiɣ** (Translative sg); possessive -ɣe/-aɣe/-jaɣe; possessive -ɛ/-tɛ; possessive -aɣanəl/-ɣanəl	possessive -n/-nən/-an/-anən; possessive -w/-uw/-anuw/-nuw	Denominal adjective-forming -p/-pa	Participial -n/-nɛ/-nə
Has allomorphs	no	yes	yes	yes	yes
Depends on syllable structure	_	yes	yes	no	yes
Depends on foot structure	_	no	yes	yes	yes
Depends on sonority	_	no	no	no	yes

As can be seen from the Table 1 above, Vogul has a number of affixes with different properties. There are affixes with no allomorphs, and hence no dependency on syllable or foot structure, or sonority. Secondly, there are affixes that have allomorphs, the distribution of which depends on syllable structure, but not on foot structure or sonority. The third type of affixes has allomorphs with the distribution dependent on foot structure, but not on syllable structure or sonority. Finally, there is at least one suffix in the language with the distribution of allomorphs dependent on syllable structure, foot structure (though not exactly in the same way the other types of affixes do, see below), and, finally on the relative sonority of the vowel in the suffix itself. We will explore all the types of allomorphy dependent on foot structure in some detail, as well as in conjunction with the stress facts. We will show that while stress seems to be weight-insensitive (which, under the current prevailing view should mean that parsing into feet should be weight-insensitive), all the types of foot structure-dependent allomorphy in the language indicates that footing must be weight-sensitive in order to predict the correct allomorph selection.

The second case study I am concerned with in this chapter is the case of a Panoan language Shipibo. I first discuss, however briefly[6], the stress pattern of the language, and show that heavy syllables attract stress in the language. Therefore, under the standard theory, the footing in the language must be weight-sensitive. The patterns of allomorphy that I turn to next, however, contradict this theory, as in order to predict the correct allomorph for suffixes the distribution of which depends on foot structure we have to parse words into binary and, crucially, syllabic weight-insensitive feet. We will discuss three suffixes that show this pattern: a suffix meaning 'again' (repetitive) with two allomorphs *-riba-* and *-ribi-* and Ergative suffix *-n-/-nin* that, in addition to the rhythmic distribution of its allomorphs comes with its own underlying accent. The distribution of the allomorphs of both suffixes clearly shows that the foot structure required to predict the correct outputs needs to be weight-insensitive, contrary to what is suggested by the stress pattern of the language.

Thus, in both case studies included in this chapter, we find incongruity between the foot structure needed to predict stress patterns and foot structure needed to predict correct allomorphs. Among other things, the case studies provide support to the hypothesis we entertain in this dissertation, namely that foot structure is a phenomenon quite separate from prominence (stress), and the fact that the two coincide in more cases than not needs to be modeled by Alignment constraints.

5.2   Case Study: Maŋşi (Vogul)

5.2.1 Preliminary Remarks

Maŋşi, or Vogul, is a Uralic Ob-Ugric language spoken in Northwestern Siberia. The dialect I describe in this dissertation is one of Northern Maŋşi dialects, specifically Upper Lozva dialect. It presumably differs somewhat from the more standard Sosva dialect (Rombandejeva (1973, 1993), Murphy (1968), Balandin and Vakhrusheva (1957), Keresztes (1998), *inter alia*), but since I do not have access to Sosva dialect speakers, I am not sure how extensive the dialectal differences are, and I will not address them here.

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[6] For a more detailed analysis, the reader is referred to Elías-Ulloa (2005).

The data presented here were collected during field trips of summer 2004 and January 2005, seven speakers total were interviewed, all but one of whom were Maŋşi-Russian bilinguals. The judgements of the speakers were in general very consistent, and all inconsistencies are noted below.

The dialect of Vogul under discussion has both short and long variants of four vowels (a, o, u, i), long [ee] and its short counterpart [ɛ], and schwa that can only be short. Within roots, the occurrence of long vowels is limited to initial syllables, though long vowels can appear in suffixes and second parts of compounds. Schwa cannot appear in the initial syllable. The long front vowels are very rare, though they do occur word-initially. I have found no suffixes that contain either long [ee] or long [ii].

Since we will be discussing foot structure, among other things, in this section, it should be mentioned that the language does not have free morphemes that only have a short vowel and no consonant. Thus, the syllable shapes CVC, VC, CVV are permitted (the latter is rare), but no free morphemes of the shapes V or CV are found. This distribution seems to suggest some sort of minimal word requirement, but since (i) there is no evidence that I am aware of that would suggest that coda consonants contribute to weight and (ii) there are no synchronic alternations in the shapes of the roots when they are concatenated with other morphemes, I will consider this distribution of syllable shapes a diachronic residue and not an active requirement in the contemporary language.

Finally, a note should be made on a very common type of allomorphy in the language, where there are two variants of certain suffixes, one vowel-initial and one consonant-initial. The allomorph that starts with a vowel attaches to the stems that end in consonants, and the allomorphs with a consonant attach to vowel-final stems. These are cases of genuine phonologically driven allomorphy (both allomorphs are underlying) rather than cases of epenthesis or deletion: suffixes that do not have two allomorphs are freely attached to the stems without triggering epenthesis in cases where a consonant-final stem is concatenated with a consonant-initial suffix.

(6)

	(a) **Locative singular -t**	cf.	(b) **plural -t/-ət**

loox-t 'bay' (Loc)　　　　　　　　loox-ət 'bays'
wiiʎt-t 'face' (Loc)　　　　　　　wiiʎt-ət 'faces'
oos-t 'sheep' (Loc)　　　　　　　oos-ət 'sheep'
pos-t 'light' (Loc)　　　　　　　　pos-ət 'lights'
at-t 'smell' (Loc)　　　　　　　　at-ət 'smells'
lus-t 'meadow' (Loc)　　　　　　　lus-ət 'meadows'
piṣ-t 'trick' (Loc)　　　　　　　　piṣ-ət 'tricks'
saaɣrap-t 'axe' (Loc)　　　　　　saaɣrap-ət 'axes'
ʎaaxxal-t 'message' (Loc)　　　　ʎaaxxal-ət 'messages'
juuntəp-t 'needle' (Loc)　　　　　juuntəp-ət 'needles'

The Locative singular suffix that has only one allomorph, -t, is attached to consonant-final stems in (6a) without epenthesis. In contrast, the plural suffix with two allomorphs, -t and -ət, when concatenated with consonant-final stems in (6b), uses the vowel-initial allomorph -ət.

Another piece of evidence that suggests that this phenomenon is genuine phonologically driven allomorphy is that the vowel-initial allomorphs of different morphemes have different vowels, rather than a 'default' vowel that would have been more consistent with epenthesis. In addition to the suffix-initial -ə that was illustrated above, an allomorph may start with -i in (7a) below, and -a in (7b) below:

(7)　　a.　　***Root + Translative case suffix -ɣ/-iɣ/-jiɣ***[7]

tootap-iɣ 'chest' (Trans)　　　　　waata-ɣ 'bank' (Trans)
soojəm-iɣ 'brook' (Trans)　　　　　ala-ɣ 'roof' (Trans)
at-iɣ 'smell' (Trans)　　　　　　　okka-ɣ 'young tame raindeer' (Trans)
poc-iɣ 'drip' (Trans)　　　　　　　nee-ɣ 'woman' (Trans)
ceent-iɣ 'hat' (Trans)　　　　　　paassa-ɣ 'mitten' (Trans)
luw-iɣ 'horse' (Trans)　　　　　　jaa-ɣ 'river' (Trans)

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[7] The last variant of the Translative suffix (-jiɣ) is used to break up a hiatus of identical vowels, i.e. if the stem ends in *i*-.

b.   *Possessive suffix ɣe/-aɣe/-jaɣe*[8]

pun-aɣɛ 'his/her/its two feathers'	aŋa-ɣɛ 'his/her/its two heaps'
luw-aɣɛ 'his/her/its two horses'	oma-ɣɛ 'his/her/its two female relatives'
woot-aɣɛ 'his/her/its two winds'	paassa-ɣɛ 'his/her/its two mittens'
oos-aɣɛ 'his/her/its two sheep'	nee-ɣɛ 'his/her/its two women'
pos-aɣɛ 'his/her/its two lights'	jaa-ɣɛ 'his/her/its two rivers'
kaat-aɣɛ 'his/her/its two hands'	ala-ɣɛ 'his/her/its two roofs'

It seems reasonable to conclude that the alternations in the suffixes above is a result of allomorphy that is driven by syllable structure requirements, rather than epenthesis and/or deletion, and should be handled along the lines of Kager (1995), attributing the alternations to the emergence of the unmarked allomorph:

Tableau 2

/at/-/iɣ/~/ɣ/ 'smell' (Trans)	DEP (VOWEL)	MAX (CONS)	NOCODA
☞ a. at-iɣ			*
b. a-ɣ		*!	*
c. atə-ɣ	*!		*
d. at-ɣ			**!

In the tableau above, the root for 'smell' *at-* is combined with a Translative case marker. Candidate (b) selects the consonant allomorph while deleting the last consonant of the root, and is ruled out by the MAX (CONS) constraint. Candidate (c) augments the stem by epenthesizing schwa[9] and, again, takes the consonant-initial allomorph; it is ruled out by the DEP constraint. The remaining relevant candidates, the forms in (a) and (d), is the choice between the forms with the short allomorph and the longer vowel-initial allomorph. Candidate (d) has two violations of the NOCODA constraint, while candidate (a) is the fully faithful stem and selects the vowel-initial allomorph, making this candidate optimal.

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[8] The last allomorph (-jaɣe) is used after stems ending in -e.

[9] or any other vowel

In contrast, for a suffix that does not have more than one allomorph available, both epenthesis and deletion are prohibited:

Tableau 3

/at/-/t/ 'smell' (Loc)	DEP (VOWEL)	MAX (CONS)	NoCODA
☞　　a. at-t			**
b. at-ət	*!		
c. a-t		*!	

Under the present analysis, candidate (b) is eliminated by the DEP constraint, since it has a vowel that is not present in the input. Candidate (c) violates the MAX constraint because of the vowel that is present in the input but not in the output. Candidate (a), though it has multiple violations of the NoCODA constraint is, therefore, the optimal candidate where there is no alternative allomorph.

With the above information in mind, we will proceed to discuss foot-sensitive alternations in the language. We will first discuss the Vogul stress pattern, and then go over a type of allomorphy that illuminates the prosodic structure of the language.

5.2.2　Stress[10]

The stress facts of Maŋşi are fairly straightforward, but considered in conjunction with certain morphological alternations we will address in the following subsection of this chapter, are quite important; that is why we will go over them in some detail. The primary stress in the language is invariably on the first syllable of the word, with the exception of some borrowings the discussion of which we will put aside for the moment.

Below are some examples of nouns in the Nominative case (zero inflection) with the possessive suffix -tɛ/-ɛ (3rd person singular possessor, singular possessed). The

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[10] Here and throughout, primary stress is marked with an acute, and secondary stress with the grave mark. Note that in the long vowels, even though the stress is marked on the first part of the vowel, it is done for convenience and does not indicate different stress levels of the two parts of a long vowel.

allomorphy of the suffix depends on the last segment of the stem it is concatenated with: the consonant-initial allomorph is used with vowel-final stems, and the vowel-initial allomorph with consonant-final stems, thus exhibiting a case of phonologically driven allomorphy of the kind discussed and analyzed in Kager (1995), among others.

In examples in (a), the stems are monosyllabic, and the resulting possessive forms are disyllabic, with primary stress assigned invariably to the initial syllable. Secondary stress is absent in these forms. In the data in (b), the same affix is added to disyllabic roots, and the resulting trisyllabic possessive forms similarly exhibit initial primary stress and lack of secondary stress.

(8)

    a.   sám-ɛ 'his/her/its eye'
           séeŋkʷ-ɛ 'his/her/its fog'
           wíiʎt-ɛ 'his/her/its face'
           xáar-ɛ 'his/her/its ox'
           át-ɛ 'his/her/its smell'
           póc-ɛ 'his/her/its drip'
           jáa-tɛ 'his/her/its river'
           née-tɛ 'his/her/its woman'
           máa-tɛ 'his/her/its land, earth'

    b.   sáaɣrap-ɛ 'his/her/its axe'
           ŋéeləm-ɛ 'his/her/its tongue'
           ʎáaxxal-ɛ 'his/her/its message'
           óoŋəɣ-ɛ 'his/her/its aunt'
           mówiɳt-ɛ 'his/her/its laughter'
           tóotap-ɛ 'his/her/its chest'
           tákʷəs-ɛ 'his/her/its autemn'
           sákka-tɛ 'his/her/its sugar'
           múuŋi-tɛ 'his/her/its egg'
           páassa-tɛ 'his/her/its mitten'
           kúrska-tɛ 'his/her/its jug'
           áɳa-tɛ 'his/her/its heap'
           óma-tɛ 'his/her/its mother'
           áki-tɛ 'his/her/its uncle'

Vogul, to the best of my knowledge, does not have native trisyllabic underived stems. However, compounding is a fairly productive form of word-formation in the language, and the compounds can be concatenated with the same inflections non-compounded stems can. In (9a), the two stems with their respective stress assignments are shown, and in (9b), the resulting trisyllabic compounds are concatenated with the same 3rd person possessive suffix we saw above. In contrast with the previous data, however, we see that there is secondary stress on the third syllable of the forms in (9b):

(9)

a.   b.
káat 'hand' + pátta 'base'   káatpattà-tɛ 'his/her/its palm (of the
                                                                                     hand)'

náajəŋ 'fiery' + xáap 'boat'   náajəŋxàp-ɛ 'his/her/its steamship'
jániɣ 'big' + úuj 'animal'   jániɣùuj-ɛ 'his/her/its elk'
púwl-əŋ 'to bathe' (PARTPRES) + kól 'house'   púwləŋkòl-ɛ 'his/her/its bathhouse'
jáa 'river' + wáata 'bank'   jáawaatà-tɛ 'his/her/its river bank'

There are several generalizations of note about the data above. First, the language has secondary stress that is assigned to alternate odd syllables, except the last syllable that is never stressed. Secondly, and this will become a point of interest as we discuss Vogul morphological processes in the next subsection, the stress assignment is <u>not</u> weight-sensitive: the secondary stress is assigned to the third syllable in the forms in (9b), regardless of whether the first syllable is light, as in forms with short initial vowels *jániɣùuj-ɛ* 'his/her/its elk' or *púwləŋkòl-ɛ* 'his/her/its bathhouse', or heavy, as in forms *káatpattà-tɛ* 'his/her/its palm (of the hand)', *náajəŋxàp-ɛ* 'his/her/its steamship' and *jáawaatà-tɛ* 'his/her/its river bank'.

The same effect can be seen with the forms where stems combined with the 3rd person singular possessive suffix are concatenated with the Ablative suffix *-nəl*. In forms in (10a), where the resulting words are trisyllabic (1syllable root + 1 syllable possessive suffix + 1 syllable Ablative suffix), the only stressed syllable is the initial one. In forms in (10b), in contrast, that are quadrisyllabic, secondary stress is assigned to the third

213

syllable, which is the syllable of the possessive suffix. Note, again, that the weight of the first syllable is disregarded with respect to stress assignment.

(10) **root+possessive+Ablative suffix *-nəl***

a.   sám-ɛ-nəl 'his/her/its eye'(Abl)
       jóor-ɛ-nəl 'his/her/its strength'(Abl)
       wíiʎt-ɛ-nəl 'his/her/its face'(Abl)
       áat-ɛ-nəl 'his/her/its hair'(Abl)
       át-ɛ-nəl 'his/her/its smell'(Abl)
       póc-ɛ-nəl 'his/her/its drip'(Abl)
       jáa-tɛ-nəl 'his/her/its river'(Abl)
       née-tɛ-nəl 'his/her/its woman'(Abl)
       máa-tɛ-nəl 'his/her/its land, earth'(Abl)

b.   sáaɣrap-ɛ̀-nəl 'his/her/its axe'(Abl)
       ŋéeləm-ɛ̀-nəl 'his/her/its tongue' (Abl)
       ʎáaxxal-ɛ̀-nəl 'his/her/its message'(Abl)
       óoŋəɣ-ɛ̀-nəl 'his/her/its aunt'(Abl)
       mówiṇt-ɛ̀-nəl 'his/her/its laughter'(Abl)
       tóotap-ɛ̀-nəl 'his/her/its chest' (Abl)
       tákʷəs-ɛ̀-nəl 'his/her/its autemn'(Abl)
       sákka-tɛ̀-nəl 'his/her/its sugar'(Abl)
       múuŋi-tɛ̀-nəl 'his/her/its egg'(Abl)
       páassa-tɛ̀-nəl 'his/her/its mitten'(Abl)
       kúrska-tɛ̀-nəl 'his/her/its jug'(Abl)
       áŋa-tɛ̀-nəl 'his/her/its heap'(Abl)
       óma-tɛ̀-nəl 'his/her/its mother'(Abl)
       áki-tɛ̀-nəl 'his/her/its uncle'(Abl)

Another possessive suffix *-aɣanəl/-ɣanəl* (3rd person dual possessor, plural possessed), which has either two or three syllables, illustrates the same pattern: the main stress is on the first syllable, and the secondary stress is assigned to odd syllables except the final syllable, regardless of the weight. In the forms in (11b), the Ablative suffix *-nəl*, added on top of the possessive suffix, provides forms up to six syllables long. In these forms, the secondary stress is assigned to the third and fifth syllable. Note that the fifth syllable

in the five-syllable long forms does not receive secondary stress, presumably because of a non-finality condition.

(11)

a.	Root + possessive -aɣanəl/-ɣanəl	b.	+ Ablative -nəl

sám-aɣ̀ànəl[11] 'their (du) eyes'   sám-aɣ̀ànəl-nəl 'their (du) eyes'(Abl)
wíiʎt-aɣ̀ànəl 'their (du) faces'   wíiʎt-aɣ̀ànəl-nəl 'their (du) faces'(Abl)
áat- aɣ̀ànəl 'their (du) hairs'   áat-aɣ̀ànəl-nəl 'their (du) hairs'(Abl)
át-aɣ̀ànəl 'their (du) smells'   át-aɣ̀ànəl-nəl 'their (du) smells'(Abl)
póc-aɣ̀ànəl 'their (du) drips'   póc-aɣ̀ànəl-nəl 'their (du) drips'(Abl)
jáa-ɣanɘ̀l 'their (du) rivers'   jáa-ɣanɘ̀l-nəl 'their (du) rivers'(Abl)
née-ɣanəl 'their (du) women'   née-ɣanɘ̀l-nəl 'their (du) women'(Abl)
máa-ɣanəl 'their (du) lands'   máa-ɣanɘ̀l-nəl 'their (du) lands'(Abl)
sáaɣrap-àɣanəl 'their (du) axes'   sáaɣrap-àɣanɘ̀l-nəl 'their (du) axes'(Abl)
ŋ́eeləm-àɣanəl 'their (du) tongues'   ŋ́eeləm-àɣanɘ̀l-nəl 'their (du) tongues' (Abl)
ʎáaxxal-àɣanəl 'their (du) messages'ʎáaxxal-àɣanɘ̀l-nəl 'their (du) messages' (Abl)
óoŋəɣ-àɣanəl 'their (du) aunts'   óoŋəɣ-àɣanɘ̀l-nəl 'their (du) aunts'(Abl)
tóotap-àɣanəl 'their (du) chests'   tóotap-àɣanɘ̀l-nəl 'their (du) chests'(Abl)
tákʷəs-àɣanəl 'their (du) autemns'   tákʷəs-àɣanɘ̀l-nəl 'their (du) autemns' (Abl)
sákka-ɣ̀ànəl 'their (du) sugars'   sákka-ɣ̀ànəl-nəl 'their (du) sugars'(Abl)
múuŋi-ɣ̀ànəl 'their (du) eggs'   múuŋi-ɣ̀ànəl-nəl 'their (du) eggs'(Abl)
páassa-ɣ̀ànəl 'their (du) mittens'   páassa-ɣ̀ànəl-nəl 'their (du) mittens'(Abl)
kúrska-ɣ̀ànəl 'their (du) jugs'   kúrska-ɣ̀ànəl-nəl 'their (du) jugs'(Abl)
áŋa-ɣ̀ànəl 'their (du) heaps'   áŋa-ɣ̀ànəl-nəl 'their (du) heaps'(Abl)
áki-ɣ̀ànəl 'their (du) uncles'   áki-ɣ̀ànəl-nəl 'their (du) uncles'(Abl)

Vogul has a number of productive diminutive affixes, some of which have either affectionate or slightly pejorative[12] overtones. Below we see two of these diminutive suffixes, -kʷɛ and -paal, the latter of which also brings in pejorative meaning. For our

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[11] This form was rejected by two of the speakers I worked with; they could not offer an alternative form, and it appears that there can be some paradigmatic gaps in the system, especially with dual forms. The rest of the speakers, however, had no difficulties producing this form, though commented that it was difficult to imagine a situation where one would refer to 'eyes that belonged to two people'

[12] It is unusual for a diminutive suffix to have a pejorative meaning, but all seven speakers I interviewed agreed that it is the case with several diminutive suffixes in Vogul

purposes, these two suffixes are appropriate for illustrating and confirming that the stress assignment in the language is weight insensitive, as the first of these suffixes contains a short, and the second a long vowel. Since both of these suffixes are very productive, they can, in most cases, be attached to almost any noun.

(12)

a. root-DIM-3ᴿᴰ DU POSS-INSTR   b. root-DIM-3ᴿᴰ DU POSS-INSTR

jór-kʷɛ-ɣànəl-təl 'their (du) traces'   jór-paal-àɣanə̀l-təl 'their (du) traces'
súp-kʷɛ-ɣànəl-təl 'their (du) shirts'   súp-paal-àɣanə̀l-təl 'their (du) shirts'
tín-kʷɛ-ɣànəl-təl 'their (du) prices'   tín-paal-àɣanə̀l-təl 'their (du) prices'
xúm-kʷɛ-ɣànəl-təl 'their (du) boys'   xúm-paal-àɣanə̀l-təl 'their (du) boys'
pún-kʷɛ-ɣànəl-təl 'their (du) feathers'   pún-paal-àɣanə̀l-təl 'their (du) feathers'
pós-kʷɛ-ɣànəl-təl 'their (du) lights'   pós-paal-àɣanə̀l-təl 'their (du) lights'
pál-kʷɛ-ɣànəl-təl 'their (du) ears'   pál-paal-àɣanə̀l-təl 'their (du) ears'
át-kʷɛ-ɣànəl-təl 'their (du) smells'   át-paal-àɣanə̀l-təl 'their (du) smells'
lúw-kʷɛ-ɣànəl-təl 'their (du) horses'   lúw-paal-àɣanə̀l-təl 'their (du) horses'
lús-kʷɛ-ɣànəl-təl 'their (du) meadows'   lús-paal-àɣanə̀l-təl 'their (du) meadows'
píʂ-kʷɛ-ɣànəl-təl 'their (du) tricks'   píʂ-paal-àɣanə̀l-təl 'their (du) tricks'

The first observation we can make is that, even though the diminutive *-kʷɛ* in (12a) contains a short vowel and the diminutive *-paal* in (12b) a long vowel, the secondary stress is assigned to the following (third) syllable in both cases, regardless of syllable weight. The data is (12b) gives us further evidence that stress assignment in the language is weight-insensitive: weight-sensitive stress assignment would give us forms like * *pún-pàal-aɣànəl-təl* for 'their (du) feathers' or * *lúw-pàal-aɣànəl-təl* for 'their (du) horses', all of which are ungrammatical in Vogul.

Despite appearances, I maintain that the foot structure in the language is binary on the moraic level, while prominence assignment does not always correspond to it, because of constraints on rhythm, i.e. CLASH and LAPSE:

Tableau 4

/saaɣrap/-/-/paal/-/w~uw~anuw~nuw/ 'my axes' (dim)	LAPSE	CLASH	ALIGN-L (LEV$_n$GRID, FT)
☞ a. (sáaɣ)rap-(pàa)(l-anuw)			*
b. (sáaɣ)rap-(pàa)(l-ànuw)		*!	
c. (sáaɣ)rap-(paa)(l-ànuw)	*!		*

Since both LAPSE and CLASH (which are unranked with respect to each other here) operate on the syllabic level, we can see how the ranking in the tableau above creates an illusion of syllabic footing: prominence is assigned to alternate syllables, regardless of their weight. Of course, if we consider a word that consists of only light syllables, there is no competition between the Prominence Alignment constraint, on the one hand, and the CLASH and LAPSE constraints, on the other hand:

Tableau 5

/puwləŋ/-/-/kol/-/w~uw~anuw~nuw/ 'my bathhouses'	LAPSE	CLASH	ALIGN-L (LEV$_n$GRID, FT)
☞ a. (púwləŋ)(kòl-uw)			
b. (púwləŋ)(kol-uw)	*!**		
c. (puwlə́ŋ)(kol-ùw)[13]			*!*

Here, the footing is actually binary on the syllabic, as well as the moraic level, hence footing actually coincides with the prominence assignment. There is really no relevant constraint with respect to which a candidate with either CLASH or LAPSE violation would be better than candidate (a). Were it not for data with heavy syllables and unviolated FTBIN(μ), we could not have established the ranking between the footing constraints and Prominence Alignment.

To conclude, barring some examples with borrowed words that we turn to next, we have accounted for the mismatch between stress assignment and foot constituency in Maŋşi: the illusion that the two notions do not interact is due to the fact that the language allows no violations of LAPSE or CLASH, and that these rhythmic constraints outrank the

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[13] This candidate is independently excluded by WDFIN constraint, which is unranked with respect to CLASH and LAPSE, but outranks the prominence alignment constraint.

Prominence Alignment constraint so that it is only in words with only light syllables that prominence uniformly surfaces on the heads of trochaic feet.

As a final observation about the stress assignment pattern in the language, we should mention that there are a few exceptions to the stress pattern we have just described. Several borrowings, especially recent ones, exhibit a different stress pattern, usually keeping the stress position of the source language:

(13)

pirkáta	from Russian	brigáda[14] 'brigade'
ɛsə́rma	from Iranian	sə́rma 'shame'
soráŋa	from Russian	sobránije 'meeting'
pulkúwni	from Russian	polkóvnik 'colonel'
ruupáta	from Russian	rabóta 'work'
kiníka	from Russian	kníga 'book'
ɛʃkóla	from Russian	ʃkóla 'school'

Interestingly enough, however, borrowings that have final stress in the source language do not keep the final stress in Vogul, but the stress is shifted onto the penultimate syllable:

(14)

a.	káalaʂ	from Russian	kalátʃ 'bun'
	kúrpa	from Russian	krupá[15] 'grain'
	túrpa	from Russian	trubá 'pipe'
	žúurnal	from Russian	žurnál 'magazine'
	swɛ́sta	from Russian	zvezdá 'star'
b.	istákan	from Russian	stakán 'glass'
	kɛnɛ́lal	from Russian	generál 'general'
	kaatálok	from Russian	katalóg 'catalogue'
	liimónat	from Russian	limonád 'lemonade'
	sɛkrɛ́tar	from Russian	sekretárʲ 'secretary'
	iʂwɛ́ʂa	from Russian	svetʃá 'candle'

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[14] with metathesis

[15] with metathesis

It is obvious that Maŋsi has adopted borrowed words to fit its native phonotactics (metathesis, epenthesis, devoicing and deletion are all common adaptations), but there is also something about borrowings that does not correspond to native phonology: stress assignment. While in (14a) we see initial primary stress, which corresponds to the language's native pattern, the examples in (14b) diverge from the regular every-odd-syllable stress placement in native Maŋsi words.

It is probable that the source language's prominence location influenced how the words were adapted into Maŋsi. Acknowledging this influence by no means signifies that underlying forms of in Maŋsi are equal to (surface or underlying) forms of source language. For example, since we see prominence assignment pattern that differs from that of native Maŋsi words, we should consider that there is something different in the underlying forms of Maŋsi borrowed forms. However, as we can see from the data in (14), stress in Maŋsi forms does not correspond to the source language's stress placement, either.

The challenge here is to determine what the underlying forms of borrowed words in Maŋsi are. For the reasons we just stated, underlying forms cannot be equivalent to the source languages' forms. One question that arises is about the forms in (14): it is clear that the borrowed words can be different from native forms in that they have an accented syllable underlyingly, but it is unclear whether it is the last syllable that is underlyingly accented (corresponding to the source language's surface accent) and the WordFinality constraint makes the Maŋsi surface forms have penultimate accent, or is it that the underlying forms themselves have penultimate accent. I believe this question can be answered if we consider derived forms of these words:

(15)

sɛkrétar-təl	'helper, servant' (Instr)	*sékrɛtàr-təl
iʂwéʂa-təl	'candle, lightbulb' (Instr)	*íʂwɛʂà-təl
kaatálok-təl	'ledger, records' (Instr)	*káatalòk-təl
istákan-təl	'see-through glass' (Instr)	*ístakàn-təl
iswésta-təl	'famous person' (Instr)	*íswɛstà-təl

The examples above show us that the underlying forms of the words in (14b) have the penultimate syllable underlyingly accented, rather than ultimate syllables, since the roots do not surface with final stress (would be penultimate in derived forms in (15)), but rather the penults of the roots are stressed. I propose, therefore, that the underlying forms of the words in (14b) have penultimate syllables accented underlyingly. The underlyingly accented penult appears to be responsible for the abnormal (for Maŋʂi) prominence in some of the borrowed words. In other words, there is a constraint on keeping lexical accent that outranks our regular Prominence Alignment constraint:

Tableau 6

* | /iswɛsta/ 'famous person'	MAX (LEV$_n$GRID)	LAPSE	CLASH	ALIGN-L (LEV$_n$GRID, FT)
☞ a. (iswés)ta				*
b. (íswɛs)ta	*!			
c. (íswès)ta			*!	*

The tableau above illustrates how lexical prominence can overwrite the Prominence Alignment requirements. Candidate (b) is eliminated by the MAX (LEV$_n$GRID) constraint.[16] Candidate (c), while incurring no violations of MAX (LEV$_n$GRID) since it keeps the underlying accent, also has prominence assigned to the foot-initial (and word-initial) syllable, which makes it resemble stress pattern of words that are not underlyingly accented, but violates CLASH. Candidate (a), therefore, even though its stress is 'exceptionally' not word-initial, is the optimal candidate here.

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[16] I also assume that, since the underlying accent is associated with the particular syllable, candidates that do not delete but reassociate the gridmark are also banned.

To summarize this subsection, we have discussed the particulars of stress assignment in the language: primary stress is always assigned to the initial syllable, regardless of syllable weight. Secondary stress is assigned to the odd-numbered syllables, and the language appears to be quantity-insensitive. The only cases where primary stress is not initial are the cases of borrowings. Finally, there are no forms, either native or borrowed, with final stress.

We will now turn to cases of prosody-conditioned allomorphy, and consider it in conjunction with the stress facts we have just established.

5.2.3   Prosody-sensitive Allomorphy

In this subsection, we will investigate two types of allomorphy in Vogul, and will show that both types of allomorphy discussed are sensitive to foot structure. We will also demonstrate that in order to predict the correct distribution of allomorphs we have to parse Vogul words into moraic feet, contrary to what the stress pattern indicates.

5.2.3.1 Allomorphy Type 1

Vogul has several suffixes that exhibit allomorphy similar to the allomorphy found in Estonian (Kager (1995), Mürk (1991)) and Sámi (Dolbey (1997)). The distribution of allomorphs is determined by the resulting footing.

One of the suffixes that exhibit this type of allomorphy is the 2nd person possessive suffix *-n/-nən/-an/-anən* (2nd person singular possessor, plural possessed). The allomorphs with initial vowels (*-an* and *-anən*) are attached to stems that end in consonants, and the consonant-initial allomorphs (*-n* and *-nən*) are attached to stems that end in vowels. However, whether one of the vowel-initial allomorphs or another is chosen, or which one of the consonant-initial allomorphs is chosen, depends on the prosodic structure of the stem.

In (16a) and (16b) below, we can observe the suffix concatenated with monosyllabic, consonant-final stems. Since the stems are consonant-final, the choice of the suffix allomorph is between *-an and -anən*, while *-n* and *-nən* are excluded by syllable structure requirements. In (16a), where the vowels of the roots are short, the shorter version of the suffix is chosen. In (16b), on the other hand, all the roots have long vowels, and they are invariably concatenated with the longer allomorph:

(16)   *Possessive suffix 2nd person singular, plural possession -n/-nən/-an/-anən*

a.   luw-an 'your (sg) horses'   b.   aaɳt-anən 'your (sg) horns'
      at-an 'your (sg) smells'   ŋaar-anən 'your (sg) swamps'
      sam-an 'your (sg) eyes'   joowt-anən 'your (sg) bows'
      tal-an 'your (sg) laps'   oos-anən 'your (sg) goats'
      jor-an 'your (sg) traces'   eet-anən 'your (sg) nights'
      put-an 'your (sg) ice-crusts'   piiɣ-anən 'your (sg) boys, sons'
      sup-an 'your (sg) shirts'   xaar-anən 'your (sg) oxen'
      tin-an 'your (sg) prices'   xuul-anən 'your (sg) fish'
      pun-an 'your (sg) feathers'   xaaʎ-anən 'your (sg) birch trees'
      pos-an 'your (sg) lights'   oos-anən 'your (sg) sheep'
      kaŋk-an 'your (sg) elder brothers'   uus-anən 'your (sg) cities'
      pal-an 'your (sg) ears'   saam-anən 'your (sg) corners'
      lus-an 'your (sg) meadows'   taal-anən 'your (sg) winters; years'
      piṣ-an 'your (sg) tricks'   joor-anən 'your (sg) strengths'
      sun-an 'your (sg) sleds'   puut-anən 'your (sg) cauldrons'
      kʷol-an 'your (sg) dwellings'   loox-anən 'your (sg) bays'

Note that the only variable between (16a) and (16b) is the length of the root vowel, the rest of the conditions being the same: the syllables are closed, and all the roots are monosyllabic. It stands to reason, therefore, to hypothesize that the allomorphy is weight-sensitive: the resulting form of root + possessive allomorph is optimally footed exhaustively, when there is an allomorph available to satisfy the condition.

As we mentioned in the previous subsection, Maɳsi does not have roots that are codaless, monosyllabic and contain a short vowel (i.e. roots of the form CV) In (16c), however, we

see monosyllabic roots that have long vowels and no coda. The allomorph of the possessive suffix that is chosen here is *-n*: since the roots end in a vowel, it is one of the consonant-initial allomorphs that is chosen, and the short allomorph would make the resulting form parsed into a foot, under the analysis that the footing is weight-sensitive. The stems in (16d) are trisyllabic and end in a consonant, so the allomorph chosen has to be vowel-initial. Between the two possible vowel-initial allomorphs, the monosyllabic one is selected, again allowing for exhaustive binary footing.

c. jaa-n 'your (sg) rivers'   d. istakan-an 'your (sg) glasses'
   maa-n 'your (sg) lands'   kɛnɛlal-an 'your (sg) generals'
   nee-n 'your (sg) women'   sɛkrɛtar-an 'your (sg) secretaries'
   ṣaa-n 'your (sg) teas'   puwləŋkol-an 'your (sg)
                  bathhouses'

The stems in both (16e) and (16f) are disyllabic and contain only light syllables, but in (16e) they are vowel-final, and in (16f) consonant-final. Thus, the shortest allomorph (*-n*) is chosen for the forms in (16e), making up a binary foot, and the longest allomorph (*-anən*) is concatenated with the stems in (16f), which makes for two binary feet.

e. sakka-n 'your (sg) pieces of sugar' f. kossəm-anən 'your (sg) birch-bark
   ala-n 'your (sg) roofs'   basket'
   okka-n 'your (sg) young tame reindeer' pasan-anən 'your (sg) table'
   simri-n 'your (sg) perches'   takʷəs-anən 'your (sg) autemn'
   kurska-n 'your (sg) jugs'   apiɣ-anən 'your (sg) grandson'
   aŋa-n 'your (sg) heaps'   tucṣaŋ-anən 'your (sg) sewing-bag
   raṣi-n 'your (sg)pieces of silk clothing'   made of reindeer hide'
   pici-n 'your (sg) nests'   ṣaxəl-anən 'your (sg) pile'
   oma-n 'your (sg) female relatives'   ulas-anən 'your (sg) chair'
   aki-n 'your (sg) uncles'   ŋaɣir-anən 'your (sg) saddles'
   pupa-n 'your (sg) bears'   isnas-anən 'your (sg) windows'
   ŋuli-n 'your (sg) pitchpines'   turap-anən 'your (sg) storms'
                  oxsar-anən 'your (sg) foxes'

Examples below further illustrate the same pattern: the roots in (16g) contain a heavy syllable followed by a light syllable that is closed. The allomorph chosen for these forms, therefore, has to be vowel-initial. Given that the roots themselves have one binary

(moraic) foot and an unparsed syllable, the monosyllabic allomorph is added to comprise the second foot.

g.   saaɣrap-an 'your (sg) axes'   h.   muuŋi-nən 'your (sg) eggs'
          ŋɹeeləm-an 'your (sg) tongues'   aarpi-nən 'your (sg) fish-fences'
          neepak-an 'your (sg) books'   iici-nən 'your (sg) evenings'
          ʎaaxxal-an 'your (sg) messages'   aawi-nən 'your (sg) doors'
          tootap-an 'your (sg) chests'   oopa-nən 'your (sg) paternal
          ʎoomwoj-an 'your (sg) gnats'   grandfathers'
          soojəm-an 'your (sg) brooks'   aaɣi-nən 'your (sg) girls,
          aaxʷtas-an 'your (sg) stones'   daughters'
          ooŋəɣ-an 'your (sg) aunts'   saali-nən 'your (sg) reindeer'
          keeŋən-an 'your (sg) buttons'   eekʷa-nən 'your (sg) women'
          juuntəp-an 'your (sg) needles'   oojka-nən 'your (sg) old men'
          aaməṣ-an 'your (sg) riddles'   puutə-nən 'your (sg) pots'
          xootal-an 'your (sg) days'   paassa-nən 'your (sg) mittens'
          kʷaaliɣ-an 'your (sg) ropes'   poora-nən 'your (sg) floats, rafts'
          toorəm-an 'your (sg) skies'   waata-nən 'your (sg) shores'

In contrast, the roots in (16h) have the final syllable open, though they also consist of a heavy syllable followed by a light syllable. In this case, a consonant-initial allomorph is added, and it also makes up the second foot of the resulting possessive form.

Note that it is crucial for the footing to be quantity-sensitive to predict the right form of the allomorph for this possessive suffix. Quantity-insensitive footing would predict the wrong results for forms containing heavy syllables, for example:

(17)
       a.   b.
       *(keeŋə)(n-anən) 'your (sg) buttons'   *(eekʷa-n) 'your (sg) women'
       *(juuntə)(p-anən) 'your (sg) needles'   *(oojka-n) 'your (sg) old men'
       *(aamə)(ṣ-anən) 'your (sg) riddles'   *(puutə-n) 'your (sg) pots'

As we can see above, quantity-insensitive parsing predicts the wrong allomorph selection: the forms in (17a) would have the disyllabic allomorph instead of a monosyllabic one that actually appears, and the forms in (17b) should have the shortest

224

possessive allomorph (-n), while they actually show up with the allomorph -nən (see (16h) above).

Similarly, we get the wrong predictions with monosyllabic roots with long vowels under the syllabic parsing analysis:

(18)

> *(eet-an) 'your (sg) nights'
> *(piiɣ-an) 'your (sg) boys, sons'
> *(xaar-an) 'your (sg) oxen'
> *(xuul-an) 'your (sg) fish'
> *(xaaʎ-an) 'your (sg) birch trees'

The allomorph that should be attached to the forms above is the disyllabic allomorph that would comprise the second foot (see (17a) above). However, if the first syllable with the long vowel is treated as just an incomplete foot, we predict the wrong forms above with the monosyllabic possessive allomorph -an.

It is clear that the allomorphy is sensitive to the foot structure of the language. The requirement that is important for choosing one of the four allomorphs here is a requirement that all syllables must be parsed into feet, and it is combined with the requirement for Binarity, crucially, on the moraic level.

Another suffix that behaves in a similar way is another possessive suffix -w/-uw/-anuw/-nuw. It is the suffix that has 1st singular possessor and plural possessed ("my nouns" scheme). If the suffix is concatenated with a stem that ends in a vowel, one of the two consonant-initial allomorphs is attached. If, on the other hand, the suffix is attached to a stem that ends in a consonant, the allomorph of this possessive suffix attached is either -uw or -anuw, i.e. one of the two vowel-initial allomorphs:

(19)

(a) (nee-w) 'my female relatives'	(b) (sup-uw) 'my shirts'
(jaa-w) 'my rivers'	(tin-uw) 'my prices'
(ṣaa-w) 'my teas'	(kaŋk-uw) 'my elder brothers'
(maa-w) 'my lands'	(pun-uw) 'my feathers'

Note, again, that parsing syllables with long vowels as binary feet by themselves would render the wrong result:

(20)

*(nee-nuw) 'my female relatives'
*(jaa-nuw) 'my rivers'
*(ṣaa-nuw) 'my teas'
*(maa-nuw) 'my lands'

With longer stems, the situation again is similar to the occurrence of the *-n/-nǝn/-an/-anǝn* allomorphy. Below are disyllabic stems with short vowels only, the second syllable open (21a), and disyllabic stems with short vowels, but with the second syllables closed:

(21)

a.		b.	
(simri-w) 'my perches'		(pasa)(n-anuw) 'my tables'	
(sakka-w) 'my pieces of sugar'		(takʷǝ)(s-anuw) 'my autemns'	
(aŋa-w) 'my heaps'		(kossǝ)(m-anuw) 'my birch- bark baskets'	
(okka-w) 'my young tame reindeer'		(api)(ɣ-anuw) 'my grandsons'	
(kurska-w) 'my jugs'		(isna)(s-anuw) 'my windows'	
(pici-w) 'my nests'		(ṣaxǝ)(l-anuw) 'my piles'	
(oma-w) 'my female relatives'		(ula)(s-anuw) 'my chairs'	
(aki-w) 'my father's brothers'		(ŋaɣi)(r-anuw) 'my saddles'	
(raṣi-w) 'my pieces of silk clothing'		(kolǝ)(s-anuw) 'my grains'	
(ala-w) 'my roofs'		(tolma)(ṣ-anuw) 'my interpreters'	

Note that the VCV stems in (21a) above take the same allomorph of the suffix as the stems of CVV shape, once again suggesting that the footing for the allomorph selection has to be weight-sensitive. The stems in (21b) take the longest allomorph *-anuw*, creating two binary moraic feet.

Longer stems behave in a similar fashion. Below we see stems of the shape CVVCV in (22a), and of the shape CVVCVC in (22b):

(22)

a. paassa-nuw 'my mittens'   b. ʎaaxxal-uw 'my messages'
    muuŋi-nuw 'my eggs'   jaarmak-uw 'my pieces of silk'
    aarpi-nuw 'my fish-fences'   ooŋəɣ-uw 'my aunts'
    iici-nuw 'my evenings'   tootap-uw 'my chests'
    aawi-nuw 'my doors'   keeŋən-uw 'my buttons'
    eekʷa-nuw 'my women'   xootal-uw 'my days'
    waata-nuw 'my shores'   ʎoomwoj-uw 'my gnats'
    saali-nuw 'my reindeer'   saaɣrap-uw 'my axes'
    oojka-nuw 'my old men'   soojəm-uw 'my brooks'
    puutə-nuw 'my pots'   toorəm-uw 'my skies'
    poora-nuw 'my floats, rafts'   ŋeeləm-uw 'my tongues'
    aaɣi-nuw 'my girls, daughters'   kʷaaliɣ-uw 'my ropes'

Both the stems in (22a) and in (22b) take monosyllabic allomorphs that create binary moraic feet in each case; the only difference between the allomorphs is whether or not they are consonant-initial. Notably, again, the only parsing that would predict the right allomorphs selection is binary parsing on the moraic level.

The foot structure-dependent allomorph selection can be further illustrated with longer stems that are created by compounding:

(23)

kaat 'hand' + patta 'base'   (kaat)(patta-w) 'my palms (of the hands)'

naajəŋ 'fiery' + xaap 'boat'   (naa)(jəŋxa)(p-anuw) 'my steamships'

janiɣ 'big' + uuj 'animal'   (jani)(ɣuu)(j-anuw) 'my elks'
puwl-əŋ 'to bathe' (PARTPRES) + kol 'house' (puwləŋ)(kol-uw) 'my bathhouses'
jaa 'river' + waata 'bank'   (jaa)(waa)(ta-nuw) 'my river banks'

The foot structure in (23) above shows the basis for the allomorph selection: the compound *(kaat)(patta-w)* 'my palms (of the hands)' has two bimoraic feet in the stem and thus selects the shortest single consonant allomorph. The compound for 'steamship' *(naa)(jəŋxa)(p-anuw)* similarly contains two feet, but since the stem is consonant-final, the allomorph has to start with a vowel, and the longest allomorph for the possessive

227

suffix is attached to the stem, creating the third foot. The third compound, *(jani)(ɣuu)(j-anuw)* 'elk', exhibits exactly the same pattern. The compound *(puwlǝŋ)(kol-uw)* 'bathhouse', on the other hand, constitutes one complete foot and has a stray syllable. The allomorph *-uw*, therefore, is attached to complete the second foot. The situation is similar with the compound *(jaa)(waa)(ta-nuw)* 'river bank': two moraic feet are complete in the stem, but a stray syllable is left over, calling for a monosyllabic allomorph *-nuw*. All of the allomorphs are distributed to insure that the resulting forms can be parsed completely into binary moraic feet.

To emphasize the fact that the parsing into feet has to be on the moraic level, rather than on the syllabic level as it appears for the stress assignment pattern, consider the following forms with the diminutive suffix *-paal* that we saw in the previous subsection:

(24)

a.   jor-paal-anuw 'my traces' (dim)   b. saam-paal-anuw 'my corners' (dim)
        sup-paal-anuw 'my shirts' (dim)   keent-paal-anuw 'my caps' (dim)
        xum-paal-anuw 'my men' (dim)   puut-paal-anuw 'my cauldrons' (dim)
        pun-paal-anuw 'my feathers' (dim)   jaa-paal-anuw 'my rivers' (dim)
        pal-paal-anuw 'my ears' (dim)   xuul-paal-anuw 'my fish' (dim)
        luw-paal-anuw 'my horses' (dim)   nee-paal-anuw 'my women' (dim)
        lus-paal-anuw 'my meadows' (dim)   uus -paal-anuw 'my cities' (dim)
        piʂ-paal-anuw 'my tricks' (dim)   leeɣ-paal-anuw 'my tails' (dim)

As we can see, the diminutive suffix *-paal* is concatenated with both short-vowel stems and long-vowel stems alike, since there is only one allomorph of this suffix, and, as is the case with the Locative singular suffix *-t* above, there is no deletion or epenthesis allowed to optimize the syllable structure on the morpheme boundaries.

The possessive suffix, on the other hand, has four different allomorphs, as we saw before. Only two of the four possible allomorphs are relevant here, however: since the diminutive suffix *-paal* ends in a consonant, the possessive allomorph has to be one of the vowel-initial allomorphs (i.e. either *-uw* or *-anuw*). As the data above shows, however, only the longer, i.e disyllabic allomorph, is selected for both forms in (24a) and (24b), regardless of the number of syllables or moras preceding the possessive suffix. The conclusion we

can draw, therefore, is that the allomorph selection treats the preceding diminutive suffix -*paal* as footed by itself, again indicating weight sensitivity.

An alternative explanation, of course, could be that since both the roots in (24a) and in (24b) above are monosyllabic, differing only in the length of the root vowel, the root together with the diminutive suffix comprise only one foot, which would mean that that foot has to be followed by the disyllabic allomorph of the possessive suffix to form a second foot. In other words, whether the footing is quantity-sensitive (as in *(puut)-(paa)(l-anuw)* 'my cauldrons' (dim)), or quantity-insensitive (as in *(puut-paa)(l-anuw)* 'my cauldrons' (dim)), the same allomorph of the possessive suffix (-*anuw*) is predicted to be selected. However, if we consider the forms below, this alternative explanation can be easily discarded:

(25)

a.	b.
(okka)-(paa)(l-anuw) 'my young tame reindeer' (dim)	*(okka)-(paal-uw)
(kossəm)-(paa)(l-anuw) 'my birch-bark baskets' (dim)	*(kossəm)-(paal-uw)
(simri)-(paa)(l-anuw) 'my perches' (dim)	*(simri)-(paal-uw)
(kurska)-(paa)(l-anuw) 'my jugs' (dim)	*(kurska)-(paal-uw)
(aŋa)-(paa)(l-anuw) 'my heaps' (dim)	*(aŋa)-(paal-uw)
(pici)-(paa)(l-anuw) 'my nests' (dim)	*(pici)-(paal-uw)
(aki)-(paa)(l-anuw) 'my uncles' (dim)	*(aki)-(paal-uw)
(takʷəs)-(paa)(l-anuw) 'my autemns' (dim)	*(takʷəs)-(paal-uw)
(ala)-(paa)(l-anuw) 'my roofs' (dim)	*(ala)-(paal-uw)
(isnas)-(paa)(l-anuw) 'my windows' (dim)	*(isnas)-(paal-uw)

In the data in (25) above, the disyllabic roots of the shape (C)VCV(C) are footed together, and the next foot is formed by the diminutive suffix -*paal*. The allomorph of the possessive suffix, therefore, has to form another foot, and this is the reason why the disyllabic allomorph is selected. In (25b), on the other hand, under quantity-insensitive footing, the diminutive suffix cannot be footed by itself to form a binary foot; hence the possessive allomorph that should be selected is disyllabic allomorph -*uw*. Clearly, the quantity-insensitive analysis predicts the wrong form of the allomorph.

A similar case can be made when we consider disyllabic stems the first syllable of which contains a long vowel. If the footing that predicts the allomorph selection is quantity-insensitive, then the allomorph selected for stems like that should be *-uw*, since all the roots are concatenated with the consonant-final diminutive *-paal* suffix. If, on the other hand, the footing is quantity-sensitive, the possessive allomorph selected in this case should once again be *-anuw*, i.e. the allomorph that attaches to stems that end in a consonant and forms another foot by itself. We can see from the data below that it is that disyllabic allomorph *-anuw* that is selected to attach to stems like that:

(26)

a.

(saaɣ)rap-(paa)(l-anuw) 'my axes'

(muu)ŋi-(paa)(l-anuw) 'my eggs'

(paas)sa-(paa)(l-anuw) 'my mittens'

(ʎaax)xal-(paa)(l-anuw) 'my messages'

(soo)jəm-(paa)(l-anuw) 'my brooks'

(oo)ŋəɣ-(paa)(l-anuw) 'my aunts'

(ii)ci-(paa)(l-anuw) 'my evenings'

(kee)ŋən-(paa)(l-anuw) 'my buttons'

(juun)təp-(paa)(l-anuw) 'my needles'

(aa)məṣ-(paa)(l-anuw) 'my riddles'

(kʷaa)liɣ-(paa)(l-anuw) 'my ropes'

(aa)wi-(paa)(l-anuw) 'my doors'

(aaxʷ)tas-(paa)(l-anuw) 'my stones'

(ʎoom)woj-(paa)(l-anuw) 'my gnats'

(nee)pak-(paa)(l-anuw) 'my books'

(aa)ɣi-(paa)(l-anuw) 'my girls, daughters'

(saa)li-(paa)(l-anuw) 'my reindeer'

(puu)tə-(paa)(l-anuw) 'my pots'

(poo)ra-(paa)(l-anuw) 'my float, rafts'

b.

*(saaɣrap)-(paal-uw)

*(muuŋi)-(paal-uw)

*(paassa)-(paal-uw)

*(ʎaaxxal)-(paal-uw)

*(soojəm)-(paal-uw)

*(ooŋəɣ)-(paal-uw)

*(iici)-(paal-uw)

*(keeŋən)-(paal-uw)

*(juuntəp)-(paal-uw)

*(aaməṣ)-(paal-uw)

*(kʷaaliɣ)-(paal-uw)

*(aawi)-(paal-uw)

*(aaxʷtas)-(paal-uw)

*(ʎoomwoj)-(paal-uw)

*(neepak)-(paal-uw)

*(aaɣi)-(paal-uw)

*(saali)-(paal-uw)

*(puutə)-(paal-uw)

*(poora)-(paal-uw)

In (26b) above we demonstrate that with quantity-insensitive footing we would get allomorph selection that is ungrammatical, despite the fact that the language appeared to be quantity-insensitive for the purposes of stress assignment pattern (see the previous subsection).

In fact, none of prosody-sensitive allomorph selection in the language treats the language as quantity-insensitive, to the best of my knowledge.

We have given illustrations with two possessive suffixes (2nd person singular possessor with plural possessed and 1st person singular possessor with plural possessed), where each of the suffixes has four allomorphs (*-n/-nən/-an/-anən*) for the former suffix and *-w/-uw/-anuw/-nuw* for the latter one). Another type of prosody-sensitive allomorphy in the language is allomorphy where only two allomorphs are available underlyingly, without the option to select a vowel-initial or consonant-initial allomorph, regardless of whether a consonant or a vowel ends the stem preceding the allomorph. One of these suffixes is an adjective-forming suffix that attaches to nominal stems. The allomorphs of this suffix are *-p* and *-pa*[17]. Regardless of whether the suffix is concatenated with a consonant-final or vowel-final stem, there is no "repair strategy" for the syllable structure:

(27)

a.

put 'ice-crust'	(put-pa) 'covered with thin ice'	*(put-p)
tin 'price'	(tin-pa) 'expensive'	*(tin-p)
xum 'man'	(xum-pa) 'human' (adj)	*(xum-p)
pos 'light'	(pos-pa) 'light' (adj)	*(pos-p)
at 'smell'	(at-pa) 'smelly, stinky'	*(at-p)
poc 'drip'	(poc-pa) 'drippy'	*(poc-p)
piṣ 'trick'	(piṣ-pa) 'decetful'	*(piṣ-p)
ṣuɳ 'wealth'	(ṣuɳ-pa) 'wealthy'	*(ṣuɳ-p)

b.

uus 'city'	(uus-p) 'urban'	*(uus-pa)
seeŋkʷ 'fog'	(seeŋkʷ-p) 'foggy'	*(seeŋkʷ-pa)
joor 'strength'	(joor-p) 'strong-minded'	*(joor-pa)
naaj 'fire'	(naaj-p) 'hot, firy'	*(naaj-pa)
suup 'mouth'	(suup-p) 'loud-mouthed'	*(suup-pa)

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[17] One of my informants uses not the prosodically-restricted allomorphs -p/-pa but rather syllable structure allomorphs -əp/-p. The rest of the speakers accepted it as an extremely colloquial version. One of the comments was that it sounded 'young' and possibly brought over from some neighboring dialect of Vogul. It also seems to be true that this suffix is not entirely productive, as we encountered quite a few nominal stems that cannot be concatenated with this suffix but rather take a more productive suffix -ŋ/-əŋ. For several stems, the suffixes seem to be used interchangeably.

woot 'wind'   (woot-p) 'windy'   *(woot-pa)
jaa 'river'   (jaa-p) 'runny'   *(jaa-pa)
eet 'night'   (eet-p) 'very dark, night-dark'   *(eet-pa)

In the data in (27a) above, we have monosyllabic stems with short vowels. When adjectivized, these stems are concatenated with the longer allomorph *-pa*, which forms a complete binary foot. Note that the roots are consonant-final, and yet they take a consonant-initial allomorph, creating consonant cluster, presumably because there is no vowel-initial allomorph available, and constraints against epenthesis or deletion override the requirements on syllable structure. The forms with the shorter allomorph *-p* are ungrammatical with these roots.

In contrast, the forms in (27b) are also monosyllabic, but they are all of the (C)VV(C) shape, i.e. containing a long vowel. These roots take the short allomorph *-p*, still forming a complete moraic binary foot. Again, no vowel-initial allomorph seems to be available, so some of the adjectives end up with complex codas. The alternative forms with the longer allomorph *-pa* are ungrammatical, as, under the moraic footing, they would form either a ternary foot, or a binary foot followed by a degenerate monomoraic foot.

In a similar fashion, disyllabic roots of the form (C)VCV(C) only take the short allomorph of the suffix and are ungrammatical with the longer version. Even if a root ends in a consonant, there is neither deletion nor insertion to accommodate the less marked syllable structure:

(28)

sakka 'sugar'   (sakka-p) 'too sweet, sugary'   *(sakka-pa)
mowiɲt 'laughter'   (mowiɲt-p) 'ridiculous, laughable'   *(mowiɲt-pa)
pici 'nest'   (pici-p) 'cosy'   *(pici-pa)
oma 'mother'   (oma-p) 'maternal'   *(oma-pa)
takʷəs 'autemn'   (takʷəs-p) 'sad, unhappy, moody'   *(takʷəs-pa)
ṣaxəl 'pile'   (ṣaxəl-p) 'piling'   *(ṣaxəl-pa)
koləs 'grain'   (koləs-p) 'grainy, distorted'   *(koləs-pa)

Note that in one case, the adjective meaning 'ridiculous, laughable' *mowiŋt-p*, there is a triconsonantal coda created by the addition of the allomorph of the adjectivizing suffix, yet, since there is no vowel-initial allomorph of this suffix available underlyingly, and both epenthesis and deletion are prohibited, it is the one-consonant allomorph that is selected. Even though the addition of the other allomorph of this suffix would not create a triconsonantal coda, that allomorph is discarded since its addition would create either a ternary or a degenerate foot, or an unparsed syllable.

Similarly, roots with a long vowel followed by a short vowel in the second syllable, always take the longer allomorph of the adjectivizing suffix, so the resulting form consists of two binary moraic feet:

(29)

	a.	b.	c.
	ŋeeləm 'tongue'	(ŋee)(ləm-pa) 'linguistic; polyglot'	*(ŋeeləm-p)
	ƛaaxxal 'message'	(ƛaax)(xal-pa) 'informative'	*(ƛaaxxal-p)
	jaarmak 'silk'	(jaar)(mak-pa) 'silky'	*(jaarmak-p)
	iici 'evening'	(ii)(ci-pa) 'evening' (adj)	*(iici-p)
	toorəm 'sky'	(too)(rəm-pa) 'heavenly; divine'	*(toorəm-p)
	juuntəp 'needle'	(juun)(təp-pa) 'sharp'	*(juuntəp-p)
	aaməṣ 'riddle'	(aa)(məṣ-pa) 'puzzling'	*(aaməṣ-p)
	xootal 'sun, day'	(xoo)(tal-pa) 'day-time' (adj)	*(xootal-p)
	aaxʷtas 'stone'	(aaxʷ)(tas-pa) 'heavy, stone-like'	*(aaxʷtas-p)
	neepak 'book'	(nee)(pak-pa) 'well-read, bookish'	*(neepak-p)
	eekʷa 'woman'	(ee)(kʷa-pa) 'feminine'	*(eekʷa-p)

The adjectives in (29b) that are formed from the corresponding nouns in (29a) all take the longer allomorph *-pa*, clearly treating syllables with long vowels as heavy. The ungrammatical forms in (29c) show that with weight-insensitive footing we would predict that the short allomorph *-p* should be attached. Crucially, that prediction is not borne out. There are several other suffixes in Vogul that behave in a similar fashion, attaching an allomorph that would complete a foot.

5.2.3.2   Allomorphy Type 2

A similar, albeit different, phenomenon can be found in verbal formation of Vogul. The participial suffix *-n/-nɛ/-nə* with the meaning "(the one) V-ing," which attaches to verbal stems, has the distribution of allomorphs that is also tied to prosodic structure of the language.

The single-consonant allomorph *-n* attaches to any stem that ends in a vowel or a single consonant:

(30)   a.   b.   c.
       ju-n 'coming'   min-n 'going'   xol-n 'stopping'
       li-n 'throwing'   xil-n 'digging'   mat-n 'aging'
       wi-n 'taking'   xuj-n 'sleeping/dreaming'   tot-n 'bringing'
       mi-n 'giving'   al-n 'killing'   mas-n 'dressing'
       tee-n 'eating'   pin-n 'placing'   kis-n 'whistling'
       waa-n 'sleeping'   pur-n 'biting'

The language has very few (only the six listed above in (30a)) verbal roots ending in a vowel, and the ones that have a short vowel ('coming', 'throwing', 'taking', and 'giving') also have consonant-final allomorphs of the roots. Since the consonant-final allomorphs of these roots are not used with the suffix in question, we will not discuss them here. As is evident in (30b), monosyllabic verbal roots that end in a single consonant are also concatenated with the shortest allomorph (*-n*), despite the fact that the resulting form has a complex coda, marked both universally and in Vogul (see distribution of allomorphs that does not depend on prosody above). The reason for such allomorph distribution is outside the scope of this chapter.

Similarly, the same allomorph *-n* is concatenated with polysyllabic roots, as well as with monosyllabic roots of the form (C)VVC, regardless of the number of syllables or vowels preceding it:

(31)   a.   b.

   xool-n 'dying'   sawal-n 'suffering'
   waar-n 'making'   moɣal-n 'laughing, smiling'
   xuuʎ-n 'leaving'   taɣat-n 'hanging'
   ool-n 'living'   pokap-n 'bursting'
   neeɣ-n 'tying, to binding'   tinal-n 'selling'
   toos-n 'drying'   xariɣ-n 'extinguishing'
   joom-n 'going, striding'
   keet-n 'sending'
   waat-n 'picking'
   naat-n 'floating'
   ʎuuʎ-n 'standing'
   noox-n 'flying up'
   kʷaal-n 'standing up'

As the data above illustrates, the same shortest allomorph of the suffix is attached to roots with two vowels in them, either monosyllabic, as in (31a), or disyllabic, as in (31b) above.

The other two allomorphs (either *-nɛ* or *-nə*) are attached to stems that end in two consonants, presumably to reduce a potential tri-consonantal coda[18]. Some of the verbs below are derived.

(32)   a.   b.
   xiwl-nə 'rowing'   xaareṣt-nə 'crackling, squeaking'
   joxt-nə 'arriving'   xaajtiɣt-nə 'running around'
   xopl-nə 'knocking, beating'   roonxuwl-nə 'yelling'
   unl-nə 'sitting'   paajt-axt-nə 'cooking' (intr)[19]
   patt-nə 'dropping'   jeekʷə-lt-nə 'beginning to dance'[20]
   xans-nə 'writing'   laawə-lt-nə 'mentioning'
   xaɲṣ-nə 'knowing'   xaajtə-ml-nə 'startting to write'[21]
   xanl-nə 'gluing'   puuwə-mt-nə 'seizing'[22]

---

[18] If, indeed, the reduction of a potential complex coda is (one of the) reasons to attach a CV allomorph, it is unclear why a monoconsonantal allomorph *-n* is attached to roots ending in two consonants instead of a CV allomorph that would have been more beneficial, leaving a one-consonant coda. While I am pointing this problem out, I leave it outside the scope of this dissertation.

[19] -axt- intransitive suffix

[20] -lt- inchoative and causative suffix

[21] inchoative

[22] -mt- momentaneous

One of the two CV allomorphs (allomorph *-nə*) is attached to both the verbal stems in (a) and in (b) in the data above. The stems in (32a) are all monosyllabic and contain a short vowel, whereas the stems in (32b) have two syllables, but one of the vowels is long. All of the stems end in two consonants. Under a moraic analysis, all of the examples in (32a) consist of a single foot, the first part of which is the verbal stem, and the second the allomorph *-nə* of the participial suffix. Similarly, in (32b), the first syllable of the stem, containing a long vowel, is footed by itself. The second syllable of the stem with the short vowel is footed together with the suffix. Just as in (32a), the whole word is parsed into binary moraic feet. Note that under a syllabic analysis, the occurrence of the allomorph with the schwa (as opposed to the allomorph with the full vowel) becomes unpredictable:

(33)

a.	b.
(xiwl-nə) 'rowing'	(xaareṣt)-(nə) 'crackling, squeaking'
(joxt-nə) 'arriving'	(xaajtiɣt)-(nə) 'running around'
(xopl-nə) 'knocking, beating'	(roonxuwl)-(nə) 'yelling'
(unl-nə) 'sitting'	(paajt-axt)-(nə) 'cooking' (intr)
(patt-nə) 'dropping'	(jeekʷə-lt)-(nə) 'beginning to dance'
(xans-nə) 'writing'	(laawə-lt)-(nə) 'mentioning'
(xaɲṣ-nə) 'knowing'	(xaajtə-ml)-(nə) 'starting to write'
(xanl-nə) 'gluing'	(puuwə-mt)-(nə) 'seizing'

The syllabic parsing above places the allomorph *-nə* as the second part of the foot in one case, in (33a), but as the initial part of the second foot in (33b). The syllabic analysis of the data, therefore, cannot explain the distribution of the allomorphs of this suffix, despite the fact that stress placement pattern in the language is quantity-insensitive.

We will next look at monosyllabic stems that contain long vowels and end in two consonants. Since the stems end in two consonants, it is either the *-nɛ*, or the *-nə* allomorph that should attach to the stem.

(34)

a.	b.
eerɣ-nɛ 'singing'	aliʂl-nɛ 'fishing'
saaŋl-nɛ 'ringing'	potərt-nɛ 'speaking'
keenɣ-nɛ 'roaring'	lowiɳt-nɛ 'reading, counting'
xaajt-nɛ 'running'	kitiɣl-nɛ 'asking (a question)'
moorm-nɛ 'wrinkling, to folding'	xaɲiʂt-nɛ 'teaching, inquiring'
uunl-nɛ 'sitting'	wojant-nɛ 'defending'
rooŋx-nɛ 'shouting'	janiɣ-m-nɛ 'growing, becoming big'[23]
uunt-nɛ 'occupying (place)'	mina-nt-nɛ 'going along'
saaɣr-nɛ 'cutting'	xoram-l-nɛ 'decorating'[24]
aaŋxʷ-nɛ 'pulling out'	tiɲʂaŋ-l-nɛ 'lassoing'[25]
ʎuuɲʂ-nɛ 'weeping'	samə-ltt-nɛ 'noticing'[26]
oox-t-nɛ 'tar'[27]	ojə-lt-nɛ 'putting to sleep'

In contrast with the previous set of data, all the verbal stems in the data in (34) above are concatenated with the allomorph -nɛ (with the full vowel). Under moraic analysis, the verbal stems in (34a) (either the roots alone, or roots with suffixes preceding the participial suffix), comprises a full bimoraic foot, and the participial suffix itself starts a second (degenerate) foot. Similarly, in (34b), the stems contain two vowels (two syllables with a short vowel each) and hence are also footed together, with the participial suffix outside the bimoraic foot.

Again, under a quantity-insensitive footing consistent with stress assignment, the distribution of the allomorphs is impossible to predict:

(35)

a.	b.
(eerɣ-nɛ) 'singing'	(aliʂl)-(nɛ) 'fishing'
(saaŋl-nɛ) 'ringing'	(potərt)-(nɛ) 'speaking'
(keenɣ-nɛ) 'roaring'	(lowiɳt)-(nɛ) 'reading, counting'
(xaajt-nɛ) 'running'	(kitiɣl)-(nɛ) 'asking (a question)'

---

[23] -m- is a suffix with the meaning 'become X'; from *janiɣ* 'big'

[24] -l- is a transitive verbalizer, from *xoram* 'decoration'

[25] see previous footnote

[26] -ltt- is a transitive verbalizer, from *sam* 'eye'

[27] -t- is a suffix with the meaning 'provide with X'; from *oox* 'tar'

(moorm-nɛ) 'wrinkling, folding'	(xaɲiʂt)-(nɛ) 'teaching, to inquiring'
(uunl-nɛ) 'sitting'	(wojant)-(nɛ) 'defending'
(rooŋx-nɛ) 'shouting'	(janiɣ-m)-(nɛ) 'growing, becoming big'
(uunt-nɛ) 'occupying (place)'	(mina-nt)-(nɛ) 'going along'
(saaɣr-nɛ) 'cutting'	(xoram-l)-(nɛ) 'decorating'
(aaŋxʷ-nɛ) 'pulling out'	(tiɲʂaŋ-l)-(nɛ) 'lassoing'
(ʎuuɲʂ-nɛ) 'weeping'	(samə-ltt)-(nɛ) 'noticing'
(oox-t-nɛ) 'tarring'	(ojə-lt)-(nɛ) 'putting to sleep'

As we can see from the examples above, forms in (35a) are parsed into a single syllabic foot, with the participial suffix comprising the second part of a foot. Forms in (35b), on the other hand, are footed differently: the stems, all of which contain two light syllables, are footed into binary syllabic feet, whereas the suffix starts another foot. Yet, both in the forms in (35a) and in (35b), the same allomorph of the participial suffix is chosen.

The explanation of the distribution of the two CV allomorphs of the participial suffix, it appears, lies in the sonority of the vowel of the suffix and the foot structure of the language that allomorphy requires. The allomorph *-nə*, with the schwa vowel that is the least sonorous, is selected when the suffix can be footed as the second (weak) part of a binary moraic foot. The other CV allomorph, *-nɛ*, appears when it is footed by itself, as the first, and the only, part of the second foot, putting the relatively more sonorous vowel [ɛ] into the strong position within a foot.

This pattern can be easily modelled within Optimality Theory utilizing a scale of constraints introduced in Kenstowicz (1994), and with de Lacy's (2004, 2006) stringent constraints for foot margins (see Chapter 2 for definitions of these constraints).

This is a scale of constraints that insures that the most undesirable peak of a foot is a schwa, followed by a constraint prohibiting high vowels [i] and [u] from being prominent and so on. By the same reasoning, a constraint like *M/a will be defined as "vowel [a] must not be the peak of a syllable occupying the weak part (margin) of a foot", with the vowel sonority scale reversed:

(36) Margin Prominence for Metrical Foot

> *M/*a*
> *M/*a, ε •ɔ*
> *M/*a, ε •ɔ, e •o*
> *M/*a, ε •ɔ, e •o, i•u*
> *M/*a, ε •ɔ, e •o, i•u, ɨ*
> *M/*a, ε •ɔ, e •o, i•u, ɨ, ə*

To account for the second type of allomorphy in Vogul discussed above, the distribution of the participial suffix allomorphs -*nə* and -*nε*[28], we will need two of the constraints specified in the stringency hierarchy:

(37)

> a. *M/*a, ε •ɔ, e •o, i•u, ɨ, ə*
> b. *M/*a, ε •ɔ*

Other Fт-Form constraints that are not outranked by any other constraint in the language would insure that the type of feet we are dealing with is trochee. The Binarity$_\mu$ constraint requires that all feet must be binary on the moraic level.

Tableau 3

/xopl/-/nε/~/nə/	Fт-Form (trochee)	FтBin$_\mu$	*M/*a, ε •ɔ*	*M/*a, ε •ɔ, e •o, i•u, ɨ, ə*
s w a. (xopl-nε)			*!	*
s w ☞ b. (xopl-nə)				*
w s c. (xopl-nε)	*!			
w s d. (xopl-nə)	*!			
s s e. (xopl)-(nε)		**!		

---

[28] The single-consonant allomorph -*n* is disregarded here for reasons stated previously in this chapter.

As can be seen from the Tableau 3 above, the first two constraints (FTFORM and BINARITY) are not ranked with respect to each other; they outrank all the other constraints in the tableau. The only candidate that does not have binary footing is candidate (e) that is parsed into two monomoraic feet. This candidate is eliminated by the BINARITY violations, even though its suffix vowel ([ɛ]) is in the strong position of the foot, since the suffix is parsed into its own monomoraic foot, and thus does **not** violate the *M/*a, ɛ •ɔ* constraint. Candidates (c) and (d) are eliminated by the FTFORM constraint, since they are iambs and not trochees. The choice of optimal candidate, therefore, is limited to candidates (a) and (b), which minimally differ with respect to with of the two CV allomorphs the stem is concatenated with. The candidate (a) has the monosyllabic stem concatenated with the allomorph with the full vowel [ɛ]. The candidate (b), on the other hand, has the suffix with the schwa attached to it. The candidate (b) is optimal.

What the tableau above illustrates, therefore, is the generalization about the distribution of different sonority vowels within feet: the reduced schwa allomorph is chosen for the weak position within a foot.

5.2.4 Summary

Note again that the parsing that would correctly predict the distribution of the CV allomorphs must be moraic, i.e. quantity-sensitive. It seems clear, therefore, that there is a contradiction exhibited in the language between the weight-insensitivity that stress pattern suggests and weight-sensitive parsing needed to predict both forms of allomorphy:

(38)

a. Moraic parsing	b. Syllabic parsing
(saaɣ)rap-(paa)(l-anuw) 'my axes'	*(saaɣrap)-(paal-uw)
(muu)ŋi-(paa)(l-anuw) 'my eggs'	*(muuŋi)-(paal-uw)
(paas)sa-(paa)(l-anuw) 'my mittens'	*(paassa)-(paal-uw)
(ʎaax)xal-(paa)(l-anuw) 'my messages'	*(ʎaaxxal)-(paal-uw)
(soo)jəm-(paa)(l-anuw) 'my brooks'	*(soojəm)-(paal-uw)
(oo)ŋəɣ-(paa)(l-anuw) 'my aunts'	*(ooŋəɣ)-(paal-uw)

(ii)ci-(paa)(l-anuw) 'my evenings'   *(iici)-(paal-uw)
(kee)ŋən-(paa)(l-anuw) 'my buttons'   *(keeŋən)-(paal-uw)
(juun)təp-(paa)(l-anuw) 'my needles'   *(juuntəp)-(paal-uw)

As we can see from the data above, repeated from (26) previously given in this chapter, it is only the moraic (weight-sensitive) parsing in (38a) that correctly predicts the shape of the possessive allomorph, whereas the syllabic parsing in (38b) gives us the wrong predictions. The parsing for predicting the correct stress pattern, on the other hand, must be weight-insensitive, as can be see below:

(39)
a.   Syllabic parsing   b.   Moraic parsing

(sáaɣrap)-(pàal-a)(nuw) 'my axes'   *(sáaɣ)rap-(pàa)(l-ànuw)
(múuŋi)-(pàal-a)(nuw) 'my eggs'   *(múu)ŋi-(pàa)(l-ànuw)
(páassa)-(pàal-a)(nuw) 'my mittens'   *(páas)sa-(pàa)(l-ànuw)
(ƛáaxxal)-(pàal-a)(nuw) 'my messages'   *(ƛáax)xal-(pàa)(l-ànuw)
(sóojəm)-(pàal-a)(nuw) 'my brooks'   *(sóo)jəm-(pàa)(l-ànuw)
(óoŋəɣ)-(pàal-a)(nuw) 'my aunts'   *(óo)ŋəɣ-(pàa)(l-ànuw)
(iici)-(pàal-a)(nuw) 'my evenings'   *(íi)ci-(pàa)(l-ànuw)
(kéeŋən)-(pàal-a)(nuw) 'my buttons'   *(kée)ŋən-(pàa)(l-ànuw)
(júuntəp)-(pàal-a)(nuw) 'my needles'   *(júun)təp-(pàa)(l-ànuw)

The examples in (39a) are parsed into trochaic weight-insensitive (syllabic) feet[29], giving us the correct stress pattern, without the secondary stress assigned to the penultimate syllable. The parsing in (39b), on the other hand, is weight-sensitive, and would therefore assign secondary stress to the penultimate syllable. Moreover, if we allow a monomoraic degenerate foot for the syllable "trapped" between the first heavy syllable and the third heavy syllable, we would get an additional ungrammatical secondary stress assigned to the second syllable in the words in (39b) above. It seems clear, therefore, that the stress pattern in the language takes into consideration syllables regardless of their weight, rather than moras.

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[29] Whether or not we parse the last syllable here into a degenerate foot does not matter, as ultimate syllables never receive stress in the language.

To summarize this section, we have discovered a discrepancy between weight-insensitivity of the stress pattern in Vogul and the clearly weight-sensitive foot parsing required for both types of prosody-sensitive allomorphy.

Having the patterns of Vogul described above in mind, we now turn to somewhat similar pattern in an unrelated language, Shipibo (Panoan family), which presents some significant minimal differences with the Vogul pattern.

5.3 Case Study: Shipibo[30] (North-Central Panoan)

5.3.1 Preliminary Remarks

Shipibo is one of Panoan languages, spoken in Peru. Its close relatives are Huariapano and Capanahua, discussed in Chapter 4. According to Pozzi-Escot (1998), Shipibo has about sixteen thousand speakers.

Shipibo presents a pattern that looks like the mirror image to the Vogul case, in that while its stress assignment is sensitive to weight, rhythmic alternations in the language clearly depend on syllabic parsing. We will argue that the parsing in the language is indeed syllabic, whereas stress is pulled onto heavy syllables by the WEIGHT-TO-STRESS constraint that outrank the Prominence Alignment constraint requiring that stress be aligned with the left edge of a syllabic foot.

Shipibo has four short vowels: /i, ɨ, ʊ, a/, and the following consonants: /p, t, k, β, s, ʃ, ş, ts, tʃ, r, m, n, w, j, h/. Onsets and codas are optional in the language. Both complex codas and complex onsets are disallowed. Furthermore, only nasals and sibilants can be codas. Stress in the language is realized as high pitch.

Monosyllabic underived nouns always have a long vowel and can also have a coda consonant. Example: [hii] 'hair', or [tʃii] 'fire'. Long vowels are not found anywhere else

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in the system (Elías-Ulloa (1999, 2003). This restriction suggests some kind of Minimal Word requirement, with consonants not contributing to weight, since there are no underived nouns of the form CVC. However, just as in the case with Vogul we discussed previously, there are no synchronic alternations indicating that the long vowel in the words like [hii] does not shorten when suffixes are added:

(40)

    (a) tʃii   'fire'

    (b) tʃii-ki   'in the fire'
        fire-LOC

    (c) tʃii-rɨs   'only fire'
        fire-only

Furthermore, we will see evidence that consonants can be moraic and attract stress in certain configurations. I will, therefore, consider the fact that no underived monosyllabic word in Shipibo has a short vowel an epiphenomenon synchronically[31].

5.3.2 Stress

In words with only open short syllables, main stress is assigned to the first syllable in the word, regardless of the number of syllables:

(41) (Data from Elías-Ulloa (2000))

    tí.ta   'mother'
    βá.kɨ   'child'
    á.ta.pa   'hen'

When suffixes (of a certain type, see below) are added to a root consisting of CV syllables only, like the root *á.ta.pa* 'hen', main stress remains on the first syllable:

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[31] See Elías-Ulloa (2003) for a different analysis that recognizes the Minimal Word restriction as synchronically active constraint in the language and utilizes Output-Output constraints to account for the lack of shortening (or lack of lengthening if the underlying representation has a short vowel) when roots like [hii] 'hair' are concatenated with other morphemes.

(42)

    (a)   á.ta.pa.-βʊ   'hens'
           hen-PL

    (b)   á.ta.pa.-ra   'hen, evidently'
           hen-EVID

    (c)   á.ta.pa.-βʊ.-ra   'hens, evidently'
           hen-PL-EVID

If, however, the second syllable of the root is a closed syllable, and the first is a CV syllable, the main stress in Shipibo words is shifted onto the second, closed syllable:

(43)

    βís.βi   'kind of wasp'
    tʃa.rás   'catalan' (a bird)
    sɨ.nín.βi.rɨs   'same, equal'

Such a pattern suggests, first, that consonants in the language do contribute to weight, and second, that the language, or at least its stress assignment pattern is weight-sensitive.

It is worth mentioning that main stress is restricted to the first two syllables of a word, regardless of shape or weight of syllables following. For example:

(44)

    sá.pi.tʊn   '(sp. of) fish'   * sa.pi.tún
    sɨ.nín.βi.rɨs 'same, equal'   * sɨ.nɨn.βi.rís

The examples above illustrate the generalization we have made previously: the main stress is assigned to the first syllable if both the first and the second syllables are light, and to the second syllable, if the second syllable is heavy. Therefore, it appears that (i) stress in the language is weight-sensitive, and (ii) it is assigned within the initial two-syllable window.

Given allomorphy patterns we discuss in the next subsection, we have to conclude that, despite the sensitivity to weight, Shipibo words are parsed into syllabic feet. This case, therefore, shows us how WEIGHT-TO-STRESS principle can affect the stress assignment

without affecting foot structure, as is shown by segmental allomorphy. Shipibo's foot dependent segmental alternation proves that the footing in this language is constant and drives the stress assignment, with the exception of WEIGHT-TO-STRESS effect:

Tableau 4

/tʃaras-ra / 'catalan, evidently'	ALIGN-L (FT, PWD)	W-t-S	ALIGN-L (LEV$_n$GRID, FT)
☞ a. (tʃarás)-ra			*
b. (tʃáras)-ra		*!	
c. tʃa(rás)-ra	*!		
d. tʃa(rás-ra)	*!		

As the Tableau above illustrates, both the constraint on feet alignment and WEIGHT-TO-STRESS principle outrank the stress alignment constraint. Candidates (c) and (d) violate the foot-alignment constraint, even though they have the stress assigned correctly to the heavy syllable and aligned to the left edge of the foot. In fact, the only difference between the two losing candidates is that candidate (c) violates the FTBIN$_{(\sigma)}$ constraint, and candidate (d) does not. Since neither of these candidates is optimal, we cannot rank the BINARITY constraint with respect to other constraint, thus we do not include it in the Tableau 6 above. Candidate (b), while its footing is correct, is stressed on the light syllable that is followed by a heavy unstressed one and therefore violates the WEIGHT-TO-STRESS principle. Since WEIGHT-TO-STRESS also outranks the constraint that requires that prominence be aligned with the left edge of a foot, candidate (b) is eliminated as well. Consequently, even though candidate (a) violates the stress alignment constraint, it is chosen as optimal due to no violations of the higher-ranking constraints.

To summarize, WEIGHT-TO-STRESS constraint is shown to be another constraint that can influence stress assignment without any effect on the foot structure that is shown by the segmental alternation between the allomorphs.

Secondary stress is not reported to occur in the language; however, there are words with certain suffixes that do surface with secondary stress. Elías-Ulloa (2003) recognizes two types of suffixes, prosodic (type I) and non-prosodic (type II). The first type of suffixes

shows up with the secondary stress on its first syllable. Elías-Ulloa (2003) suggests that so-called prosodic suffixes start their own foot and thus have another stress assigned. Since this thesis is arguing for certain separation between footing and stress location, I will remain more cautious and say that all we know is that these suffixes (Type I) have a lexical stress in the lexicon, stress that shows up on the surface, presumably because of some sort of MAX(stress) constraint. Thus, rather than proposing that the appearance of secondary stress points to footing that starts when these suffixes are attached, I am leaving the issue unresolved, and argue that in Shipibo the main indication of parsing into feet is allomorphy that we will be discussing in the next subsection. Below we see some of the suffixes that do come with their own stress mark (45a), and some that do not cause Shipibo words surface with secondary stress (45b):

(45)

	(a)	Type I suffixes	(b)	Type II suffixes

(a)   Type I suffixes

/-ʃú.ku/ diminutive
/-rún.ki/ reportative

/-nín/ ergative

(b)   Type II suffixes

/-a/, /-ki/, /-ai/ finished action indicative, indicative-interrogative, interrogative
/-βu/ plural
/-ra/ evidential

Below is a paradigm of the word /a.ta.pa/ 'hen' with different types of suffixes added. The data in (46a-c) show that certain suffixes (type II) do not carry secondary stress even if the word has four or more syllables. (46d-f) show that some suffixes (type I) introduce secondary stress. More than one secondary stress is possible, depending on how many type I suffixes are added to the word (46g). The example in (46h) shows a word with type II suffix and a Type I suffix. Secondary stress is only seen in the Type I suffix. Finally, the example in (46i) shows that compounds have secondary stress on the second root.

(46)   Paradigm *atapa* 'hen' + suffixes

    (a)   á.ta.pa.-βʊ   'hens'
               hen-PL

    (b)   á.ta.pa.-ra   'hen, evidently'
               hen-EVID

(c)   á.ta.pa.-βʊ.-ra   'hens, evidently'
        hen-PL-EVID

(d)   á.ta.pa.-nìn   'hen' (Ergative)
        hen-ERG

(e)   á.ta.pa.-rùn.ki   'hen, reportedly'
        hen-REP

(f)   á.ta.pa.-ʃù.ku   'little hen'
        hen-DIM

(g)   á.ta.pa.-ʃù.ku.-rùn.ki   'little hen, reportedly'
        hen-DIM-REP

(h)   á.ta.pa.-βʊ-rùn.ki   'hens, reportedly'
        hen-PL-REP

(i)   á.ta.pa.-βi.ni   'rooster'
        hen-male

It seems reasonable, therefore, to suggest that the suffixes that cause a word to surface with secondary stress have underlying prominence. This prominence must be realized on the surface, even though the language in general bans secondary stress:

Tableau 5

* /atapa/-/ʃúku/ 'little hen'	MAX (LEV$_n$GRID)	* LEV$_2$GRID	ALIGN-L (LEV$_n$GRID, FT)
☞ a. (á.ta.)(pa.-ʃù.)ku		*	**
b.(á.ta.)(pa.-ʃu.)ku	*!		**

Even though both candidates in the tableau above violate the Prominence Alignment constraint twice (the 'additional' secondary stress in candidate (a) is not foot-initial), candidate (b) is eliminated by the MAX (LEV$_n$GRID) constraint: its underlying gridmark does not appear on the surface. Candidate (a) emerges as a winner.

Note that this analysis predicts that the foot structure of the language is not changed by the underlying prominence, just like it is not changed by the Weight-To-Stress requirement.

To summarize, all the Shipibo data presented in this subsection illustrates that the stress assignment pattern in the language is weight-sensitive, with some instances of secondary stress attributed to lexical stress appearing on the surface as secondary stress. There is no evidence presented by the stress pattern that footing is persistent throughout the word, as there is no secondary stress assigned, except, again, the morphology-based stress. Further complications of Shipibo stress assignment do not contradict our conclusion that the stress assignment in the language is quantity-sensitive, and is analyzed in further detail in Elías-Ulloa (2003, 2005).

With this background, we now turn to another prosody-sensitive phenomenon in Shipibo, allomorphy that depends on rhythmic structure of words in the language.

5.3.3   Rhythmic Allomorphy

According to Elías-Ulloa (2003, 2005), and Lauriault (1948), among others, Shipibo has at least two types of allomorphy that depend on the rhythmic shape of the stems that precede them. In one case, one of the vowels in a disyllabic suffix alternates between [i] and [a]; in the other case, the suffix attaches different allomorphs, either a consonant, or a whole syllable. The choice of one of the two allomorphs of this suffix also relies on the rhythmic composition of the stem.

5.3.3.1 The *-riba-* ~ *-ribi-* Allomorphy

To the best of my knowledge, it was Lauriault (1948) who first noticed the existence of a rhythmic alternation in Shipibo. According to Lauriault, the suffix that means 'again' has two allomorphs, *-ribi-* and *-riba-*, depending on the number of vowels that precede it. After an even number of vowels the allomorph *-riba-* occurs, and after an odd number of vowels the allomorph *-ribi-* surfaces, as in examples below:

(47) **Suffix *riba ~ ribi* alternations (from Lauriault 1948); the suffix is underlined**

    (a)   a-**riba**-kɨ   'did it again'
            do-again-PAST

    (b)   pi-**riba**-kɨ   'ate again'
            eat-again-PAST

    (c)   ka-**riba**-kɨ   'went again'
            go-again-PAST

As we can see from the data in (47a-c) above, when the suffix is attached to a monosyllabic (C)V root, the allomorph that is attached is the allomorph with the more sonorous vowel [a] (*-riba-*). The same holds when the suffix is attached to a stem with three (C)V syllables:

    (d)   a-ma-rɨ-**siba**-kɨ   'merely made him do it again'[32]
            do-CAUS-merely-again-PAST

    (e)   a-pari-**riba**-kɨ   'did it first again'
            do-immediately-again-PAST

    (f)   yomɨtso-**riba**-kɨ   'stole again'
             steal-again-PAST

    (g)   ka-yama-**riba**-kɨ   'did not go again'
             go-NEG-again-PAST

While there are no examples available to me where the suffix is concatenated with five or seven syllables, it seems reasonable to analyze the alternation between the allomorphs of this suffix as one dependent on the suffix's position in the foot of any given form: when the second syllable of the suffix starts a foot, the allomorph surfaces as *riba*, with left-aligned binary feet.

This generalization is supported by the data when the suffix attaches to stems that contain an even number of (C)V syllables:

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[32] The underlying form is /a-ma-ris-riba-ki/ (Lauriault (1948:23)). It appears that assimilation takes place between an adjacent /sr/ sequence with /s/ surfacing.

(48)

  (a) a-ma-**ribi**-kɨ   'made him/her do it again'
      do-CAUS-again-PAST

  (b) yono-**ribi**-kɨ   'commanded again'
      command-again-PAST

  (c) ka-ma-**ribi**-kɨ   'made him/her to go again'
      go-CAUS-again-PAST

  (d) bakɨ-**ribi**-ra   'again the child'
      child-again-EVID

  (e) jaka-pari-**ribi**-kɨ   'he sat down again and immediately'
      sit down-immediately-again-PAST

In examples (48a-d), the suffix is attached to two (C)V syllables, thus starting a new foot. In these cases, the suffix's second syllable is the second part of a foot comprised completely of the disyllabic suffix. The allomorph that surfaces, therefore, is the allomorph with the less sonorous vowel [i] (-*ribi*-). Similarly, in example in (48e), the suffix is concatenated with a stem with four (C)V syllables, i.e. with a stem that contains two complete feet. The suffix, once again, starts its own foot, and its second syllable is in the weak position of the foot, surfacing as -*ribi*-.

So far, all the roots we have looked at had only open syllables, with or without an onset. Given that stress in the language is quantity-sensitive, i.e. is attracted to closed syllables, as we discussed in the previous subsection, we would expect closed syllables of stems to render different results than the stems that contain open syllables only. However, the following data shows us that this prediction is incorrect:

(49)

  (a) Syllabic parsing of CVC syllables   (b) Moraic parsing of CVC syllables

  (mísko)-(**ribi**)-ra   *(mís)(ko-**ri**)(**ba**-ra)
  cramp-again-EVID
  'again the cramp, evidently'

(his-ri)(ba-kɨ)   *(his)-(**ribi**)-kɨ
see-again-PAST
'saw again'

Despite what the stress pattern of the language suggests, moraic parsing of closed syllables renders the incorrect result for the distribution of the allomorphs of the suffix under question. In the examples in (49a), the closed syllables are parsed as light, and this parsing renders the correct result for the distribution of the allomorphs.

In the first example, *mísko-**ribi**-ra* 'again the cramp, evidently', the root consists of a closed syllable followed by an open one. Under the syllabic parsing, the suffix *-riba-/-ribi-* starts the second foot, where both syllables of the suffix are footed together, thus surfacing with the allomorph *-ribi-*, since the second syllable is parsed as the second (weak) part of a foot. Moraic parsing, on the other hand, foots the first syllable of the root as a binary moraic foot by itself, and the second syllable of the root is parsed together with the first syllable of the suffix. The second syllable of the suffix, therefore, should start its own foot and occupy the first (strong) position in it; given this parsing the allomorph that should surface here is **-riba-*, with a more sonorous vowel in the second syllable. This prediction is clearly incorrect.

In the second example, on the other hand, *his-riba-kɨ* 'saw again', the root completely consists of a closed syllable. If, as in (49b), it is footed by itself comprising a binary moraic foot, the suffix should start its own foot, and the second syllable would be parsed into the second (weak) part of the foot, thus the word should surface with the allomorph **-ribi-*. If, on the other hand, we follow syllabic parsing as in (49a), the root is footed together with the first syllable of the suffix, and the second syllable of the suffix is parsed into the first part of the second foot, and occupies the strong position in that foot. This syllabic parsing gives the correct prediction that the *-riba-* allomorph shows up in this form.

It appears, therefore, that we are faced with a dilemma similar to the one we pointed out when we investigated the Vogul stress and allomorph selection: the stress pattern

251

suggests that words are parsed into moraic feet, while allomorph selection is only predictable from syllabic parsing. The difference with Vogul case is that, in Vogul, it was the allomorph selection that required moraic parsing, while stress insensitive to syllable weight.

5.3.3.2 Ergative suffix *-n/-nin* Rhythmic Alternations

A similar pattern is presented by another Shipibo suffix, the ergative suffix *-nin-/-n*. This ergative suffix also alternates: it surfaces as *-n* when added to a noun with an even number of syllables but as *-nin* when added to a noun with an odd number of syllables[33].

(50)

(a)	(βá.kɨ)		'child'
	(βa.kɨ́-n)		'child (ergative)' (Lauriault 1993)
(b)	(táɨ)		'foot'
	(ta.ɨ́-n)		'foot' (ergative)
(c)	(á.ta).pa		'hen'
	(á.ta.)(pa.-nìn)		'hen' (ergative) (Lauriault 1993)

In the examples in (50a) and (50b) above, both roots have two vowels. In the case of (50b), Lauriault (1993) syllabifies the two vowels of the root into different syllables. In both (50a) and (50b), therefore, the roots comprise disyllabic feet, and thus receive the shorter allomorph *-n* that shifts the stress to the second syllable (confirming that stress is weight-sensitive), but not adding any material that would not fit into the same disyllabic foot.

In contrast, the example in (50c) has a root that consists of three open syllables. The first two syllables of the root are parsed together, while the third syllable is parsed together with the ergative suffix. The allomorph of the ergative suffix that is added is, consequently, the longer of the two, *-nin*. Notice, also, that the ergative suffix is one of the Type I suffixes that bring in their lexical stress. The hypothesis we operate under is

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[33] A similar alternation for the ergative suffix is found in Capanahua (Loos 1978:159-61)

that this allomorphy is triggered by a requirement to parse the whole form into binary feet (see Saami, Estonian and Vogul, previously discussed in this thesis). The parsing for the form in (c), therefore, predicts the correct allomorph of the suffix added to the root *atapa* 'hen'; however, it also suggests that while certain suffixes (Type I) have lexical stress that shows up as secondary stress on the surface, it does NOT come with its own footing, but is rather parsed into the second part of the final foot, leaving the whole form in (50c) parsed into two disyllabic feet.

(d)   ʃin.ka   '(sp. of) parrot'
        (ʃin.ká-n)   '(sp. of) parrot' (ergative) (Loriot 1993:389)

(e)   *(ʃin.)(ka-nˋin)

Looking at the form in (50d) above, we can easily conclude that this type of allomorphy also indicates that the rhythmic alternations are weight-insensitive, i.e. closed syllables are parsed the same way light syllables are parsed. In the form above, the whole root *ʃin.ka* '(species of) parrot' is parsed into a binary syllabic foot, thus the ergative allomorph added is the shorter one, *-n*, that is parsed into the same foot without adding another syllable.

An interesting exception to this pattern is presented by stems that end in consonants. When such a stem is concatenated with the ergative suffix, an epenthetic vowel is inserted between the consonant of the root and the consonant of the short allomorph *-n*:

(51)
     wi.táʂ   'leg'
     wi.ta.ʂ-ɨn   'leg' (ergative)

     *wi.táʂ-n   (without epenthesis)
     *wi.tá-n (without epenthesis, with deletion of the last consonant of the stem)

As we mentioned previously, the language does not have complex codas anywhere. It seems that this constraint is ranked high in the language, and outranks constraints that

require all syllables in a Prosodic Word to be parsed into binary feet:

Tableau 6

/witaʂ/-/-/n/~/nin/	MAX [+cons]	*COMPCODA	DEP [-cons]	FTBIN (σ)	PARSE (σ)
☞ a. (wi.ta.)ʂ-ɨn			*		*
b. (wi.tá.ʂ-n)		*!			
c. (wi.tá.-n)	*!				
d. (wí.ta.)(ʂ-ɨ̀n)			*	*!	

What the pattern illustrated in the tableau above shows is that while both consonant deletion and complex codas are forbidden in the language, the violations of DEP [-cons] and exhaustive parsing are less costly in the language. The comparison between candidate (a) and candidate (d) shows that binary syllabic parsing is more important than parsing all syllables into feet, as the winning candidate (a) leaves the last closed syllable unparsed. This subpart of the Shipibo grammar is illustrated in the following:

(52)

MAX [+cons], *COMPCODA
|
DEP [-cons], FTBIN (σ)
|
PARSE (σ)
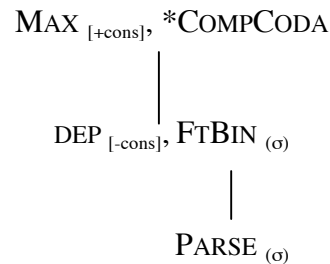
In concluding this subsection, we should emphasize again that while the stress pattern in the language indicates that the language is quantity-sensitive, both types of allomorphy require syllabic parsing into binary feet, with closed syllables never parsed into feet by themselves. What the rhythmic allomorphy shows us, therefore, is that the footing in the language is required to be quantity-insensitive, and forbids degenerate footing preferring to leave the third closed syllable unparsed.

5.4 Local Conclusions

The main theoretical claim of this thesis is that stress and foot structure are separate, though mutually dependent linguistic notions, and their interrelation must be regulated by a set of constraints. This chapter, in particular, discusses how the difference between stress and foot structure can be demonstrated in some cases of allomorphy selection. The conclusions we can draw from the case studies presented in this chapter show that the main premise of this dissertation can be maintained and reinforced by investigating certain types of interaction between prosody and allomorphy.

In the two cases we discussed, all types of allomorphy under consideration are shown to be foot structure-dependent, though in slightly different ways. However, stress appears to be also sensitive to rhythm in both case studies. The main puzzle comes from the fact that stress assignment pattern and allomorphy selection patterns do not appear to use the same foot structure.

In two of our case studies in this chapter we have shown, in particular, that sensitivity to syllable weight can be different for stress and allomorph selection. In Vogul, the stress placement pattern is clearly weight-insensitive, and ostensibly relies on binary syllabic feet to assign both primary and secondary stress. Both types of allomorphy discussed above, on the other hand, clearly demonstrate that the language **must** be sensitive to syllable weight and **must** form binary moraic feet in order to predict the distribution of all of the allomorphs that depend on prosody. The case study proves that the allomorphy selection cannot simply rely on the stress pattern of the language, since the same allomorphs can appear before or after a stressed syllable, and we simply get ungrammatical forms if we try to use stress positions as environments for allomorph distribution. Moreover, we clearly cannot rely on the foot structure that is apparently shown by the rhythmic stress assignment pattern.

Similarly, the Shipibo case study deals with the mismatch of stress and allomorph distribution. In contrast to Vogul, however, there is only primary stress in Shipibo, and it

is clearly weight-sensitive: it is easy to demonstrate that heavy syllables attract stress. Secondary stress is missing in Shipibo, except for some very interesting suffixes that seem to carry a stress of their own that appears as secondary on the surface. The question we asked there is whether it is foot structure that is prespecified in the underlying representations of those suffixes, or prominence, and if it is possible to answer this question with support of empirical data. It turns out that allomorphy selection in Shipibo, which itself clearly relies on foot structure of the language, could provide us with an answer to this question. Allomorph selection that treats the language as quantity-insensitive, shows us that the exceptional suffixes must be prespecified for some sort of prominence in the lexicon, but definitely not any element of foot structure, as such a prespecification would render Shipibo allomorph selection unpredictable. In a sense, the Shipibo case is a mirror image to the Vogul case, in that Vogul stress is weight-insensitive, while allomorphy indicates moraic binary feet, whereas Shipibo stress depends on syllable weight, and its prosody-sensitive allomorphy depends on quantity-insensitive binary footing.