The Study of Word Stress and Accent

Theories, Methods and Data

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13 The Scales-and-Parameters Approach to Morpheme-Specific Exceptions in Accent Assignment

*Alexandre Vaxman**

1 Introduction

Since its inception, Generative Phonology has been plagued by the recurrent problem of exceptions: while the theory naturally aims at generality and completeness of coverage, exceptions need to be dealt with, often calling for special mechanisms.

This chapter presents a new take on this problem in the domain of accent assignment, focusing on two interesting types of exceptions related to the concept of *lexical accent*. The first type consists of lexical accent systems with exceptional lexically accented morphemes (the so-called "accented dominant morphemes") that "win" word accent over another morpheme expected to receive the accent following the accent rule of the language. The second type consists of phonological weight-sensitive (WS) systems in which certain morphemes are lexically marked because, in forms containing these morphemes, accent location is not phonologically predictable.

Traditionally, *dominance effects* (which characterize the first type of system) are accounted for by having recourse to a special Accent Deletion rule that deletes all lexical accents to its left (e.g. Kiparsky 1984; Halle and Vergnaud 1987; Idsardi 1992). Accent Deletion is limited to dominance effects and is, therefore, unable to account for the second type of system just mentioned.

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In this chapter, I introduce the Scales-and-Parameters (S&P) theory, a new theory of word accent computation which accounts uniformly (in terms of a single accentual grammar) for different types of systems, namely lexical accent systems (with or without dominant morphemes), phonological WS systems in which some morphemes are lexically marked, as well as traditional phonological WS systems (see Vaxman 2014a, 2014b, 2015a, 2014b, 2016a, 2016b, 2016c, 2016d, 2017).

The S&P theory takes as a point of departure the Primary Accent First (PAF) theory, originally put forth by Harry van der Hulst in the 1990s (van der Hulst 1996, 1997, 2010, 2012). The former follows the latter in separating word accent ("primary stress") from rhythm ("non-primary stress") and in assigning those two types of word prominence on separate phonological planes, both without the use of metrical feet. (For strong empirical evidence in favor of this view, the reader is referred to van der Hulst 2010, 2012, Goedemans and van der Hulst 2014, McGarrity 2003.) In this chapter, I will focus on word accent.

2 The Parameter System

2.1 Introduction

The S&P theory is a parametric theory: it captures cross-linguistic variation in accentual patterns in terms of a small set of parameters. Taking the parametric PAF grammar as a point of departure, the S&P parameter system also diverges from it in multiple ways: while PAF makes a number of correct predictions, it strongly overgenerates (see Vaxman 2016b, 2016c, 2016d); therefore, it needs to be altered in order to reduce its parameter space. The S&P theory achieves this, while retaining the correct predictions made by PAF.

To that end, the PAF grammar is altered as follows:

(i) Among certain parameters, dependency relations are introduced, based on tests against data in StressTyp (the largest-to-date database of stress patterns in the world's languages).

(ii) PAF's Extrametricality (EM) parameter, which allows for both initial and final EM, is replaced with the Nonfinality (NF) parameter, which limits EM to the right word edge (no left-edge EM).

These changes result in a drastic reduction of the hypothesis space, as compared to the PAF grammar, bringing the S&P theory very close to descriptive adequacy (Vaxman 2016c, 2016d).

Moreover, augmenting the parameter system with novel types of weight scales allows us to accurately derive word accent location for languages that have lexical accents (see Sections 3–5).

The present section is organized as follows. In Section 2.2, I list and define the parameters proposed; then, in Section 2.3, I explain and illustrate how they work, while also discussing some dependency and ordering relations holding between specific parameters (see Vaxman 2016d: 34–64 for an exhaustive list and motivation of these relations). Finally, Section 2.4 sums up the main points.

2.2 *Parameters of the S&P Grammar*

The following two sections describe the proposed parameter system. This assigns accent on the Accent Grid, a "grid-only" (i.e. footless) representation of word-level prominence (as in the PAF theory).

The parameters in the system are listed in (1).

(1) Parameter statements

a. ***The Domain Size parameter*** (DS): the accent domain is {Bounded/Unbounded}.
b. ***The Domain Edge parameter*** (DE): a bounded accent domain is formed at the {Left/Right} word edge.
c. ***The Nonfinality parameter*** (NF): the peripheral element at the right word edge is not allowed to receive word accent. {Yes/No}
d. ***The Nonfinality Unit parameter*** (NF Unit): the NF Unit is a {Syllable/Segment}.
e. ***The Weight parameter*** (W): the language is weight-sensitive. {Yes/No}
f. ***The Project Position parameter*** (PP): project {Leftmost/Rightmost} position in the accent domain onto line 1 of the Accent Grid.
g. ***The Select parameter*** (Sel): choose the {Leftmost/Rightmost} gridmark on line 1 by placing a gridmark over it on line 2.

2.3 *Explication of the S&P Parameters*

In this section, I elaborate on different S&P parameters, clarifying the statements in (1), which I illustrate with examples from various languages. I also describe here some dependency and ordering relations that hold between these parameters.

By "dependency" between two parameters A and B, I understand a relation whereby, for some value of A, B may not be set to *at least one* of its values. (A parameter that may *not* be set to any value is said to be "blocked.")

"Parameter ordering" refers here to the particular order in which the parameters of a grammar apply to individual forms. (Frequently, the definitions of parameters themselves suggest the correct order of application.)

(1a) ***The Domain Size parameter*** (DS): the accent domain is {Bounded/ Unbounded}.

The Domain Size parameter determines the size of the accent domain, which is either bounded or unbounded. A bounded accent domain contains exactly two syllables; an unbounded accent domain corresponds to an entire word (except, potentially, a final EM syllable).[1]

Domain Size (Unbounded)		Yana (CV:, CV_iV_j heavy)
[(l l ˈh h h l)]	hapˀaˈlaamaubiiwi	mud
[(ˈl l l)]	ˈputˀukˀu	skull

Domain Size (Bounded)		Classical Latin (CV:, CV_iV_j, CVC heavy)
(ˈh l) <σ>]	doˈmesticus	domestic-NOM.MASC
(l ˈh) <σ>]	repriˈmuntur	restrain-3Prs.Pl-PRES.PASS

(1b) ***The Domain Edge parameter*** (DE): a bounded accent domain is formed at the {Left/Right} word edge.

Recall that, in languages with Domain Size (Unbounded), accent domain is co-extensive with the word, while in languages with Domain Size (Bounded), it is smaller than the word. For the latter, the Domain Edge parameter determines the word edge where the bounded accent domain is placed.

Domain Edge (Right)		Aklan (CVC heavy)
(ˈh h)]	ʔaˈsirˌtar	lucky
(l ˈh)]	kiˌnapuˈtus	wrap instrument-FOC-PAST.POSTER

Domain Edge (Left)		Capanahua (CVC heavy, except CVʔ)
[(ˈh l)	ˈsontako	young girl
[(l ˈh)	wiˈrankin	he pushed it

Note that Domain Edge is dependent on Domain Size and ordered after it. Indeed, in Domain Size (Unbounded) systems, where accent domain is co-extensive with the word, Domain Edge cannot be set. Therefore, Domain Edge is dependent on Domain Size, which implies that Domain Size must be set before Domain Edge, that is, the former precedes the latter.

(1c) **The Nonfinality parameter** (NF): the peripheral element at the right word edge is not allowed to receive accent. (Yes/No)

[1] In the abstract accent patterns given here, "h" stands for "heavy," "l" for "light," "( )" for the accent domain, "[" and "]" for the left and right word boundary, respectively. If a pattern contains only one bracket, then the other word boundary is not relevant; for example "(ˈh l)]" refers to *right*-edge bounded systems.

In some languages, the word-final unit is never accented, which means that it is "extrametrical," that is, invisible to accent assignment. For example, in Latin, accent falls on the penultimate syllable, if it is heavy; otherwise, accent is on the antepenult. Therefore, in Latin, the word-final syllable is never accented.

Nonfinality (Yes)		Classical Latin
(1 ˈh) <σ>]	reˈfe:kit	remake-PERF-3Sg
	reˈfektus	remake-PART.PASS.NOM.Masc
(ˈl l) <σ>]	ˈanima	soul-NOM.FEM

This pattern is captured by setting the Nonfinality parameter to "Yes".

(1d) ***The Non-finality Unit parameter*** (NF Unit): the NF Unit is a {Syllable/ Segment}.

The S&P theory allows for two extrametrical units, viz. the syllable and the Coda consonant. In a system with NF Unit (Syllable), the word-final syllable may not receive the word accent, as illustrated by Classical Latin in (1c). Setting NF Unit to "Segment" makes the Coda consonant in word-final CVC syllables invisible to accent assignment. As a result, these become light word-finally.

For example, in Kenuzi-Dongola, the rightmost heavy (CVV, CVC) syllable receives the word accent. CV syllables count as light in Kenuzi. Word-final CVVC and CVC syllables do not pattern together: in final position, the former are accented (heavy), while the latter are unaccented (light). (See Armbruster 1960: 95.)

In the S&P theory, this pattern is accounted for by making the word-final Coda *consonant* extrametrical. This explains why CVC syllables are light, on a par with CV syllables, while CVVC syllables, whose branching nucleus is visible to accent assignment, are heavy (even though the final C is extrametrical). This case illustrates that, in addition to the "Syllable" setting, the Nonfinality Unit parameter can be set to "Segment" (i.e. the Coda consonant).

Note that, if a language does not display extrametricality, then the word-final unit (syllable or segment) may not be extrametrical. In other words, if NF (No), then NF Unit may not be set. Therefore, the NF Unit parameter is dependent on the NF parameter and set after it.

(1e) ***The Weight parameter*** (W): the language is weight-sensitive. (Yes/No)

By definition, in languages with Weight (No), phonological properties of syllables (length, closure, height, sonority) do not affect accent location; accent location is invariable ("fixed") across all forms of that language.

(1f) **The Project Position parameter** (PP): project the {leftmost/rightmost} position in the accent domain onto line 1 of the Accent Grid.

In a given language, forms without heavy syllables ("all-light" forms) have fixed accent location within the accent domain. In such forms, in both BS and US, accent falls on the leftmost or rightmost syllable within the domain (in systems with NF, default accent shifts one syllable inside the word).

The combination of Project Position, which places a gridmark over the {leftmost/rightmost} syllable on line 1 of the Accent Grid in all-light forms, with Domain Size and Domain Edge (for bounded systems), exemplified in (2), successfully captures the parallel between bounded and unbounded systems with respect to the default accent location, as summarized in (3).

(2)

	Domain Size		
	Bounded		*Unbounded*
	DE (L)	*DE (R)*	
	*	*	*
PP (L)	[(1 1)	(1 1)]	[(1 1 1 1 1)]
	*	*	*
PP (R)	[(1 1)	(1 1)]	[(1 1 1 1 1)]

(3)

Bounded systems		*Unbounded systems*
Left edge	*Right edge*	
[('1 1)	('1 1)]	[('1 1 1 1 1)]
[(1 '1)	(1 '1)]	[(1 1 1 1 '1)]

(1g) ***The Select parameter*** (Sel): choose the {Leftmost/Rightmost} gridmark on line 1 by placing a gridmark over it on line 2.

Select chooses a unique (leftmost/rightmost) gridmark from all gridmarks on line 1 of the Accent Grid by placing another gridmark on top of it on line 2 of the grid. This gridmark is read off as word accent on the corresponding syllable. In particular, Select chooses a unique gridmark for word accent in forms with multiple heavies. There are two possible sources for a gridmark on line 1: projection of a heavy syllable ("Weight Projection") or that of a peripheral position in all-light forms (due to Project Position). Derivations in (4) illustrate the role of Select in assigning accent on the Accent Grid to forms with heavy syllables.

(4)
```
              Domain Size
    Bounded            Unbounded
 DE (L)   DE (R)    DE "not set"
   *        *           *             Select (Left)
   * *      * *         *   * *       Weight Projection   Accent Grid
 [('h h)  ('h h)]   [(l 'h l h h l)]
   *          *       *               Select (Right)
   * *      * *       *   *   *       Weight Projection   Accent Grid
 [(h 'h)  (h 'h)]   [(l h l h 'h l)]
```

2.4 *Summary*

The goal of the parameter system introduced above is to capture cross-linguistic variation in accentual patterning in terms of a small number of binary parameters, some of which are related by dependencies.

This significantly reduces the parameter space, as compared to the PAF theory. Further, testing the predictions of the two theories against cross-linguistic data in StressTyp reveals that, for phonological WS systems, the PAF grammar strongly overgenerates, while the S&P parameter system closely approaches descriptive adequacy.

Specifically, as established in Vaxman (2016d), the parameter space for the S&P grammar generates 25 types of phonological accent systems (20 WS + 5 WI). Based on StressTyp data, at least 21 language is effectively attested (while the remaining four await assessment).

However, in some languages, accent location is affected by accent-attracting and accent-repelling morphemes and is, therefore, not (entirely) predictable on phonological grounds. This suggests that, to also cover such systems, the S&P formalism needs to be enriched.

3 Weight Scales

3.1 *Diacritic Weight*

It is well known that morphemes, like syllables, are capable of attracting or repelling word accent: certain morphemes can be accented, others cannot – a capacity identified as "diacritic weight" in van der Hulst (1999: 19), by analogy with syllable weight.

Capturing accent attraction in terms of weight, rather than in terms of lexical accents, implies a radical change in perspective. Thus, under the proposed view, accent-attracting morphemes are diacritically heavy (rather than lexically accented), while accent-repelling morphemes are diacritically light (rather than lexically unaccented).

One may, then, ask if syllable weight and diacritic weight are different instances of the same notion of "weight" or if they correspond to two different notions of "weight."

Obviously, the two differ in that syllable weight is phonologically motivated (by syllable and/or segmental structure), whereas diacritic weight is unpredictable and has to be assigned in the lexicon (as the term suggests).

However, since syllable weight and diacritic weight pattern together in that both attract word accent, we are led to the conclusion that diacritic weight is a particular type of weight in general.

3.2 *The Diacritic Weight Scale*

It is well known that, in some phonological accent systems, accent is assigned with reference to a phonological weight scale (for an excellent survey, see Gordon 2006). Examples of some such scales are given in Table 13.1.

Similarly, the way accent behaves in certain lexical accent systems indicates that these systems are characterized by *scalar* weight distinctions.

I, then, propose that, in such lexical accent systems, accent is assigned with reference to a *diacritic weight scale*, that is, a language-specific scale in which (sets of) morphemes are ordered according to their relative diacritic weight. An example of a diacritic weight scale is given in (5).

(5) $sup_d > h_d > l_d$

(Henceforth, the subscript "$_d$" stands for "diacritically"; "sup", "h" and "l" for "superheavy," "heavy" and "light," respectively.)

3.3 *The Diacritic Weight Grid*

I propose to represent weight relations on what I call a *Weight Grid* by encoding relative weight of morphemes and/or syllables (according to the language-

Table 13.1 *Examples of phonological weight scales (from Gordon 2006: 27–28)*

Klamath (isolate; Oregon, USA)	CVV(C) > CVC > CV
Moro (Niger-Kongo; Sudan)	CVC > full V > reduced V
Kobon (Trans-New Guinea; PNG)	low V > mid V > high V > reduced V
Asheninca (Maipurean; Peru)	CVV > Ca(C), Ce(C), Co(C), CiC > Ci > Cɨ

specific weight scale) as columns of gridmarks: the taller the column, the heavier the relevant unit (syllable or morpheme); a light unit gets one gridmark.[2]

In lexical accent systems, which only have diacritic weight, diacritic Weight Grids represent differences in (diacritic) weight among *morphemes*.

For example, the weight scale (5) corresponds to the diacritic Weight Grid in (6).

(6) *A Diacritic Weight Grid*

sup_d	h_d	l_d
*	*	*
*	*	
*		

Phonological, diacritic and other types of weight scales (see below) can all be encoded as such Weight Grids.

Unlike weight scales, the Weight Grid is a genuine phonological *representation*: phonological rules (not discussed here) that are part of the S&P grammar can manipulate (insert/delete) gridmarks on the Weight Grid for a word, which changes the weight of the relevant morpheme in the course of derivation. (This accounts for preaccenting and for certain dominance effects; see Vaxman 2016d.)

Therefore, even though the weight scales and the Weight Grid express the same weight relations, they are not equivalent, as only the latter is a linguistic representation and has, for this reason, a formal status in the S&P theory.

3.4 Early Research on Accentual Hierarchies

While the weight scales and their role in accent assignment are part of the present innovative proposal, one must recall that the general *notion* of "weight scale" for lexical accent systems is not entirely new.

In the mid-1960s, the eminent French Slavicist Paul Garde drew a sharp distinction between "lexical accent" as a property of morphemes ("*l'accentuation, propriété du morphème*") and "word accent" (Garde 1965: 32–33), proposing that morphemes are characterized by two accentual properties: "lexical accent" ("*accentuation*") and "accentual strength" ("*force accentuelle*"), the latter being "the ability to realize its own lexical accent against those of the other morphemes in the same word" (Garde 1968: 32). The observation that, in certain languages, for example, Russian, morphemes form more than two accentual classes with respect to their relative accentual strength led Garde to the hypothesis that differences in accentual strength

[2] The present "Weight Grid" proposal builds upon the idea to grid syllable weight/sonority in Prince (1983: 57–59) and van der Hulst (1984: 67–68), later worked out for sonority relations by Parker (1989: 9–12).

among morphemes can be captured in terms of an "accentual strength hierarchy" (Garde 1968: 32), in other words, a *scale.*

Importantly, Garde's accentual strength hierarchy is not merely a classificatory device. Rather, the hierarchy for a given language directly governs accentual resolution whenever morphemes of different levels in this hierarchy co-occur within a word: the highest one "wins" over the others and receives word accent.

Note that this proposal presupposes that, in every word, there is *at most one* strongest morpheme. Evidently, this is not necessarily the case; in particular, a word may contain *more* than one such morpheme. Garde's approach offers no means to arbitrate among multiple accentually strongest morphemes in a word and, as a result, fails to generate an output in this case. By contrast, as I will show, the Scales-and-Parameters theory allows for selection of one among several "strongest" units (syllables, morphemes) in the word by the parameter system.

In the next two sections, I examine accent assignment in Central Selkup and Eastern Literary Mari, representative of lexical accent systems displaying dominance effects and of phonological WS systems with morphological exceptions, respectively. These case studies will lead me to augment and refine the formal apparatus described above. I will show that the resulting S&P grammar correctly derives these types of systems.

4 Central Selkup

4.1 Introduction

Central Selkup (C. Selkup) is a set of moribund dialects spoken near the Ob' River in Siberia (Tomsk region, Russia). While there are several descriptions and analyses of accent placement in Taz (Northern Selkup) (McNaughton 1976; Tranel 1991; Idsardi 1992; Halle and Idsardi 1995), little (if any) attention has been paid to C. Selkup by Western linguists.

Selkup data which follow only appeared in Russian-language publications and are drawn from Normanskaya, Fedotov, and Šešenin (2011) and Normanskaya (2011, 2012), based on existing fieldwork materials, especially the very large Dulzon archive (held at the National Pedagogical University of Tomsk, Russia) and recent fieldwork by N. L. Fedotov, S. E. Šešenin, and M. K. Amelina.

In this section, I will first give a description of the accentual system of C. Selkup, limiting myself to the Napas variety of the Tym dialect and the Parabel variety of the Narym dialect (Section 4.2); I will, then, account for this system within the S&P theory (Section 4.3).

4.2 The Description

C. Selkup has a large number of minimal pairs, such as (7).

(7) a. ˈydəʃpa fall-PRES-3Sg (of a night)
b. yˈdəʃpa get drunk-PAST-3Sg

Therefore, accent in this language is contrastive and not phonologically predictable. Accordingly, C. Selkup has previously been analyzed as a lexical accent system, for which lexical (un)accentedness of individual morphemes has been established based on their accentual patterning in complex words (Normanskaya, Fedotov, and Šešenin 2011; Normanskaya 2011, 2012). I will now describe and exemplify these patterns.

In Napas, when a lexically accented suffix, for example, /-e/, is attached to an unaccented root, as in (8a), accent falls on the suffix, the only lexically accented morpheme of the word. In words with more than one lexically accented morpheme, the leftmost one receives the accent (8b). In lexically unaccented words, accent is initial (8c).

(8) *Napas*

a. *unaccented root-accented suffix*
kapˈt-e currant (berry)
kɨˈgʲ-e river

b. *accented root-accented suffix*
ˈkomd-e money
ˈkverʲ-e crow
ˈtʲʃʲib-e fly

c. *unaccented root-unaccented suffix*
ˈam-a mother
ˈloɣ-a fox
ˈlak-a thing

The same behavior is observed in Parabel.[3]

(9) *Parabel*

a. *unaccented root-accented suffix*
kal-ˈa cup
paʒ-ˈa birch.bark.container
teʃ-ˈa frost

b. *accented root-accented suffix*
ˈarm-a coolness
ˈkag-a corpse
ˈkad-e spruce
ˈkyʒ-e urine

[3] Due to the lack of relevant data in the literature available to me, the default accent location in Parabel could not be determined.

The accentual behavior exemplified above can be described in lexical accent terms with the rule (10).

(10) *The accent rule of Central Selkup*
Accent falls on the leftmost lexically accented morpheme in the word (if any); otherwise, accent is initial.

However, if a lexically accented root is followed by a special (so-called "accent-categorizing") suffix, for example, the semelfactive suffix *-ol* in the representative examples (11), this suffix, rather than the root, receives word accent, resulting in a violation of (10) (Normanskaya, Fedotov, and Šešenin 2011; Normanskaya 2011, 2012).[4]

(11)	ta'p-ol-gu	kick (*of an animal*)-SEMEL-INF
	ko'b-al-gu	scour-SEMEL-INF

In the S&P terms, setting Select to "Left" captures the general case in (10), but fails to derive the special case in (11), indicating that the S&P grammar needs to be enriched.

4.3 *The Account*

4.3.1 The Diacritic Weight Scale of Central Selkup The problem is, then, how to capture the general accent rule of C. Selkup and the idiosyncratic behavior of the accent-categorizing suffix using a single accent-assigning mechanism.

As we know from Section 4.2, C. Selkup has three classes of morphemes: accent-categorizing, accent-attracting, and accent-repelling, which we will refer to below as *Class A, Class B*, and *Class C*, respectively.

We will now demonstrate that these classes differ in the degree of diacritic weight and that the binary relation HEAVIER-THAN holds between these weight degrees.

The HEAVIER-THAN relation is established through pairwise comparisons between morphemes. For example, the comparison of the morphemes in (11) leads us to conclude that *Class A* morphemes are heavier than the *Class B* ones, and the comparison of the *Class B* and *Class C* morphemes in (8a–9a) indicates that the former are heavier than the latter.

C. Selkup lacks forms consisting of a *Class C* morpheme and a *Class A* morpheme, which, otherwise, would allow for the relevant pairwise comparison. However, it is possible to show *indirectly* that *Class A* morphemes are heavier than *Class C* morphemes by offering evidence that the weight relation HEAVIER-THAN is *transitive*.

[4] These authors mention that C. Selkup has several accent-categorizing morphemes; however, they only discuss the semelfactive suffix ([-ol] and [-al] being its allomorphs.)

Evidence for transitivity comes from the forms in the language that contain morphemes from all three classes. The idea is that accent in such forms cannot be attracted to *Class C* morpheme(s) in the presence of *Class B* morpheme(s) because the latter are heavier than the former and, therefore, *attract* accent. However, *Class B* morphemes cannot receive the accent, either, because the form also contains a *Class A* morpheme, and this is heavier than the *Class B* morpheme(s). Therefore, the *Class A* morpheme is predicted to receive word accent. If, in a given language, the relevant *Class A* morpheme is effectively accented in such forms, then it is *heavier* than the *Class C* morpheme and, therefore, the weight relation is transitive.

Indeed, all C. Selkup forms of this type in our corpus are accented on the *Class A* suffix. For example, in (12), where the *Class C* root is followed by the *Class A -ol*, the *Class C -bɨ* and the *Class B -gu* suffixes, accent falls on the *Class A* suffix.

(12) *Class C root – Class A suff – Class C suff – Class B suff*

kad-ˈol-bɨ-gu	scratch
yt-ˈal-ʒu-gu	make drunk

I conclude that the binary HEAVIER-THAN relation is transitive. Obviously, it is also reflexive and antisymmetric. Therefore, HEAVIER-THAN is an ordering relation on the set of diacritic weights.

Let us call *Class A* morpheme(s) "diacritically superheavy," *Class B* morphemes "diacritically heavy," and *Class C* morphemes "diacritically light." In these terms, C. Selkup has the diacritic weight scale in (13):

(13) diacritically superheavy > diacritically heavy > diacritically light

The weight scale (13) is translated into the Weight Grid in (14) which represents the diacritic weight of every morpheme (given by the scale) as a column of gridmarks, where the number of gridmarks in a given column is equal to the weight degree of that morpheme.

(14) *The Diacritic Weight Grid for C. Selkup*

sup_d	h_d	l_d
*	*	*
*	*	
*		

Accent assignment on the *Accent* Grid, on which the parameter system operates (see Section 2.3), requires to first project weight onto this grid from the *Weight* Grid. Weight projection is constrained by the *Weight Projection Principle* (WPP), which states that only the *heaviest* units (morpheme, syllable) in a given form are projected onto line 1 of the Accent Grid, that is, only the units with the tallest column of gridmarks on the Weight Grid among all relevant units in that form. If all units in the form are light (i.e. if each unit receives only one gridmark on the Weight Grid), then there is nothing to project. Instead, Project Position (Left/Right) inserts a gridmark onto the empty line 1 at the corresponding (Left/Right) word edge. Lastly, the Select (Left/Right) parameter promotes a line 1 gridmark onto line 2, yielding word accent. In this way, WPP controls the interface between the Weight Grid and the Accent Grid, acting as a filter.

4.3.2 The Accentual Grammar We are now in a position to define the accentual grammar for C. Selkup, consisting of the Weight Grid (14) and the parameter system (15).

(15) Domain Size (Unbounded)
Nonfinality (No)
Weight (Yes)
Project Position (Left)
Select (Left)

(Note that Domain Edge is blocked because Domain Size is set to "Unbounded" and the NF Unit is blocked because NF is set to "No"; see the discussion of dependencies in Section 2.3.)

In words with heavies, word accent is assigned by, first, projecting the heaviest morphemes in the word (according to the Weight Grid) onto line 1 of the Accent Grid. Then, the Select parameter, set to "Left," chooses the leftmost gridmark on line 1 by placing a gridmark on its top on line 2 of the Accent Grid, thus yielding word accent.

If all morphemes are light, there is nothing to project. In that case, Project Position (Left) inserts a gridmark over the initial syllable, after which Select (Left) (vacuously) chooses this gridmark as word accent. This interaction between the Project Position and Select parameters accounts for the default accent location.

4.3.3 Derivations I will now describe and exemplify how the derivation runs in different types of case.

(i) Words Containing Heavy Morphemes In the absence of a superheavy morpheme, all heavy morphemes are the heaviest ones in the accent domain; therefore, they are projected onto the Accent Grid. Then, Select (Left) chooses the leftmost gridmark. For example, the derivation for the Napas Selkup form ˈtvelgu ('steal-INF') runs as in (16).

(16) /tvel-gu/: *heavy root* /tvel/, *heavy suff* /-gu/

```
  *     Select (Left)
  *  *  Weight Projection    Accent Grid
-------------------------
  *  *                       Weight Grid
  *  *
tvel-gu
ˈtvelgu
```

In the example above, the root is diacritically heavy. Consider now the form aˈvʲeʃpugu ('burn.down-INF') in (17), in which the root is diacritically light, while certain suffixes are diacritically heavy. Hence, these suffixes are projected, while the root is not. The Select parameter chooses the leftmost gridmark in the domain (here, the leftmost heavy suffix).

(17) /av-eʃ-pu-gu/: *light root* /av/, *heavy suff* /-eʃ/, *light suff* /-pu/, *heavy suff* /-gu/

```
   *           Select (Left)
   *     *     Weight Projection       Accent Grid
-----------------------------------
*  *  *  *                             Weight Grid
   *     *
av-eʃ-pu-gu
aˈvʲeʃpugu
```

(ii) Words Containing a Superheavy Morpheme Since the superheavy morpheme is the heaviest morpheme in the word, it is the only one to be projected. Then, it is chosen by Select (Left), yielding accent on this suffix.[5] This is exemplified by the derivation (18) for the form taˈpolgu ('kick-SEMEL-INF').

(18) /tap-ol-gu/: *heavy root* /tap/, *superheavy suff* /-ol/, *heavy suff* /-gu/

```
    *       Select (Left)
    *       Weight Projection      Accent Grid
------------------------------
*   *  *                           Weight Grid
*   *  *
    *
tap-ol-gu
taˈpolgu
```

[5] In forms with multiple superheavy morphemes, accent is predicted to fall on the leftmost one. However, this prediction could not be tested for C. Selkup because it seems to lack such forms. (Further empirical research on this point is needed.)

(iii) All-light Morphologically Complex Words In words that only consist of diacritically light morphemes ("all-light" words), there is nothing to project. Project Position (Left) applies, inserting a gridmark onto line 1 of the Accent Grid over the word-initial syllable, which is then chosen by Select (Left), yielding initial accent. This is illustrated with the derivation (19) for the form 'lar-em-bu-gu ('fear-INF') of the Chaya variety (Southern Selkup).

(19) /lar-em-bu-gu/: *a light root followed by three light suffixes*

*	Select (Left)	
*	Project Position (Left)	Accent Grid
* * * *		Weight Grid
lar-em-bu-gu		
'larembugu		

4.4 Summary

Summarizing, while the parameter system of the S&P theory by itself cannot account for accent location in lexical accent systems, it can do so when augmented with diacritic weight scales. In this section, I have offered evidence for a diacritic weight scale in C. Selkup and shown that the augmented grammar correctly derives accent location in different types of forms. This approach is superior to that of lexical accent theories because the scalar nature of weight allows for diacritic weight scales, while lexical accent is categorical and, therefore, precludes scales altogether.

5 Eastern Literary Mari

5.1 Introduction

As discussed in the preceding section, weight allows for a scale. In some languages, accent is assigned with reference to a phonological weight scale (Section 3.2), while in certain others, it is assigned with reference to a diacritic weight scale (Section 4.3.1). This predicts that there exists a system where accent is assigned with reference to a scale that orders both types of weight. In this section, I demonstrate that this type of weight scale (which I call "hybrid") is effectively attested in Eastern Literary Mari (ELM).

Eastern Literary Mari is the standardized dialect of Mari, based on Eastern Mari (better known to Western linguists as "Eastern Cheremis"). Mari displays extensive dialectal variation, with Eastern (or Meadow) Mari and Western (or Mountain) Mari as major dialects, and other dialects, such as Northwestern Mari and Forest Mari. These different dialects encompass a large number of speech varieties, some limited to a single village (see Normanskaya 2008: 366–367 for a detailed list). In this chapter, I will focus on ELM.

Accent location in ELM is, by and large, phonologically predictable, but a small number of exceptional morphemes condition systematic deviations from regular accent location, determined by the phonological accent rule. Specifically, Eastern Literary Mari is a Last/First WS unbounded system exhibiting some "lexical flavor."

The problem is, then, how to accommodate morpheme-specific exceptions within an essentially phonological accent system. As I will show, this requires augmenting the parameter system of the S&P theory with hybrid weight scales.

5.2 Phonological Weight Criteria

The prevalent opinion in the phonological literature is that, in ELM, accent falls on the last full vowel of the word (Itkonen 1955; Sebeok and Ingemann 1961; Hayes 1995; Vaysman 2009).

In nouns, accent falls on the last full vowel in words with full vowels, except the mid vowels /e/, /o/, /ø/ in word-final position, as in (20a), those in which the final syllable contains a mid vowel and is closed by a consonant (20b), those with both full vowels and /ə/ (but without mid vowels in word-final position), as in (21), and those in which all word-internal vowels are full, while the vowel in the final open syllable is mid (/e/, /o/ or /ø/), as in (22). Therefore, these syllable types are heavy.

(20)	a.	olˈma	apple
	b.	pyˈrtys	nature
		pajˈrem	holiday
		køgørˈtʃen	dove

(21)	a.	ˈerək	freedom
	b.	ˈkalək	nation
	c.	ˈputʃəməʃ	porridge

(22)	a.	kopˈʃange	beetle
	b.	ˈketʃe	day
	c.	ˈjumo	God
	d.	ˈpetʃe	fence
	e.	ˈkolmo	shovel
	f.	ˈkorno	road
	g.	ˈkutko	ant
	h.	ˈʃyrtø	thread
	i.	ˈʃyrgø	face

Final open syllables with mid vowels reject the accent, on a par with schwa; therefore, these syllable types are both light (23).

(23) a. ˈkogəlʲo pie
b. ˈkoləzo fisherman
c. ˈikʃəve child

Now, consider accent location in words without full vowels. In schwa-only words, as in (24), and those in which all syllables have schwa, except the word-final syllable with a mid vowel (/e/, /o/, or /ø/), as in (25), accent is initial.

(24) a. ˈpələʃ ear
b. ˈʃəʒə now
c. ˈʧələm phone receiver

(25) a. ˈərəʃe stale
b. ˈʃərpe shard
c. ˈʃəmləʃe researcher
d. ˈʃəmle seventy
e. ˈʧətəʃe patient
f. ˈəlʲe be-3Sg.PAST

The syllable types in (24)–(25) clearly pattern together as light.[6] Thus, the default accent location in ELM is initial.

5.3 The Accent Rule

Given these weight criteria, the accent rule of ELM can be stated as follows:

(26) *The accent rule of ELM*

Accent falls on the rightmost heavy syllable of the word; otherwise, accent is initial.

In other words, ELM is an unbounded Last/First WS accent system, that is it is "default-to-opposite" (as opposed to C. Selkup, which is "default-to-same").

Note that (26) makes no reference to the morphological structure of words: it applies uniformly to morphologically simple and complex words (inflected and derived) for all lexical categories alike. (For ample evidence, see Vaxman 2014b, 2015b, 2016d, 2017.)

[6] Syllables with non-final mid vowels are heavy in ELM: mid vowels count as light only when final. This variable weight of syllables with mid vowels instantiates what Rosenthal and van der Hulst (1999) describe as *Weight-by-Position-by-position*.

5.4 Exceptional Suffixes

Several inflectional suffixes (Comitative, Negative Gerund, Comparative, Imperative) in ELM exhibit exceptional accentual behavior. Since they are morphologically productive and, therefore, result in systematic exceptions, any adequate account must reckon with them. In this section, I will, first, describe the exceptional patterns and, then, offer a formal account within the S&P theory.[7]

To begin with, nouns marked with the comitative suffix /-ge/ do not abide by the phonological accent rule: this suffix always gets the accent (see Riese et al. 2012: 97). In particular, when the possessive suffixes /-na/ "1Pl.Poss" or /-da/ "2Pl.Poss" and the comitative /-ge/ are attached to the root, accent falls on /-ge/.

(27)	a. joˈtʃa	child	jotʃa-ˈge	child-COM
	b. ˈjeʃ	family	jeʃ-na-ˈge	family-1Pl.Poss-COM
	jeʃ-da-ˈge			family-2Pl.Poss-COM

Similarly, in negative gerunds formed by attaching the suffix /-de/ to the verbal root, accent falls on /-de/, thus violating the phonological accent rule.

(28)	naˈl-aʃ	take	nal-ˈde	take-Neg.GERUND
	tuneˈm-aʃ	study	tunem-ˈde	study-Neg.GERUND

Another type of exception, forms with the comparative /-la/ are never accented on that suffix (Riese et al. 2012: 127), although it contains the last heavy syllable of the word (29a). When the possessive suffixes /-em/ (1Sg. Poss) or /-et/ (2Sg.Poss) and the comparative /-la/ are attached to a root in this order, accent consistently falls on the possessive suffix, not on /-la/ (29b).

(29)	a. ˈkajək	bird	ˈkajək-la	bird-COMPAR
	tulˈʃol	coal	tulˈʃol-la	coal-COMPAR
	tøˈʃak	featherbed	tøˈʃak-la	like a featherbed
	b. pørt-ˈem-la	house-1Sg.Poss-COMPAR		
	pørt-ˈet-la	house-2Sg.Poss-COMPAR		

The imperative suffix /-sa/ (2Pl.IMPER) is also never accented word-finally:

(30) koˈdaʃ stay-INF ˈkodsa stay-2Pl.IMPER

Summarizing, the phonological accent rule of ELM states that accent falls on the last heavy syllable of a word; otherwise, accent is initial. At the same time, ELM exhibits systematic deviations from the regular pattern that are

[7] Related data in Vaysman (2009) are incompatible with the accent rule of ELM (the standard dialect), as stated here, and probably come from some other Eastern Mari variety.

triggered by several exceptional morphemes. In S&P terms, this indicates that accent is assigned in ELM with reference to both phonological and diacritic weight.

5.5 *The Account*

5.5.1 Establishing the Hybrid Weight Scale of ELM The goal of this section is to propose an accent-assigning mechanism that would correctly predict, in the case of ELM, accent location in both regular and exceptional patterns.

We have already seen in Section 5.4 that, unlike in C. Selkup, accent in ELM is sensitive to both phonological and diacritic weight.

Regarding phonological weight, it was shown in Section 5.2 that ELM is a phonological WS system displaying a binary weight distinction between (phonologically) heavy and light syllables. We shall notate this (obvious) weight asymmetry as $h_p > l_p$.

Regarding diacritic weight, Section 5.4 indicates that ELM morphemes form two non-intersecting classes: *Class A* morphemes, such as /-ge/ and /-de/, receive word accent in violation of the accent rule; *Class B* morphemes, such as /-la/ and /-sa/, never receive word accent, even when, according to the accent rule, this should be the case.

Similar to phonological weight, diacritic weight in ELM involves a binary weight distinction, one between diacritically heavy (*Class A*) and diacritically light morphemes (*Class B*), that is, *Class* A > *Class* B. Evidence here comes from forms that contain morphemes from both classes.

To begin with, we show that the roots in (31) belong to *Class A*.

(31)	a. mo	what	b. ni-ˈmo	nothing	c.	*ˈni-mo
	kö	who	ni-ˈgö	nobody		*ˈni-gö

In (31a), word accent falls on the bare roots and remains on those in (31b): the pattern in (31c) is unattested. Crucially, this is despite the fact that the root *syllable* is phonologically light, while the prefix syllable is phonologically heavy. Thus, these *roots* attract the accent in violation of the phonological accent rule of ELM. Therefore, what counts for accent placement in this case is not the phonological weight of the root *syllable*, but the diacritic weight of the root as a *morpheme*.

We conclude that these morphemes belong to *Class A* and that this morpheme class is heavier than the class of phonologically heavy syllables.

Now, consider the forms in (32) having the *Class A* roots /mo/ and /gö/ (an allomorph of /kö/) followed by the *Class B* suffix /-la/.

(32) ni-ˈmo-la nothing-COMPAR
ni-ˈgö-la nobody-COMPAR

Since, in (32), accent falls on the root, not the suffix, *Class A* is *heavier* than *Class B*.

Thus, each type of weight involves a binary weight distinction: diacritically heavy (h_d) versus diacritically light (l_d), phonologically heavy (h_p) versus phonologically light (l_p).[8] The question arises, then, whether these weights are ordered and, if so, then how.

As I will now demonstrate, they are effectively ordered into a single "hybrid" weight scale (33) for ELM:

(33) $h_d > h_p > \{l_d, l_p\}$

In order to establish (33), the following pairwise comparisons have to be carried out: h_d versus h_p, h_p versus l_d, h_d versus l_p, and l_d versus l_p. (See above for $h_d > l_d$; also, obviously, $h_p > l_p$.)

(i) Comparing Heavy Morphemes and Heavy Syllables ($h_d > h_p$) First, consider the plural suffix /-vlak/ in the form pørt-ˈvlak ('house-Pl'). Accent on -vlak in pørt-ˈvlak indicates that the syllable /vlak/ in this suffix is phonologically heavy (the last heavy syllable in the word). Also, in pørt-ˈvlak-əʃte ('house-Pl-Inessive'), accent falls on vlak, the syllables in /əʃte/ being light, which confirms that -vlak is phonologically heavy.

Now, when the suffix /-vlak/ is attached to the suffix /-na/ (1Pl.Poss), accent falls on the latter, witness (34):

(34) pørt-ˈna-vlak house-1Pl.Poss-Pl
tʃodra-ˈna-vlak forest-1Pl.Poss-Pl

If we treated /na/ as a phonologically heavy syllable, the phonological accent rule of ELM would incorrectly assign accent to the phonologically heavy syllable /vlak/ because this is the rightmost heavy syllable. Since accent falls, in fact, on /-na/, this should be analyzed as a diacritically heavy suffix, instead. In this way, the pattern (34) provides evidence that heavy morphemes are heavier than heavy syllables ($h_d > h_p$) in ELM.

(ii) Comparing Heavy Syllables and Light Morphemes ($h_p > l_d$) Consider the comparative suffix /-la/ in ˈpørt-ʃə-la ('house-3Sg.Poss-COMPAR'). Since the syllable /-la/ in the suffix is phonologically heavy, the accent rule of ELM predicts that it should receive the accent. Since, in fact, it is unaccented in this

[8] Henceforth, the subscripts "p" and "d" under "h" and "l" notate phonological and diacritic weight, respectively.

form, /-la/ must be treated as a diacritically light suffix. Based on the pattern above, I conclude that, in ELM, phonologically heavy syllables are heavier than diacritically light morphemes (i.e. $h_p > l_d$).

(iii) Comparing Heavy Morphemes and Light Syllables ($h_d > l_p$) Recall that the suffix /-ge/ is diacritically heavy. Initial default accent in the all-light monomorphemic form (35a) indicates that the root counts as a sequence of light syllables for accent assignment.

(35) a. ˈpələʃ ear-NOM
b. pələʃ-ˈge ear-COMIT

Therefore, accent on the diacritically heavy suffix /-ge/ in (35b) provides evidence that diacritically heavy morphemes are heavier than phonologically light syllables ($h_d > l_p$).

(iv) Comparing Light Morphemes and Light syllables ($l_d > l_p$) When the diacritically light comparative suffix /-la/ is attached to the root /pələʃ/ ('ear'), which consists of two light syllables, the resulting form ˈpələʃ-la ('ear-COMPAR') has default initial accent, indicating that the root syllables and the suffixal morpheme are equally light. Otherwise, this would not be an all-light form, with default initial accent. Therefore, diacritically light morphemes and syllables are equally light, that is, mutually unordered ($\{l_d, l_p\}$).

Summarizing, I have shown that $h_d > l_d$, $h_d > h_p$, $h_p > l_d$, $h_d > l_p$, and that l_d and l_p are mutually unordered, but ordered with respect to the other weights. Also, obviously, $h_p > l_p$. Hence, the weight relation on the set $\{h_d, h_p, l_d, l_p\}$ is transitive. Clearly, it is also reflexive and antisymmetric. Therefore, this relation is a partial order.

I conclude that accent is assigned in ELM with reference to the hybrid weight scale (33).

5.5.2 The Grammar The weight scale (33) translates into the Hybrid Weight Grid (36).

(36) *The Hybrid Weight Grid for ELM*

h_d	h_p	l_d	l_p
*	*	*	*
*	*		
*			

We can now define the accentual grammar for Eastern Literary Mari, consisting of the Hybrid Weight Grid (36) and of the parameter system (37).

(37) Domain Size (Unbounded)
Weight (Yes)
Nonfinality (No)
Select (Right)
Project Position (Left)

5.5.3 Extrametricality: An Alternative to Diacritic Lightness? In what precedes, I have treated unaccentable (monosyllabic) morphemes as diacritically light. One might suggest, instead, that their inability to receive word accent is simply due to extrametricality, in which case one could dispense with diacritic lightness.

Let us, then, compare this "EM Hypothesis" with the one adopted here, which I will refer to as the "Diacritic Lightness Hypothesis." The former predicts that the EM syllable is unaccentable, while word-internal syllables may receive the accent (because extrametricality is limited to peripheral units). The latter predicts that the relative morpheme never receives the accent, regardless of its position in the word.

Evidence in favor of the Diacritic Lightness Hypothesis comes from the behavior of the Comparative suffix /-la/ in ELM. This suffix may co-occur with the Possessive suffix in any order (without change in meaning), but *invariably fails to receive word accent*:

(38)

		root-Poss-COMPAR	*root-COMPAR-Poss*
	1Pl: /-na/	pørt-ˈna-la	pørt-la-ˈna
	2Pl: /-da/	pørt-ˈda-la	pørt-la-ˈda

Since /-la/ is never accented, regardless of its position in the word, the Diacritic Lightness Hypothesis is supported (at least for ELM), while the EM Hypothesis has to be rejected.

Note that the Possessive suffixes and the suffix /-la/ are morphologically productive and can be attached to other roots in any order, as well. Therefore, the unaccentedness of /-la/ in (38) is a systematic phenomenon which requires a principled account.

5.5.4 Derivations Returning to the accentual grammar of ELM (Section 5.5.2), I will now illustrate how it works with sample derivations. Relating to the Weight Grids, I assume that only the heaviest units in a given word project their weight from the Weight Grid onto the Accent Grid in the course of derivation (*Weight Projection Principle*).

(i) Words with More Than One Heavy Morpheme Since, in ELM, diacritically heavy morphemes are heavier than phonologically heavy syllables, the two heavy suffixes are projected onto line 1 of the Accent Grid, while the heavy syllables /tʃo/ and /dra/ are not projected. Then, Select (Right) chooses the rightmost of the two gridmarks on line 1, yielding final accent.

(39)

			*	Select (Right)	
		*	*	Weight Projection	Accent Grid
h_p	h_p	h_d	h_d		Weight Grid
*	*	*	*		
*	*	*	*		
		*	*		

tʃodra-na-ge
tʃodra-na-ˈge forest-1Pl.Poss-COMIT

(ii) Words with More Than One Heavy Syllable Since the syllables have the same weight, both are projected on line 1 of the Accent Grid. Then, Select (Right) chooses the rightmost of the two gridmarks, yielding final accent.

(40)

*		Select (Right)	
*	*	Weight Projection	Accent Grid
h_p	h_p		Weight Grid
*	*		
*	*		

pajrem
pajˈrem holiday

(iii) Words with Heavy Morphemes and Heavy Syllables Since the suffix /-ge/ is the heaviest unit in the word, it is projected onto the Accent Grid, while syllables are not. Then, Select (Right) chooses the line 1 gridmark, yielding final accent.

(41)

		*	Select (Right)	
		*	Weight Projection	Accent Grid
h_p	h_p	h_d		Weight Grid
*	*	*		
*	*	*		
		*		

pørt-em-ge
pørtemˈge house-1Sg.Poss-COMIT

(iv) Words with Heavy Morphemes and Light Syllables Since the suffix /-ge/ is the heaviest unit in the word, it is projected onto the Accent Grid, while the root syllables are not. Then, Select (Right) chooses the line 1 gridmark, yielding final accent.

```
(42)          *      Select (Right)
              *      Weight Projection   Accent Grid
      ____________________________

      l_p l_p h_d                        Weight Grid
       *   *   *
               *
               *
      pələʃ-ge
      pələʃˈge    ear-COMIT
```

(v) Words with a Light and a Heavy Morpheme Since light morphemes and heavy syllables are lighter than diacritically heavy morphemes, the suffix /-na/ is the only word unit to be projected onto the Accent Grid. Then, the resulting gridmark is chosen by Select (Right), yielding accent on /na/.

```
(43)          *      Select (Right)
              *      Weight Projection   Accent Grid
      ________________________________

      h_p  h_d l_d                       Weight Grid
       *    *   *
       *    *
            *
      pørt-na-la
      pørtˈnala    house-1Pl.Poss-COMPAR
```

(vi) Words with a Light Morpheme and a Heavy Syllable Since heavy syllables are heavier than light morphemes, only the heavy syllable /pørt/ is projected onto the Accent Grid. Then, Select (Right) chooses the line 1 gridmark over /pørt/, yielding accent on this syllable.

```
(44)      *      Select (Right)
          *      Weight Projection   Accent Grid
      __________________________

      h_p  l_d                       Weight Grid
       *    *
       *
      pørt-la
      ˈpørtla   house-COMP
```

(vii) Words with Light Morphemes and Light Syllables Since light syllables and light morphemes are equally light, nothing is projected onto the Accent Grid, resulting in an empty line 1. Project Position (Left) places a gridmark on that line over the initial syllable, which is then chosen by Select (Right), yielding the default accent on the initial syllable.

(45)

*		Select (Right)	
*		Project Position (Right)	Accent Grid
$l_p\, l_p\ \ l_d$			Weight Grid
* * *			
pələʃ-la	ˈpələʃ-la ear-COMPAR		

6 The Scales-and-Parameters Approach to Accentual Dominance

In the preceding sections, I have addressed the problem of exceptions in accent assignment through the study of two types of systems with exceptional morphemes: lexical accent systems (C. Selkup) and phonological WS systems (Eastern Literary Mari).

The first type of system with exceptional morphemes is characterized by the presence of a lexically accented *dominant* morpheme, which wins the word accent over the morpheme expected to receive it according to the accent rule.

Traditionally, this dominance effect has been analyzed as resulting from "accent deletion" whereby a lexically accented dominant morpheme triggers an *Accent Deletion rule*, which deletes all lexical accents to its left (Halle and Vergnaud 1987; Inkelas 1998), and surfaces with the word accent. The rule, as stated in Kiparsky (1984: 203), is given in (46):

(46) $\acute{V} \rightarrow \underset{*}{V} \,/\, \text{——} X + \underline{\underline{S}}$

where $\underset{*}{V}$ is a deaccented stem vowel that carried a lexical accent, "$\underline{\underline{S}}$" a dominant suffix that triggers deaccenting, "X" the potential intervening material, and "+" a morpheme boundary.

Note that the Accent Deletion rule (an indispensable part of the traditional approach) is non-local (as it targets *all* accented morphemes to its left), which makes it computationally more complex than the S&P approach to dominance.

By contrast, the S&P approach derives word accent on the lexically accented dominant morpheme by treating it as the form's heaviest morpheme under the *same parameter settings* as for the forms without the dominant morpheme. No recourse to the Accent Deletion rule is, then, needed.

In this way, the S&P approach uniformly accounts for both the regular patterns and the accented dominant morphemes using a single accent-assigning mechanism.

The second type of system consists of phonological accent systems having morphological exceptions that violate the (phonological) accent rule. The S&P approach allows for a unified account of regular and exceptional accent by combining phonological and diacritic weights into a single hybrid weight scale (see Section 5.5 on ELM).

Summarizing, the S&P approach successfully accounts for both the accent rule and the exceptions to it in different types of accent systems in a uniform way, in terms of a *single* accent-assigning mechanism.

Returning to dominance, one may note that the S&P approach to this phenomenon is quite general; it is not limited to forms with a single accented dominant morpheme (as in C. Selkup). For example, consider the following Vedic verbal form which contains two accented dominant suffixes (Calabrese *ms*: 54–55).[9]

(47) dha:ra:yiˈsyava (/dhar-ay-sa-ya-va/) 'You two will cause to bear'

In terms of lexical accents, the root *-dhar* and the thematic suffix *-sa* are unaccented recessive morphemes, suffixes *-ay* (CAUS) and *-ya* (FUT) are accented dominant, and the suffix *-va* (T+AGR) is accented recessive.

I analyze the right-hand accented dominant morpheme in such forms as ***heavier*** than the left-hand one; since the left one is superheavy, the right one is, then, "*super*-superheavy." This leads to the weight scale (48) having four degrees of diacritic weight.

(48) super-superheavy > superheavy > heavy > light

Accordingly, I posit that *-ay* is superheavy and *-ya* super-superheavy (which is allowed by the fact that the reverse order of these suffixes is ruled out by the morphology). The suffixes *-dhar* and *-sa* are treated as light and *-va* as heavy.

The derivation proceeds as in (49).

[9] I am grateful to Andrea Calabrese for sharing his manuscript on stress and ablaut in Vedic and for valuable critical discussion of these issues.

```
(49)                 *   Select (Left)
                     *   Weight Projection      Accent Grid
      ____________________________________
       * *      * *                             Weight Grid (derived)
         *      * *
         *      *
                *

      dha:r-a:y-is -ya-va                       Ablaut (/a/ → Ø)
      dha:r-a:y-isa-ya-va                       /i/-Insertion
                                                Vowel Lengthening
      ____________________________________
       * *   *  * *                             Weight Grid (UR)
         *      * *
         *      *
                *

      /dhar-ay -sa-ya-va/
      [dha:ra:yi'syava]
```

Since *-ya* is the heaviest morpheme on the Weight Grid (in particular, it is heavier than the dominant morpheme to its left), it is the only one to project its weight on to the Accent Grid, which correctly assigns word accent to the *rightmost accented dominant morpheme*.

Thus, the Scales-and-Parameters theory uniformly accounts for both accentual exceptions in different types of accent systems (lexical and hybrid) in terms of a single accent-assigning mechanism, while in lexical accent theories, the Accent Deletion rule is limited to dominance effects only.

7 Comparison with the Simplified Grid Theory

7.1 Introduction

As discussed in Section 2, the S&P parameter system almost attains descriptive adequacy (for phonological accent systems). Let us now look at a well-known representative of metrical phonology, the Simplified Grid Theory (SGT) (Idsardi 1992; Halle and Idsardi 1995). Focusing on phonological accent systems, I will demonstrate that SGT is excessively powerful, which leads to overgeneration and parametric ambiguity.

7.2 The SGT Grammar Strongly Overgenerates

In this section, I show that the SGT grammar strongly overgenerates and explain why this is the case.

Let us estimate the size of the parameter space of SGT. First, we must ask how many settings each parameter of the SGT grammar has. In Table 13.2, I list the SGT parameters, together with the number of settings for each (according to Halle and Idsardi 1995).

The parametric space generated by this grammar has 1,536 ($=2^9*3$) possible combinations of parameter settings. The space is so large due to the following factors:

(i) The Edge and Head parameters are set *independently on each line* of the derivation (for each, its line 1 setting may differ from its line 0 setting).
(ii) The Edge parameter involves as many as three binary parametric choices.
(iii) The Iterative Constituent Construction parameter is language-specific in that systems may lack it altogether, which gives three parametric choices (rather than two), that is, the usual "Left" and "Right," plus *absence* of the parameter for a given language.

Since SGT generates both primary and secondary stress, while the S&P grammar only generates primary stress, the two grammars, taken as such, are not comparable. However, they can be compared for accent systems with primary stress and can also be made comparable by complementing the S&P grammar with a rhythmic component.

In fact, the PAF grammar contains a parametric component that assigns rhythm on a special Rhythm Plane, separate from the Accent Plane (van der Hulst 2014). For the sake of a quantitative comparison between the S&P and SGT grammars, let us adopt here Harry van der Hulst's approach to rhythm and directly *augment* the S&P grammar with this rhythmic component, given in (50). Since it contains five binary parameters, it yields 2^5 types of rhythm.

(50) Polar beat (Yes/No)
Rhythm (polar/echo)
Weight (Yes/No)
Lapse (Yes/No)
Nonfinality (Yes/No)

In the resulting grammar, rhythmic parameters are different from the accentual ones, and rhythm is assigned separately (and later in the derivation) by (50). The size of the resulting parameter space for languages having rhythm is 800 ($=25*2^5$), where 2^5 is the number of possible rhythm types (there are five rhythm parameters) and 25, the number of word accent systems generated by the accentual S&P grammar (see Section 2.4). The total number of generated systems is 825 (=25 word accent system without rhythm + 800 accent systems with rhythm), while (as we have seen) Idsardi's grammar generates 1,536 systems.

I, then, conclude that the augmented S&P grammar yields a significantly smaller parameter space than the SGT grammar.

Table 13.2 *The count of the parameter settings in SGT*

Parameters	Settings	# settings	
			line 0
Project	L/R	2	
Edge	L/R, L/R, L/R	2^3	
ICC (*language-specific*)	L/R/*None*	3	
Head	L/R	2	
			line 1
Edge	L/R, L/R, L/R	2^3	
Head	L/R	2	

Given that a complete, reliable stress typology is lacking (so far), the typological predictions of the two theories in question cannot be tested for both accent and rhythm against the actual data. By contrast, if we focus on accent and abstract away from rhythm, these theories become comparable.

Let us compare the generative power of these two theories with respect to accent systems lacking rhythm. In SGT, rhythm is due to the ICC, a parameterized rule responsible for iterative footing. Excluding the ICC (to remove rhythm), the SGT grammar generates 512 (=2^9) accent systems (see Table 13.2). The accentual parameter system of S&P generates 25 different types of accent systems without rhythm. As noted, this is close to the actual number of attested accent systems lacking rhythm.

This comparison strongly suggests that some combinations of parameter settings in Idsardi's theory correspond to a single language (parametric ambiguity) and/or some combinations are unattested (overgeneration). I address this hypothesis in the next section.

7.3 *Parametric Ambiguity in SGT*

Interestingly, one case of parametric ambiguity in SGT is discussed by Bill Idsardi himself (Idsardi 1992: 15–16). He shows that, in Koya, word accent location can be derived in two different ways, namely by setting all parameters either to "Left" or to "Right" (which has the effect of placing either all left, or all right parentheses and heads on the metrical grid). This is evidenced by the derivations in (51), drawn from Idsardi (1992: 15–16).

(51) *Parametric ambiguity (Koya)*

a. *The "left parenthesis" derivation*

```
line 0   Project: L     x x (x x x x (x x x
                        L L  H L L L  H L L
         Edge: LLL     (x x (x x x x (x x x
         Head: L        x    x        x
                       (x x (x x x x (x x x
line 1   Edge: LLL     (x    x        x
                       (x x (x x x x (x x x
         Head: L       (x
                       (x    x        x
                       (x x (x x x x (x x x
                       ˈl l  h l l l  h l l
```

b. *The "right parenthesis" derivation*

```
line 0   Project: R     x  x  x) x x x x) x x
                        L  L  H  L L L H  L L
         Edge: RRL      x) x  x) x x x x) x x
         Head: R        x     x         x
                        x) x  x) x x x x) x x
line 1   Edge: RRL      x)    x         x
                        x) x  x) x x x x) x x
         Head: R        x
                        x)    x         x
                        x) x  x) x x x x) x x
                        ˈl l  h  l l l h  l l
```

Accordingly, Idsardi (1992: 15–16) and Halle and Idsardi (1995: 409–410) admit that both sets of parameter settings yield the *same* accentual patterns in Koya: "A given set of stress patterns can be consistent with more than one parameter setting. <...> For the facts of Koya stress, both systems will work" (Halle and Idsardi 1995: 409–410).

Another case of parametric ambiguity readily comes to mind. In Taz Selkup, accent falls on the last heavy syllable, otherwise accent is initial. The combination of parameter settings in (52a) from Halle and Idsardi (1995) and the one that I suggest in (52b) each correctly derive the same prominence profile for Taz.

(52) *Parametric ambiguity (Taz Selkup)*

a. *Halle and Idsardi (1995: 412–413)*

line 0	Project: L	x x x x x	x (x x x (x x
		L L L L L	L H L L H L
	Edge: LLL	(x x x x x	(x (x x x (x x
	Head: L	x	x x x
		(x x x x x	(x (x x x (x x
line 1	Edge: RRR	x)	x x x)
		(x x x x x	(x (x x x (x x
	Head: R	x	x
		x)	x x x)
		(x x x x x	(x (x x x (x x
		ˈl l l l l	l h l l ˈh l

b. *The proposed alternative*

line 0	Project: L	x x x x x	x (x x x (x x
		L L L L L	L H L L H L
	Edge: RRL	x) x x x x	x)(x x x (x x
	Head: L	x	x x x
		x) x x x x	x)(x x x (x x
line 1	Edge: RRR	x)	x x x)
		x) x x x x	x)(x x x (x x
	Head: R	x	x
		x)	x x x)
		x) x x x x	x)(x x x (x x
		ˈl l l l l	l h l l ˈh l

Thus, simply setting the line 0 Edge to "RRL" in (52b) instead of "LLL" in (52a), while keeping the other parameter settings intact, yields the same accentual patterns.

Thus, in Koya and Taz, different combinations of parameter settings yield the same prominence profile. That is, the SGT grammar yields some parametrically ambiguous patterns. In addition, for Taz, the output foot structure in (52a, 52b) is the same, which means that, in this case, foot structure cannot serve as a cue to the learner (Harry van der Hulst, per. com., 2016).

In brief, I have adduced, in this section, some evidence to the effect that SGT leads to parametric ambiguity, which constitutes a classical challenge for learning.[10]

[10] Unless attainment of the correct grammar is not assumed as a criterion for successful learning (William Snyder, per. com., 2016).

7.4 *Evidence for Overgeneration*

I will now present a piece of evidence that the SGT grammar leads not only to parametric ambiguity, but also to overgeneration. In particular, it generates unattested accentual patterns such as (53).

As evidenced by (54), the SGT grammar can assign word accent to the *penultimate heavy* syllable in (53). However, the resulting pattern is unattested cross-linguistically (see Vaxman 2016c, 2016d: 39–77).

(53) *h l l ˈh h <l>

(54)

```
               x               Head: R
  x            x)  x           Edge: RLR    line 1
  x            x   x           Head: L
  (x  x  x  (x  (x)   x        Edge: RLR
  (x  x  x  (x  (x    x        Project: L   line 0
   h  l  l  ˈh   h   <l>
```

Setting, instead, Head (L) on line 1 would project the leftmost gridmark on that line, as the foot head, onto the top of the grid, resulting in word accent on the *leftmost heavy* syllable (55). The pattern in (55) is unattested as well.

(55) *ˈh l l h h <l>

In fact, the absence of such patterns is a consequence of the Accent Locality Hypothesis (ALH), a broad descriptive generalization about possible accent locations in forms with final EM (put forth in Vaxman 2016d: 39).

(56) *The Accent Locality Hypothesis*
If a phonological weight-sensitive system involves nonfinality, then, in forms containing heavy syllables, accent must fall on the heaviest syllable closest to the right word edge.

The ALH receives strong empirical support from tests against carefully assessed and (re)analyzed StressTyp data, as well as from detailed examination of available literature (Vaxman 2016d: ch. 1).

The ALH implies that, in phonological WS languages with final EM, accent is never located to the left of the rightmost heavy syllable. This, then, rules out the patterns (53) and (55), among others.

Unlike SGT, the S&P grammar respects the ALH due to a specific dependency between certain parameters in the system that blocks the generation of such patterns. The dependency is characterized by the following implication, which is a formal restatement of the ALH:

(57) [Weight (Yes) ^ Nonfinality (Yes)] → Select (Right)

In this section, I have presented evidence that, for phonological accent systems, the Simplified Grid Theory strongly overgenerates and leads to parametric ambiguity, whereas the Scales-and-Parameters theory closely approaches descriptive adequacy.

8 Conclusions

In this chapter, I have addressed the issue of accentual exceptions due to particular morphemes, aiming at an integrated theory that would account for the accent rule of a given language and the exceptions to that rule in a *uniform* way, that is, with the *same set of parameter settings* for both regular and exceptional patterns (without introducing additional, dedicated machinery).

Two types of morpheme-specific exceptions have been considered: accented dominant morphemes in lexical accent systems and exceptionally behaving morphemes in phonological ("hybrid") systems. Any successful account of these systems must treat exceptional morphemes uniformly.

To that end, the notion of "weight" is extended from syllables ("phonological weight") to morphemes, treating their accent-attracting ability as "diacritic weight." Since weight is an ordinal variable (as opposed to lexical accent, which is categorical), it allows for scalar distinctions, leading to novel types of weight scales ("diacritic" and "hybrid") that contain diacritic and/or phonological weight. Based on case studies of accentuation in Central Selkup and Eastern Literary Mari, I have offered evidence that these weight scales are effectively attested and have developed a rigorous method of weight scale construction. (For additional case studies, see Vaxman 2016d.)

Besides the weight scales for lexical accent systems and hybrid systems, the Scales-and-Parameters grammar contains a parameter system that, by itself, accounts for phonological accent systems. Taking the PAF theory (van der Hulst 1996, 1997, 2010, 2012, 2014) as a point of departure, the S&P theory proposes a revised set of binary parameters among which ordering and dependency relations hold (Section 2). While the PAF grammar strongly overgenerates, parametric dependencies in the S&P system significantly reduce its parameter space, bringing the S&P theory very close to descriptive adequacy (Vaxman 2016c, 2016d).

Further, comparison of the S&P parameter system with the grammar of the Simplified Grid Theory (Idsardi 1992; Halle and Idsardi 1995), chosen here as an influential representative of metrical stress theory, has revealed that, in the case of phonological accent systems, SGT strongly overgenerates and leads to parametric ambiguity, while S&P comes very close to descriptive adequacy (Section 7). The interested reader is referred to Vaxman (2016d: ch. 1) for a detailed study.

Augmenting the S&P parameter system with diacritic and hybrid weight scales allows the resulting grammar to account for morpheme-specific exceptions in lexical accent systems and hybrid accent systems.

In lexical accent systems, the theory assigns greater diacritic weight to "accented dominant" morphemes than to the recessive ones. Since, in forms with such a morpheme, it is the only unit to be projected onto the Accent Grid (*as per* the Weight Projection Principle), it receives word accent (Section 4.3). Comparing this approach to dominance with the traditional Accent Deletion approach, it becomes apparent that the *non-local* character of the Accent Deletion rule (which targets *all* accented morphemes to its left) makes the Accent Deletion approach computationally more complex than the S&P approach. Another important advantage of the S&P approach regarding lexical accent systems is that it allows *maintaining the same* parameter settings for *both* regular forms and those with an accented dominant morpheme, as opposed to the idiosyncratic Accent Deletion rule which only accounts for the latter (Section 6).

In hybrid systems, as well, the S&P approach allows for a unified account of regular and exceptional accent locations by combining phonological and diacritic weight in a single hybrid weight scale. By contrast, the Accent Deletion approach is simply not applicable in this type of system (Section 5.5).

Whereas Accent Deletion is, indeed, limited to dominance effects, the Scales-and-Parameters grammar is *sufficiently* powerful to uniformly account for different types of accentual exceptions in lexical versus hybrid accent systems. At the same time, the question arises of whether weight scales do not make the grammar *excessively* powerful. In what specific ways should the scales be constrained in order to attain descriptive adequacy? For example, in the case of hybrid weight scales, one may ask whether phonologically heavy syllables can outweigh diacritically heavy morphemes. While this issue requires further empirical inquiry, certain formal constraints on weight relations have already been identified (see Vaxman 2016d: 225–239).

Specifically, in systems with a *hybrid* weight scale, accent is assigned with reference to *either* phonological *or* diacritic weight. For example, in ELM, the heaviness of the *morpheme* /-ge/ plays a role in accent assignment; by contrast, the lightness of the *syllable* /ge/ (exhaustively) contained in this morpheme is irrelevant for this purpose.

It turns out that phonological and diacritic weight are not always independent. For example, in Tundra Nenets, accent is assigned with reference to a *diacritic* weight scale in which the weight of certain morpheme classes depends on the weight of syllables that these morphemes contain; that is, *both* types of weight contribute to accent assignment (Vaxman 2016d: 227).

Thus, while in most lexical accent systems, diacritic weight is an irreducible property of morphemes, in certain others (e.g. Tundra Nenets and Mattole), it may depend on syllable weight predictable from syllable structure and/or segmental content (as in phonological accent systems). Therefore, diacritic weight is either lexical, or partly derivable, on a language-specific basis.

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