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How to Beat without Feet: Weight Scales and Parameter Dependencies in the Computation of Word Accent

Alexandre Vaxman

University of Connecticut, sasha.vaxman@gmail.com

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How to Beat without Feet:
Weight Scales and Parameter Dependencies in the Computation of Word Accent

Alexandre Vaxman, PhD
University of Connecticut, 2016

This dissertation examines word accent assignment in phonological, lexical and mixed accent systems. These different types of systems did not receive a uniform account in the existing stress theories. The main goal of the Scales-and-Parameters (“S&P”) theory introduced here is to provide a uniform account of these three types of systems in terms of a single accent-assigning mechanism.

Taking the Primary Accent First theory, or “PAF” (van der Hulst 1996, 2010, 2012), as a point of departure, the new theory proposes a revised set of parameters related by ordering and dependencies. A comparison of the PAF and S&P theories reveals that, for phonological accent systems, the former strongly overgenerates, while the latter is close to descriptive adequacy.

As a next step towards a unified accentual grammar, which must also account for systems with lexical accent, a new weight theory is constructed through a series of case studies. The notion “weight” is extended to morphemes by treating their accent-attracting ability as “diacritic weight” (in place of lexical accent). Further, since weight allows for scalar distinctions, novel types of weight scales are predicted that contain either diacritic weight alone (in lexical accent systems), or both phonological and diacritic weight (in mixed systems). Extended case studies of accentuation in Central Selkup, Uzbek, Eastern Literary Mari and Tundra Nenets reveal that all these types of weight scales are effectively attested.

It is, then, proposed that the S&P grammar consists of a parameter system and of three types of weight scales.

Importantly, the Scales-and-Parameters theory makes possible a uniform account of different kinds of exceptions in different types of systems, in particular of dominant morphemes in lexical accent systems (Selkup, Uzbek, Sanskrit) and morphologically-conditioned exceptions in mixed systems (Eastern Literary Mari), capturing both the accent rule of the language and exceptions to it with a single accentual grammar.

I also propose here a new accentual typology and discuss how it informs parameter setting in the Scales-and-Parameters grammar.

The dissertation examines over 30 accent systems through detailed case studies and the analysis of data in StressTyp (the largest existing database of accentual patterns).

**How to Beat without Feet:
Weight Scales and Parameter Dependencies in the Computation of Word Accent**

Alexandre Vaxman

B.A., Université Paris7-Denis Diderot, 2002

M.A., Université de Provence, 2006

M.A., University of Connecticut, 2012

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University of Connecticut

2016

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Alexandre Vaxman

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APPROVAL PAGE

Doctor of Philosophy Dissertation

How to Beat without Feet:

Weight Scales and Parameter Dependencies in the Computation of Word Accent

Presented by

Alexandre Vaxman, B.A., M.A., M.A.

Major Advisor _____
Harry van der Hulst

Associate Advisor _____
Andrea Calabrese

Associate Advisor _____
William Snyder

University of Connecticut

2016

In memory of my father Leonid Vaksman who died so young

И я выхожу из пространства

В запущенный сад величин...

Осип Мандельштам

«Восьмистишия»

Et je sors de l'espace

Dans le jardin délaissé des valeurs...

Ossip Mandelstam

“Les octaves”

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*«Бог сохраняет все; особенно - слова
прощенья и любви, как собственный свой голос.»*

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SYMBOLS AND ABBREVIATIONS

()	accent domain
[left word edge
]	right word edge
σ	syllable
(σ σ)	bounded accent domain
(σ σ σ σ σ)	unbounded accent domain
[(σ σ)	left-edge bounded accent domain
(σ σ)]	right-edge bounded accent domain
< >	extrametrical unit
< σ >	extrametrical syllable
<C>	extrametrical consonant
(σ σ) < σ >]	bounded accent domain followed by a final extrametrical syllable
(σ σ σ σ σ σ) < σ >]	unbounded accent domain followed by a final extrametrical syllable
h	heavy
l	light
sup	superheavy
h_p	phonologically heavy
l_p	phonologically light
h_d	diacritically heavy

l_d	diacritically light
sup_d	diacritically superheavy
$preacc$	preaccenting
$(^l h h)$	leftmost of the two heavy syllables in a bounded domain bears word accent
$(h ^l h)$	rightmost of the two heavy syllables in a bounded domain bears word accent
$(^l l l)$	leftmost light syllable in an all-light bounded domain bears word accent
$(l ^l l)$	rightmost light syllable in an all-light bounded domain bears word accent
$(l ^l h h l h l)$	leftmost heavy syllable in an unbounded domain bears word accent
$(l h h l ^l h l)$	rightmost heavy syllable in an unbounded domain bears word accent
$(^l l l l l l)$	leftmost syllable in the unbounded domain bears word accent
$(l l l l l ^l l)$	rightmost syllable in the unbounded domain bears word accent
\emptyset	both settings of a parameter are unavailable (<i>i.e.</i> , it may not be set to any value)
acc	(lexically) accented

<i>acc_{dom}</i>	(lexically) accented dominant
AL	Accent Locality
ALH	Accent Locality Hypothesis
BS	bounded system
DE	Domain Edge parameter
DS	Domain Size parameter
dur	duration
ECC	Evidence Condition for Cyclicity
EM	Extrametricality parameter
F	formant
f ₀	fundamental frequency
ICC	Iterative Constituent Construction
intens	intensity
L	“Left” setting of a parameter
[L]	the Lightning feature (which is lexically associated with a lightning morpheme and which triggers the Lightning rule)
N	Negative (“No”) setting of a parameter
NF	Nonfinality parameter
NF Ut	Nonfinality Unit parameter
PP	Project Position parameter
P-WG	Phonological Weight Grid
R	“Right” setting of a parameter
<i>recess</i>	recessive

R-WG	Relativized Diacritic Weight Grid
Sel	Select parameter
SGT	Simplified Grid Theory
S&P	Scales-and-Parameters theory
<i>unacc</i>	(lexically) unaccented
<i>unacc_{dom}</i>	(lexically) unaccented dominant
US	unbounded system
W	Weight parameter
WFR	Word Formation Rule
WG	Weight Grid
WI	weight-insensitive
WP	Weight Projection
WS	weight-sensitive
Y	Positive (“Yes”) setting of a parameter

Introduction

Introduction

This dissertation examines word accent assignment in three types of accent systems, *viz.* phonological, lexical and mixed, and formulates an explicit theory of word accent that allows for a uniform account of these different types of systems in terms of a single accentual grammar.

1. Basic assumptions

At the outset, certain terms to be used need to be clarified. Following van der Hulst (1984, 1996, 2010, 2012, a.o.) and Goedemans & van der Hulst (2014), I will use the term “accent” to refer to an abstract prosodic prominence devoid of phonetic content, keeping the term “stress” for a set of phonetic correlates which together realize word accent (“stress-accent”), as opposed to “pitch-accent”, understood as the accent whose only phonetic correlate is pitch (see Beckman 1986).

The Scales-and-Parameters (S&P) theory, introduced here, takes as a point of departure the Primary Accent First theory (henceforth, “PAF”), proposed by Harry van der Hulst and his co-researchers in the 1990s (van der Hulst 1984, 1996, 1997, 2010, 2012, 2014). Following PAF, the S&P theory separates word accent (“primary stress”) from rhythm (“secondary/non-primary stress”), taking them to be different entities, and assumes that these must be assigned on separate phonological planes without recourse to metrical feet. (For strong empirical evidence in favor of this view, the reader is

referred to van der Hulst (1996, 2010), Goedemans & van der Hulst (2014), and McGarrity (2003), a.o.)

In this dissertation, I will focus on word accent.

2. The main goal

Historically, synchronic accentology was primarily concerned with phonological accent systems, *i.e.* accent systems in which accent location is predictable on phonological grounds alone. (This is, for example, the case of most studies in metrical phonology of the 1980's-early 1990's.)

However, in some languages, accent is not assigned with reference to phonological properties: it is not *phonologically predictable*. The general approach in this case has been to, first, associate special diacritics, called “lexical accents”, with certain morphemes in the lexicon (based on their accent-attracting properties in accentual patterns) and, then, to derive accent location with reference to those accents.

A third type of systems are phonological systems that also have some lexically accented morphemes. This type received insufficient attention in metrical phonology, despite its theoretical interest (made apparent in Chapter 2).

What these systems have in common is precisely the fact that they are *accent* systems: they assign accent to words in some predictable way (phonologically or otherwise). Therefore, an adequate theory of accent must provide a *uniform* account for these different types of systems. However, current theories of accent fail to do so.

In this dissertation, I present a new theory of word accent that permits a *uniform* account of these three types of accent systems (phonological, lexical and “mixed”) in terms of a *single* accent-assigning mechanism.

3. Diacritic weight. Weight scales

It will be shown with respect to phonological accent systems, that, compared to Harry van der Hulst’s PAF theory and to Bill Idsardi’s Simplified Grid Theory, the Scales-and-Parameters theory significantly reduces the parameter space, so as to attain descriptive adequacy (see Chapter 1). But besides the phonological accent systems, the S&P theory also needs to account for systems which involve lexical accents.

Regarding those, we note that, on a par with syllables, *morphemes* can attract or repel word accent, a capacity that van der Hulst (1999:19) identifies as “diacritic weight”. I will argue that “lexical accent” should be replaced with “diacritic weight” as a primitive of the theory. Capturing accent attraction by morphemes in terms of diacritic weight (not as lexical accents) implies, in fact, 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).

Since syllable weight and diacritic weight pattern together in that they both attract word accent, then *diacritic weight is a particular type of weight*. The notion “diacritic weight” is, thus, an extension of the “weight” notion from syllables to morphemes.

This makes possible an integrated account of phonological, lexical and mixed systems in terms of a unique accent-assigning mechanism that refers to phonological (syllable) and/or diacritic (morphemic) weight.

Unlike lexical accent (which is categorical), weight is an ordinal variable (witness, the phonological weight scales, *e.g.*, in Klamath, Kwakw'ala and Komi). Since diacritic weight is a type of weight, it allows for a scale. This, then, leads me to introduce new types of weight scales: *diacritic* weight scales for lexical accent systems and *mixed* weight scales that order phonological and diacritic weight for the above-mentioned mixed systems.

Thus, the Scales-and-Parameters theory augments the parametric system with a small number of weight scales in order to provide a *uniform* account for phonological, lexical and mixed accent systems which makes it attain descriptive adequacy for phonological accent systems, while achieving, for lexical and mixed accent systems, a close fit between the set of possible languages generated by the accentual grammar and the set of attested languages.

(The theory also straightforwardly accounts for accent systems with a *binary* weight *distinction* by treating it as a trivial subcase of a (phonological or diacritic) weight *scale*.)

4. Early research on lexical accent hierarchies

While the particular kind of weight scales and their diverse use are an important innovative proposal put forth in this work, it must be recalled that the notion of *weight scale* for lexical accent systems is not entirely new.

As early as mid-1960's, an eminent French Slavist, Paul Garde, clearly distinguished between “lexical accent” as a property of morphemes (*l’accentuation, propriété du morphème*) and “word accent”, proposing that morphemes are characterized by two accentual properties: “lexical accent” and “accentual strength” (Garde 1965, 1968). P. Garde’s idea was that, in certain languages, (classes of) morphemes are organized into a language-specific hierarchy according to the accentual strength of those morphemes.

Thus, pertaining to lexical accent, Paul Garde writes:

Nous admettrons donc que dans les langues à accent chaque morphème possède un ensemble de virtualités accentuelles, qui constituent l’accentuation du morphème. Mais ces virtualités ne se réalisent que dans le cadre du mot, où elles déterminent la place de l’accent. Nous distinguerons désormais soigneusement l’accentuation, propriété du morphème, et l’accent, propriété du mot. L’accent d’un mot n’est que la réalisation des virtualités accentuelles des morphèmes qui le composent. (Garde 1965:32-33)

Further, Garde submits that morphemes are endowed with an inherent “accentual strength” (“force accentuelle”), which is “the ability to realize its own lexical accent against those of the other morphemes in the same word”:

la force accentuelle, c'est-à-dire l'aptitude à réaliser sa propre accentuation au détriment de celle des autres morphèmes présents dans le même mot (Garde 1968:32).

The observation that, in certain languages (e.g., Russian), morphemes form more than two accentual classes, according to their relative accentual strength, leads Garde the proposal that differences in accentual strength among morphemes can be captured in terms of an “accentual strength hierarchy”, which is essentially a *scale*:

Du point de vue de la force accentuelle, les morphèmes russes se classent en un certain nombre de rangs superposés, de force inégale. Le rang supérieur comprend les morphèmes dont l'accentuation se réalise toujours: ainsi les trois suffixes d'imperfectivation -а-, -ва- (auto-accentués), -ыва- (préaccentué). Le rang inférieur comprend les morphèmes dont l'accentuation ne se réalise jamais, comme le dés. -ши du gér. passé. Les rangs intermédiaires comprennent d'autres morphèmes qui voient leur accentuation se réaliser dans certains mots, et non pas dans d'autres. (Garde 1968:32)

For Russian, this accentual strength hierarchy, as P. Garde envisions it, would have an important number of levels:

Il n'y a pas, comme en allemand ou en italien, deux classes de morphèmes, mais un grand nombre de classes (sans doute une quarantaine environs) <...> entre

ces deux classes extrêmes s'étagent un grand nombre de classes intermédiaires renfermant la grande majorité des morphèmes de la langue. (Garde 1965:37)

Importantly, the accentual strength hierarchy is not merely a classificatory device. According to Garde, accentual resolution in a given language would be directly governed by an accentual strength hierarchy of that language: whenever morphemes of different levels in the hierarchy co-occur within a word, the highest one in the hierarchy “wins” over others and receives the accent. Thus,

Chaque mot est le théâtre d'un conflit entre les virtualités accentuelles de tous les morphèmes qui le composent, et ce conflit est résolu uniquement par l'application de la hiérarchie définie ci-dessus. Dans chaque mot se réalise l'accentuation du morphème le plus fort, et l'accentuation des autres est neutralisée. (Garde 1965:38)

The statement “dans chaque mot se réalise l'accentuation du morphème le plus fort” in the quote above, obviously, presupposes that, in every word, there is *at most one* strongest morpheme. However, this is not necessarily the case; in particular, there may be *more* than one strongest morpheme in a word.

Paul Garde's approach has no means to arbitrate among multiple accentually strongest morphemes within a single word; as a result, this approach fails to generate an output in this case.

By contrast, as will be shown later, the Scales-and-Parameters theory proposed in this dissertation allows for selection of one among several “strongest” units (syllables, morphemes) in the form, due to its parameter system.

Regrettably, Paul Garde’s pioneering insights into accentual strength hierarchies have not been worked out into a full-fledged lexical accent theory, and examples of explicit analyses in terms of such hierarchies are lacking.

5. The descriptive sources

The theoretical goals of this work required careful attention to the data and to linguistic phenomena, needed to correctly formulate the accent rules and to describe the systematic exceptions to those rules.

Every phonologist is aware that when it comes to the study of accent, data are frequently unreliable and insufficient. This is sometimes due to practical reasons (recording conditions, preservation of materials, limitations of instrumental studies, etc); however, authors tend not to consult primary sources, instead reproducing data and generalizations already available in the theoretical literature.

Rather than proliferating second-hand quotes, I have sought here to overcome inaccuracies in the data and generalizations by carefully verifying these against the original descriptive sources. To that end, I have used a considerable number of descriptive works, mostly research articles and some grammars, which offer a wealth of descriptive information about accent in a wide range of languages, *e.g.* Selkup, Tundra Nenets, Hondarribia Basque, Negev Bedouin Arabic, Seneca, Tahitian and many more.

Comparing these sources with StressTyp records allowed me to identify the correct information on which I could, then, base my (re-)analyses.

In addition, this research clarifies a number of StressTyp records and will contribute to amendment and enrichment of the data and the formal analyses in StressTyp in the near future.

Some languages examined in detail in Chapter 2 are severely underdescribed in the Western literature. Important publications about these languages, based on fieldwork and archival records, appeared only recently in Russian-language publications (Normanskaya 2011, 2012; Normanskaya et al. 2011; Amelina 2011; Staroverov 2006), which makes them difficult to access for Western researchers.

I present here detailed empirical studies of lesser known and often critically endangered languages that use phonological descriptions and instrumental-phonetic studies based on extensive fieldwork (Amelina 2011, Staroverov 2006, Šešenin 2011) which have been crucial for correctly stating the accentual generalizations and identifying the exceptional patterns in this dissertation.

In addition, I have benefitted from audio recordings of Tundra Nenets speech that Maria Amelina (Institute of Linguistics, Russian Academy of Sciences) generously shared with me in 2014-2015, and had the opportunity to inspect those in Praat to ascertain some of her conclusions about the phonetic correlates of accent in the Yamal dialect. Maria also provided me with important information about accentual correlates and segmental alternations relevant for the study of syllable weight in Tundra Nenets.

See the Appendix for a list of languages examined (with varying level of detail) in this dissertation.

6. Comparing (or not) the S&P theory with other theories of word accent

Finally, I would like to clarify why, in this dissertation (Chapter 1), I compare the S&P theory with the Primary Accent First theory (and, briefly, with Idsardi's Simplified Grid Theory), but not with OT approaches to stress.

One reason is that the S&P theory and PAF theory are *comparable*: both are parametric and share an important part of their parameter system and accentual representations. Further, both theories compute word accent independently of rhythm. By contrast, metrical theories take stress to be a single entity and seek to account for both in a single mechanism that builds primary stress on top of secondary stress. As mentioned above, separation of accent and rhythm was convincingly argued elsewhere (van der Hulst 1996, 2010, 2012; Goedemans & van der Hulst 2014), to which I refer the reader. I now turn to my reasons for not adopting OT in this work.

To begin with, a linguistic theory is standardly regarded as complete only if it contains both a theory of representations and a theory of derivations. OT does not define a fixed set of linguistic representations, nor does it define what a possible constraint is.

Second, it has become a staple of Optimality Theory that, unlike in rule- and parameter-based theories, computation is purely parallel and constraint-based. However, this is no longer the case: nowadays, OT frameworks incorporate elements of derivational theories, such as levels in Stratal OT (Kiparsky 2008, 2015; Bermudez-Otero *in prep.*) and serial derivations in Harmonic Serialism (McCarthy 2010). This means that modern versions of OT are also, in part, derivational.

Conversely, constraints are not an exclusive privilege of OT. Indeed, parametric theories may be viewed as constraint-based because a parameter, when set to a particular value, is equivalent to a constraint. For example, the Domain Size parameter of the S&P theory, set to “Bounded”, can readily be restated as a (potential) constraint *DomainSizeBounded* (“the accent domain must be bounded”). Thus, both types of theories involve derivations and constraints.

Third, it is a well-known fact that constraint *re*-ranking, which OT uses to capture cross-linguistic variation, leads to rampant overgeneration. Indeed, for the same number of independent binary parameters and of independent constraints, the size of the parameter space is significantly smaller than the size of the space of constraint re-rankings: for n parameters, there are 2^n possible languages, whereas for a system with n constraints, there are $n!$ possible languages, a number that grows much faster. It is, then, not surprising that constraint re-ranking strongly overgenerates, with a large number of languages generated by permutations of individual constraints being unattested.

Note that, in the theory proposed here, the accentual parameters are ordered, which may resemble constraint ranking in OT. The crucial difference between parameter ordering and constraint ranking is that OT has *language-specific* constraint reranking, while, in the S&P theory, the order of parameters is “fixed” for all languages, *i.e.* this order is *universal*. In this respect, the S&P theory is more constrained than OT.

Reasons stated above have led me to adopt a parametric approach.

7. Outline of the dissertation

The dissertation is organized as follows.

In Chapter 1, after a quick review of several basic concepts in the study of word accent, the parameter system of the S&P theory is presented, including the ordering and dependency relations among certain parameters. It is, then, shown that, while the PAF grammar strongly overgenerates, the S&P grammar significantly reduces the parameter space in such a way as to generate all, and only, the attested languages. That is, the S&P theory attains the level of descriptive adequacy.

In Chapter 2, I offer a series of extended case studies in which a careful examination of several (severely underdescribed) accentual systems reveals that the parameter system of the S&P theory is not sufficiently powerful. At the same time, these studies will lead to formulation of the Scales Approach to systems with lexical accent, which augments the S&P grammar with special types of weight scales. At the end of Chapter 2, the (mostly local) treatment of dominance in the S&P theory is presented and compared to the Accent Deletion approach common to many lexical accent theories. The (potential) need for cyclicity in S&P derivations is also considered.

In Chapter 3, through (re)analysis of various accent systems, I revisit a range of typological issues that inform the problem of the (non-)setting, for certain languages, of two important S&P parameters, *viz.* Select and Project Position.

Chapter 4 offers a synopsis of the theoretical results achieved in this dissertation.

The last chapter brings together the main points, describes certain limitations of the proposed theory and outlines several interesting venues for future research in this area.

At the end, an Appendix illustrates the proposals made in Chapter 1 with a tree that represents the generation of language types by the S&P parameter system.

Chapter 1

The parameter system of the Scales-and-Parameters theory

The parameter system of the Scales-and-Parameters theory

1.1. Introduction

In this first chapter, I present the parameter system of the Scales-and-Parameters (S&P) theory. This system results from a substantial revision of the PAF parametric grammar, with the goal to accurately capture cross-linguistic variation in accentual behavior in terms of a small number of parameters and dependencies among them.

In this chapter, I will focus on phonological WS systems.

Comparing the yield of the two parameter systems against cross-linguistic data reveals that the PAF grammar strongly overgenerates, while the Scales-and-Parameters theory does not, thus closely approaching descriptive adequacy. As I will show, what makes the PAF grammar excessively powerful is that it lacks parameter dependencies and allows for initial extrametricality.

As an empirical basis for this cross-linguistic investigation, I have used StressTyp (currently, the largest database of stress patterns in world's languages), as well as available descriptions of individual accent systems, which allowed me to check and complement information from StressTyp.

Chapter 1 is organized as follows. Section 1.2 reminds some basic concepts and phenomena of the accent theory. In section 1.3, I introduce the parameter system of the S&P theory; in particular, parameter dependencies and parameter ordering. I also determine here which languages among those generated by this parameter system are attested. In section 1.4, I compare sets of languages yielded by the S&P and PAF

grammars, respectively, and conclude that the S&P grammar significantly reduces the parameter space without over- or undergenerating.

1.2. Some basic concepts

1.2.1. Weight

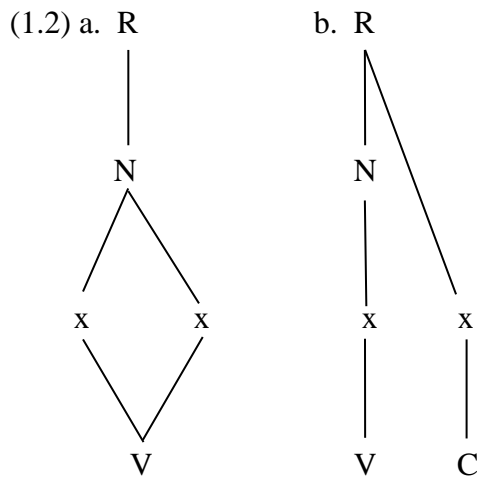
In some languages, certain syllables show a special accentual behavior in that they attract accent (“heavy” syllables), as opposed to other syllables that do not (“light” syllables). Systems that display a weight distinction are called “weight-sensitive” (WS); systems in which syllables do not affect accent location are “weight-insensitive” (WI).

By definition, phonological weight is *predictable* from phonological properties, such as syllable structure and vowel quality (“fullness”, height). Cross-linguistically, the most typical weight factors (for accent) are vowel length (CVV) and syllable closure (CVC). (For a detailed survey, see Gordon 2006).

A standard example of weight conditioned by syllable structure is Classical Latin where a syllable is heavy if it is closed or contains a long vowel; otherwise, it is light. The Latin accent rule makes reference to this distinction: accent falls on the antepenultimate syllable if the penult is light (open); otherwise the penult is accented. The role of weight here is exemplified by the Latin forms in (1.1) (from Hayes 1981: 27-28).

(1.1) ini ^l mi:kus	unfriendly	NEG-friendly-Sg
pe ^l perki:	I have refrained	RED-refrain-PERF.1Prs.Sg
^l tenebrae	shadows	gloom-Pl

Since vowel length can be represented as a branching Nucleus (1.2a) and syllable closure as a branching Rime (1.2b), the structural generalization about this weight factor is that, in cases like Latin, syllables are heavy if they contain a branching node below the Rime.



Thus, (phonological) weight is a phonologically predictable capacity of syllables to attract accent.

In some languages, *morphemes* may attract (or repel) accent. Unlike with syllables, this *morphemic* capacity is not predictable. Traditionally, this capacity is encoded as a *lexical accent* associated with morphemes in their lexical entry.

However, phonologically heavy syllables and lexically accented morphemes can both attract accent. In this sense, diacritic marking on a morpheme is not an *actual* accent, but a *potential* one, *i.e.* a kind of *weight* (van der Hulst 1999). Since it is diacritic (unpredictable), van der Hulst (1999) aptly terms it “diacritic weight”, a term which I adopt.

The role of diacritic weight in accent systems with/without syllable weight will be addressed in detail in Chapter 2.

1.2.2. Boundedness

Boundedness is a property of accent systems related to the notion of “accent domain”, *i.e.* the word-internal phonological domain within which word accent is located. By definition, in bounded systems (BS), accent is located within a bisyllabic window at or near a word edge, whereas in unbounded systems (US), the accent domain is the entire word.

Further, a peripheral phonological unit (a syllable or segment) may be barred from receiving word accent (on the language-specific basis): in other words, the unit “invisible” to accent assignment. This phenomenon is called Extrametricality (EM). I argue in section 1.3.3.3 that there is no left-edge EM, while right-edge EM effectively exists. I will refer to the latter as “Nonfinality”.

Therefore, in BS, accent location is limited to the first two syllables at the left word edge (due to a bounded domain) or to the last three syllables at the right word

edge (due to a bounded domain plus, potentially, a final EM syllable). By contrast, in US, any syllable within the word may be accented.

The following examples illustrate the difference between BS and US.

(Henceforth, square brackets indicate an edge of the word; parentheses indicate the accent domain. The “σ” symbol (in angle brackets or not) outside the accent domain stands for an extrametrical syllable. Letters “l” and “h” mean “light” and “heavy”, respectively. The rest of the notation is clarified in the “Symbols and Abbreviations” list at the beginning of this work.)

(i) *Examples of bounded systems*

a. *Taz Selkup* (Samoyedic): “If the first syllable is open and the second syllable contains a long vowel or a diphthong, then accent falls on the second syllable; otherwise, accent is initial.” (McNaughton 1976:135). Stress type: Initial/Initial.

(1.3) a. [(^h h)	^h ʃe:reisə	enter-3Prs.Sg.PastIndef
b. [(^h l)	^h ʊtætətkinə	reindeer-Lative/Dative.Pl
c. [(l ^h)	am ^h qe:ŋa	is to take
	am ^h meiqo	eat-Intensive.Perfect
d. [(^l l)	^h innæne:te _l	upper

b. *Classical Latin* (Indo-European): If the penultimate syllable is light (CV), then accent falls on the antepenultimate syllable; otherwise, accent is on the penult. Stress type: Penult/Antepenult.

- | | | |
|----------------------|--------------|---------------------------------|
| (1.4) a. (h 'h) <σ>] | kon¹struktus | “collected together” |
| | | heap.PART.PERF.PASS.Sg.NOM.MASC |
| b. (¹h l) <σ>] | do¹mestikus | “belonging to the house” |
| | | domestic.NOM.MASC |
| c. (l 'h) <σ>] | repi¹muntur | “they are held back” |
| | | restrain-3Prs.Pl-PRES.PASS |
| d. (¹l l) <σ>] | re¹primitur | “it is held back” |
| | | restrain-3Prs.Sg-PRES.PASS |

(ii) *Examples of unbounded systems*

a. *Yana* (Hokan): “The word stress tends to fall on the first heavy syllable, that is, on the first syllable that is either closed with a consonant, or which contains a vowel cluster. Where there is no heavy syllable, the first syllable tends to carry the stress” (Sapir & Swadesh 1960:4). Stress type: First/First (“default-to-same”).

- | | | |
|-------------------------------------|---|-------|
| (1.5) a. [(l l ^h h h l)] | hap ² a ^l laamaubiiwi | mud |
| b. [(^l l l l)] | put ² uk ² u | skull |

b. *Chuvash* (Turkic): Accent falls on the last syllable with a full vowel; otherwise, on the initial syllable (Hayes 1981:58). Stress type: Last/First (“default-to-opposite”).

- (1.6) a. [(h h 'h)] sarla'ka widely
- b. (l 'h l l)] əs'lerəmər we worked
- c. [(l l l l)] 'əsləpər we shall work

In the following sections, I introduce a new parametric theory of accent assignment and show how it accounts for a range of accentual concepts and generalizations, such as those described above.

1.3. Parameters of the S&P grammar, their ordering and dependencies

1.3.1. Introduction

As already mentioned in section 1.1, the PAF theory is a parametric theory: it attempts to capture cross-linguistic variation in accentual patterns in terms of a rather small set of parameters. However, as I will show, this theory makes wrong predictions with respect to the set of attested languages, which means that the parametric grammar of the PAF theory should be modified.

To this end, the S&P theory, developed here, proposes a revised set of parameters, some of which enter into dependencies. Indeed, as I will now discuss, most

of the parameters in the proposed parameter set are ordered and certain parameters are dependent on certain others. This substantially reduces the dimensionality of the parametric system of the S&P theory, compared to that of the PAF theory.

1.3.2. The parameters of the S&P grammar

1.3.2.1. Parameter statements

Compared to the PAF theory, the S&P theory introduces several new parameters.

While in the PAF theory, the binary Extrametricality (EM) parameter can be set to “Left” or “Right”, the S&P theory eliminates EM Edge (Left), only retaining the “Right” setting. As a result, EM Edge is no longer a parameter and is discarded in the S&P theory.

Instead, I propose to merge EM Edge (Right) with the EM parameter (Yes/No) of the PAF theory into a single Nonfinality parameter (Yes/No) where Nonfinality (Yes) makes the word-*final* unit invisible to accent assignment; Nonfinality (No) allows the word-final unit to receive word accent. In this way, building right-edge EM into the Nonfinality parameter excludes left word-edge EM altogether and, thus, limits EM to the right word edge.

The S&P theory also innovates with respect to the variation in type and location of the accent domain. The PAF theory proposes to capture the bounded/unbounded distinction in terms of the Domain Parameter in (1.7):

(1.7) *The Domain Parameter*

A bounded accent domain is formed at the left/right word edge. (Left/Right)

Thus, the “Left” and “Right” settings of the Domain parameter only apply to a bounded accent domain. In order to account for the unbounded systems, van der Hulst (2012) proposes that the Domain parameter may remain “unset” (not set to any value). This means that (1.7) allows for three choices: “Left”, “Right” and “Unset” (*i.e.* neither “Left”, nor “Right”).

However, it is unclear why not setting the Domain parameter would yield an unbounded domain: if the domain is placed neither at the left, nor at the right word edge, then it may be placed anywhere within the word. Clearly, this is different from the accent domain being the whole word.

In order to properly capture the bounded/unbounded distinction and keep all parameters binary, I split, in (1.8), the Domain parameter into two distinct parameters: the Domain Size parameter (1.8a) and the Domain Edge parameter (1.8b).

The parameters of the S&P theory are defined in (1.8).

(1.8) *The parameters of the Scales-and-Parameters theory*

- a. The Domain Size parameter: the accent domain is {Bounded/Unbounded}.
- b. The Domain Edge parameter: a bounded accent domain is formed at the {Left/Right} word edge.
- c. The Nonfinality parameter: the peripheral element at the right word edge is not allowed to receive accent. (Yes/No)

- d. The Nonfinality Unit parameter: the nonfinality unit is a {Syllable/Segment}.
- e. The Weight parameter: the language has weight distinctions.¹ (Yes/No)
- f. The Project Position parameter: project {Leftmost/Rightmost} position in the accent domain onto line 1 of the Accent Grid.
- g. The Select parameter: choose the {Leftmost/Rightmost} gridmark on line 1 by placing a gridmark over it on line 2.

TABLE 1.1. *Abbreviations of the parameter names in (1.8).*

<i>Parameter name</i>	<i>Abbreviation</i>
Domain Size	DS
Domain Edge	DE
Nonfinality	NF
Nonfinality Unit	NF Unit
Weight	W
Project Position	PP
Select	Sel

1.3.2.2. Explication of the S&P parameters

Now, I will clarify and exemplify the parameter statements listed above in relation to certain important concepts of the accentual theory.

(1.8a) The Domain Size parameter: the accent domain is {Bounded/Unbounded}.

¹ For any type of weight (phonological and/or diacritic), the Weight parameter is set to “Yes”; the negative setting corresponds to weight-insensitive systems.

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 extrametrical syllable).

For example, in Taz Selkup (see section 1.2.2), accent alternates between the initial and second syllable; syllables deeper inside the word are never accented. Therefore, the accent domain in this language is bounded.

- (1.9) a. [(^hh h) ^hše:reisə enter-3Prs.Sg.PastIndef
 b. [(l ^hh) am^hqe:ŋa is to take

This pattern is captured in the S&P theory by setting the Domain Size parameter to “Bounded”.

By contrast, in Yana (see section 1.2.2), accent is not limited to the initial (1.10a) or second (1.10b) syllable, but may reach outside the bisyllabic window, as in (1.10c): in Yana, accent falls on the leftmost heavy syllable, which may be deeper inside the word than the two syllables at the word edge (when these are both light). Thus, the forms in (1.10) instantiate an unbounded domain co-extensive with the word.

- (1.10) a. [(^hl l l)] put^huk^hu skull
 b. [(l ^hh l)] i^htaalʔpa head scratcher
 c. [(l l ^hh h h l)] hap^ha^hlaamaubiiwi mud

This pattern is captured in the S&P theory by setting the Domain Size parameter to “Unbounded”.

(1.8b) *The Domain Edge parameter: a bounded accent domain is formed at the {Left/Right} word edge.*

Recall that, in unbounded accent systems, *i.e.* those with Domain Size (Unbounded), accent domain is co-extensive with the word. In languages with Domain Size (Bounded), the accent domain is smaller than the word. For this type of system, the accent domain is located near the word edge where the accent falls.

For example, in Aklan (Chai 1971), accent falls on the penultimate syllable, if it is heavy (CVC); otherwise, accent is final. Therefore, in Aklan, the accent domain is located at the right word edge.

(1.11) ('h h)]	ʔa'sir tar	lucky
('h l)]	'gas ta	spend
(l 'h)]	ki napu'tus	wrap instrument-FOC-PAST.POSTER
(l 'l)]	pi'tu	seven

The pattern in (1.11) is captured by setting the Domain Edge parameter to the “Right” setting.

In some systems, accent falls near the left word edge. For example, in Capanahua (Loos 1969, Safir 1979), accent falls on the second syllable, if it is heavy (CVC other than CV?); otherwise, it is initial (1.12).

(1.12) [(h 'h)	pisʃ'kap	small
[('h l)	'sontako	young girl
[(l 'h)	wi'rankin	he pushed it
[('l l)	'tʃitʃika	knife

The pattern in (1.12) is captured by setting the Domain Edge parameter to the “Left” setting.

(1.8c) *The Nonfinality parameter: the peripheral element at the right word edge is not allowed to receive accent. (Yes/No)*

The S&P theory allows for a word-final element that is invisible to accent assignment, which means that this element cannot receive the accent (*i.e.* it is “extrametrical”). For example, in Latin, accent falls on the penultimate syllable, if it is heavy; otherwise, on the antepenult. Thus, the word-final syllable is never accented.

(1.13) (l 'h) <σ>]	re'fe:kit	remake-PERF-3Sg
	re'fektus	remake-PART.PASS.NOM.Masc

(11) <σ>] 'anima soul-NOM.FEM

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

(1.8d) *The Nonfinality Unit parameter: the nonfinality unit is a {Syllable/Segment}.*

The S&P theory recognizes two extrametrical units, viz. the syllable and the coda segment. The former prevents final accentuation in the way just described. The latter turns a heavy closed syllable into an open and, therefore, light one, making it repel the accent.

Thus, Armbruster (1960:95) reports that, 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: the former, but not the latter, are accented in this position. That is, the former are heavy; the latter are light.

The S&P theory accounts for this patterning by analyzing the word-final coda consonant as extrametrical. In this way, CVC syllables are treated as light for purposes of accent assignment, on a par with CV syllables, while CVVC syllables remain heavy because their branching nucleus remains “visible”.

Cases like this suggest that, in addition to the “syllable” setting, the Nonfinality Unit parameter has the “segment” setting (specifically, the coda consonant).

(1.8e) *The Weight parameter: the language has weight distinctions. {Yes/No}*

The Weight parameter (W) distinguishes between WS and WI languages; it is set to “Yes” for the former and “No” for the latter.

Barring other potential factors, languages with Weight (No) have “fixed” accent (*i.e.* accent location is the same across all forms of that language). For example, Pintupi has fixed initial accent. Indeed, this falls on the first syllable, regardless of syllable structure, *e.g.* the initial syllable is accented, whether open (1.14a) or closed (1.14b). Moreover, in (1.14c), accent also falls on the initial open syllable, even though the following syllable is closed.

- (1.14) a. 'muŋu orphan
 b. 'ŋalku₁ninpa eating
 c. 'pu₁ŋ₂kalat₃u we (sat) on the hill

This fixed pattern reveals that accent assignment does not make reference to syllable weight, *i.e.* the Weight parameter is set to “No” for this language.

By contrast, in a Weight (Yes) language, heavy syllables serve as accent-attractors and one of those receives word accent. For example, in Taz Selkup, accent falls on the second syllable, if it is heavy (CVV) and the initial syllable is light (see section 1.2.2).

- (1.15) [(l 'h) am'qe:ŋa is to take

Thus, syllable weight affects accent location in Taz: accent falls on certain syllables (called “heavy”), rather than on other syllables (the “light” ones). In other words, Taz is a (phonological) weight-sensitive system. This weight-sensitive behavior is captured in the S&P theory by setting the Weight parameter to “Yes”.

Importantly, derivations in the S&P theory are constrained by the *Weight Projection Principle* which requires that, in WS systems, only the heaviest units in a given word be projected onto the Accent Grid; projection of light units is disallowed (as they lack heaviness required for weight projection). As a result, only the heaviest units are candidates for receiving the word accent in this theory. Unlike WS systems, in WI systems, nothing is projected onto the Accent Grid.

As argued at length in Chapter 2, besides phonological weight, accent may also be assigned with reference to the diacritic weight of morphemes. Specifically, I will treat the accent-attracting/repelling abilities of individual morphemes as diacritic (“morphemic”) weight. Accordingly, in the S&P theory, a language has Weight (Yes), if it has at least one type of weight (phonological or diacritic); it may have both. In this way, the S&P theory extends the Weight parameter of the PAF theory to include diacritic weight. Obviously, WI systems lack weight altogether and correspond to Weight (No).

(1.8f) *The Project Position parameter: project {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 within the accent domain. While accent location in such words varies

depending on the language, it is limited to peripheral syllables (modulo final extrametrical syllable): in both BS and US, accent falls either on the leftmost, or on the rightmost syllable within the domain (in systems with extrametricality, default accent shifts one syllable inside). This is illustrated in (1.16).

(1.16)		Domain Size			
		<i>Bounded</i>	<i>Unbounded</i>	<i>Bounded</i>	<i>Unbounded</i>
	<i>Left</i>	[(¹ 11)	[(¹ 11111)	[(¹ 11)	[(¹ 11111) <σ>]
PP					
	<i>Right</i>	[(1 ¹)	[(1111 ¹)	[(1 ¹)	[(1111 ¹) <σ>]

Thus, there is a parallel between BS and US with respect to default accent location.

In the S&P theory, the Project Position parameter places a gridmark over the {leftmost/rightmost} syllable in the domain on line 1 of the Accent Grid, after which the Select parameter places a gridmark over it on line 2, thus assigning word accent to this syllable.

(1.17) DS (Bounded)		DS (Unbounded)	
DE (L)	DE (R)		
*	*	*	Select (Left)
*	*	*	Project Position (Left)
[(¹ 11)	(¹ 11)]	[(¹ 11111)]	

*	*	*	Select (Right)
*	*	*	Project Position (Right)
[(l 'l)	(l 'l)]	[(l l l l 'l)]	

As we see from (1.17), the interaction of Project Position and Select successfully captures the parallel between BS and US illustrated in (1.16).

(1.8g) *The Select parameter: choose the {Leftmost/Rightmost} gridmark on line 1 by placing a gridmark over it on line 2.*

In forms with more than one heavy syllable, one such syllable must be selected to receive word accent.

To that end, the Select parameter chooses the {leftmost/rightmost} line 1 gridmark by placing another gridmark over it on line 2. The resulting *tallest* column of gridmarks on the Accent Grid is “read off” as word accent.

(1.18) DS (Bounded)	DS (Unbounded)	
DE (L) DE (R)		
*	*	*
		Select (Left)
**	**	**
		Weight Projection
[(^l h h)	(^l h h)]	[(l ^h l h h l)]
*	*	*
		Select (Right)
**	**	**
		Weight Projection
[(h ^l h)	(h ^l h)]	[(l h l h ^l h l)]

I will now argue that the parameters above are partially ordered and that some of them are dependent on others.

1.3.3. Reducing the parameter space

1.3.3.1. Introduction

In this section, I show how a particular ordering of parameters in the S&P theory and dependencies among some of them reduce its parameter space. In particular, I propose a non-trivial dependency between the Nonfinality and Select parameters, stated in the Accent Locality hypothesis presented below. From this hypothesis, a specific prediction is drawn, tested against StressTyp data and found to be borne out, thus supporting the hypothesis.

1.3.3.2. Parameter ordering and parameter dependencies in the S&P grammar

I will now demonstrate that the parameters of the S&P theory form a particular partial order and that certain parameters are dependent on others.

By “parameter ordering”, I understand a particular order in which the parameters of a grammar apply. Frequently, the definitions of parameters themselves suggest the correct order of application. “Dependency” between two parameters A and B is a relation whereby, for some value of A, B may not be set to at least one of its values.

Below, I list the dependencies and ordering among the parameters of the S&P grammar. Interestingly, for some parameters in this grammar, dependency implies ordering (written as *Dependency* \rightarrow *Ordering* below): if the parameter Y is dependent on the parameter X, then X and Y are ordered.

(i) *Dependency* \rightarrow *Ordering*

If the Domain Size parameter is set to “Unbounded”, then the Domain Edge parameter cannot be set. If the Domain Size parameter is set to “Bounded”, then Domain Edge can be set (to “Left” or “Right”). Therefore, the Domain Edge parameter is dependent on Domain Size, which implies that Domain Size must be set before Domain Edge, *i.e.* Domain Size precedes Domain Edge.

<p>Domain Size (Unbounded) \rightarrow Domain Edge “not set”</p> <p>Domain Size < Domain Edge</p>

(ii) *Dependency* \rightarrow *Ordering*

Since the unbounded systems are WS (by definition), Domain Size (Unbounded) implies Weight (Yes): in this case, Weight may not be set to “No”. By contrast, if Domain Size (Bounded), then Weight may be set to “Yes” or “No” (yielding WS and WI languages, respectively). Therefore, Weight (Yes) is dependent on Domain Size (Unbounded).

Also, the Domain Size parameter is set before the Weight parameter because projecting weight requires setting up an accent domain in which weight will be

considered. Without delimiting an accent domain, it is unknown where within the word weight should be projected.

Domain Size (Unbounded) \rightarrow Weight (Yes)

Domain Size $<$ Weight

(iii) *Ordering*

The Project Position parameter applies to all-light words in WS and WI languages alike. Therefore, Weight and Project Position are independent parameters because Project Position can be set to “Left” or “Right”, regardless of the setting of Weight (and *vice versa*). However, these parameters are ordered. For the Project Position parameter to apply, certain words of the language must be characterized as all-light, which makes reference to weight distinctions. Therefore, Weight must precede Project Position.

Weight $<$ Project Position

(iv) *Dependency \rightarrow Ordering*

The Nonfinality Unit parameter is ordered after the Nonfinality parameter and is dependent on it: if NF (Yes), then the NF Unit parameter may assume any setting; if NF (No), then NF Unit is blocked (because, in the absence of nonfinality, there may be no nonfinality units in a language).

Nonfinality (No) \rightarrow Nonfinality Unit “not set”

Nonfinality < Nonfinality Unit

(v) *Ordering*

A peripheral unit (syllable/segment) must be determined as extrametrical before the size of the accent domain is chosen. Otherwise, this unit could be treated as part of the accent domain, *i.e.* become visible to accent assignment.

Nonfinality Unit < Domain Size

(vi) *Ordering*

The Weight parameter is set before the Select parameter because for the Select parameter to choose a heavy syllable, the system must be characterized as weight-sensitive, to begin with.

Weight < Select

(vii) *Ordering. Dependency*

For all-light words, the Select parameter applies to the output of the Project Position parameter. I also posit that, in WI systems, the setting of Select is identical to that of Project Position; thus, the former is dependent on the latter.

Weight (No) \rightarrow [[PP (Left) \rightarrow Select (Left)] & [PP (Right) \rightarrow Select (Right)]]

Project Position < Select

The orderings obtained above entail (by transitivity) those in (1.19).

(1.19) a. [[NF < NF Unit] & [NF Unit < Domain Size]] \rightarrow NF < DS

b. [[DS < DE] & [DE < W]] \rightarrow DS < W

c. [[NF < DS] & [DS < W] & [W < PP]] \rightarrow NF < PP

The order between Nonfinality and Project Position in (1.13c), derived formally in (1.19), is independently supported based on how these parameters are defined in the S&P theory. Namely, since Nonfinality makes a peripheral unit (segment/syllable) invisible to accent assignment, the Project Position parameter must be ordered after it. Otherwise, a peripheral unit would become visible to accent assignment.

Nonfinality < Project Position

In conclusion, note that the parameter ordering and dependencies above follow either from the definitions of the parameters, or are logical consequences thereof. In this sense, they are “intrinsic” to the parameter system, rather than an empirical result. The next section uncovers a non-trivial *empirical* dependency between the values of Select and Nonfinality in WS systems.

See the Appendix for the graph of all the dependency and ordering relations discussed in this dissertation.

1.3.3.3. The Accent Locality Hypothesis

No *weight-sensitive* bounded system with accent on the third syllable is known to us. Also, while word accent on the antepenult is believed to be attested, this seems to occur only in WI systems. In other words, in WS systems, left-edge extrametricality does not exist for WS and WS systems with right-edge extrametricality do not place accent on the left (*i.e.* antepenult) syllable in the bounded accent domain.

When combined, these observations suggest the following Accent Locality Hypothesis (ALH) for WS systems:

(1.20) *The Accent Locality Hypothesis*

If a WS system has nonfinality, then, in words with heavy syllables, accent must fall on the heavy syllable closest to the right edge of the word.

The effect of (1.20) is illustrated in (1.21).

(1.21) l h l l (h 'h)<σ>] *l h l l ('h h)<σ>]

Note that this hypothesis holds for every setting of the Nonfinality Unit parameter, *i.e.* not only for its “syllable” setting, but also for the “segment” setting.

The Accent Locality Hypothesis is a *locality* hypothesis in that it specifies a particular distance between the candidate for accent and the nonfinality edge. That is, in WS systems that involve nonfinality, the location of the accented syllable in the domain is predictable: accent falls on that heavy syllable which is closest to the nonfinality edge. In other words, the Accent Locality Hypothesis (1.20) states that this distance is always minimal for WS BS. This means that (1.20) sets a strong locality requirement, which makes it theoretically interesting.

The Accent Locality Hypothesis translates into the following implication:

(1.22) Weight (Yes) & Nonfinality (Yes) \rightarrow Select (Right)

(If Nonfinality is set to “No”, the Select parameter can be freely set to either setting, regardless of how the Weight parameter is set.)

Summarizing, the S&P system proposed above includes two important innovations:

- (i) Extrametricality is restricted to the right word edge: there is no EM (Left) in the S&P grammar;
- (ii) *The Accent Locality Hypothesis*: if Weight (Yes) & NF (Yes), then Select (Right).

In the rest of section 1.3, the prediction of these two hypotheses is tested against the data in *StressTyp* (currently, the largest database of stress patterns in the world’s languages).

1.3.4. The Accent Locality prediction

According to the Accent Locality hypothesis, the Select parameter depends on the Nonfinality parameter in WS systems: if W (Yes) & NF (Yes), then Sel (Right). From this hypothesis, the following testable prediction can be drawn:

(1.23) The Accent Locality prediction

There are no WS languages characterized by the combination {NF (Yes), Select (Left)}. The three other combinations of parameter values for Nonfinality and Select are attested.

Below, based on StressTyp data, which, in many cases, I have corrected, and some reanalysis, I will provide evidence that there are no genuine cases of {W (Yes), NF (Yes), Select (Left)}. This implies that the Accent Locality prediction is borne out (both for BS and US), thus lending support to the Accent Locality Hypothesis.

1.3.4.1. Testing the Accent Locality prediction for BS

A StressTyp query for bounded WS systems with Nonfinality (Yes) and Nonfinality Unit (syllable) returns the result in Table 1.2.²

² Note that NF (Yes) translates into EM (Right) of the PAF theory. Accordingly, it is coded “EM (Right)” in StressTyp.

TABLE 1.2. *Bounded WS languages with NF (Yes) and NF Unit (syllable).*

<i>Nonfinality</i>	<i>Select</i>	<i>Languages</i>
Yes	Left	Bhojpuri, Roro, Hopi, Central Sierra Miwok
Yes	Right	19 languages

Table 1.2 shows an overall bias towards {NF (Yes), Select (Right)} in bounded WS systems. Indeed, reanalysis below reveals that three apparent counter-examples to the prediction (Bhojpuri, Roro, Central Sierra Miwok) are, in fact, spurious, thus providing support for the Accent Locality Hypothesis in (1.20).

1.3.4.2. Reanalysis: Roro, Bhojpuri, Central Sierra Miwok

(i) Roro

Strong (1913-1914), the only descriptive source on accent placement in Roro, gives the following accentual description:

In words with two syllables the accent is on the first syllable. In words with three syllables the accent is on the first syllable if it contains a diphthong but otherwise on the second syllable. In words with more than three syllables the accent is on the second syllable. (Strong 1913-1914:286)

This short passage forms the entire “Accent” section of Strong’s article about Roro. As we can see, Strong describes different accentual patterns, but does not state any accent rule and does not give any examples, which makes this description unreliable.

Moreover, the analysis in StressTyp is incompatible with Strong's description. The reported accent pattern in trisyllabic words requires Weight (Yes) and Select (Left), while fixed accent in longer words implies Weight (No) and, therefore, Select must be "unset" (*i.e.* not set).

Since the only existing accentual description of Roro is unreliable and the StressTyp analysis is wrong, there is no reason for viewing this language as an exception to the Accent Locality hypothesis.

(ii) *Bhojpuri*

Bhojpuri is formally analyzed in StressTyp as having Domain Edge (Right), Select (Left) and Nonfinality (Yes), which derives antepenultimate accent.

However, nonfinality, proposed for Bhojpuri in StressTyp, is incompatible with final accent in words in which all vowels are short and the final syllable is closed, as in (1.24).

(1.24) ga^lab to melt

Note also that antepenultimate accent only occurs in Bhojpuri words with at least four syllables (1.25).

(1.25) k^ha^lta^mka^lrab to finish

agwa^li:ka^lrab to lead

The StressTyp analysis of antepenultimate accent in Bhojpuri as having Select (Left) and Nonfinality (Yes) does not account for the restriction that antepenultimate accent in this language depends on the presence of a syllable to its left.

Since the analysis of Bhojpuri with {Nonfinality (Yes), Select (Left)} makes wrong predictions and, therefore, does not reach the level of descriptive adequacy, Bhojpuri is not characterized by this combination of parameter settings.

(iii) *Central Sierra Miwok*

Central Sierra Miwok (CSM) has been analyzed in StressTyp with Select (Left) and EM (Right), which is incompatible with the Accent Location prediction. As I will now show, this analysis is wrong: while Select is effectively set to “Left”, the system does not involve extrametricality.

The data and generalizations below are drawn from the grammar of Miwok by Freeland (1951), the only book-size description for CSM, with minor additions from a CSM dictionary (Freeland & Broadbent 1960).³

In CSM, syllables with a long vowel (1.26) and word-internal CVC syllables (1.27) are heavy, while CV and final CVC syllables are light. Among the CVC syllables, both those with a coda consonant followed by another consonant in the onset to the right (1.27a) and those closed by the first member of a geminate (1.27b) are heavy.

³ Unfortunately, I cannot provide glosses for the data below because they are not glossed in Freeland (1951), the only available source.

(1.26) 'ha:na?

'tʃa:majɪ?

ka'wa:tʃi?

(1.27) a. 'paŋkajɪ?

ka'laŋpa:

b. 'han:a?

'wittapi?

Note that, in (1.26)-(1.27), accent is initial or second, never further to the right, which is always the case in CSM. Therefore, CSM is a BS with a left-edge bounded domain.

The data in (1.28) indicates that, when both syllables in the accent domain are heavy, the leftmost heavy one receives the accent. Therefore, the Select parameter is set to “Left” in CSM.

(1.28) 'ja:ja:li?

'mɪ:ɦɪ:na?

'ɦuʃ:e:pi?

¹hil:af:y:k command-PAST

¹katʃ:a:k say-PERF

¹woʔla:ʃ as he was going home

Summarizing, CSM is a WS system with a left-edge bounded accent domain and Select (Left). All this is consistent with traditional descriptions. In addition, CSM was described with right-edge EM. However, as I will now show, the accent system in CSM does not involve nonfinality.

Conspicuously, Freeland (1951) reports a word-final rhythmic beat in certain types of nouns and verbs (under specific conditions). Thus, trisyllabic nouns with initial accent have a rhythmic beat on the final syllable. (When word accent is second, lack of the beat on the third syllable is due to stress clash avoidance).

(1.29) ¹huʃ:e:piʔ water spirit

¹wak:a:liʔ rattlesnake

¹tak:a,w:aʔ ground squirrel

¹how:oi tuʔ beads

Longer nouns also carry a rhythmic beat on their final syllable (unless this corresponds to a case suffix).

(1.30) 'palat̪:a̪ta woodpecker

'sit̪:ik:iniwa obsidian

Similar to nouns, trisyllabic verbs with initial accent also have a rhythmic beat on their final syllable.

(1.31) 'lep:a̪na:k I finished

'naj:i̪ʔiʔ he is always scolding

'we:li̪j:iʔ he goes to get

Since the final rhythmic beat is direct evidence against nonfinality, it is clear that the final syllable is not invisible to accent assignment in CSM.

In conclusion, Central Sierra Miwok is a left-edge WS BS with Select (Left) and Nonfinality (No).

1.3.4.3. A genuine exception: Hopi

Hopi is analyzed in StressTyp as a WS system having EM (Right) and Select (Left)}, which violates the AL prediction. In this section, I will describe the accent patterns of Hopi and conclude that the analysis in StressTyp is correct, but with several non-negligible caveats.

For data, I am relying here on Jeanne (1978) and Kalectaca (1978).

Hopi has a left-edge bounded accent domain: accent is confined to a bisyllabic window at the left word edge. Since CVC and CVV syllables receive accent in Hopi, they are heavy. Thus, a CVC syllable is accented when it is initial (1.32a) or second (1.32b), while the other syllable in the domain is light.

- (1.32) a. 'ʔacvewa chair
- 'lestavi roof beam
- 'pentani will write
- 'maamatsi recognize
- 'tuumojta eating
- b. ca'qapta dish
- pa'napca window
- wu'nuvtu stand up
- ju'aata talking

When both syllables in the accent domain are heavy, accent falls on the initial syllable. Therefore, Select is set to “Left” in Hopi.

Additional evidence for Select “Left” comes from reduplication. In Hopi, prefixing reduplication is followed by deletion of the first stem vowel. This results in a consonant cluster whose left-hand member closes the initial syllable, making it heavy.

In this case, accent falls on the initial syllable, in particular, when the second syllable is also heavy (Jeanne 1978). This is exemplified in (1.33). We again conclude that the Select parameter is set to “Left” in Hopi.

(1.33) <i>Singular</i>	<i>Plural</i>	
ca ¹ qapta	¹ cacqapta	dish
pa ¹ napca	¹ papnapca	window
mim ¹ rikho	¹ mimrikho	hunting stick

Final syllables are always unaccented in Hopi. Evidence for final extrametricality comes from fixed initial accent in disyllables. Indeed, in this language, disyllabic words constitute a special case. In such forms, accent is invariably fixed initial, even when the initial syllable is light, while the second syllable is heavy. When both syllables are heavy, accent is also initial, which, once more, indicates that Select is set to “Left”. Further, since in “all-light” words, like in words with heavies, accent falls on the initial syllable, the Nonfinality parameter is set to “Yes”. The fact that, in longer words, the final syllable is always unaccented, is consistent with final extrametricality in disyllables. Therefore, Nonfinality is set to “Yes” in Hopi.

Summarizing, Hopi combines {Weight (Yes), NF (Yes) and Select (Left)}. Therefore, Hopi is, effectively, a counter-example to the Accent Locality hypothesis proposed above.

However, we are dealing here with a marked, cross-linguistically rare situation where the extrametrical syllable is contained *inside* the accent domain. This very special configuration arises from the fact that accent in all disyllabic words is fixed on the initial syllable, which unavoidably includes the extrametrical syllable inside the accent domain. Thus, this situation is highly marked both language-specifically and cross-linguistically, which reduces the relevance of Hopi as an exception to the Accent Locality hypothesis.

Hopi is the only genuine exception to the Accent Locality hypothesis, as all other apparent exceptions have been shown to be spurious (see above). I must add that, if we restrict the hypothesis to languages where the extrametrical syllable is never included in the accent domain (*i.e.* the unmarked case), Hopi would no longer fall under the scope of the Accent Locality hypothesis.

1.3.4.4. Nonfinality units other than the syllable

Above, I have shown that the AL Condition holds for systems with NF (syllable). Now, I will show that this condition also holds for systems with other nonfinality units.

A simple query in StressTyp for WS languages with Nonfinality (Yes) and nonfinality units other than the syllable (Nonfinality Unit = “consonant”, “echo vowel”, “heavy syllable”, “mora”) returns the output in Table 1.3.

TABLE 1.3. *Bounded WS languages with nonfinality units other than the syllable.*

<i>Nonfinality</i>	<i>NF Unit</i>	<i>Weight</i>	<i>Select</i>	<i>Language</i>
Yes	Consonant	Yes	Right	Cebuano, Evenki
Yes	Heavy syllable	Yes	Right	Dutch, Norwegian
Yes	Mora	Yes	Right	Hindi
Yes	Echo vowel	Yes	Right	Tobelo

Table 1.3 lists all languages in StressTyp characterized by these parameter settings. That is, when the setting of Nonfinality Unit is other than the “syllable”, one finds WS languages with Nonfinality (Yes) and Select (Right), but no WS language with Nonfinality (Yes) and Select (Left).

To sum up, I have shown (based on the data in StressTyp) that, in WS BS with nonfinality, Select is always set to “Right” (for all nonfinality units); no such systems with Select (Left) are attested.

We, then, conclude that the Accent Locality hypothesis is supported for bounded WS systems with nonfinality.

1.3.5. Testing the Accent Locality prediction for US

In the preceding section, it was shown that the Accent Locality Hypothesis (1.20) is supported for BS. I will now test the prediction for US. A StressTyp query similar to the one above, but for all values of the Nonfinality Unit parameter, returns the output in Table 1.4.

TABLE 1.4. *Unbounded WS languages with Nonfinality (Yes).*

<i>Nonfinality</i>	<i>Nonfinality Unit</i>	<i>Select</i>	<i>Language</i>
Yes	syllable (?)	Left	Zeberio Basque
Yes	Vowel	Left	Tahitian
Yes	Segment	Left	Gorowa
Yes	Syllable	Right	Classical Arabic, Sindhi, Western Mari
Yes	Consonant	Right	Kenuzi-Dongola
Yes	Segment	Right	Cyrenaican Bedouin Arabic, Cairene Arabic
Yes	Foot	Right	Munsee, Unami, Passamaquoddy

Table 1.4 shows that most unbounded systems with nonfinality have Select (Right). I will now argue that the three US in Table 1.4. which are reported with {Weight (Yes), Nonfinality (Yes), Select (Left)} in StressTyp, namely, Zeberio Basque, Gorowa and Tahitian, are not genuine counter-examples because their formal analysis (as given in StressTyp) is incompatible with the existing descriptions.

1.3.5.1. Zeberio Basque

Zeberio Basque is reported in StressTyp as having EM (Right) (*i.e.* Nonfinality (Yes) in the S&P theory) and Select (Left), which is in contradiction with the Accent Locality hypothesis.

According to Hualde (1999), on which StressTyp heavily relies, the last syllable of a specific domain (defined with respect to the stem) is extrametrical in inflected words, while being accentable in uninflected words. However, note that this is incompatible with having extrametricality in Zeberio because a parameter setting may not be restricted to only a part of the lexicon. Note also that word-internal extrametricality, proposed by Hualde, is very rare cross-linguistically and that it is not related to the EM parameter as this is defined in the PAF theory.

I am, then, led to conclude that the formal analysis of Zeberio in StressTyp is (at least) suspect.

1.3.5.2. Gorowa

Following Hayes (1981:119), Gorowa is analyzed in StressTyp as a WS system with EM (Right) and Select (Left). However, final accent in words such as (1.34) provides evidence against final extrametricality in this language.

(1.34) ha^ˈma is-here

ga^ˈla which

ao^ˈwa drink

Summarizing, accent behavior in Zeberio Basque and Gorowa does not offer counter-evidence to the Accent Locality hypothesis.

1.3.5.3. Tahitian

Tahitian is analyzed in StressTyp as a WS systems with Select (Left) (following Tryon 1970, Hayes 1981) and with right-edge vowel EM, which is incompatible with the AL prediction. However, as I will now argue, this analysis is wrong.

In a thorough, richly documented elicitation-based study of Tahitian accentuation (Bickmore 1995), Lee Bickmore arrives at sharply different accentual generalizations, presented below. These will lead me to conclude that Tahitian is characterized by {Weight (Yes), NF (Yes), Select (Right)}.

Let us begin with the weight criteria. Syllables that contain a long vowel (1.35) and those that contain a diphthong (1.36) are both heavy in Tahitian.

(1.35) *CV: syllables heavy*

^l va:hi	place
^l ma:ha	satisfied
^l pe:ni	paint
me ^l re:ni	melon
pa ^l hi:	ship
pi ^l ru:	gold
haʔa ^l va:	judge
para ^l ri:	be shattered

(1.36) CV_1V_2 syllables heavy

ho'roi wash

pa'rau speak

ma'hae torn

pri'pou pants

'ʔaeto eagle

Since diphthongs make a syllable heavy, a word must be said about syllabification of surface vowel sequences. Given a vowel sequence V_1V_2 , if V_1 is more sonorous than V_2 , then V_1 and V_2 form a diphthong in the UR; otherwise, they correspond to an underlying vowel sequence. For example, the surface sequence [eu] is a diphthong, *e.g.* [pe.u] (“custom”) (because this vowel sequence displays a decreasing sonority profile), while surface sequences [ua] and [io] are heterosyllabic, *e.g.* in [tu.a.hi.ne] and [ʔi.o.re], respectively (because these vowel sequences are rising in sonority).

Note that the words in (1.35)-(1.36) above each contain one heavy syllable. Evidently, the Select parameter, which chooses among several heavy syllables, may not be set based on these data.

Importantly, Bickmore (1995:416) observes that words with multiple syllables with a long vowel receive the accent on the *rightmost* such syllable, witness (1.37).

(1.37) a:'pa:	kiss
o:'pu:	stomach
pu:'te:	sack
ho:'te:ra	hotel
a:'vo:ta	avocado
pa:ni'e:	basket
pa:to:'to:	knock
ta:ni:ni:'to:	be dizzy

In words that have more than one syllable with a diphthong, accent falls on the rightmost such syllable, witness (1.38).

(1.38) au'fau	pay
----------------	-----

Also, in words that contain both a syllable with a long vowel and a syllable with a diphthong, the the rightmost heavy one receives the accent, witness (1.39).

(1.39) fa:'nau	give birth
pa:'rau	oyster

₁ pi:ˈhae	tear up
₁ ho:ˈpoiʔa	responsibility
₁ ta:ˈtauro	cross
₁ fa:reˈrei	meet
₁ pa:raˈrai	thin

Summarizing, in words with multiple heavy syllables, accent falls on the rightmost heavy one. Therefore, in Tahitian, the Select parameter is set to “Right” (not “Left”). Thus, Tahitian is not a counter-example to the Accent Locality hypothesis.

Now, recall from above that, in addition to proposing Select (Left) for this language, the StressTyp analysis also claims that EM parameter is set to “Yes”, with EM Unit (vowel). Specifically, the word-final vowel is made extrametrical.

I will now show that this analysis is wrong. Indeed, if vowels were extrametrical word-finally, then only the left-hand member of the syllable Nucleus would remain accentable in this position. This would turn all final long vowels into short ones for purposes of accent assignment, making them light. This, in turn, predicts that they could not receive the accent in presence of a heavy vowel to the left. However, the data in (1.40) provides evidence that, in this case, accent is final.

(1.40) o:ˈpu:	stomach
a:ˈpa:	kiss

pa:to:'to: knock

ta:ni:ni:'to: be dizzy

Thus, Tahitian does not have the Nonfinality Unit (vowel). Obviously, the final syllable is not extrametrical either, because accent in Tahitian frequently falls on the final syllable, as evidenced by the examples above.

I conclude that the Nonfinality parameter is set to “No” in Tahitian.

Finally, it is worth noting that Tahitian is a BS, as Bickmore (1995:421) convincingly argues against previous analyses. Thus, if, in a word, there is a heavy syllable to the left of the three-syllable right-edge window only containing light syllables, accent does not reach out to that heavy syllable, remaining within the window, as in BS.

(1.41) |to:mi'tera commissioner

|ma:ni'ota manioc

In conclusion, Tahitian is a bounded WS system with Select (Right) and Nonfinality (No), a possibility compatible with the Accent Locality prediction.

1.3.6. Ruling out the opposite-edge extrametricality

The PAF theory allows the accent domain in bounded systems to be located at the word edge opposite to that where the EM unit is located (I call this “opposite-edge extrametricality”).

However, since the peripheral unit at the other edge of the word is far from the accent domain, it obviously cannot receive the accent. Since opposite-edge EM, thus, makes no sense, I suggest dispensing with it. In other words, the accent domain and the EM unit must be located at the same edge of the word.

In terms of the S&P theory, Nonfinality (Yes) implies Domain Edge (Right). Since there is no EM (Left) in this theory, this rules out the combination of left-edge EM with accent near the right word edge. I propose to implement this implication as a dependency of the Domain Edge parameter on the Nonfinality parameter: DE (Right) is dependent on NF (Yes). (For NF (No), both settings of DE are allowed.)

This predicts absence of systems with the accent domain at the left word edge and an extrametrical syllable at the right word edge. In fact, StressTyp reports only one language with these parameter settings, namely Laragia. However, consulting the primary source on Laragia (Capell 1984) reveals that there is no evidence for extrametricality in this language. I conclude that Laragia is not a valid counter-example to my claim.

1.4. A parametric typology of accent systems

1.4.1. Systems yielded by the S&P grammar (complete list)

The parametric grammar of the S&P theory in (1.8), constrained by the parameter dependencies stated in section 1.3.3.2, yields the following types of accent systems.

1.4.1.1. Bounded systems

In WS BS, 4 types of systems without nonfinality are predicted at each word edge (because there are 4 combinations of settings for the Select and Project Position parameters). For systems with nonfinality, only 2 types are possible because left-edge EM cannot be generated in principle (there is no such parameter in the theory) and because the Select parameter is dependent on the Nonfinality parameter in WS systems: Select may not be set to “Left” if NF (Yes). In total, 10 BS generated.

These are listed in (1.42)-(1.44).

(1.42) *Left-edge WS bounded systems without nonfinality*

DS (B), DE (L), NF (No)

a. Select (R), Project Position (L)

[('h l) [(l 'h) [(h 'h) [(l l)

Capanahua (Panoan)

b. Select (R), Project Position (R)

[('h l) [(l 'h) [(h 'h) [(l 'l)

Archin (N. Caucasian)

c. Select (L), Project Position (L)

[(^hl) (l^h) (^hh) (^ll)] Yindjibarndi (Pama-Nyungan)

d. Select (L), Project Position (R)

[(^hl) (l^h) (^hh) (^ll)] Ossetic (IE)

(1.43) *Right-edge WS bounded systems without Nonfinality*

DS (B), DE (R), NF (No)

a. Select (R), Project Position (L)

(^hl)] (l^h)] (h^h)] (^ll)] Epera Pedée (Chocoan)

b. Select (R), Project Position (R)

(^hl)] (l^h)] (h^h)] (^ll)] Yapese (Austronesian)

c. Select (L), Project Position (L)

(^hl)] (l^h)] (^hh)] (^ll)] Sundanese (Austronesian)

d. Select (L), Project Position (R)

(^hl)] (l^h)] (^hh)] (^ll)] Aklan (Austronesian)

(1.44) *Right-edge WS bounded systems, with Nonfinality*

DS (B), DE (R), NF (Y), NF Unit (syll)

a. Select (R), Project Position (L)

(^hl) <σ>] (l^h) <σ>] (h^h) <σ>] (^ll) <σ>] Classical Latin (IE)

b. Select (R), Project Position (R)

(^hl) <C>] (^lh) <C>] (h^h) <C>] (l^l) <C>] Cebuano⁴

As we see, all 10 types of BS systems generated by the S&P grammar are attested cross-linguistically (according to StressTyp).

1.4.1.2. Unbounded systems

The S&P theory proposes that Domain Edge is dependent on Domain Size: Domain Edge is blocked when Domain Size (Unbounded). Therefore, when Nonfinality is set to “No”, four combinations of settings for the Select and Project Position parameters are possible for US. In addition, when Nonfinality is set to “Yes”, (only) two combinations are possible (because Select is dependent on Nonfinality in WS systems). In total, 6 types of US are generated. All these are listed in (1.45)-(1.46).

(1.45) *Unbounded WS systems without nonfinality*

DS (Unbounded), NF (No)

a. Select (R), Project Position (L)

[^ll h l^h l l l] [^ll l l l l l l] Kuuku Yaʔu (Pama-Nyungan)

b. Select (R), Project Position (R)

[^ll h l^h l l l] [^ll l l l l l^l] Aguacateco (Mayan)

c. Select (L), Project Position (L)

⁴ In Cebuano, the word-final extrametrical unit is the coda consonant, rather than the syllable. Note that no languages are found in StressTyp for these parameter settings with EM Unit (syllable). However, Cebuano is consistent with this typology, given that systems with NF Unit (consonant) and those with NF Unit (syllable) both involve extrametricality. Consonant extrametricality is, thus, legitimate evidence for the Accent Locality Hypothesis.

[(l l 'h l h l l l)] [(l l l l l l l l)]

Au (Papua)

d. Select (L), Project Position (R)

[(l l 'h l h l l l)] [(l l l l l l l 'l)]

Kwak'wala (Wakashan)

(1.46) *Unbounded WS systems, with nonfinality*

DS (Unbounded), NF (Yes), NF Unit (syllable)

a. Select (R), Project Position (L)

(l l h l 'h l l l)<σ>] [(l l l l l l l l)<σ>]

Sindhi (Indo-Aryan)

b. Select (R), Project Position (R)

(l l h l 'h l l l)<σ>] [(l l l l l l l 'l)<σ>]

Western Mari (Uralic)

To sum up, the S&P grammar generates a total of 16 types of accent systems, *i.e.* 6 types of US and 10 types of BS, all of which are attested (according to StressTyp).

While the S&P theory has a smaller parameter space than the PAF theory, both theories contain an insight that the modern metrical theories do not. Thus, van der Hulst (1996, 2010, 2012) notes that the PAF theory captures the parallel between BS and US in terms of the same combinations of settings, *modulo* boundedness/unboundedness of the system. This parallel is fully preserved in the S&P theory. Indeed, in the absence of nonfinality, for both BS and US, the leftmost or rightmost heaviest syllable in the accent domain receives the accent; in all-light words, accent falls on a peripheral syllable. In languages with nonfinality, in both BS and US, the rightmost heaviest

syllable in the accent domain receives the accent; in all-light words, accent falls on a peripheral syllable.

However, the S&P theory differs from the PAF theory in making Select dependent on Nonfinality, which disallows the systems with nonfinality that assign accent to the leftmost heaviest syllable within the accent domain.

Summarizing, the S&P theory preserves the parallel between BS and US from the PAF theory, while reducing the number of possible accent systems.

In the next section, I will discuss another way in which the S&P theory reduces the parameter space.

1.4.2. Comparing the PAF and S&P theories

1.4.2.1. Systems with EM (Left) generated by the PAF grammar

In the preceding section, all systems generated by the Scales-and-Parameters grammar are listed. Note that these are also generated by the PAF grammar, but the set of all systems generated by the PAF grammar is a superset of the set of all systems generated by the S&P grammar.

Below, I list all accent systems generated by the PAF theory with the EM parameter set to “Left”.⁵ The S&P grammar does not generate those systems.

(1.47) *Left-edge WS bounded systems, with left-edge extrametricality*

Domain (Left), EM (Left), EM Unit (syllable)

⁵ Recall that EM (Right) of the PAF theory corresponds to Nonfinality (Yes) in the S&P theory, while EM (Left) in the former has no analog in the latter.

a. Select (R), Default (L)

[<σ> ('h l) [<σ> (l 'h) [<σ> (h 'h) [<σ> ('l l) *Unattested*

b. Select (R), Default (R)

[<σ> ('h l) [<σ> (l 'h) [<σ> (h 'h) [<σ> (l 'l) *Unattested*

c. Select (L), Default (L)

[<σ> ('h l) [<σ> (l 'h) [<σ> ('h h) [<σ> ('l l) *Unattested*

d. Select (L), Default (R)

[<σ> ('h l) [<σ> (l 'h) [<σ> ('h h) [<σ> (l 'l) *Unattested*

(Kashaya reanalyzed)

(1.48) *Right-edge WS bounded systems, with left-edge extrametricality*

Domain (Right), EM (Left), EM Unit (syllable)

a. Select (R), Default (L)

[<σ>...('h l)] [<σ>...(l 'h)] [<σ>...(h 'h)] [<σ>...('l l)] *Unattested*

(Hondarribia Basque reanalyzed)

b. Select (R), Default (R)

[<σ>...('h l)] [<σ>...(l 'h)] [<σ>...(h 'h)] [<σ>...('l l)] *Unattested*

c. Select (L), Default (L)

[<σ>...('h l)] [<σ>...(l 'h)] [<σ>...('h h)] [<σ>...('l l)] *Unattested*

d. Select (L), Default (R)

[<σ>...(ʰl)] [<σ>...(lʰ)] [<σ>...(ʰh)] [<σ>...(lʰ)] *Unattested*

(1.49) *Unbounded WS systems, with left-edge extrametricality*

Domain *unset*, EM (Left), EM Unit (syllable)

a. Select (R), Default (L)

[<σ> (llh lʰhll)] [<σ> (ʰlllllll)] *Unattested*

(Negev Bedouin Arabic reanalyzed)

b. Select (R), Default (R)

[<σ> (llh lʰhll)] [<σ> (lllllllʰ)] *Unattested*

c. Select (L), Default (R)

[<σ> (llʰhllhll)] [<σ> (lllllllʰ)] *Unattested*

d. Select (L), Default (L)

[<σ> (llʰhllhll)] [<σ> (ʰlllllll)] *Unattested*

Thus, the PAF theory predicts the existence of 12 types of accent systems with EM (Left) listed above (8 BS and 4 US), of which only three are reported in the literature (Kashaya, Hondarribia Basque and Negev Bedouin Arabic). However, as I will argue in the next section, these languages do not instantiate the combinations of

parameter settings in (1.47d), (1.48a) and (1.49a), respectively. Therefore, all 12 types of systems with EM (Left) predicted by the PAF theory turn out to be unattested.

1.4.2.2. Reanalysis: Kashaya, Hondarribia Basque and Negev Bedouin Arabic

(i) *Kashaya*

Kashaya is the only reported language with the combination {EM (Left), Domain (Left), Select (Left)}. This combination predicts accent on the second syllable whenever this syllable is heavy; otherwise, on the third. Indeed, this is the pattern in words that begin with a disyllabic or longer root (the root is bolded).

(The description and data for Kashaya presented here are drawn from Buckley 2013).

- (1.50) a. **tum**¹huʔk^he will buy
- ma**¹ʔahqaw feed
- b. **tum**hu¹ci:du keep buying
- ma**ʔa¹ci:du keep eating

However, if the root at the left word edge is monosyllabic and this syllable is heavy, then accent is initial, as evidenced by (1.51).

- (1.51) **him**t^huʔ don't go get (anything)!

¹qomqaba after bathing (someone)

¹s'ihqamela I persuaded someone to do it

Obviously, EM (Left), which rules out initial accent, is not compatible with initial accent in (1.51).

Another pattern incompatible with the combination of parameter settings above is accent on the fourth syllable, as in (1.52).

(1.52) **ʔic^ha:t^hi¹ne:mu** that is not a spider

Summarizing, under specific circumstances, accent in Kashaya can fall on the initial or fourth syllable, thus reaching out of the bounded window. That is, Kashaya is an example of so-called “broken window” systems, known to be problematic for any theory of stress.

Importantly, the StressTyp analysis fails to capture these special patterns. This means that Kashaya does not instantiate the combination of parameter settings in (1.47d). Also, this combination is not attested for any other language. Therefore, the combination {EM (Left), Select (Left)} in (1.47d) is not attested cross-linguistically.

(ii) *Hondarribia Basque*

Hondarribia Basque is the only language to be analyzed in StressTyp with Domain (Right), EM (Left), Select (Right) and Default (Left).

The following description is based on Hualde & Sagarzazu (1991).

In Hondarribia, accent is limited to the stem (affixes are never accented) and its behavior depends on stem length.

In words with stems of three or more syllables, accent is WS: it falls on the stem-final syllable if it is closed; otherwise, on the penultimate syllable of the stem. In particular, when both penultimate and final syllables of the stem are heavy, accent falls on the stem-final syllable (1.53a); therefore, the Select parameter is set to “Right”. When both the penultimate and final syllables are light, accent falls on the penult (1.53b); therefore, the Project Position parameter is set to “Left”.

(1.53) a. irabaz^ltun the winner

astiz^lken-a Wednesday

alar^lgun-ak widowers

b. tan^lkerá appearance

o^lsaba uncle

a^lragi-ya meat

ema^lkumi-a woman

In words with a disyllabic stem, accent is fixed (no effect of syllable weight). There are two kinds of accent patterns: stem-initial accent and accent on the second syllable of the stem.

In the general case, accent falls on the second syllable, as can be seen in (1.54). Note that, unlike in trisyllabic stems, the stem-final syllable is here accented even if it is open, confirming that accent assignment is WI here.

(1.54) bi'zar	barb
e'gun-ian	in the day
gi'zon	man
as'ko	much
es'te	intestine
le'ku-a	place
be'gi-ya	eye

On the other hand, Hondarribia has a large class of exceptions to this pattern which display stem-initial accent, as exemplified in (1.55).

(1.55) 'besti-a	beast
'librua	book
'kontu	tale
'malku-a	tear

¹ pasmu.a	pus
¹ baso-ra	glass
¹ toki-ra	place
¹ sotu-a	portal

Clearly, initial accent in words like those in (1.55) provides direct evidence against initial extrametricality.

As emphasized in Hualde & Sagarzazu (1991), establishing an accent rule for Hondarribia requires treating the “exceptional” pattern in (1.55) as the unmarked case and the more frequent pattern in (1.54) as special (which requires lexical marking). This is because disyllabic stems (traditionally described as having initial accent) pattern with trisyllabic stems ending in a CV syllable: both have accent on the penult (in a disyllabic stem, the stem-initial syllable is also the penultimate one). Importantly, this penultimate pattern is compatible with stem-final accent in trisyllabic stems ending in a CVC syllable (153b): all disyllabic stems with initial accent end in a CV syllable, never in a CVC syllable.

This analysis, then, boils down to a simple accent rule: “Assign the accent to the penultimate syllable in stems that end in a vowel and to the final syllable in stems that end in a consonant” (Hualde & Sagarzazu 1991:150). By contrast, treating stems with the accent on the second syllable as the general case precludes any straightforward generalization across the available patterns.

Now, recall from above that “initial” (penultimate) accent in disyllabic stems offers evidence against the claims about initial extrametricality in Hondarribia. Crucially, viewing “initial” accent in disyllabic stems as a regular pattern further strengthens the case against extrametricality.

I conclude that the EM parameter is not set to “Left” in Hondarribia Basque.

(iii) *Negev Bedouin Arabic*

According to Hayes (1981:114) and Kenstowicz (1983:6), in Negev Bedouin Arabic, accent falls on the rightmost heavy syllable in the word; otherwise, it falls on the second syllable. Based on this accent rule, the language has been analyzed in StressTyp as {EM (Left), Select (Right)}. However, as I will now argue, there is no left-edge extrametricality in this system (while the setting of Select is correct).

In Negev Bedouin Arabic, syllables with a long vowel and word-internal closed syllables behave as heavy, while open syllables and word-final closed syllables behave as light. The representative piece of data in (1.56), in which accent falls on the rightmost CVV syllable, provide evidence that the Select parameter is, indeed, set to “Right”.⁶

(1.56) rka:^lba:t stirrups

By contrast, there is evidence that the EM parameter is not set to “Left”. Note that the accent rule given above implies that initial heavy syllables attract the accent.

⁶ In this Negev section, I adopt the transcription of the primary sources (which do use IPA).

This is, indeed, the case, as evidenced by the forms in (1.57) (drawn from Shawarbah 2012:100; Blanc 1971:120).

- (1.57) 'alḡanam the sheep
 'margabāh mirror
 'arkadah he put it down
 'sa:fatah she saw him

The traditional left-edge extrametricality analysis was motivated by the default accent on the second syllable, as illustrated in (1.58), which would suggest that the initial syllable is extrametrical.

- (1.58) ga'da lunch
 fa'rasah his horse
 ḡu'ṇam sheep (COLL.)
 ka'tab he wrote
 za'lamalak your (MSg) man

However, as reported in Blanc (1971:121), the pattern in (1.58) has exceptions with initial accent (1.59).

(1.59) 'fugara	poor
'yuṣara	prisoners
'maṛah	woman
'jatak	she came to you

Summarizing, while the Select parameter is, effectively, set to “Right” in Negev Bedouin Arabic, the EM parameter is not set to “Left”. As I have shown, the EM analysis is inconsistent with accent on the initial heavy syllable and with initial accent in some “all-light” words. Therefore, according the S&P theory, this accent system is analyzed with Nonfinality (No) and Select (Right).

Thus, elimination of EM allows us to account for initial accent in this language. However, since, in US, accent typically falls on a peripheral syllable, one must account for the observed second syllable accent (without recourse to extrametricality).

An interesting approach to this problem is to posit a separate accent domain for the default. Specifically, we could assume that the Select and Project Position parameters operate on distinct, independent domains. This implies that the two domains may differ with respect to boundedness; in particular, the Select domain may be unbounded, while the Project Position domain is bounded. This combination of Project Position Domain (Bounded) and Project Position (Right) correctly derives the default accent on the second syllable in “all-light” words:

- (1.60) * Select Domain (Unbounded), Select (Right)
- * Project Position Domain (Bounded), Project Position (Right)

[(11) 111

Evidently, this proposal still needs to be fully fleshed out; however, given the scope of the present work, I have to leave its elaboration for future research.

1.4.2.3. Weight-sensitive systems with {EM (Right), Select (Left)} generated by the PAF grammar

Another source of languages generated by the PAF grammar, but not the S&P grammar, is that, in the PAF theory, the EM parameter and the Select parameter are independent: Select may be set to either setting for every setting of EM.

For {EM (Right), Select (Right)}, the PAF grammar generates the same set of accent systems as the one generated by the S&P grammar with {Weight (Yes), Nonfinality (Yes), Select (Right)} (see section 1.4.1).

For {Weight (Yes), Nonfinality (Yes), Select (Left)}, the S&P grammar does not generate any language because, in this theory, Select is dependent on Nonfinality in a way that rules out this particular combination of settings. By contrast, in the PAF theory, the combination {EM (Right), Select (Left)} is possible. It generates the systems listed in (1.61)-(1.63).

(1.61) *Left-edge WS bounded systems, with right-edge extrametricality*

Domain (Left), EM (Right), EM Unit (syllable)

a. Select (L), Default (L)

[('h l)...<σ>] [(l 'h)...<σ>] [('h h)...<σ>] [(l l)...<σ>] *Unattested*

b. Select (L), Default (R)

[('h l)...<σ>] [(l 'h)...<σ>] [('h h)...<σ>] [(l 'l)...<σ>] I/S *Unattested*

(Hopi reanalyzed)

(1.62) *Right-edge WS bounded systems, with right-edge extrametricality*

Domain (Right), EM (Right), EM Unit (syllable)

a. Select (L), Default (L)

('h l) <σ>] (l 'h) <σ>] ('h h) <σ>] ('l l) <σ>] *Unattested*

(Bhojpuri reanalyzed)

b. Select (L), Default (R)

('h l) <σ>] (l 'h) <σ>] ('h h) <σ>] (l 'l) <σ>] *Unattested*

(1.63) *Unbounded WS systems, with right-edge extrametricality*

Domain *unset*, EM (Right), EM Unit (syllable)

a. Select (L), Default (R)

(l l 'h l h l l l)<σ>] (l l l l l l l 'l)<σ>] *Unattested*

Tahitian (reanalyzed)

b. Select (L), Default (L)

(11^h1^h111)< σ >] (11111111)< σ >]

Unattested

As we can see, none of the 6 accent systems with {EM (Right), Select (Left)} is attested.

1.4.2.4. “Opposite-edge domain” systems generated by the PAF grammar

In the PAF theory, the Domain and Extrametricality parameters are independent; in particular, they may be set to opposite values, generating the language types in Table 1.5.

TABLE 1.5. *The opposite-edge systems.*

<i>Domain</i>	<i>EM</i>	<i>Select</i>	<i>Default</i>	<i>Language</i>	<i>Comment</i>
Left	Right	Left	Left	N/A	Violation of ALH (see section 1.4.2.3) Opposite-edge domain (section 1.3.6)
Left	Right	Left	Right	N/A	Violation of ALH (see section 1.4.2.3) Opposite-edge domain (section 1.3.6)
Left	Right	Right	Left	N/A	Opposite-edge domain (section 1.3.6)
Left	Right	Right	Right	N/A	Opposite-edge domain (section 1.3.6)
Right	Left	Left	Left		No left-edge EM (section 1.4.2.1) Opposite-edge domain (section 1.3.6)
Right	Left	Left	Right		No left-edge EM (section 1.4.2.1) Opposite-edge domain (section 1.3.6)

Right	Left	Right	Left		No left-edge EM (section 1.4.2.1) Opposite-edge domain (section 1.3.6)
Right	Left	Right	Right		No left-edge EM (section 1.4.2.1) Opposite-edge domain (section 1.3.6)

These 8 systems generated by the PAF grammar are all unattested. Note that all of them involve the accent domain and EM at opposite edges and therefore are not generated by the S&P grammar; moreover, 4 among these (listed in section 1.4.2.1) have left-edge EM and 2 others (listed in section 1.4.2.3) violate the Accent Locality Hypothesis.

1.4.2.5. Parameter space reduction: the results

The S&P and PAF grammars yield distinct, although intersecting, sets of languages. Table 1.6. lists all types of languages yielded by the S&P grammar.

TABLE 1.6. *The language types yielded by the S&P grammar.*

<i>DS</i>	<i>DE</i>	<i>Sel</i>	<i>PP</i>	<i>NF</i>	<i>Attested?</i>
B	L	L	L	No	Yindjibarndi
B	L	L	R	No	Ossetic
B	L	R	L	No	Capanahua
B	L	R	R	No	Archin
B	R	L	L	No	Sundanese
B	R	L	R	No	Aklan
B	R	R	L	No	Epera Pedée

B	R	R	R	No	Yapese
B	R	R	L	Yes	Classical Latin
B	R	R	R	Yes	Cebuano
U	N/A	L	L	No	Au
U	N/A	L	R	No	Kwak'wala
U	N/A	R	L	No	Kuuku Ya?u
U	N/A	R	R	No	Aguacateco
U	N/A	R	L	Yes	Sindhi
U	N/A	R	R	Yes	Western Mari

As can be seen from Table 1.6, the S&P grammar generates 16 types of WS languages. The PAF grammar also generates these 16 types, with EM (Right) replacing Nonfinality (Yes).

In addition, the PAF grammar generates a large number of unattested language types, displayed in Table 1.7.

TABLE 1.7. *The unattested languages generated by the PAF, but not S&P, grammar.*

<i>Domain</i>	<i>EM</i>	<i>Select</i>	<i>Default</i>	<i>attested?</i>
Left	Left	Left	Left	Unattested
Left	Left	Left	Right	Unattested
Left	Left	Right	Left	Unattested
Left	Left	Right	Right	Unattested
Right	Left	Left	Left	Unattested
Right	Left	Left	Right	Unattested

Right	Left	Right	Left	Unattested
Right	Left	Right	Right	Unattested
Left	Right	Left	Left	Unattested
Left	Right	Left	Right	Unattested
Left	Right	Right	Left	Unattested
Left	Right	Right	Right	Unattested
Right	Right	Left	Left	Unattested
Right	Right	Left	Right	Unattested
Not set (UNB)	Left	Left	Left	Unattested
Not set (UNB)	Left	Left	Right	Unattested
Not set (UNB)	Left	Right	Left	Unattested
Not set (UNB)	Left	Right	Right	Unattested
Not set (UNB)	Right	Left	Left	Unattested
Not set (UNB)	Right	Left	Right	Unattested

All 20 language types above, generated by the PAF grammar, are unattested; the S&P grammar does not generate those languages.

Table 1.8 presents the count of all language types generated by the S&P and PAF grammars, respectively.⁷

⁷ In Table 1.8b, I only count those languages with nonfinality where NF Unit (*syllable*), not NF Unit (segment). There are 16 such systems. The total of all *weight-sensitive* systems generated by the S&P theory, including those with NF Unit (segment), is 20 systems, while the total for the PAF grammar is 60 systems. Clearly, counting the segment as a nonfinality unit only widens the gap between the two theories with respect to overgeneration.

TABLE 1.8. *The count of WS languages generated by the PAF and S&P grammars.*

a. *The PAF grammar: 36 WS systems.*

	<i>EM unset</i>	<i>EM unset</i>	<i>EM (L)</i>	<i>EM (L)</i>	<i>EM (R)</i>	<i>EM (R)</i>	<i>Total</i>
<i>Bounded</i>	<i>Dom (L)</i>	<i>Dom (R)</i>	<i>Dom (L)</i>	<i>Dom (R)</i>	<i>Dom (L)</i>	<i>Dom (R)</i>	
	4	4	4	4	4	4	24

<i>Unbounded</i>	4	4	4	4	4	4	12
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Total: 36

b. *The S&P grammar: 16 WS systems.*

<i>Domain</i>	<i>NF (No) = EM unset</i>	<i>NF (No) = EM unset</i>	<i>NF (Yes)</i>	<i>Total</i>
<i>Size</i>				
	<i>DE (Left)</i>	<i>DE (Right)</i>	<i>DE (Right)</i>	
<i>Bounded</i>	4	4	2	10

<i>Unbounded</i>	4	2	6
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Total: 16

In addition, the S&P grammar generates 5 WI systems with/without the nonfinal syllable.

Finally, Table 1.9 compares the PAF and S&P grammars with respect to the number of generated, attested, unattested and “missed” WS language types.

TABLE 1.9. *The number of generated, attested, unattested and missed types of weight-sensitive systems for the PAF and S&P grammars, respectively.*

<i>Grammar</i>	<i>Generated</i>	<i>Attested (after reanalysis)</i>	<i>Overgenerated</i>	<i>Undergenerated</i>
PAF	36	16	20	0
S&P	16	16	0	0

Summarizing, the PAF grammar does not undergenerate. However, it massively overgenerates: 20 languages out of 36, *i.e.* more than a half of the languages generated by the PAF grammar, are unattested. By contrast, the S&P grammar neither under-, nor overgenerates: it generates all, and only, those languages that are effectively attested.

I conclude that the S&P grammar significantly reduces the parameter space and attains the level of descriptive adequacy.

1.5. Comparison of the S&P theory with the Simplified Grid Theory

1.5.1. Introduction

It was shown above that the parameter system of the Scales-and-Parameters theory has a low generative capacity and that, moreover, it neither under-, nor overgenerates.

I will now compare this theory with a sample metrical theory, namely, the widely known Simplified Grid Theory (SGT) of Idsardi (1992) and Halle & Idsardi

(1995). I will demonstrate (focusing here on phonological accent systems) that the SGT is excessively powerful, and leads to parametric ambiguity and overgeneration.

1.5.2. Excessive generative power of the SGT and its theoretical implications

Earlier in this chapter, we have established that the parameter space for the S&P parametric grammar generates 21 types of phonological accent systems (16 WS + 5 WI), all of which are attested (according to StressTyp). That is, for every combination C, there is some S generated by C (*i.e.* no overgeneration). Conversely, for every phonological accent system S in StressTyp, there is a combination of parameter settings C of the S&P theory such that C generates some S (*i.e.* no undergeneration).

Let us now estimate the size of the parameter space of Bill Idsardi's SGT. We must ask first how many settings each parameter of the SGT grammar has.

In Table 1.10, I list the SGT parameters, together with the number of settings for each (according to Halle & Idsardi 1995).

TABLE 1.10. *Number of settings for the parameters of the SGT grammar.*

<i>parameters</i>	<i>settings</i>	<i># settings</i>
<i>line 0</i>		
Project	L/R	2
Edge	L/R, L/R, L/R	2 ³
ICC (<i>language-specific</i>)	L/R/ <i>None</i>	3
Head	L/R	2

line 1

Edge	L/R, L/R, L/R	2^3
Head	L/R	2

The parametric space generated by this grammar has 1,536 ($=2^9 \cdot 3$) 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 *three* binary choices;
- (iii) The Iterative Constituent Construction parameter is language-specific in that systems may lack it altogether, which gives 3 parametric choices (rather than two), *i.e.* the usual “Left” and “Right”, plus *absence* of the parameter for a given language.

Since the 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 H. van der Hulst's approach to rhythm and augment the S&P grammar with this component. It contains 5 binary parameters:

(1.64) Polar beat (Yes/No)

Rhythm (polar/echo)

Weight (Yes/No)

Lapse (Yes/No)

NF (Yes/No)

Since rhythmic parameters are different from the accentual ones in this grammar, the size of the resulting parameter space is $672(=21 \cdot 2^5)$, where 21 is the number of systems generated by the S&P grammar alone. The total number of generated systems equals 693 systems ($=21$ without rhythm + 672 with rhythm), while Idsardi's grammar generates 1,536 systems.

Thus, the "augmented" S&P grammar yields a significantly smaller parameter space than the SGT grammar. Since linguists lack a complete typology of stress systems, it is not possible to evaluate the two theories by comparing the generated systems as a whole (for both accent and rhythm) against the actual ones.

By contrast, for systems that lack rhythm, such a comparison can be made. Since, in the SGT, these systems are generated without the ICC (the parameterized rule responsible for iterative footing), the SGT generates $512(=2^9)$ such systems.

Since the 21 possible combinations of parameter settings allowed by the S&P parameter system yield 21 types of accent systems without over-, nor undergenerating, there exist *at most* 21 attested systems without rhythm. Therefore, the gap between the possible types of systems without rhythm in the SGT and systems without rhythm that are attested is larger than 491 ($=512 - 21$).

This comparison suggests that, for systems that lack rhythm, the SGT strongly overgenerates, while the predictions made by the S&P theory are much more accurate. We should, then, expect that some combinations of parameter settings in Idsardi's theory correspond to a single language (parametric ambiguity) and/or some combinations are unattested (overgeneration); this will be the topic of the next sections.

Recall, though, that the SGT adopts the traditional metrical assumption that stress is a single phonological entity admitting more than one degree (or level) and that metrical theory is, therefore, expected to derive *together* (as part of the same derivation) both primary and secondary stress locations.

Taking into account secondary stress, we expect more than 21 types of systems because some of those might, in fact, have several subtypes, depending on secondary stress patterns that these systems exhibit.

However, if we assume that all of the 1,536 possible accent systems generated by the SGT system correspond to the 21 attested types of languages, then, for every such type, there should exist an average of 73 ($1,536 \approx 21 \cdot 73$) actually attested types of languages characterized by different *secondary* stress patterns. This, however, is exceedingly implausible.

1.5.3. Parametric ambiguity

Interestingly, one case of parametric ambiguity in the SGT is discussed by Bill Idsardi himself (Idsardi 1992:15-16). Specifically, 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 places either all left, or all right parentheses and heads on the metrical grid. This is displayed in (1.65), drawn from Idsardi (1992:15-16).

(1.65) *Parametric ambiguity (Koya)*

a. A “*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
		'11h111h11

b. A “*right parenthesis*” derivation

line 0 Project: R x x x) x x x x) x x

LL 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

^l11h111h11

It is observed in Idsardi (1992:15-16) and Halle & Idsardi (1995:409-410) that both sets of parameter settings yield the *same* accentual patterns of 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 & Idsardi 1995:409-410)

We can readily point out another case of parametric ambiguity. In Taz Selkup, accent falls on the last heavy syllable, otherwise accent is initial. The combination of parameter settings in (1.66a) from Halle & Idsardi (1995) and the one that I suggest in (1.66b) each correctly derive the same prominence profile for Taz.

(1.66) *Parametric ambiguity (Taz Selkup)*

a. *Halle & Idsardi (1995:412-413)*

line 0	Project: L	x x x x x	x(x x x (x x
		L LL L L	LH 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
		'11111	l h l l 'h l

b. *An alternative proposed here*

line 0	Project: L	x x x x x	x (x x x (x x
		L L L L L	L HL 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
		'l 11 1 1	1 h 1 1 'h 1

Thus, simply setting the line 0 Edge to “RRL” in (1.66b) instead of “LLL” in (1.66a), while keeping the other parameter settings intact, yields the same accentual patterns.

Thus, in Koya and in Taz, different combinations of parameter settings yield the same prominence profile. That is, the SGT grammar yields parametrically ambiguous patterns. In addition, for Taz, the output foot structure in (1.66a) and (1.66b) is the

same, which means that, in this case, foot structure cannot be used to facilitate learning (Harry van der Hulst, *p.c.*, 2016).

Summarizing, I have offered evidence that Idsardi's SGT leads to parametric ambiguity which constitutes a classical challenge for learning, unless the learner is supplied additional information (or if, as in some approaches, attaining the correct grammar is not assumed as a criterion for successful learning; William Snyder, *p.c.*, 2016). I will now show that the SGT also leads to overgeneration, focusing on two interesting cases.

1.5.4. Overgeneration

1.5.4.1. The Accent Locality Hypothesis

Earlier in this chapter, I proposed and supported empirically the Accent Locality Hypothesis (ALH), according to which, in WS systems with nonfinality, accent always falls on the heavy syllable which is closest to the right word edge: $h'h <\sigma>]$. This implies that the pattern $*^l h h <\sigma>]$ is unattested: according to ALH, in weight-sensitive languages, accent is never on a heavy syllable to the left of the last heavy syllable in the word. That is, we never encounter accent patterns like (1.67).

(1.67) $*\dots^l h (l\dots) h <\sigma>$

$*\dots^l h (l\dots) h (l\dots) h <\sigma>$

The SGT can be easily shown to predict certain patterns violating the ALH. For example, as shown in (1.69), the SGT grammar can assign the accent to the penultimate heavy syllable in (1.68).

(1.68) h l l 'h h <l>

(1.69)	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 'h h <l>		

Alternatively, setting the Head parameter to “L” on line 1 places the accent on the first heavy syllable of the word, thus violating the ALH in that the system displays final EM, but accent does not fall on the rightmost non-final heavy syllable.

Thus, both patterns violate the ALH and are, therefore, unattested, which provides evidence that the SGT overgenerates. By contrast, the S&P grammar respects the ALH because Select is dependent on Nonfinality, so that if NF (Yes) & Weight (Yes), then Select may not be set to “Left”. As a result, the S&P grammar does not overgenerate in this respect.

1.5.4.2. Initial extrametricality

As argued in Chapter 1 (section 1.4.2.1), based on specific case studies, there seem to be no genuine *weight-sensitive* accent systems with initial EM, with the purported cases coming from inaccurate descriptions (*e.g.*, Negev Bedouin Arabic) and analytic simplifications (*e.g.*, Kashaya).⁸

Contrary to the fact, the SGT predicts a range of weight-sensitive systems with left-edge EM, as evidenced, for example, by the following derivations.

(1.70) x Head: R
 x (x x Edge: LRL line 1
 x x x Head: L
 (x (x x (x Edge: LRL
 (x x x (x Project: L line 0
 <h> l l 'h

(1.71) x Head: L
 x (x x Edge: LRL line 1
 x x x Head: L
 (x (x (x x) Edge: RRR
 (x (x (x x Project: L line 0
 <h> 'h h l

⁸ Initial EM in Winnebago, suggested by third-syllable accent, need not concern us here because Winnebago is a *weight-insensitive* system.

The reason why these derivations (among other ones that are possible) yield unattested patterns is because, for weight-sensitive systems, left-edge extrametricality does not exist. This, again, provides evidence that the SGT overgenerates.

1.5.5. Summary

Summarizing, although Idsardi's Simplified Grid Theory aims at capturing both primary and secondary stress, while the Scales-and-Parameters theory proposed in this dissertation is limited to word accent, the two theories are, nevertheless, comparable with respect to word accent assignment.

I have shown here that the Simplified Grid Theory overgenerates and leads to parametric ambiguity, unlike the Scales-and-Parameters theory which attains descriptive adequacy (for the class of phonological accent systems).

1.6. Chapter conclusions

In this first chapter, I have argued that the parameters of the Scales-and-Parameters system in (1.8) are ordered in a particular way and that certain parameters are dependent on others. Some of those dependencies are intrinsic, as they derive from the content of the parameters themselves, while others result from empirical hypotheses and are, therefore, extrinsic.

In particular, I have submitted the Accent Locality Hypothesis (1.20) which leads to a dependency between the Select and Nonfinality parameters:

(1.20) If a WS system has nonfinality, then, in words with heavy syllables, accent must fall on the heaviest syllable closest to the right edge of the word.

From (1.20), I have drawn the testable, falsifiable Accent Locality prediction in (1.23).

(1.23) There are no languages characterized by the combination {Weight (Yes), NF (Yes), Select (Left)}. The three other combinations of parameter values for Nonfinality and Select are attested.

A careful analysis of StressTyp data has revealed that the prediction (1.23) is borne out for both bounded and unbounded weight-sensitive systems (for all nonfinality units). Therefore, the Accent Locality Hypothesis is supported.

I have also provided an explicit, exhaustive list of all possible systems generated by the PAF and S&P grammars, respectively, indicating which systems are attested and which are not.

See the Appendix for a tree which represents the generation of language types by the S&P parameter system, as well as dependency and ordering relations between the parameters.

To conclude, comparison of the PAF and S&P grammars by means of a parametric typology has revealed that, for phonological accent systems, the former strongly overgenerates, while the latter significantly reduces the parameter space in specific ways that make this grammar descriptively adequate.

Chapter 2

Case studies

Case studies

2.1. Introduction

In the preceding chapter, it was demonstrated that the PAF grammar strongly overgenerates. I presented the parameter system of the Scales-and-Parameters theory, and identified the ordering and dependencies among its parameters. As shown, this significantly reduces the parameter space, compared to the PAF grammar.

Further, primarily designed for phonologically predictable accent, the PAF theory does not capture accent assignment in systems which involve lexical accent (at least, to some extent).

The goal of the present chapter is, then, to construct, based on case studies from the latter kind of languages, a “full-blown” Scales-and-Parameters grammar that would account for such systems in a uniform way, compatible with the account for phonological accent systems. To that end, in this chapter, the S&P grammar will be augmented with novel types of weight scales.

Empirical evidence on which my proposal is based comes from detailed, reliable descriptions (often, for the first time in English), complemented with instrumental-phonetic studies (when available).

Chapter 2 is organized as follows. Each case study consists of two main parts: a description and a theoretical account. First, I will consider two pure lexical accent systems, *viz.* Central and Southern Selkup (section 2.2), and Uzbek (section 2.3). The following sections examine two accent systems that combine syllable weight and

lexical accent. *viz.* Eastern Literary Mari (section 2.4) and Tundra Nenets (section 2.5). Finally, I will revisit problems relating to accentual dominance (section 2.6) and cyclicity (section 2.7) from the perspective of the Scales-and-Parameters theory, and explain how the Scales approach at the core of this theory can successfully eliminate apparent problems.

2.2. Central and Southern Selkup

2.2.1. Introduction

In this section, I examine accent assignment in Selkup (a Samoyedic language of the Uralic family), limiting myself to its Central and Southern varieties.

While accent in Taz Selkup (a Northern Selkup dialect) was previously described and analyzed in several important publications, including metrical (McNaughton 1976; Idsardi 1992; Halle & Idsardi 1995), little attention has been paid in the Western literature to Central and Southern Selkup.

Yet, there exists an extremely rich archive of fieldwork materials for these dialects (the so-called “Dulzon archive”), collected and organized over decades by a group of Soviet scholars. These extensive materials recently served as a source for several quite detailed Russian-language publications which describe and exemplify accentual patterns of different Central and Southern varieties. (Normanskaya et al. 2011, Normanskaya 2011, 2012).

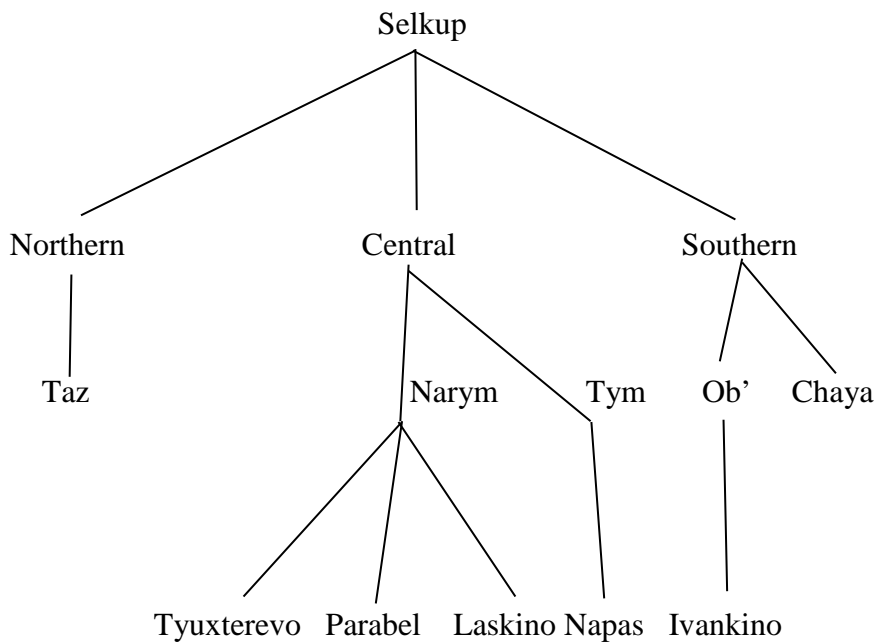
The goal of this section is, first, to arrive at an accurate description of accent and weight in these dialects (using the Russian-language publications above) and, second, to account for these descriptive generalizations in terms of the S&P theory.

The section is organized as follows. In section 2.2.2, I provide background information on Selkup dialects, some of which will be described here, and on the descriptive sources used. The next section is a cursory look at the vowel system of the Central and Southern Selkup. Section 2.2.4 shows, based on minimal pairs and phonetic evidence, that, in these dialects, word accent is contrastive and is, therefore, assigned with reference to lexical accents. Section 2.2.5 describes accentual patterns in Napas and Parabel (two Central Selkup varieties) with reference to lexical accents assigned to individual morphemes. Then, based on the data in section 2.2.5, I identify an important problem for accent theories posed by special behavior of certain Selkup suffixes (section 2.2.6). Section 2.2.7 offers a novel account of accent assignment in Central and Southern Selkup. In particular, in sections 2.2.7.1-2.2.7.3, notions “diacritic weight”, “diacritic weight scale” and “Weight Grid” are introduced. This leads me to propose a diacritic weight scale for Central and Southern Selkup (section 2.2.7.4). Then, I account for accent assignment in this language in terms of an S&P grammar that contains a particular set of parameter settings and the diacritic weight scale established in the preceding section (section 2.2.7.5). Sample derivations illustrate how this grammar works (section 2.2.7.6). In the end, a conclusion sums up the results.

2.2.2. The background

Selkup belongs to the Samoyedic group of the Uralic language family. It is not dialectally monolithic, consisting rather of a number of dialects. The tree in (2.1) represents the dialectal variation with respect insofar as accent is concerned, with some dialects consisting of several linguistic varieties.

(2.1) *Major Selkup dialects*



The major dialectal split with respect to accentuation is that between Northern Selkup varieties vs Central and Southern Selkup varieties. For example, the more extensively studied dialect of Taz (Northern Selkup) has a phonological WS system (CVV heavy) described as a bounded I/I WS system in McNaughton (1976:135) and reanalyzed as L/F in Idsardi (1992). Unlike Taz, accent in Central and Southern dialects

of Selkup is assigned by an unbounded F/F accent system with reference to diacritic weight.

In this section, I will mostly discuss Central Selkup, namely the Tym dialect (as spoken in the village of Napas) and the Narym dialect (as spoken in the villages of Parabel and Laskino). I must add that, although the Far South dialect of Chaya is the only Southern Selkup dialect mentioned here, the results can be straightforwardly extended to Southern Selkup dialects as well. All Selkup data used here come from Normanskaya et al. (2011) and Normanskaya (2011, 2012) whose work is based on:

(i) fieldwork-based materials from the extensive “Dulzon archive” (held at the the National Pedagogical University of Tomsk);

(ii) on the materials from a 2009 fieldwork expedition (elicitors: N. L. Fedotova, S. E. Šešenin and M. K. Amelina).

Before discussing accent in Central and Southern Selkup dialects, I will briefly mention their vowel system.

2.2.3. The vowel system

Selkup dialects may differ with respect to their vowel system. The representative system of Parabel and Narym Selkup (Šešenin 2011) is given in (2.2).

(2.2) *The vowel system of Parabel and Narym Selkup*

i	y	ɨ	u
e	ø	ə	o
æ			a

Symmetries in (2.2) with respect to backness and rounding are reminiscent of languages with vowel harmony. Indeed, Selkup exhibits harmony processes, but little seems to be mentioned the literature.

Given that accent assignment in Central and Southern dialects of Selkup does not make reference to the phonological properties of vowels, the vowel systems of the Selkup dialects are not relevant to the accentual description below.

2.2.4. Contrastive accent

The accent system of C. and S. Selkup is unbounded: while, in (2.3a,b), accent is inside the three-syllable window at the left word edge, it can also reach outside the window, witness (2.3c-e).

- (2.3) a. ¹tʃøndiʃpugu cover-INF
- b. tʃøn¹diʃpugu girdle-INF
- c. losti¹rolⁱdʒigu cross-SEMEL-INF

d. adɪmbi'gu appear-INF

e. kyʒəmbu'gu urinate-INF

Further, C. and S. Selkup has many minimal pairs, such as those in (2.3a,b) and in (2.4), which implies that accent in C. and S. Selkup is contrastive and, therefore, not phonologically predictable. Accordingly, these dialects of Selkup have been analyzed as a lexical accent system, with lexical (un)accentedness of individual morphemes being determined based on their accentual patterning in complex words (Normanskaya et al. 2011; Normanskaya 2011, 2012).

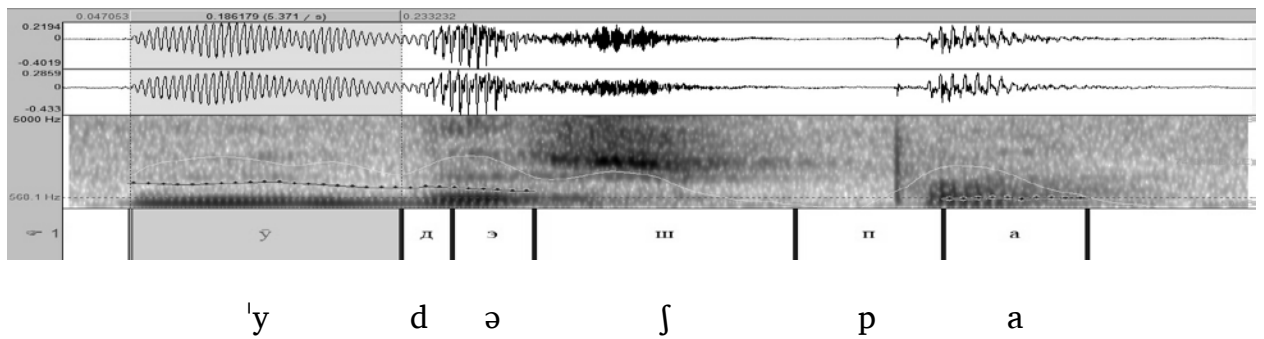
(2.4) a. 'ydəʃpa fall-PRES-3Sg (of a night)

b. y'dəʃpa get drunk-PAST-3Sg

Phonetic evidence supports this conclusion. For example, Figure 2.1 offers acoustic evidence that the words in (2.4a,b) only differ in accent location. (Increased duration is the acoustic correlate of accent in Selkup.)

FIGURE 2.1. *The results of the acoustic analysis of the minimal stress pair in (2.4).
(From Normanskaya et al. 2011).*

a. *The waveform, the spectrogram, the f_0 trace and the intensity contour of [ʔydəʃpa] in (2.4a) as produced by a female speaker (Narym Selkup, the variety spoken in the village of Parabel).*



b. *The waveform, the spectrogram, the f_0 trace and the intensity contour of [yʔdəʃpa] in (2.4b) as produced by a female speaker (Narym Selkup, the variety spoken in the village of Parabel).*

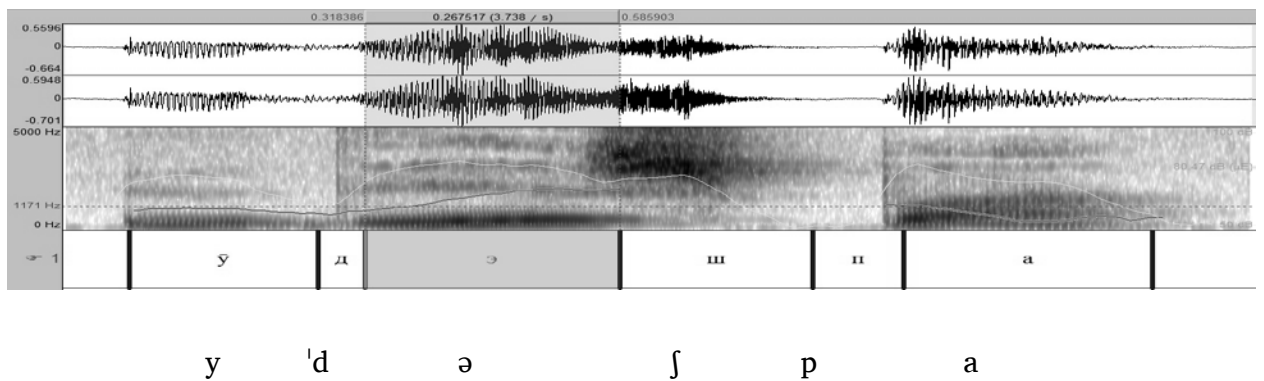
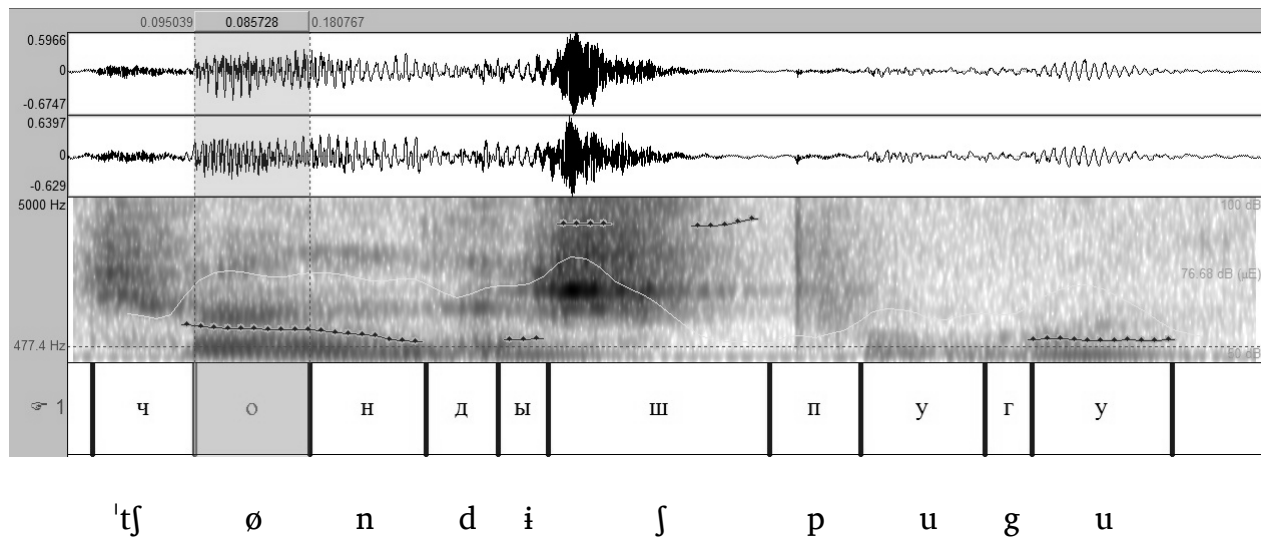


Figure 2.2 illustrates the difference in accent location between (2.3a) and (2.3b).

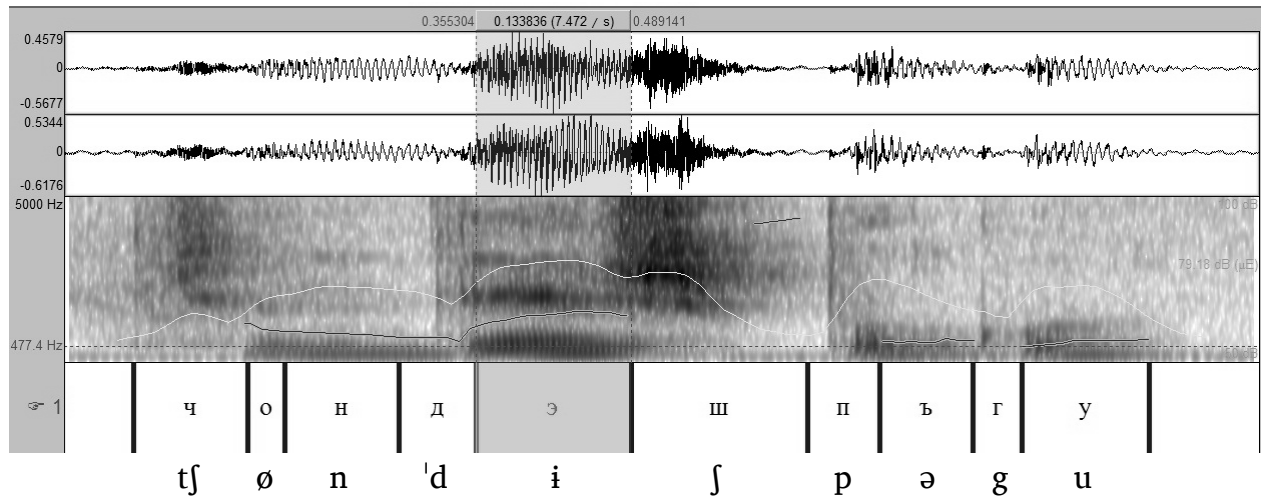
FIGURE 2.2. *The results of the acoustic analysis of the minimal stress pair in (2.3a,b).*

(From Normanskaya et al. 2011).

a. *The waveform, the spectrogram, the f_0 trace and the intensity contour of [ʰtʃøndiʃpugu] in (2.3a) as produced by a female speaker (Narym Selkup, the variety spoken in the village of Parabel).*



b. *The waveform, the spectrogram, the f_0 trace and the intensity contour of [tʃøn'diʃpugu] in (2.3b) as produced by a female speaker (Narym Selkup, the variety spoken in the village of Parabel).*



Thus, following Normanskaya et al. (2011), I conclude (based on phonological and phonetic evidence above) that Central and Southern Selkup is an unbounded lexical accent system.

2.2.5. Accent patterns in Central Selkup

In this section, I establish the accent rule for two Central Selkup varieties, viz. Napas and Parabel.

2.2.5.1. Accent patterns in Napas Selkup

Let us begin with Napas Selkup. First, when a lexically accented suffix, *e.g.* /-e/ in (2.5), is attached to an unaccented root, accent falls on the suffix, which is the unique lexically accented morpheme in the word.

(2.5) *unaccented root-accented suffix*

kap't-e	current (berry)
---------	-----------------

ki'g ^j -e	river
----------------------	-------

Further, in words with two lexically accented morphemes, the leftmost such morpheme is accented.

(2.6) *accented root-accented suffix*

'komd-e	money
---------	-------

'kver ^j -e	crow
-----------------------	------

'tʃib-e	fly
---------	-----

If the word-initial morpheme (the root in Selkup) is lexically accented, then it receives the accent, even in presence of lexically accented suffixes.

(2.7) *accented root-accented /-eʃ/-unaccented /-pu/-accented /-gu/*

^h ig ^j -eʃ-pu-gu	detach-INF
^h kil-eʃ-pu-gu	cast.aside-INF
^h tar-eʃ-pu-gu	make.distant-INF
^h ʃer ^j -eʃ-pu-gu	break.in-INF

If the word-initial morpheme (the root) is lexically unaccented, then accent falls on the leftmost lexically accented suffix.

(2.8) *unaccented root-accented /-eʃ/-unaccented /-pu/-accented /-gu/*

il- ^h eʃ-pu-gu	weigh.off-INF
xel- ^h eʃ-pu-gu	sharpen.up-INF

Summarizing, in words that contain lexically accented morphemes, the leftmost such morpheme is accented.

Finally, in lexically unaccented words, accent falls on the initial syllable. That is, default accent is initial in Napas. For example, when the unaccented suffix /-a/ is added to an unaccented root, as in (2.9), accent falls on the initial syllable of the word.

(2.9) *unaccented root-unaccented suffix*

'am-a	mother
'loy-a	fox
'lak-a	thing
'mak-a	stick
'mik-a	needle

I conclude that, in Napas Selkup, accent falls on the leftmost lexically accented morpheme in the word; otherwise, accent is initial.

2.2.5.2. Accent patterns in Parabel Selkup

Let us now turn to the accentual patterns in another Selkup variety, namely the Parabel variety of Narym Selkup.

To begin with, note that certain morphemes vary in accentedness depending on the variety of Selkup. For example, the suffix */-gu/*, lexically accented in Napas, is unaccented in the Southern dialect of Chaya. Also, the suffix */-a/*, lexically unaccented in Napas, is accented in Parabel.

Let us now examine the accent patterns in Parabel. When an accented suffix is attached to an unaccented root, accent falls on the suffix. For example, when the accented suffix */-a/* is attached to an unaccented root, accent falls on */-a/* (2.10).

(2.10) *unaccented root-accented suffix*

kal- ¹ a	cup
paʒ- ¹ a	birch.bark.container
teʃ- ¹ a	frost

In words with two lexically accented morphemes, accent falls on the leftmost one. Evidence comes from words like (2.11) and (2.12).

(2.11) *accented root-accented suffix /-a/*

¹ arm-a	coolness
¹ kag-a	corpse
¹ kuj-a	scoop
¹ mer-a	price

(2.12) *accented root-accented suffix /-e/*

¹ kad-e	spruce
¹ kyʒ-e	urine
¹ yn-e	belt

Unfortunately, in the case of Parabel, it is not possible to determine the default accent location due to the lack of relevant data.

2.2.5.3. The accent rule (preliminary)

Based on the description above, the accent rule for Napas and Parabel Selkup can be approximated as follows.

(2.13) The accent rule (preliminary)

Accent falls on the leftmost lexically accented morpheme in the word (if any); otherwise, accent is initial.

2.2.6. The problem: “accent-categorizing” suffixes

Normanskaya et al. (2011) and Normanskaya (2011, 2012) report the existence of a class of special suffixes that they call “accent-categorizing”. These are special in that they receive word accent, regardless of the presence or absence of a lexical accent on the other morphemes in the word. Unfortunately, the authors mention only one accent-categorizing morpheme, the semelfactive suffix *-ol/-al*. This suffix is accent-categorizing in certain Selkup varieties, including Parabel (but not in others, such as Napas).

The property of accent categorization is illustrated in (2.14).

(2.14) a. *accented root-categorizing suffix-accented suffix*

tap-^lol-gu kick-SEMEL-INF

kob-^lal-gu scour-SEMEL-INF

b. *unaccented root-categorizing suffix-unaccented suffix-accented suffix*

kad-^lol-bi-gu scratch

yt-^lal-ʒu-gu make drunk

Thus, when an accented root is followed by an accent-categorizing suffix (not necessarily immediately), the root does *not* get the word accent (2.14a). Therefore, the accent rule, saying that the leftmost lexically accented morpheme receives the word accent, is here violated.

Crucially, the PAF theory fails to capture the pattern in (2.14a): indeed, setting Select to “Left” would capture the general case described by the accent rule (2.13), but does not derive the special pattern in (2.14a).

In the next section, I will show how this problem is addressed in the framework of the S&P theory.

2.2.7. The account

As noted above, the PAF theory cannot capture accent categorization: no possible way of setting the PAF parameters would derive (2.14a). This leads me to further extend the theory by defining novel types of *weight scales*.

Below, I introduce the notions *diacritic weight* (section 2.2.7.1), *diacritic* and *hybrid weight scales* (section 2.2.7.2) and the *Weight Grid* (section 2.2.7.3). These are, then, instantiated for C. and S. Selkup dialects (section 2.2.7.4), as part of their overall accentual grammar (section 2.2.7.5). Finally, sample derivations will illustrate how the proposed grammar accurately assigns word accent (section 2.2.7.6).

2.2.7.1. Diacritic weight

Morphemes, like syllables, are capable of attracting or repelling accent: certain morphemes can be accented, while others cannot. This is what van der Hulst (1999:19) has named “diacritic weight”. Thus, accent attraction can be captured in terms of weight, rather than in terms of lexical accents. This implies a radical change in perspective: in this view, accent-attracting morphemes are diacritically heavy (rather than lexically accented), while accent-repelling morphemes are diacritically light (rather than lexically unaccented).

The question arises, then, whether syllable weight and diacritic weight are different instances of the same notion “weight”.

Indeed, these differ in that syllable weight is phonologically motivated (by syllable and/or segmental structure), while diacritic weight is not predictable and, as such, must be assigned in the lexicon.

Nevertheless, diacritic weight and syllable weight group together because they pattern together: as discussed later on, in certain languages, they are ordered in a single weight scale and accent is assigned with reference to both.

In sections 2.2.7.2-2.2.7.3, building on the notion of “diacritic weight”, I augment the theory with additional formal devices in order to extend its empirical coverage.

2.2.7.2. Introducing diacritic and hybrid weight scales

It is well-known that, in some WS languages, accent is assigned with reference to a phonological weight scale. Examples of some such scales are given in Table 2.1.

TABLE 2.1. *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 > Ci̇

Similarly, in some accent systems with diacritic weight, diacritic weight distinctions are scalar rather than binary. In these systems, accent is assigned with reference to a diacritic weight scale, *i.e.*, 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 (2.15).

(2.15) diacritically superheavy > diacritically heavy > diacritically light

Although diacritic weight scales resemble phonological weight scales in that both are ordinal, the two differ in that the former order *morphemes*, while the latter

order *syllables*. This predicts that another type of scale is also possible: a language-specific scale that orders both syllables and morphemes. This prediction turns out to be correct: as discussed in section 2.3.8.2, such scales, which I call “hybrid weight scales”, are effectively attested, *e.g.*, in Eastern Literary Mari (Vaxman 2014, 2015c).

2.2.7.3. The Weight Grid

A *Weight Grid* is a phonological representation of relative weight of morphemes/syllables (according to the weight scale of the language) as columns of gridmarks: the taller the column, the heavier the relevant unit (syllable or morpheme); a light unit gets one gridmark. Phonological, diacritic, hybrid and relativized weight scales (to be discussed) can all be translated into such Weight Grids.

For example, the weight scale *superheavy* > *heavy* > *light* corresponds to the Weight Grid in (2.16).

(2.16) *The Weight Grid*

sup	h	l
*	*	*
*	*	
*		

The present “Weight Grid” proposal builds on proposals to grid syllable weight/sonority in Prince (1983:57-59) and van der Hulst (1984:67-68), worked out later for sonority relations by Parker (1989:9-12).

Finally, one must bear in mind that, in a lexical accent system, where only morphemes have weight, the Weight Grid represents *morphemic* differences in *diacritic* weight (not syllable weight distinctions).

2.2.7.4. The diacritic weight scale of Central and Southern Selkup

The question at hand is, thus, how to capture the general accent rule of Central Selkup and the behavior of the accent-categorizing suffix in terms of a single accent-assigning mechanism.

Viewing accent attraction as a manifestation of diacritic weight leads us to analyzing *-ol* as diacritically *superheavy* because this suffix always attracts accent; crucially, in words that also contain heavy morphemes. Therefore, Central Selkup displays a *scalar* weight distinction, opposing diacritically *superheavy* vs. diacritically *heavy* (“lexically accented”) vs. diacritically *light* (“lexically unaccented”) morphemes.

The weight relation *heavier-than* is established through pairwise comparisons between morphemes. For example, the comparison of the morphemes in (2.14a) leads us to conclude that superheavy morphemes are heavier than the heavy ones, and the comparison of the heavy and light morphemes in (2.5) for Napas and (2.10) for Parabel indicates that the former are heavier than the latter.

Unfortunately, the available Selkup data do not contain forms with both light and superheavy morphemes, which would make the relevant pairwise comparison possible.

However, it is possible to demonstrate that superheavy morphemes are heavier than the light ones *indirectly*, by providing evidence that the weight relation “heavier-than” is *transitive*.

To that end, one must show that, if the superheavy morpheme is *heavier* than the heavy morpheme *and* the heavy morpheme is *heavier* than the light morpheme, then the superheavy morpheme is *heavier* than the light one.

Evidence for transitivity comes from those forms that contain all three types of morphemes. In such forms, accent cannot be attracted to diacritically light morpheme(s) because of the presence of diacritically heavy morpheme(s), which are heavier than the former and which, therefore, *attract* accent. However, the diacritically heavy morphemes are not permitted to effectively receive the word accent, because these forms (by hypothesis) also contain a superheavy morpheme, which is heavier than the heavy morphemes. Therefore, it is predicted that accent will fall on the superheavy morpheme.

Now, for a given language, if it is the case that the superheavy morpheme is effectively accented in all such forms, then this morpheme is *heavier* than the light morphemes in these forms and, therefore, the weight relation is transitive.

Indeed, the Selkup forms of this type in our corpus are accented on the superheavy. In particular, in [kad-¹ol-bi-gu] from (2.14b), in which a light root followed by the superheavy suffix –ol, the light suffix -bi and the heavy suffix –gu, accent falls on the superheavy morpheme.

Therefore, the *heavier-than* relation for C. Selkup morphemes is transitive.

In addition, superheavy > light in Selkup. Evidently, this *heavier-than* relation is also reflexive and antisymmetric.

Therefore, Central and Southern Selkup has the diacritic weight scale in (2.17):

(2.17) diacritically superheavy > diacritically heavy > diacritically light

Now, we can restate the accent rule of Selkup in its final form, with reference to the weight scale in (2.17).

(2.18) *The accent rule of C. and S. Selkup (final)*

In words that contain diacritically heavy and/or superheavy morpheme(s), accent falls on the leftmost diacritically *heaviest* morpheme; if all morphemes in the word are diacritically light, accent is word-initial.

I will now present the S&P grammar needed to derive the accent patterns described above.

2.2.7.5. The accentual grammar of Central and Southern Selkup

The diacritic weight scale (2.17) is translated into the Weight Grid (2.19). Recall that this represents the diacritic weight of every morpheme (given by the weight scale) as a column of gridmarks, where the number of gridmarks in a given column is equal to the weight degree of that morpheme.

I now propose that the accentual grammar of C. and S. Selkup consists of the Weight Grid (2.19) and of the combination of parameter settings (2.20).

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

sup _d	h _d	l _d
*	*	*
*	*	
*		

(Henceforth, the subscript “_d” stands for “diacritic”; “h”, “l” and “sup” stand for “heavy”, “light” and “superheavy”, respectively.)

(2.20) Domain Size (Unbounded)

Nonfinality (No)

Weight (Yes)

Project Position (Left)

Select (Left)

In words with heavies, word accent is assigned by, first, projecting the morphemes that are heaviest 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 top of that gridmark 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.

2.2.7.6. Derivations

I will now describe how the derivations work for Selkup in different cases and illustrate this with sample derivations.

One must pay attention that, in the course of a derivation, *only the heaviest* morphemes in a word *project their weight* from the Weight Grid onto the Accent Grid. With this important assumption in mind, there are several situations to consider.

(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.

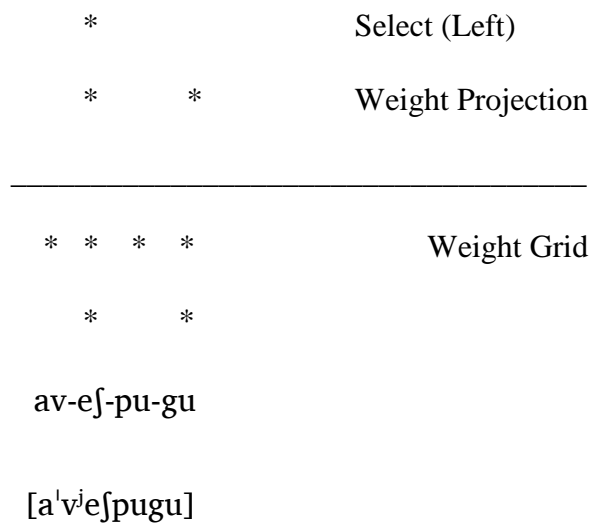
For example, the derivation for the Napas Selkup form [ʔvelgu] (“steal-INF”) runs as in (2.21).

(2.21) /tvel-gu/: *heavy root* /tvel/, *heavy suffix* /-gu/



In the example above, the root is diacritically heavy. Consider now the form [a¹vⁱe]pugu] (“burn.down-INF”) in (2.22), in which the root is diacritically light, while certain suffixes are diacritically heavy. These suffixes are projected, while the root is not (it is light). The Select parameter chooses the leftmost gridmark in the domain.

(2.22) /av-ef-pu-gu/: /av/: *light*; /-ef/: *heavy*; /-pu/: *light*; /-gu/: *heavy*

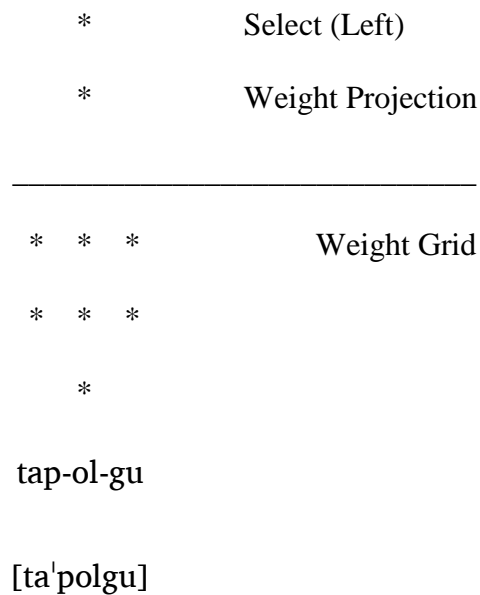


(ii) *Words that contain a superheavy morpheme*

Since the superheavy morpheme is the heaviest in the word, it is the only one to be projected. Then, it is chosen by Select (Left) chooses the superheavy suffix, making it accented.

This is exemplified by the derivation (2.23) for the form [ta'polgu] (“kick-SEMEL-INF”).

(2.23) /tap-ol-gu/: *heavy root* /tap/, *superheavy suffix* /-ol/, *heavy suffix* /-gu/



Furthermore, the current theory predicts accent on the leftmost superheavy morpheme in words with more than one such morpheme. In practice, I could not test this prediction due to lack of relevant data..

(iii) “*All-light*” 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 (2.24) for the form [ˈlar-em-bu-gu] (“fear-INF”) in the Chaya variety (Southern Selkup).

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

*	Select (Left)
*	Project Position (Left)
<hr/>	
* * * *	Weight Grid
lar-em-bu-gu	
[ˈlarembugu]	

2.2.8. Summary

In this section, I have presented (for the first time in English) an accentual description of Central and Southern Selkup, drawing on recent Russian-language descriptions (Normanskaya et al. 2011; Normanskaya 2011, 2012).

As noted by these authors, these Selkp varieties have contrastive accent falling on the initial syllable of the leftmost diacritically heavy morpheme, otherwise on the initial syllable of the word. Therefore, this is an unbounded WS First/First accent system.

While the PAF theory correctly accounts for accent location in a number of languages, it encounters difficulties with respect to those accent systems that involve lexical accent. The S&P theory makes such an account possible by reanalyzing lexical accent as diacritic weight, which further allows for the notion of a *diacritic weight scale*.

Specifically, I have shown how the S&P theory captures accentuation in Central and Southern Selkup in terms of the diacritic weight scale (2.17), encoded in the grammar as the Weight Grid (2.19), and of the set of parameter settings (2.20).

Importantly, diacritic weight scales are possible because *weight allows for scalar distinctions*. Lexical accent theories are unable to make reference to weight scales because *lexical accent distinctions are inherently binary* (accented vs. unaccented).

In order to account for dominant morphemes, lexical accent theories have, instead, recourse to accent deletion (see Poser 1984, Kiparsky 1984, Inkelas 1997) whereby word accent on the (lexically accented) dominant morpheme results from deletion of accents on all other accented morphemes in the form. For a comparison of the Scales and Accent Deletion approaches, see section 2.6.

Thus, weight scales containing diacritic weight play a central role in the S&P theory. In the next section, I will show that in Uzbek, accent is assigned with reference

to the same ternary diacritic weight scale (2.15) as in (genetically unrelated) Selkup, a finding that lends additional empirical support to the notion of “diacritic weight scale”.

2.3. Uzbek

2.3.1. Introduction

This section offers a study of word-level accentuation in Uzbek (Eastern Turkic, Altaic), spoken in Uzbekistan and neighboring countries of Central Asia. I will mostly focus on Standard Uzbek.

The accent system of Uzbek is severely understudied, with only a handful of descriptions and hardly any formal account. Data here come mainly from Sjoberg (1962, 1963) and Bodrogligeti (2003), which are important descriptive sources on Uzbek.

Generally, accent in Uzbek is final (which is very common in Turkic languages). At the same time, there are numerous exceptions, many of which are associated with productive morphological processes and, therefore, require a systematic formal account.

The goal of the section is to draw accurate accentual generalizations for Uzbek and to account for these generalizations in terms of the S&P theory. This account must integrate the general accent rule with the exceptions to it.

The section is organized as follows. After mentioning Uzbek vowel system (section 2.3.2), I will describe the accent patterns, state the accent rule and present different kinds of exceptions violating this rule (section 2.3.3). Then, I will offer an

integrated account of accent assignment in Uzbek in terms of the S&P theory whereby the general accent rule and the exceptions to it are accounted in the same way using a single accentual grammar for both. In the end, it will be illustrated with sample derivations how this grammar works (section 2.3.4).

2.3.2. The vowel system

Based on her detailed phonemic classification of vocalic allophones of Uzbek, Sjöberg (1963) establishes the classical 5-vowel system (/i, u, e, o, a/) for Uzbek. Interestingly, unlike other Turkic languages, Uzbek lacks vowel harmony.

2.3.3. The accentual description

2.3.3.1. Contrastive accent

In Uzbek, accent location is variable and different accent locations can distinguish words, all else being the same, witness the following minimal stress pairs (drawn from Sjöberg 1962, 1963 and Trofimov 1980):

(2.25) a. at^las silk cloth

^latlas atlas

 b. e^ltik boot

^letik ethics

c. joz- ^l ma	written (by hand)
^l joz-ma	write-NEG
d. fi ^l zik	physical
^l fizik	physicist

The existence of minimal accent pairs, such as above, implies that accent in Uzbek is contrastive.

2.3.3.2. The default final accent

Word accent is known to be final in Uzbek. Thus, in the “native” vocabulary, it falls on the final syllable in morphologically simple words and regularly shifts to the word-final syllable under suffixation (Vinogradov 1966).

(2.26) kiʃ ^l lok	village
kiʃloklari ^l miz	our villages
kiʃloklarimizdagi ^l lar	those in our villages

Also, many loanwords displaying non-final accent in the source language receive, in Uzbek, regular accent on the last syllable. For example, the Russian form with accent on the initial syllable in (2.27) was adapted in Uzbek with final accent.

(2.27)	<i>Russian</i>	<i>Uzbek</i>	<i>gloss</i>
	¹ pojst	pɔ ¹ jist	train

2.3.3.3. Exceptional accent patterns

Accent in Uzbek is generally final, but there is also a large number of exceptions. Thus, in certain numerals, including the words in (2.28), accent falls on the initial syllable.

(2.28)	¹ etti	seven
	¹ sakkiz	eight
	¹ ontort	fourteen
	¹ etmif	seventy
	¹ sakson	eighty

Further, many bound morphemes of Uzbek behave in exceptional ways with respect to accent location.

First, in certain complex verbal forms, accent is initial.

(2.29)	¹ kel-sin-lar	come-3Prs-Pl!
	¹ bof-la-ma	head-VERBALIZ-NEG

Second, accent is also initial in wh-words, *e.g.* words derived from /qa(n)/ (“what”).

(2.30) 'qandaj	what kind
'qajsi	which
'qaer-da	what-LOCATIVE (where)
'qan-tʃa	what-EQUAT (how much)
'qalaj	how

Finally, indefinite pronouns derived by prefixation of [alla-] have initial accent:

(2.31) 'alla-nima	some-what (something)
'alla-qaer-da	some-what-LOCATIVE (somewhere)
'alla-qaer-ga	some-what-LATIVE (to somewhere)
'alla-qajok-da	some-which-LOCATIVE (somewhere)
'alla-maxal-da	some-late.time-LOCATIVE (late)
'alla-maxal-ga-tʃa	some-time-LATIVE-EQUAT (until late)

While some Uzbek affixes and particles attract the accent away from the default final location, some others repel the accent. This is illustrated in (2.32) with the example of the equative /-tʃa/, restrictive /-gina/ and comparative /-dek/ case suffixes (2.32a-c), Past suffix /-di/ (2.32d), the emphatic particle /-da/ (2.32e) and the interrogative particles /-mi/ and /-tʃi/ (2.32f).

(2.32) a. ʊzbek-tʃa	Uzbek-EQUAT (“the Uzbek way”)
kahramon- ^l lar-tʃa	hero-PI-EQUAT (“heroically”)
b. u- ^l lar-gina	3Prs-PI-RESTRICT (“only they”)
paxta-kor- ^l lar-gina	cotton-worker-PI-RESTRICT
	(“only the cotton growers”)
c. ^l toʃ-dek	stone-COMPAR (“like stone”)
d. ^l ket-di	leave-PAST.3Sg
e. kel- ^l di-da	come-PAST.3Sg-EMPHAT (“but he came!”)
tʃik- ^l di-da	go.out-PAST.3Sg-EMPHAT (“but he went out!”)
f. kel- ^l di-mi	come-PAST-INTERR (“came?”)
^l sen-tʃi	2Prs-INTERR (“you?”)

In addition, there are many loanwords in Uzbek, primarily from Russian, Arabic and Persian. Importantly, certain loanwords have retained the non-final accent of the source forms. For example, the Arabic and Persian loanwords in (2.33a) have penult accent, while the one in (2.33b) has accent on the antepenult.

(2.33) a. 'lekin	but
'tʃuŋki	because
'hamma	all
'hozir	now
'bazan	sometimes
b. 'masala	for example

2.3.4. The account

2.3.4.1. Introduction

In the preceding section, I gave a detailed list of exceptions to the final accent in Uzbek. As we have seen, most exceptions result from productive suffixation and/or cliticization. Thus, exceptions are here systematic and cannot be memorized, which suggests a need for a principled formal account.

Below, I offer an account of accent assignment in Uzbek which uniformly integrates the accent rule and the systematic exceptions of Uzbek in terms of the S&P theory.

2.3.4.2. An unbounded system

As frequently noted (*e.g.* see Vinogradov 1966), Uzbek accent is generally final. Also, in many words, accent is penult or antepenult, which suggests that Uzbek is a right-edge BS. However, in certain morphologically complex words, accent falls more than three syllables from the right edge, reaching the initial syllable, as exemplified in (2.34):

(2.34) 'allanima	something
'allaqantʃa	several
'allaqajokda	somewhere
'allamaxalda	late
'allanevaktgatʃa	until late
'allamaxalgatʃa	until late

Such words provide evidence that Uzbek is, in fact, an US. I conclude that the Domain Size parameter is set to “Unbounded” in Uzbek.

2.3.4.3. Setting Select and Project Position

I also submit that, while accent in Uzbek is not sensitive to phonological weight, it is sensitive to diacritic weight; that is, Uzbek distinguishes diacritically heavy vs. diacritically light morphemes.

I will now determine the setting of the Select and Project Position parameters. The default accent in Uzbek always falls on the final syllable, as illustrated by words in (2.35), which do not contain heavy morphemes.

(2.35) *Default final accent in Uzbek*

kiʃˈlok	village
kiʃloklariˈmiz	our villages
kiʃloklarimizdagiˈlar	those in our villages
kahramonˈlar	hero-Pl

I conclude that, in Uzbek, the Project Position parameter is set to “Right” in an unbounded accent domain.

Let us now turn to the Select parameter. Note that the verbalizer /-la/ and negative /-ma/ in (2.36) are diacritically light. Importantly, the root /boʃ/ is diacritically heavy; otherwise, the forms in (2.36) would receive the default final accent.

(2.36) a. ¹boʃ-la begin-VERBALIZ-IMPER

b. ¹boʃ-la-ma begin-VERBALIZ-NEG

Since the root /boʃ/ is heavy, the word in (2.37) is not an “all-light” word. Therefore, the final accent in (2.37) is not the default accent; rather, the infinitival marker /-moq/ is accented because it is diacritically heavy.

(2.37) boʃ-la-¹moq begin-VERBALIZ-INF

Thus, (2.37) contains two diacritically heavy morphemes: the root /boʃ/ and the suffix /-moq/. Since accent falls on the latter, which is the rightmost heavy morpheme, the Select parameter is set to “Right”.

2.3.4.4. Preaccenting suffixes

This section describes the process of preaccenting in Uzbek in terms of diacritic weight.

Considering first (2.38a), the Past suffix [-di], attached to the root [ol], is unaccented; since it repels the accent, it is diacritically light. However, in (2.38b), where [-di] is attached to the same root, [-di] is accented; hence, in (2.38b), it is diacritically heavy.

Assuming that the suffixes /-sin/ and /-lar/ are diacritically light, accent on the root /kel/ (“come”) indicates that /kel/ is diacritically heavy. Assuming further that the Past suffix /-di/ is preaccenting explains why it is not accented in (2.39b). If this is the case, then the root is heavy; also, /-di/ is made diacritically heavy by the preaccenting intensifier /-da/. Then, Select (Right) chooses the rightmost heavy morpheme in the word, which yields word accent on /-di/.

- (2.39) a. 'kel-sin-lar come-3-Pl!
- b. 'kel-di come-PAST (he came)
- c. kel-'di-da come-PAST-INTENS

Thus, the accent patterns of Uzbek indicate that accent assignment in this language involves the process of preaccenting, triggered by special suffixes discussed here. In addition, Uzbek has certain other preaccenting morphemes (such as /-tʃi/ and /-tʃa/), as described in Sjöberg (1963:25-26).

2.3.4.5. Superheavy morphemes in Uzbek

I will now argue that Uzbek has a class of superheavy morphemes. To this end, consider first the form in (2.40), which has initial accent.

what-LOCATIVE

some-what-LOCATIVE (“where”)

This is reminiscent of the behavior of the superheavy suffix /-ol/ in Selkup.

Consider now the particle /-tʃa/ (EQUATIVE). As observed in Sjöberg (1962:25), in words containing this particle, accent falls on the immediately preceding syllable. This strongly suggests that the morpheme /-tʃa/ is preaccenting.

For example, in (2.43), accent falls on the root, which indicates that the preaccenting /-tʃa/ makes the root /qan/ diacritically heavy, unless it is heavy underlyingly.

(2.43) 'qan-tʃa what-EQUAT ('how much')

Comparing (2.43) with (2.44) below, we note that accent no longer falls on the root /qan/, but on the prefix /alla-/.

(2.44) 'alla-qan-tʃa some-what-EQUAT (some)

As we just saw, the root /qan/, followed by /-tʃa/, is diacritically heavy. Since the accent is on /-alla/, not on /-qan/ and since the Select parameter is known to be set to “Right”, I conclude that /alla-/ attracts accent because it is heavier than the diacritically heavy root /-qan/. That is, again, the prefix /alla-/ is superheavy.

The prefix /alla-/ is not the only superheavy morpheme in Uzbek. Thus, the derivational prefix /ser-/ (“much”) is always accented.

First, consider the monomorphemic word [ho¹sil] (“harvest”) in (2.45a). When its root combines with the preaccenting locative suffix /-da/ in (2.45b), accent on the root can be derived in two ways: either this root is diacritically heavy in the UR, or it is diacritically light, but made heavy by the preaccenting suffix in the course of the derivation.

- (2.45) a. ho¹sil harvest
b. ho¹sil-da harvest-LOC

Now, consider the form (2.46) accented on the prefix /ser-/.

- (2.46) 'ser-hosil-da much-harvest-LOC (“fertile”)

Accent on the prefix /ser-/ in (2.46) indicates that this is at least as heavy as the root.

Now, if this prefix were as heavy as the root, accent would fall on the rightmost heavy morpheme, *i.e.* the root, due to Select (Right). Since, however, accent falls on /ser-/, I conclude that the prefix /ser-/ is superheavy.

In the same way, the negative prefix /nɔ-/ may be shown to be superheavy.

In this section, I have demonstrated that certain Uzbek morphemes are diacritically superheavy. We find that Uzbek has a ternary diacritic weight distinction, opposing superheavy vs. heavy vs. light morphemes (whether the latter are preaccenting or not).

2.3.4.6. Local summary

Summarizing the findings above, Uzbek has the ternary diacritic weight scale in (2.47), encoded into the Weight Grid in (2.48).

(2.47) superheavy > heavy > light

(2.48) sup_d h_d l_d

* * *

* *

*

Also, the parameters for this language are set as follows:

(2.49) Domain (Unbounded)

EM (No)

Weight (Yes)

Select (Right)

Project Position (Right)

Further, I distinguish two types of diacritically light morphemes: the preaccenting and non-preaccenting ones. Project Position applies in words that only consist of non-preaccenting diacritically light morphemes. As will be shown in the next section, the preaccenting (light) morphemes differ from non-preaccenting light morphemes in that they trigger the application of a special rule which modifies the Weight Grid in such a way that the preceding light morpheme becomes heavy. The non-preaccenting light morphemes do not have this ability because they do not trigger this rule.

I assume that the Project Position parameter applies if the accent domain consists only of non-preaccenting diacritically light morphemes; if the domain contains at least one preaccenting morpheme, it is the Select parameter which applies, instead.

Finally, recall that the ternary diacritic weight scale (2.47), which contains superheavy morphemes, is also found Central and Southern Selkup, which is genetically unrelated to Uzbek (see section 2.2.7.4-2.2.7.5). This provides additional support for extending the PAF theory by introducing diacritic weight and the diacritic weight scale.

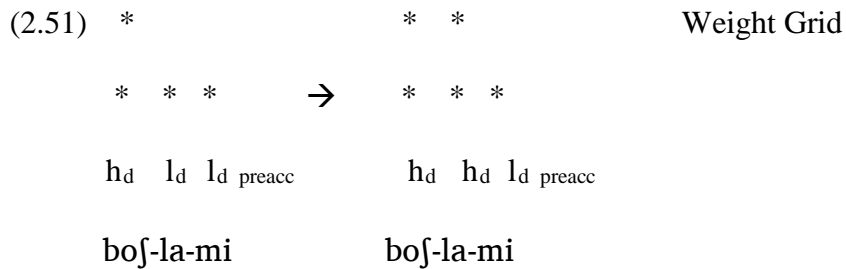
2.3.4.7. The Gridmark Insertion rule

Let us now return to the process of preaccenting. In this section, I will show a way to formally capture this process in terms of a special *Gridmark Insertion* rule (2.50) which applies on the Weight Grid:

(2.50) *Gridmark Insertion*

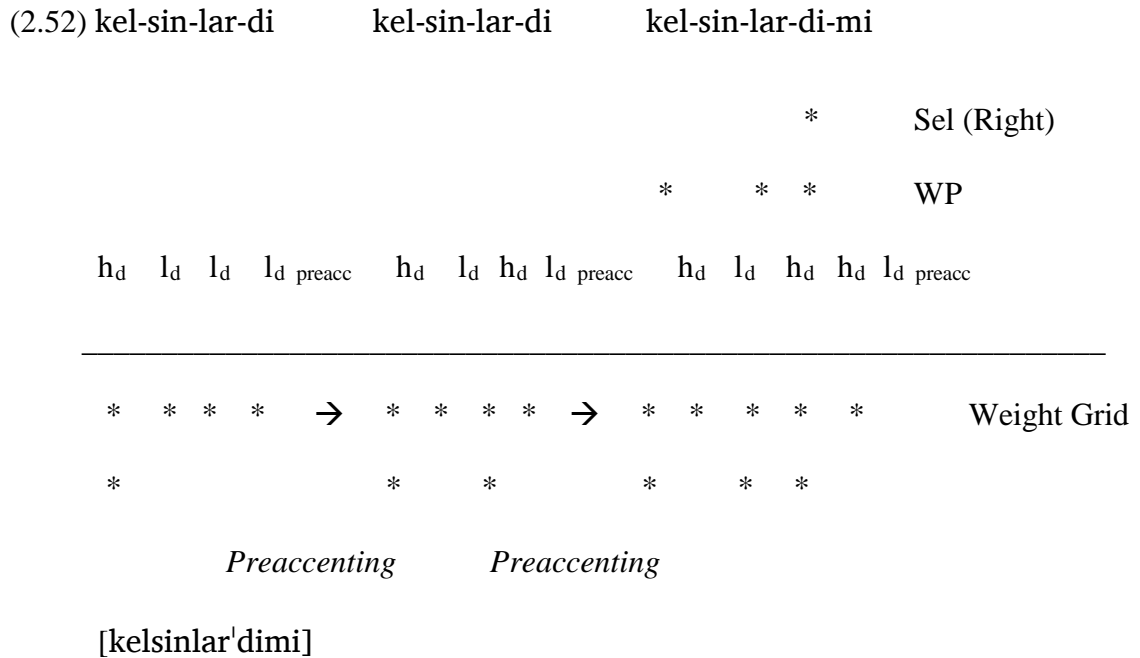
Insert a gridmark on line 2 of the Weight Grid over the final syllable of a light morpheme, if this is immediately followed by a preaccenting morpheme.

In (2.51), I illustrate how Gridmark Insertion applies to /boʃ-^lla-mi/ (“begin-VERBALIZ-INTERR”), making [la] heavy. Note that Gridmark Insertion adds a second gridmark over /-la/ on the Weight Grid on the right side of the arrow (as shown below).



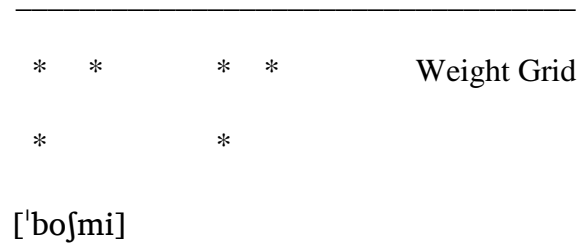
In the UR for the surface form [kel-sin-lar-^ldi-mi] (“come-3-PI-PAST”), the suffixes /-sin/ and /-lar/ are diacritically light, while the suffix /-di/ and the particle /-mi/ are preaccenting. An application of the Gridmark Insertion rule to /kel-sin-lar-di/, triggered by the preaccenting particle /-di/, adds a gridmark over /-lar/; then, Gridmark Insertion reapplies, triggered by /-mi/, to add a gridmark over /di/. As a

result, /-lar/ and /-di/ each have two gridmarks on the Weight Grid, which represents their heaviness. This is shown in (2.52).



By contrast, if a preaccenting morpheme follows a diacritically heavy one, as in [ˈboʃ-mi] (begin-INTERR), where /boʃ/ is heavy and /-mi/ is preaccenting, the Gridmark Insertion rule fails to apply to the root because its structural description is not met: this rule only applies to diacritically light morphemes (whereas /boʃ/ is diacritically heavy).

(2.53) bof-mi → bof-mi



2.3.4.8. The Weight Grid as a phonological representation

At this juncture, I want to emphasize that the Weight Grid and the weight scale are not notational equivalents because, unlike the weight scale, the Weight Grid is a phonological *representation*.

Linguistic representations are typically thought of as structures to which rules/constraints apply, modifying them in some way.

In the case of preaccenting, the Gridmark Insertion rule adds a gridmark on the Weight Grid to a diacritically light morpheme if it is immediately followed by a preaccenting morpheme. Thus, an application of the Gridmark Insertion rule changes the Weight Grid.

Since entities in the Weight Grid may be targeted by rule(s), the Weight Grid is not merely a graphic translation of the weight scale, but a genuine phonological representation.

2.3.4.9. Extrametricality and cliticization: alternatives to preaccenting in Uzbek?

At this juncture, the question arises whether extrametricality could replace preaccenting in explaining why, in certain Uzbek words, the word-final morpheme is unaccented and accent is penult. However, as I will now argue, extrametricality is incompatible with certain patterns and cannot replace preaccenting.

To begin with, final extrametricality is incompatible with the default final accent in Uzbek (obviously, an extrametrical syllable may not be accented).

Similar evidence can be found in Saudi Diaspora Uzbek (a group of varieties spoken in the Hijaz region of Saudi Arabia), where some words receive a secondary stress on the final syllable (Bokhari & Washington 2014).

(2.54) 'tor ₁ la	four together
er'kagda ₁ qa	like a man
erkag'larda ₁ qa	like men

Obviously, secondary stress (rhythmic beat) on the final syllable in (2.54) is incompatible with final extrametricality.

Also, since, in the S&P theory, the extrametrical units are limited to syllables and segments (there is no foot EM in this theory), the peripheral unit invisible to accent assignment is, at most, one syllable. However, some unaccented clitics in Uzbek are disyllabic. This is problematic for the EM approach because only the final syllable of such morphemes would be extrametrical. Therefore, the EM approach fails to account

for the unaccentedness of the initial syllable in these morphemes. By contrast, the Preaccenting approach, which considers these morphemes preaccenting, explains both why they are unaccented and why accent falls on the immediately preceding morpheme.

For example, the bisyllabic clitic /-gina/, which can occur word-finally, is unaccented. As exemplified in (2.55), accent does not fall on /-gina/, but on the preceding suffix.

(2.55) *The restrictive clitic /-gina/*

u- ^l lar-gina	3Prs-PI-RESTRICT (“only they”)
paxta-kor- ^l lar-gina	cotton-worker-PI-RESTRICT
	(“only the cotton growers”)

While the EM approach correctly predicts that the syllable /na/ in /-gina/ is unaccented, it does not preclude the possibility of accent on the syllable /gi/. Thus, within the PAF theory, the combination of Default (Right), needed for the default final accent, with EM (Right) derives accent on /gi/. Metrical accounts of Uzbek that would posit iambic feet in Uzbek (in order to capture the default final accent) would also assign accent to /gi/. However, this prediction is wrong: accent falls on the suffix

which precedes /-gina/. Therefore, the EM approach is unable to account for the accent on the preceding morpheme. By contrast, assuming that the clitic /-gina/ is preaccenting, it makes the preceding morpheme heavy, after which it is chosen for accent by Select (Right). This corresponds to the output form in (2.55).

In the case of Uzbek enclitics, another way to make them invisible to accent assignment would be to exclude them from the accent domain by placing them outside the p-word. For example, as reported in Sjoberg (1962:258), the enclitics /-man/ and /-tʃi/ in (2.56) are unstressed.

(2.56) a. men stu ¹ dent-man	I student-PREDIC.1Sg
b. bōla- ¹ lar-tʃi	child-Pl-INTERR
bōla- ¹ lar-tʃa	child-Pl-EQUAT (“childishly”)

In forms like (2.56), the accented penultimate syllable immediately precedes the unaccented clitic and, since the clitic is outside the p-word, one is tempted to say that what we have is simply regular final accent within the p-word.

However, evidence from the accentual behavior of clitic clusters in Uzbek shows that this alternative is wrong. Thus, while for words that end in a single clitic, the Cliticization approach and the Preaccenting approach both predict that accent will fall on the syllable immediately preceding the clitic, they diverge with respect to accent location in clitic clusters. Indeed, for words with two clitics, the Cliticization approach,

The data in (2.57)-(2.58), reported in Sjöberg (1962:258), are fully compatible with the prediction of the Preaccenting approach, which is borne out, but incompatible with the prediction of the Cliticization approach, which, therefore, is wrong.

- In conclusion, while neither the Cliticization approach, nor the EM approach succeed in accounting for final unaccentedness in Uzbek, the Preaccenting approach does.

2.3.4.10. Need for lexical specification

In what precedes, we have examined some cases of non-final accent and established that Uzbek has diacritically heavy, diacritically light and (light) preaccenting morphemes. In addition, as noted in section 2.3.3.3, certain morphologically simple words, *e.g.* (2.59), also have non-final accent.

(2.59) 'etti seven

'sakson eighty

Obviously, non-final accent cannot be due to preaccenting in monomorphemic words.

In order to account for unpredictable accent location in these words, I propose to encode it with a gridmark placed on line 1 of the Accent Grid over that syllable which will receive the surface accent. Then, Select (Right) promotes this gridmark, yielding word accent on the marked syllable of the root.

2.3.4.11. Derivations

I will now present sample derivations that show how the S&P grammar (see section 2.3.4.6) assigns accent to Uzbek words.

(i) *Default accent*

Recall that, in Uzbek, the Project Position parameter is set to “Right”. For example, given the word [paxtakor^llar] (“cotton-worker-PI”), final accent is assigned as in (2.60):

(2.60)	*	Select (Right)
	*	Project Position (Right)
paxta-kor-lar		
<hr/>		
	l _d l _d l _d	Weight Grid
	* * *	

(ii) *Words with heavy morphemes*

In words that contain a heavy syllable, like [ˈboʃ-la-ma] (“begin-VERBALIZ-NEG”), this syllable is projected and, then, chosen by Select (Right), as shown in (2.61).

(2.61)	*	Select (Right)
	*	Weight Projection
boʃ-la-ma		
<hr/>		
	* * *	Weight Grid
	*	

(iii) *Words with a preaccenting suffix*

In a word that contains a preaccenting morpheme, such as [paxta-kor-¹lar-gina] (“cotton-worker-PI-RESTRICT”), the Gridmark Insertion rule, triggered by the preaccenting diacritically light suffix (here, /-gina/), makes the preceding light suffix (here, /-lar/) heavy by adding a gridmark to its column on the Weight Grid. As a result, the suffix /-lar/ became heavier than the morphemes to its left and the suffix /-gina/ (which is diacritically light because it is preaccenting). Therefore, /-lar/ is the only unit in (2.62) to project weight. Then, Select (R) chooses the gridmark over /-lar/ on the Accent Grid, thus placing accent on /-lar/.

(2.62)					*		Select (Right)			
					*		Weight Projection			
	paxta-kor-lar-gina				paxta-kor-lar-gina					
<hr/>										
	l_d	l_d	l_d	$l_{d\text{ preacc}}$	\rightarrow	l_d	l_d	h_d	$l_{d\text{ preacc}}$	Weight Grid
	*	*	*	*		*	*	*	*	
								*		

(iv) *Words with a superheavy morpheme*

In words that contain a superheavy morpheme, this morpheme is the heaviest one; hence, it is the only one to be projected. After projection, it is chosen for accent by Select (Right).

For example, in [ˈalla-qaer-da] (“some-what-LOCATIVE”), accent is assigned as follows:

$$(2.63) \quad \begin{array}{l} * \\ * \end{array} \quad \begin{array}{l} \text{Select (Right)} \\ \text{Weight Projection} \end{array}$$

$$\text{alla-qaer-da}_{\text{preacc}} \rightarrow \text{alla-qaer-da}$$

Weight Grid

(v) *Lexical marking for an unpredictable accent location*

In words with unpredictable accent location, the accented syllable is lexically specified with a gridmark placed on the Weight Grid. It is projected on line 1 of the Accent Grid; thus, it is treated in the same way as “regular” gridmarks that represent weight. Finally, it is promoted to word accent by Select (Right).

For example, in [etmɪʃ] (“seventy”), accent is assigned as in (2.64).

(2.64)	*	Select (Right)
	*	Weight Projection
		etmif
<hr/>		
	*	Weight Grid/Lexical marking

2.3.5. Summary

I have presented here the accent patterns of Uzbek and offered a formal account of accent assignment in this language. In particular, I have shown that the various heterogeneous exceptions to final accent can be derived by the following grammar consisting of the diacritic weight scale (2.65a) and the set of parameter settings (2.65b), complemented with the rule (2.65c).

(2.65) a. superheavy > heavy > light

b. Domain Size (Unbounded)

EM (No)

Weight (Yes)

Select (Right)

Project Position (Right)

c. *The Gridmark Insertion rule*

Insert a gridmark on line 2 of the Weight Grid over the final syllable of a diacritically light morpheme, if this is immediately followed by a preaccenting morpheme.

Central and Southern Selkup dialects (genetically unrelated to Uzbek) have the same diacritic weight scale, which provides additional empirical support for this device.

While the two languages have the same weight scale, they differ in that Uzbek (but not C. and S. Selkup) has preaccenting morphemes. In order to account for preaccenting, I have proposed the *Gridmark Insertion rule* in (2.65c) which operates on the Weight Grid, making the immediately preceding diacritically light morpheme heavy. Since the Gridmark Insertion rule can affect the Weight Grid, the latter is a genuine phonological representation, as it can encode changes in weight due to rule application.

In conclusion, in Uzbek and in Central and Southern Selkup, accent is assigned with reference to a *diacritic weight* scale. At the same time, some languages are known to assign accent with reference to a *phonological* weight scale (*e.g.*, Gordon 2006).

From this, a testable prediction can be drawn that there exists a language in which both types of weight are ordered in a single weight scale. This prediction is borne out: as demonstrated in the next section, this type of weight scale (which I call “hybrid”) is effectively attested in Eastern Literary Mari.

2.4. Eastern Literary Mari

2.4.1. Introduction

In this section, I examine the accent system of Eastern Literary Mari (henceforth, ELM).

There are few detailed and accurate sources on the prosody of ELM in Western languages (many publications are in Russian). For this reason, important descriptions of ELM were frequently more or less ignored in Western theoretical literature. In addition, useful pieces of information are hard to locate and, to my knowledge, have not been previously brought together.

Eastern Literary Mari is the standardized dialect of Mari based primarily on Eastern Mari. In fact, Mari displays extensive dialectal variation, with Eastern Mari (also known as Meadow Mari) and Western (or Hill) Mari as major dialects, alongside certain others, such as Northwestern and Forest Mari. These different dialects embrace numerous speech varieties, often characteristic of individual villages (for a detailed list, see Normanskaya 2008:366-367). In this section, I will focus on Eastern Literary Mari.

The section is organized as follows. In the first part, I give a detailed description of the accent patterns and draw descriptive generalizations about weight and accent in ELM. After a brief overview of the vowel system (section 2.4.2), I establish the basic facts of accent placement which allows me to accurately state the accent rule of ELM (section 2.4.3), which turns out to be simple and quite general (section 2.4.3). Regular accentuation in adapted loanwords provides independent evidence for the rule (section 2.4.5). At the same time, in addition to a few lexical exceptions (section 2.4.6), ELM has a small set of productive suffixes which leads to systematic exceptions to the accent

rule (section 2.4.7). In the second part, I will give a novel account of accent assignment in ELM which uniformly captures the accent rule and the exceptions in terms of a single accentual grammar containing a particular *hybrid weight scale*.

2.4.2. The vowel system

Eastern Literary Mari has the vowel system in (2.66).

(2.66) *The vowel system of ELM*

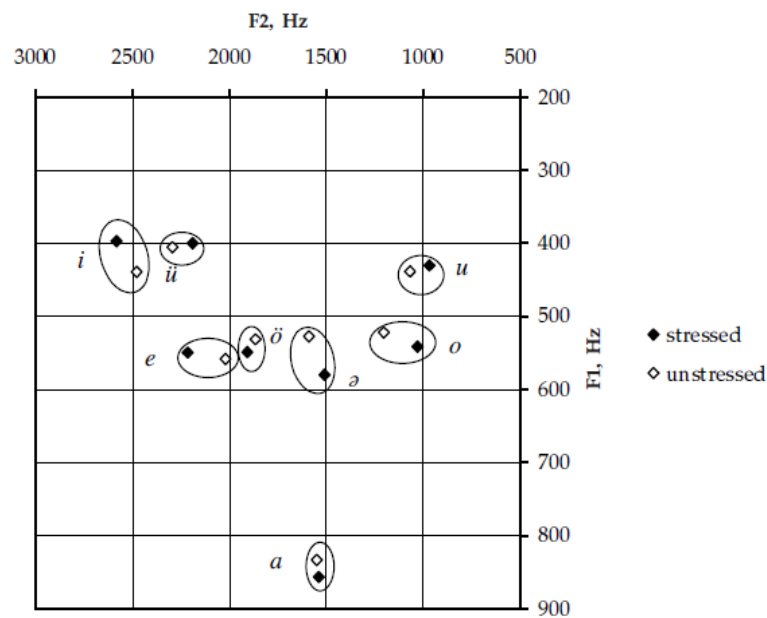
i	y	u
e	ø	o
	ə	
	a	

Eastern Mari in general, in particular ELM, has an underlying /ə/, which is always realized as a central mid vowel.

According to Riese et al. (2012), all mid vowel segments that occur in word-final position (not only /ə/, but also full mid vowels) undergo reduction. Indeed, Lehiste et al. (2005) found that unaccented word-final [e o ø] (in phrase-final position) shift towards the center of the acoustic space in the direction of the unaccented [ə],

although there is no phonetic neutralization (see Figure 2.3). In this sense, the mid vowels, effectively, undergo reduction.

FIGURE 2.3. *The F_1 x F_2 plot of word-final accented and unaccented vowel sounds of Eastern Literary Mari in phrase-final position (average for 4 female speakers). (From Lehiste et al. 2005)*



2.4.3. The accent rule

I will now show that Eastern Literary Mari is, for the most part, a classical Last/First WS unbounded system.

It is well-known in Uralic linguistics that, in morphologically simple nouns of Eastern Mari, accent falls on the last full vowel (Itkonen 1955, Sebeok and Ingemann 1961; Hayes 1995, Vaysman 2009).

This generalization is illustrated in (2.67) for nouns only containing full vowels, in (2.68) for those with both full vowels and /ə/, but without mid vowels (/e/, /o/, /ø/) in word-final position and those in which all word-internal vowels are full, while the final vowel is mid (/e/, /o/, or /ø/), as in (2.69).

The data in (2.69) illustrate accent placement in words which both end in a final mid vowel while also containing one (or more) schwa.⁹

- (2.67) a. paj'rem holiday
 b. ol'ma apple
 c. py'rtys nature
 d. køgør'tʃen dove

- (2.68) a. 'erək freedom
 b. 'kalək people, nation
 c. 'putʃəməʃ porridge

- (2.69) a. kop'ʃange beetle

⁹ The accent in the four-syllable form ['kajəmæʒe] (go-Pass.Participle-3Sg.Poss) is initial, thus falling outside a bounded window at the right word edge. This is direct evidence that ELM is an US.

b. 'ketʃe	day
c. 'jumo	God
d. 'petʃe	fence
e. 'kolmo	shovel
f. 'korno	road
g. 'kutko	ant
h. 'ʃyrtø	thread
i. 'ʃyrgø	face

The data in (2.70) provides evidence that full mid vowels in final open syllables count as light, on a par with schwa.¹⁰

(2.70) a. 'kogəlʲo pie

¹⁰ Vaysman (2009) indicates final accent for (2.69f, g, h), while emphasizing that non-final accent in these forms would lead to ill-formedness. However, already Sebeok and Ingemann (1961:9) noted that [kor'no] and ['korno] are both possible in Eastern Mari (without morphological or semantic differences). It turns out, as checked against recent, reliable sources (Normanskaya 2008:106; Васильев & Учаев 2003), that the words in (2.69f, g, h), thus including ['korno], are not accented on the final /o/; rather, the accent location indicated in (2.69f, g, h) is the only correct one, like for all forms in (2.68). This mismatch between the sources might simply be due to a difference between the dialects studied by Vaysman and by me. Given that Vaysman's data seem to be based especially on her fieldwork on the border between Mari El Republic and the Nijni District of the Russian Federation, it is possible and likely that part of her data, including the forms in (2.69f, g, h), are not from ELM.

b. 'kɒləzə fisherman

c. 'ɪkʃəve child

Consider now how words without full vowels are stressed. Those words in which all syllables contain schwa, as in (2.71), and those in which all syllables contain schwa, except the final one, which contains a mid vowel (/e/, /o/ or /ø/), as in (2.72), receive accent on the initial syllable.

(2.71) a. 'pələʃ ear

b. 'ʃəʒə now

c. 'tʃələm phone receiver

(2.72) a. 'ərəʃe stale

b. 'ʃərpe shard

c. 'ʃəmləʃe researcher

d. 'ʃəmlə seventy

e. 'tʃətəʃe patient

f. 'əlʲe be-3Sg.PAST

Clearly, these two types of words patterns together for accent, behaving as “light-only”. As the discussion above demonstrates, in ELM, open final syllables with mid vowels as well as syllables with /ə/ (regardless of their position in the word) behave as light, while all other syllable types behave as heavy. In particular, whenever mid vowels occur elsewhere than word-finally, they are heavy. The generalization here is that weight “cares” whether a mid vowel is final, as in (2.69), (2.70) and (2.72). The fact that mid vowels count as light only word-finally is an instance of what Rosenthal & van der Hulst (1999) call “Weight-by-Position-by-position”.

On the other hand, non-mid vowels (2.73a) and full vowels (including the mid ones) in *closed* final syllables (2.73b) are heavy.

(2.73) a. a ¹ ru	sterile
i ¹ zi	small
ko ¹ kla	distance
b. na ¹ laʃ	take
ky ¹ leʃ	(be) necessary

I conclude that accent in ELM is governed by the following phonological accent rule:

(2.74) *The accent rule of ELM*

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

2.4.4. Generality of the accent rule

Apart from a small number of exceptionally behaving suffixes (see section 2.4.7), accent assignment in ELM does not make reference to morphological structure, applying uniformly (i) in morphologically simple and complex (inflected, derived) words, and (ii) for all lexical categories.

First, accent assignment does not depend on morphological complexity. All but a handful morphologically simple words respect the accent rule (for exceptions, see section 2.4.6).

The data in (2.75) provides evidence that the accent rule (2.74) applies to inflected nouns in the same way as to morphologically simple nouns:

(2.75) <i>Nom</i>	<i>Gen</i>	<i>Inessive</i>	<i>Lative</i>	<i>Gloss</i>
'kid	'kid-ən	'kid-əʃto	kid-eʃ	hand
'mut	'mutən	'mut-əʃto	mu't-eʃ	word
pa'ʃa	pa'ʃa-n	pa'ʃa-ʃte	pa'ʃ-aʃ	work
'vate	'vat-ən	va'te-ʃte	va't-eʃ	wife
u'rem	u'remən	u'rem-əʃto	ure'm-eʃ	street

'mlande	'mlandə-n	'mland-əfto	mlan'd-eʃ	earth
'pələʃ	'pələʃ-ən	'pələʃ-əfto	pələ'ʃ-eʃ	ear

Further, (2.76) provides evidence that the accent rule (2.74) applies to derived nouns in the same way as to inflected and morphologically simple nouns, without regard to their word-internal morphological structure.

(2.76) *Noun Formation*

a. $A \rightarrow N$

'vik	direct (straight)	'vik-lək	directness
'taza	healthy	ta'za-lək	healthiness

b. $V \rightarrow N$

'vontʃ	cross	von'tʃ-ak	crossing
'jyl	burn	jy'l-em	ashes
'pogən	gather	pogən-ə'maʃ	gathering
'kokər	cough	'kokər-təʃ	cough

c. $N \rightarrow N$

¹ jol	leg	jo ¹ l-aʃ	trousers
¹ jol	leg	jo ¹ l-eʃke	pedestrian
par ¹ n ¹ a	finger	par ¹ n ¹ a-ʃ	thimble
¹ koʒ	fir	ko ¹ ʒ-er	fir-grove
¹ piste	linden	pis ¹ te-r	linden grove
¹ imne	horse	im ¹ ne-ʃke	rider
məska ¹ ra	joke	məska ¹ ratʃe	joker

I conclude that accent location in nouns is determined by the phonological accent rule (2.74) and does not depend on their morphological structure. Thus, no morphological conditions limit the application of (2.74) to nouns.

The same is true of derived adjectives. Consider accent placement in denominal adjectives and in those derived from other adjectives.

(2.77) *Adjectival Formation*

a. $N \rightarrow A$

¹ vuj	head	vu ¹ j-an	quick-witted
¹ vij	strength	vi ¹ j-an	powerful (strong)

c. 'vuj-dəmə-lək recklessness

Importantly, in verbs, the accent rule applies in the same way as in nouns and adjectives (in all conjugation classes).

In conclusion, accent assignment in ELM does not make reference to categories; in particular, nouns, verbs and adjectives are treated the same.

2.4.5. Evidence from loanwords

Another source of evidence in support of the accent rule in (2.74) comes from Russian loanwords. A large number of adapted loanwords in ELM conform to the accent rule.

In some loanwords, the reduced final vowel of the Russian form was adapted in ELM as a (full) non-mid vowel. In those words, accent shifts to this final syllable (which is unaccented in the source form), thus respecting the accent rule of ELM (2.79a). If the final vowel of a source form is adapted as a mid vowel in ELM, then accent falls on the last syllable that contains a full vowel, respecting the accent rule of ELM (2.79b).

(2.79) <i>Russian</i>	<i>ELM</i>	<i>gloss</i>
a. mɐ'ʃinə	maʃi'na	car
'knigə	kni'ga	book

b. pʌ'vidlə	po'vidle	jam
'datʃə	'datʃe	summer cottage
'bɒtʃkə	'vɒtʃo	barrel
'kuxnɪə	'kuxnɪo	kitchen

Summarizing, the accent rule (2.74) applies to phonologically adapted loanwords in the same way it applies to the “native” vocabulary.

While the accent rule of ELM is quite general, it also has a number of exceptions. Some of those, reduced to a small closed list of words, are considered in the next section. Then, I turn to *systematic* exceptions to the accent rule associated with productive accent-affecting suffixes (section 2.4.7).

2.4.6. Lexical exceptions

Exceptional words are, mainly, nouns and adverbs; they form small closed lists.

Thus, a handful of underived nouns (which all belong to the 3rd nominal declension) have accent on the final [e], thus violating the accent rule (2.74):

- (2.80) a. ku'e birch
- b. kə'ne hemp

c. ser¹ye comb

d. ʃok¹te sieve

A handful of morphologically simple adverbs also have accent on the final [e], thus violating the accent rule (2.74):

(2.81) a. e¹re always

b. e¹ʃe quickly

c. vaʃ¹ke soon

d. tə¹ge~tu¹ge so

Exceptional accent in (2.80)-(2.81) is unpredictable: we cannot appeal to morphology here because these forms are monomorphemic. For this reason, I suggest specifying accent location in their lexical entries.

2.4.7. Exceptional suffixes

Beside the aforementioned lexical exceptions, ELM also has a few suffixes which behave in exceptional ways with respect to the accent rule. These are the Comitative and Comparative case suffixes in nouns and the Neg-Gerund and Imperative suffixes in verbs. Since these suffixes are morphologically productive and,

therefore, lead to systematic exceptionality in the accentual patterns, any adequate account of the accent system of ELM must reckon with these particular suffixes. I discuss this in the second part of this case study.

First, nouns in the Comitative case, marked with suffix /-ge/, do not abide by the accent rule.¹¹ This suffix always gets stress in surface forms (see Riese 2012:97) and its mid vowel is not phonetically reduced:

(2.82) *Nouns in Comitative*

jo'tʃa	child	jotʃa- ^l ge	child-COM
kni ^l ga	book	kniga- ^l ge	book-COM
^l jeʃ	family	jeʃ- ^l ge	family-COM

When the Possessive suffixes /-na/ “1Pl.Possessive” or /-da/ “2Pl.Poss” and the Comitative suffix /-ge/ are attached to the root, accent falls on /-ge/.

(2.83) jeʃ-na- ^l ge	family-1Pl.Poss-COM
jeʃ-da- ^l ge	family-2Pl.Poss-COM

¹¹ Data cited in this respect by Vaysman (2009) do not match the general rule of ELM (the standard dialect) and, probably, come from some other variety of Eastern Mari.

Second, the negative gerunds formed by adding the suffix /-de/ to the verb stem are exception to the accent rule, with stress always falling on the suffix /-de/ (regardless of conjugation class), as illustrated in (2.84):

(2.84)	lud-aʃ	read	lud- ^l de	read-NEG.GERUND
	nal-aʃ	take	nal- ^l de	take-NEG.GERUND
	tunem-aʃ	study	tunem- ^l de	study-NEG.GERUND

Third, nouns in the Comparative case, formed with the Comparative /-la/, are never accented on that suffix, witness the following forms (Riese 2012: 127):

(2.85)	'kajək	bird	'kajək-la	like a bird
	tul ^l ʃol	coal	tul ^l ʃol-la	like coal
	tø ^l ʃak	featherbed	tø ^l ʃak-la	like a featherbed

Thus, the Comparative suffix /-la/ rejects accent.

When a Possessive suffix and the Comparative case suffix /-la/ are both added to a root, then accent falls on the Possessive suffix (not on /-la/):

(2.86) *root-POSS-COMPAR*

/-em-la/ pørt-^lem-la

/-et-la/ pørt-^let-la

Interestingly, the Possessive suffixes and the Comparative /-la/ may occur in any order (without change in meaning). Crucially, the Comparative /-la/ invariably fails to receive the accent, regardless of the suffix order:

(2.87) *root-POSS-COMPAR* *root-COMPAR-POSS*

3SG: /-ʒe/ ^lpørt-ʒə-la ^lpørt-la-ʒe

1Pl: /-na/ pørt-^lna-la pørt-la-^lna

2Pl: /-da/ pørt-^lda-la pørt-la-^lda

Also, in Imperatives, formed by suffixing the verbal stem with /-sa/ (2Pl.IMPER), the vowel of this final suffix is never accented, even though it consists of a full-vowelled syllable.¹² Rather, accent falls on the closest preceding full vowel, as in the right column in (2.88a); otherwise, accent is initial, as in (2.88b).

¹² The suffix /-sa/ has several allomorphs, as we can see in (2.88).

- (2.88) a. ko¹daʃ stay-INF ¹kodsa stay-2PL.IMPER
- ko¹daʃ leave-INF ¹kodəza leave-2PL.IMPER
- vo¹zaʃ write-INF ¹vozəza write-2PL.IMPER
- pəta¹raʃ finish-INF pə¹tarəza finish-2PL.IMPER
- jamdə¹laʃ prepare-INF ¹jamdələza prepare-2PL.IMPER
- tunək¹taʃ teach-INF ¹tunəktəza teach-2PL.IMPER
- b. ¹jəŋgərtəza call-2PL.IMPER

Summarizing, the phonological accent rule of ELM exhibits lexically-conditioned systematic exceptions. These are associated with productive accent-attracting and accent-repelling suffixes.

2.4.8. Local summary

Summarizing, the phonological accent rule of Eastern Literary Mari states that accent falls on the last heavy syllable of a word; otherwise, accent is initial. At the same time, Mari exhibits systematic deviations from the regular accentual pattern which are triggered by several exceptional morphemes. Thus, Eastern Literary Mari is a phonological accent system with some “lexical flavor”.

2.4.9. The account

2.4.9.1. Introduction

The goal of this section is to propose an accent-assigning mechanism for ELM that would correctly predict accent location in both regular and exceptional patterns.

As noted above, ELM is a special type of phonological WS systems which, unlike C. and S. Selkup and Uzbek, is, in addition, sensitive to diacritic weight. The basic idea of the present account is to order phonological and diacritic weight in a single weight scale.

2.4.9.2. The hybrid weight scale in Eastern Literary Mari

2.4.9.2.1. The notion “hybrid weight scale”

As stated, accent is generally assigned in ELM according to the descriptive generalization in (2.74), repeated here as (2.89).

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

Also, recall that, alongside with the accent rule (2.89), ELM has systematic exceptions, associated with a small number of productive suffixes (see section 2.4.7).

The latter can be accounted for in terms of diacritic weight. For example, the Comitative suffix /-ge/ is always accented and is, therefore, diacritically heavy (2.90a), whereas the Comparative suffix /-la/ is never accented and, therefore, is diacritically light (2.90b).

(2.90) a.	jo'tʃa	child	jotʃa-'ge	child-COMITATIVE
	'jeʃ	family	jeʃ-'ge	family-COMITATIVE
b.	'kajək	bird	'kajək-la	bird-COMPARATIVE
	tul'ʃol	coal	tul'ʃol-la	coal-COMPARATIVE

Given a morpheme and a syllable co-extensive with it, the question arises which type of weight (phonological or diacritic) counts for accent assignment. To illustrate, let us return to the diacritically heavy Comitative suffix /-ge/ in (2.90a). As a syllable, /ge/ is phonologically light because it is a final open syllable with a mid vowel. If accent were assigned with reference to phonological lightness of /ge/, then the phonological accent rule would wrongly predict that /ge/ is unaccented.

This example offers evidence that ELM is neither a purely diacritic weight system (unlike C. and S. Selkup), nor one in which accent is sensitive to phonological weight alone (unlike a phonological WS system). Rather, this is a “hybrid” system, sensitive to both types of weight.

Each type of weight (phonological or diacritic) involves, in ELM, a binary distinction (“heavy” vs. “light”), resulting in four different types of weight: diacritically

heavy (h_d), phonologically heavy (h_p), diacritically light (l_d) and phonologically light (l_p).¹³

The question arises, then, whether these are ordered in any way. As an answer, I will now introduce the notion of a “*hybrid*” *weight scale* and show that ELM has this type of scale.

I define a hybrid weight scale as a language-specific scale which orders phonological and diacritic weight. A hybrid weight scale indicates that only one type of weight (phonological or diacritic) is taken into account. In particular, if a morpheme is co-extensive with a syllable which it contains, then only one type of weight (phonological or diacritic) is taken into account.

I will now argue that the grammar of ELM contains the hybrid weight scale (2.91), which orders diacritically heavy morphemes over phonologically heavy syllables over both diacritically light morphemes and phonologically light syllables (the latter being mutually unordered).

$$(2.91) \ h_d > h_p > \{l_p, l_d\}$$

In order to establish the hybrid weight scale in (2.91), the following pairwise comparisons must be carried out: h_d vs. h_p , h_d vs. l_p , h_d vs. l_d , l_d vs. l_p .

¹³ Henceforth, when placed after “h” and “l”, the subscripts “_p” and “_d” abbreviate “phonologically” and “diacritically” (heavy, light), respectively.

2.4.9.2.2. Pairwise comparison

In order to establish the hybrid weight scale in (2.91), the following pairwise comparisons must be carried out: h_d vs. h_p , h_d vs. l_p , h_d vs. l_d , l_d vs. l_p .

(i) *Comparing heavy morphemes and heavy syllables* ($h_d > h_p$)

First, consider the plural suffix /-vlak/ in the form [pørt-¹vlak] (“house-Pl”).

Accent on [-vlak] in [pørt-¹vlak] indicates that the syllable /vlak/ in this suffix is phonologically heavy (word-final syllable). Also, in [pørt-¹vlak-əʃte] (house-Pl-Inessive), accent falls on [vlak], both syllables in /əʃte/ being phonologically light, which confirms that [-vlak] is phonologically heavy.

Observe now that, when the suffix /-vlak/ is attached to the suffix /-na/ (1Pl.Poss), accent falls on the latter, witness (2.92):

(2.92) pørt-¹na-vlak house-1Pl.POSS-Pl

tʃodra-¹na-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, (2.92) provides evidence that heavy morphemes are heavier than heavy syllables in ELM ($h_d > h_p$).

(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/ is heavy, the phonological accent rule predicts that it should be accented in this form. In fact, however, it is unaccented; therefore, it must be treated as a diacritically light suffix. Thus, in the form above, accent falls on the phonologically heavy /pørt/, not on the diacritically light suffix. Therefore, in ELM, heavy syllables are heavier, than light morphemes ($h_p > l_d$).

(iii) *Comparing heavy and light morphemes* ($h_d > l_d$)

First, let us determine the weight of the roots in (2.93). The forms in (2.93a) are accented; in (2.93b), accent falls on the root, even though the root syllable is phonologically light, while the prefix one is phonologically heavy. This is supported by the fact that the possible opposite pattern in (2.93c) is unattested. Therefore, what counts is not the *phonological* weight of the root syllable, but the *diacritic* weight of the root as a morpheme, which is heavy.

- (2.93) a. mo what
 kö who
 b. ni-'mo nothing
 ni-'gö nobody
 c. *'ni-mo
 *'ni-gö

Now, consider the forms in (2.94) with the diacritically heavy roots /mo/ and /kö/ and the diacritically light Comparative suffix /-la/ (already encountered above).

- (2.94) ni-'mo-la nothing-COMPAR
 ni-'gö-la nobody-COMPAR

In (2.94), accent falls on the heavy root, rather than on the light suffix. Therefore, heavy morphemes are heavier than the light ones ($h_d > l_d$).

(iv) *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 (2.95a) indicates that the root counts as a sequence of light syllables for accent assignment.

(2.95) a. ¹pələʃ ear-NOM

b. pələʃ-¹ge ear-COMIT

Word accent on the heavy suffix /-ge/ in (2.95b) provides evidence that heavy morphemes are heavier than light syllables ($h_d > l_p$).

(v) *Comparing light morphemes and light syllables* ($\{l_d, l_p\}$)

When the diacritically light suffix /-la/ (Comparative) is attached to the root /pələʃ/ (“ear”), which contains two phonologically light syllables, the resulting form [¹pələʃ-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.

Indeed, if the diacritically light morpheme were heavier, than the phonologically light syllables, then the former alone would project its weight; the latter would not, being the lowest on the weight scale. As a result, the suffix would receive the accent, but, in fact, does not. Therefore, it is not the case that light morphemes are heavier than light syllables.

If, on the other hand, the root syllables were heavier, than the suffix, accent would fall on the second syllable in the root because this would be the rightmost heavy syllable in the accent domain. In both cases, accent would be other than initial, which is not the case.

Therefore, light morphemes and light syllables are equally light; that is, they are mutually unordered ($\{l_d, l_p\}$).

2.4.9.2.3. From pairwise comparison to the hybrid weight scale

It was shown above that $h_d > h_p$, $h_p > l_d$, $h_d > l_d$, $h_d > l_p$ and that l_d and l_p are mutually unordered (but lighter, than the others). In addition, $h_p > l_p$ (by definition). Therefore, the weight relation on the set $\{h_d, h_p, l_d, l_p\}$ is transitive. Evidently, this relation is also reflexive and antisymmetric. Therefore, it is a (partial) ordering.

I conclude that the accentual grammar of ELM contains the hybrid weight scale (2.96):

$$(2.96) \ h_d > h_p > \{l_d, l_p\}$$

In systems with a hybrid weight scale, accent assignment makes reference to syllabic and morphemic weight *disjunctively*: for a given morpheme, accent is assigned with reference to its (diacritic) weight or to the (phonological) weight of syllables which this morpheme contains, following the hybrid weight scale.

2.4.9.3. The grammar

The hybrid weight scale (2.96) translates into the Hybrid Weight Grid (2.97a).

I submit that the accentual grammar of ELM consists of this Hybrid Weight Grid (2.97a) and of the set of parameter settings (2.97b).¹⁴

(2.97) *The accentual grammar of ELM*

a. *The Hybrid Weight Grid*

h_d h_p l_d l_p

* * * *

* *

*

b. Domain Size (Unbounded)

Weight (Yes)

Nonfinality (No)

Select (Right)

Project Position (Left)

2.4.9.4. Derivations

Below, I describe how derivations run in different types of cases. I assume that, for hybrid weight grids, only the heaviest units in a word project their weight from the

¹⁴ van der Hulst (2010) suggests that the EM parameter is set to “Right” in ELM: “one complicating factor in Literary Mari is that final open syllables are never accented. We must then assume that these are extrametrical.” In fact, as described above, only *mid* vowels repel the accent word-finally, while high and low vowels are accented in this position (other than in exceptional suffixes). Therefore, the Nonfinality parameter is set to “No” in ELM.

Weight Grid onto the Accent Grid in the course of derivation. This is the Weight Projection Principle (which controls weight projection from the Weight Grid onto the Accent Grid), already encountered in the case of Selkup and Uzbek.

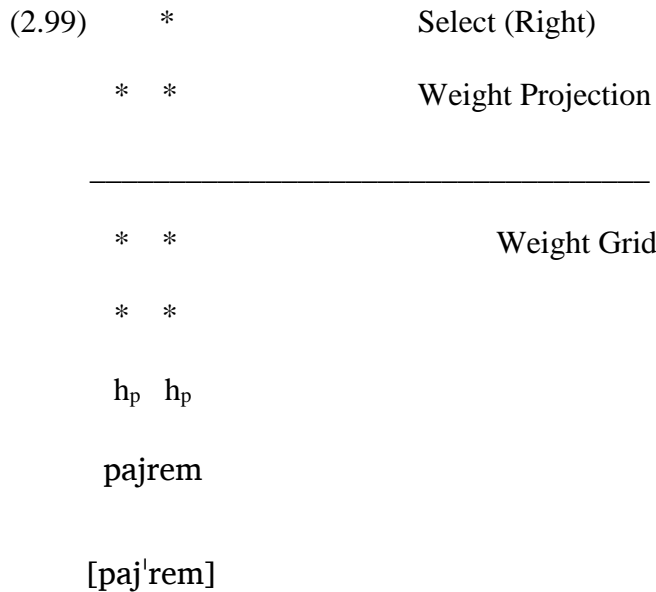
(i) *Words with more than one heavy morpheme*

In [tʃodra-na-^lge] (“forest-1Pl.Poss-COMIT”), which consists of the root /tʃodra/ (“forest”), containing two phonologically heavy syllables, and two diacritically heavy suffixes, the 1Pl Possessive /-na/ and the Comitative /-ge/, accent falls on [ge]. Since, in EML, 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 accent on [ge].

(2.98)	*	Select (Right)
	* *	Weight Projection
<hr/>		
	* * * *	Weight Grid
	* * * *	
	* *	
	h _p h _p h _d h _d	
	tʃodra-na-ge	[tʃodra-na- ^l ge]

(ii) *Words with more than one heavy syllable*

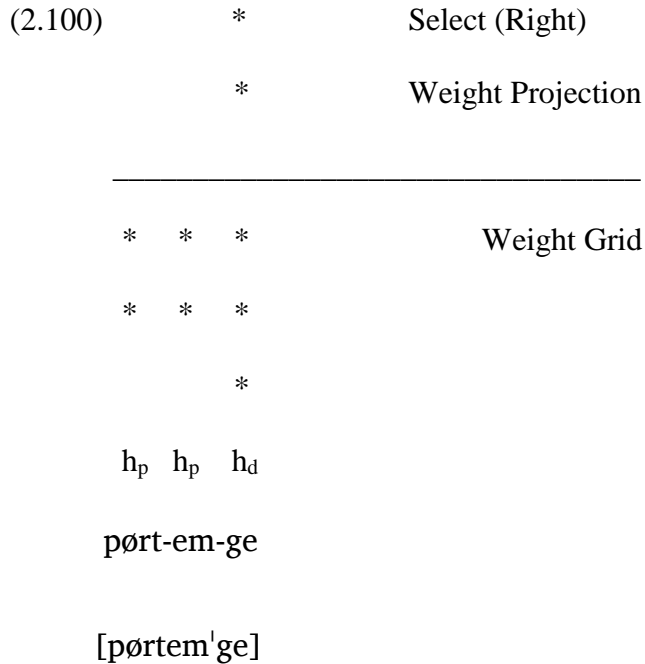
Since the syllables are equally heavy, both are projected on line 1 of the Accent Grid. Then, Select (Right) chooses the rightmost of the two gridmarks, yielding final accent.



(iii) *Words with heavy morphemes and heavy syllables*

In [pørt-em-¹ge] (“house-1Sg.POSS-COMIT”), which consists of the phonologically heavy syllables /pørt/ and /em/, and of the diacritically heavy Comitative suffix /-ge/, accent falls on /ge/. Since, in ELM, diacritically heavy morphemes are heavier than phonologically heavy syllables, the suffix /-ge/ is the heaviest element in the word. Therefore, it is projected on line 1 of the Accent Grid,

while the syllables are not. Then, Select (Right) chooses the gridmark on line 1, yielding accent on /-ge/.



(iv) *Words with heavy morphemes and light syllables*

In [pələʃ'ge] (“ear-COMIT”), which consists of the root /pələʃ/ (“ear”), containing two phonologically light syllables, and of the diacritically heavy Comitative suffix /-ge/, accent falls on /-ge/. Since, in ELM, diacritically heavy morphemes are heavier than phonologically light syllables, /-ge/ is projected onto line 1 of the Accent Grid, while the root syllables are not projected. Then, Select (Right) chooses the line 1 gridmark, yielding accent on [ge].

(2.101) * Select (Right)
 * Weight Projection

 * * * Weight Grid
 *
 *
 l_p l_p h_d
 pələʃ-ge
 [pələʃ'ge]

(v) *Words with a light and a heavy morpheme*

In [pørt'nala] (“house-1Pl.Poss-COMPAR”), which consists of the phonologically heavy syllable /pørt/, the diacritically heavy suffix /na/ and the diacritically light suffix /-la/, accent falls on /na/.

Since, in ELM, light morphemes and heavy syllables are both lighter than heavy morphemes, the latter are the only ones to be projected onto line 1 of the Accent Grid. The gridmark on line 1 (which results from weight projection) is then chosen by Select (Right), thus yielding accent on /na/.

(2.102)	*	Select (Right)
	*	Weight Projection
<hr/>		
	* * *	Weight Grid
	* *	
	*	
	h_p h_d l_d	
	pørt-na-la	
	[pørt ¹ nalə]	

(vi) *Words with a light morpheme and a heavy syllable*

In [ˈpørtla] (“house-COMP”), which consists of the root /pørt/ (“house”), containing a phonologically heavy syllable, and the diacritically light Comparative suffix /-la/, accent falls on [pørt].

Since, in ELM, 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 word accent over this syllable.

(2.103)	*	Select (Right)
	*	Weight Projection
<hr/>		
	* *	Weight Grid
	*	
	h _p l _d	
	pørt-la	
	[ˈpørtla]	

(vii) *Words with light morphemes and light syllables*

In [ˈpələʃla] (“ear-COMPAR”), which consists of the root /pələʃ/ (“ear”), containing two light syllables, and of the diacritically light Comparative suffix /-la/, accent is initial.

Since, in ELM, light syllables and light morphemes are equally light, nothing is projected from the Weight Grid, resulting in an empty line 1 on the Accent Grid. Project Position (Left) places a gridmark on this line over the initial syllable, then chosen by Select (Right), yielding the default initial accent.

(2.104) * Select (Right)
 * Project Position (Left)

* * * Weight Grid

l_p l_p l_d

pələʃ-la

[ˈpələʃ-la]

(viii) *Words with unpredictable accent location*

When accent location is not predictable, I propose to assign a gridmark in the lexical entry to the syllable that will have the surface accent. In the course of the derivation, this gridmark appears on line 1 of the Accent Grid and is, then, chosen for the accent by Select (Right).

For example, accent in [serˈye] (“comb”) is assigned as in (2.105).

(2.105) * Select (Right)
 * Weight Projection

* WG/Lexical marking

serye

[serˈye]

2.4.10. A note: The Scales Approach vs. Head Dominance

Interestingly, the theory presented above turns out to be at odds with a well-known lexical accent theory.

The theory of Head Dominance (Revithiadou 1999) associates accent assignment with morphological headedness, whereby accent depends on the lexical-accentual property of the morphological head. According to the theory, in order to derive accent location, knowledge of both morphological constituency and morphological headedness is required.

Combined with a special approach of morphology (Categorial Morphology), in which inflectional affixes are dependents to roots, as opposed to derivational suffixes, taken to be heads, this leads Anthi Revithiadou to the conclusion that

if compositionality and head-dominance indeed require a one-to-one correspondence between prosodic and morphological headedness, then it is justifiable to expect elements that are morphological heads such as roots or derivational suffixes to be marked with a ... lexical accent.

(Revithiadou 1999:47)

Now, note that, in addition to the previously encountered inflectional Comitative suffix /-ge/, ELM also has a homophonous derivational suffix /-ge/ which differs from the former in that it respects the phonological accent rule:

(2.106)	joʃ ^l kar	red	joʃ ^l kar-ge	red
	uʒar	green	u ^l ʒar-ge	green

Thus, the derivational /-ge/ surfaces unaccented, whereas the inflectional /-ge/ surfaces accented, opposite to what Head Dominance predicts. By contrast, the S&P grammar for ELM, which crucially includes the Hybrid Weight Grid, correctly derives both types of forms.

This demonstrates that accent assignment is not always correlated with morphological structure.

2.4.11. Summary

In this section, I have offered a detailed accentual description in Eastern Literary Mari, including the accent rule for phonologically predictable accent location as well as certain exceptionally behaving suffixes.

At the theoretical level, the goal of this section was to give a *uniform* account of both the accent rule and the exceptions to it by means of a *single* accentual grammar, rather than treating exceptions separately, as idiosyncratic items (which is typical of other generative approaches).

This led me to the notion of a *hybrid weight scale*, a novel type of weight scale in which phonological and diacritic weights are ordered. In particular, I have established a hybrid weight scale for ELM and proposed that the accentual grammar of

ELM consists of a particular “hybrid” Weight Grid (a grid representation of the hybrid weight scale) and of the S&P parameter system.

In this way, this Scales Approach accomplishes our goal (see above): it *uniformly* captures the phonological accent rule of Eastern Literary Mari together with the apparent morphological (and lexical) exceptions to this rule, treating both *in the same way* through the use of a *single* accentual grammar.

2.5. Tundra Nenets

2.5.1. Introduction

In this section, I examine accent assignment and phonetic correlates of word accent in several dialects of Tundra Nenets, a Samoyedic language of the Uralic family.¹⁵

Tundra Nenets is a ramified group of dialects which differs much from Forest Nenets, another dialect group: the two groups have been reported to be mutually unintelligible (at least for some speakers).

There is no consensus about accent location in Tundra Nenets among various authors: accent is reported to be final in Castrén (1966 [1854]), initial in Salminen (1997, 2012), van der Hulst (2010) and StressTyp, and phonologically unpredictable, making reference to morphology in Tereschenko (1965).

This difference of opinion is due, in part, to paucity of reliable data and accent reports. Traditionally, students of Tundra Nenets laid emphasis on morphology

¹⁵ This study owes much to Maria Amelina who generously provided fieldwork recordings and valuable information on Tundra Nenets views, while not necessarily sharing my point of view. All potential errors are mine.

(Tereshchenko 1956), segmental phonology (Salminen 1993), morphonological alternations (Janhunen 1986), and on comparative studies within Uralic (Helimski, 1982), whereas phonological and phonetic studies on accent were extremely few. This paucity is reflected, in particular, by the absence of stress marks in Nenets dictionaries (*e.g.*, Tereschenko 1965).

Among publications about Nenets phonology that discuss accentuation, Salminen (1997) has gained some authority. According to this work, Tundra Nenets has initial accent, with rhythmic beats on every non-final odd syllable (the final syllable never gets a beat). Further, Salminen recognizes a schwa phoneme in Tundra Nenets, which he transcribes as / \circ /, and states that, in unstressed position, this / \circ / is a realization of what he calls the (unique) “short vowel” of Tundra Nenets and transcribes as / \emptyset /. If an odd syllable contains a / \circ /, then the rhythmic beat, which normally falls on odd-numbered syllables, shifts leftwards from the syllable with schwa to the preceding even-numbered syllable. (Due to the absence of relevant data, it is unclear whether this shift to a pre-schwa position creates a clash with the beat on the odd-numbered syllable immediately before.)

As stated, this stress rule implies that, in Tundra Nenets, rhythm is WS (with schwa behaving as light), while accent is WI (fixed initial). Regrettably, Salminen provides no clear examples to illustrate his stress rule.

None of the works just mentioned examine the phonetic correlates of accent in order to provide support for the descriptions of accent patterns. An experimental study by Staroverov (2006), based on fieldwork in a village of Nelmin Peninsula, is a step in this direction. The Malaya Zemlya dialect of this speech community belongs to the

Western group of Tundra Nenets dialects (in the outfall of the Pechora River). Acoustic correlates of stress in nouns in two representative dialects, the Far-West dialect of the Kanin Peninsula and the Eastern dialect of Yamal, are subject of a careful study by Amelina (2011), which I discuss below.

Based on their recent empirical findings, I will formulate an accent rule for Tundra Nenets and argue in detail that this is a WS unbounded system in which phonological and diacritic weight both play a central role, interacting in a complex way in terms of two different weight scales.¹⁶

The section is organized as follows. After a quick sketch of the vowel system of Tundra Nenets (section 2.5.2), I touch upon cross-linguistic variation in accentual correlates (section 2.5.3). In the next two sections, I discuss in detail the phonologically (un)predictable aspects of accent assignment in Tundra Nenets, focusing first on phonological weight in morphologically simple words (sections 2.5.4-2.5.5), then on diacritic weight in morphologically complex words (section 2.5.6). Section 2.5.7 presents an original account of accent assignment in Tundra Nenets within the S&P theory and illustrates it with sample derivations. Results and limitations are summarized in section 2.5.8.

2.5.2. The vowel system

There is no consensus among linguists as to which vowels are part of the system. In addition, some scholars tend to change to their opinion rather frequently.

¹⁶ The present account is limited to nouns and adjectives; little information about accent location for other categories seems to be available.

Thus, Tereshchenko (1965:864) distinguishes multiple degrees of distinctive vowel length in Tundra Nenets, *viz.* “long”, “neutral”, “short” and “extra-short”, and supports these phonemic distinctions with minimal pairs. However, in another work (published the following year) Tereschchenko makes a different claim, according to which the system comprises the “neutral” vowel phonemes /i i u e o œ a/ (Tereshchenko 1966:377) and does not involve length distinctions. Since she proposes that Tundra Nenets vowels differ in *phonetic* duration, but does not recognize distinctions of *phonemic* length, this probably means that she has reanalyzed “non-neutral” (*i.e.* “short”, “extra-short” and “long”) vowel phonemes of Tereschchenko (1965) as allophones of the “neutral” vowel phonemes. In the same chapter, though, Tereshchenko (1966) recognizes the distinctive function of vowel length in Tundra Nenets. To sum up, Tereshchenko has made divergent claims about the vowel system of Tundra Nenets that are contradictory and, therefore, hardly reliable.

A different view is voiced in Tapani Salminen’s investigations. According to Salminen (1997), Tundra Nenets has a 9-vowel system in (2.106), with the classical five-vowel set of short vowels (/i e o a u/) (which Salminen refers to as “neutral”), two long vowels /i:/ and /u:/, a diphthong that Salminen notates as /æ/ and a vowel that he notates as /ø/ (/ə/), which is shorter at the phonetic level than all other vowels except the extrashort / °/ segment.

(2.107) *The vowel system of Tundra Nenets (after Salminen 1997)*

Extrashort	Short	Neutral	Long (Stretched)
	i u	i: u:	
°	e o		
	ø a		æ

Based on her recent fieldwork, Amelina (2011) confirms that Salminen's vowel system for the Yamal dialect is correct (modulo phonemic transcription).

By contrast, she notes that the long high vowel segments /i:/ and /u:/ are absent from the vowel system of the Kanin dialect. I will adopt here T. Salminen's vowel system because it has received support from careful recent fieldwork. As for transcription, I abide by Maria Amelina's notation rather than Salminen's.¹⁷

Finally, note that the vowel system of the Malaya Zemlya dialect described in Staroverov (2006:3) coincides with the Kanin system as identified in Amelina (2011) (see above).

2.5.3. Phonetic correlates of word accent in Tundra Nenets

In this section, I discuss the phonetic aspects of Tundra Nenets word prosody, providing details about the acoustic and perceptual correlates of accent in Tundra

¹⁷ M. Amelina transcribes certain phonemes differently from T. Salminen: for example, she uses /ǎ/ instead of Salminen's /ə/ and does not include the overshoot /°/ in the vowel inventory.

Nenets dialects based on recent research on the Yamal and Kanin dialects (Amelina 2011) and on the Malaya Zemlya dialect (Staroverov 2006).

In this section, in addition to the phonetic description of the accentual correlates, I will ascertain accent location and discriminate between different kinds of word-level prominence based on instrumental studies.

I rely here on highly informative fieldwork by two linguists.

The data on the Malaya Zemlya dialect (Western Tundra Nenets) as spoken in the village of Nelmin Peninsula, situated in the outfall of the Pechora River, come from Staroverov (2006).

The acoustic correlates of stress in nouns and adjectives of the Far-West dialect of Kanin, spoken on the Kanin Peninsula, and the Eastern dialect of Yamal are examined in a careful study by Amelina (2011). I have also benefited from information and recordings of Yamal utterances generously shared by Maria Amelina (Maria Amelina, *p.c.*, 2014-2015).

In a thorough study of phonetic correlates characterizing word accent in Yamal and Kanin dialects of Tundra Nenets, Amelina (2011) analyzes acoustically a large sample of morphologically simple disyllabic nouns and adjectives of both dialects collected during her fieldwork.¹⁸

In Table 2.2 below, several words of the Yamal dialect are given, together with the potential stress correlates (duration, intensity, f_0) for each syllable.

¹⁸ Maria Amelina reports that the fieldwork materials used in Amelina (2011) were collected in the Sö-Yaxa village of the Yamal region (Yamalo-Nenets autonomous district) and the Oma village of the Circumpolar region (Nenets autonomous district).

TABLE 2.2. *Duration (ms), intensity (dB) and fundamental frequency (Hz) of vowels in underived disyllabic words. The Yamal dialect of Tundra Nenets. (From Amelina 2011)*

	Word	<i>dur.syl1</i>	<i>intens.syl</i>	<i>f₀ syl1</i>	<i>dur.syl2</i>	<i>intens.syl2</i>	<i>f₀ syl2</i>
a. σ_1 stressed	'n'aba	196	82.33	207	44	81.26	208
	'janeʔ	146	79.65	175	59	74.64	172
	'n'ada	123	81.9	184	60	80.22	185
	'sarwa	111	82.40	190	58	81.07	192
	'jes'a	95	79.98	172	100	75.92	176
	pă'd'ă	58	80.32	184	61	81.26	179
b. σ_2 stressed	ŋu'χud	51	84.87	209	121	83.66	175
	s'i'd'a	68	82.52	190	81	82.85	167
	si'ra	52	82.51	197	115	81.88	170
	jăb'ta	37	82.98	161	73	85.06	166
	χă'lew	71	85.47	213	169	84.54	219

Based on Table 2.2, we conclude with M. Amelina that in the Yamal dialect, the acoustic correlates of accent are duration and intensity, the most robust correlate in this dialect being duration. As illustrated in Table 2.2, the accented syllable in Yamal words has greater duration than the unaccented syllable in almost all words, whereas this is

not always the case for intensity. Thus, in some words (like [ŋu'χud] and [si'ra] given above), intensity is less in the accented syllable than the unaccented one; therefore, duration is the only correlate of accent in these words.

In disyllables with accent on the first syllable, intensity is a reliable correlate of accent because it is greater for the first syllable than for the second in all words, while duration is less reliable because it may be smaller for the first syllable than for the second (*e.g.*, [ʲesʲa] in Table 2.2). That is, accent in disyllabic words accented on the first syllable is always realized with greater intensity on the accented syllable, sometimes (but not always) accompanied by duration. However, in disyllabic words accented on the second syllable, intensity is not a correlate of accent at all: indeed, in many words of the dialect (*e.g.*, in [ŋu'χud] and [si'ra] in Table 2.2), intensity is lower for the accented syllable than for the unaccented one, leaving duration as the only acoustic correlate of second-syllable accent in disyllables.

Summarizing, the acoustic correlates of accent in Yamal depend on the location of accent within the word. Namely, in disyllables with initial accent, the main accentual correlate is intensity, accompanied by duration in some words, while in disyllables with accent on the second syllable, duration is the only correlate of accent. In other words, at least in disyllables, word accent in the Yamal dialect has a “mixed” phonetic nature: it is both quantitative (duration) and/or “expiratory” (intensity), depending

Yamal is not alone in this respect. For instance, in Arapaho (Algonquian), the accentual correlates are not constant for the language as a whole. Rather, they differ depending on the phonemic length of the vowel. Indeed, Bogomolets (2014:10-12)

discovered that, in Arapaho, phonemically short accented vowels have greater intensity and higher fundamental frequency than short unaccented vowels, whereas phonemically long accented vowels have greater duration than the unaccented ones.

Let us now turn to the Kanin dialect. In Table 2.3, several Kanin words are given, together with the potential stress correlates (duration, intensity, f_0) for each syllable.

TABLE 2.3. *Duration (ms), intensity (dB) and fundamental frequency (Hz) of vowels in underived disyllabic words. The Kanin dialect of Tundra Nenets. (From Amelina 2011)*

	Word	<i>dur.syll1</i>	<i>intens.syll1</i>	<i>f₀ syll1</i>	<i>dur. syll2</i>	<i>intens.syll2</i>	<i>f₀ syll2</i>
a. σ_1 stressed	'p'irtʃ'i	224	91.68	233	116	89.53	317
	'jor'a	242	84.14	178	159	85.69	194
	'n'awko	171	82.69	179	39	84.28	243
	'sarwu	195	86.07	197	115	84.17	243
	'jes'a	164	84.51	186	117	85.55	279
	æ'r'o	247	84.17	171	123	85.14	191
	jo'ni?	113	84.63	240	190	82.68	273
b. σ_2 stressed	ji'r'i	50	76.44	159	99	80.81	181
	no'χo	86	83.44	190	101	83.31	214
	jäb'ta	87	83.06	192	102	89.37	261
	χä'lew	71	85.47	213	169	84.54	341

Based on Table 2.3, we conclude that, in the Kanin dialect, the acoustic correlate of accent is duration alone; unlike in the Yamal dialect, intensity in Kanin is not a stress correlate. It is also worth noting that all the available material displays the rise of f_0 from the initial to the second syllable, *regardless of accent location*.

This seems to suggest (*contra* Amelina 2011:34) that “the accent system of Kanin Tundra Nenets can be viewed as based on duration and, in part, pitch”. In my view, the only accentual correlate in Kanin is duration, while the f_0 rise is an invariant prosodic characteristic of Kanin words. In other words, Kanin is a “duration-accent dialect” (see van der Hulst 2011).

While in Kanin, the rise of fundamental frequency is a secondary phonetic property of words, rather than an accentual correlate, in the Malaya Zemlya dialect, this rise is a genuine accentual correlate because its location is not fixed; instead, it is associated with the position of the accented syllable. Duration, which is the unique correlate of accent in Kanin, becomes, in turn, an invariant accompanying characteristic of Malaya Zemlya words. Since f_0 is the only accentual correlate in Malaya Zemlya, this is a pitch-accent dialect (see discussion below).

Indeed, Staroverov (2006) finds that every word in his Malaya Zemlya corpus displays a rise of f_0 . Evidence for the claim that accent in this dialect is cued by rising pitch comes from a perceptual experiment which has shown that, among pitch, loudness and duration, Malaya Zemlya listeners were attentive to pitch modulation. In addition, Staroverov’s informants explicitly recognized pitch as key to accent location. In this dialect, accent location is variable and the location of the pitch rise is also variable, revealing accent location. That is, accent in Malaya Zemlya is not fixed initial (*contra*

Salminen 1997) and an increase in fundamental frequency (perceptually, a pitch rise) is the unique phonetic correlate of accent.

Summarizing, the phonetic correlates of word accent in Tundra Nenets vary with the dialect. The acoustic correlates of accent in the Yamal dialect are intensity and duration where either one or the other is the dominant correlate, depending on accent location. In the Kanin dialect, accent is cued by duration only: this is, thus, a “duration-accent” dialect. By contrast, in the Malaya Zemlya dialect, the only perceptual correlate of accent is pitch; f_0 is then an acoustic correlate of accent in this dialect. In other words, in the Yamal dialect, accent is realized by a “package” of phonetic correlates, whereas, in the Malaya Zemlja dialect, the unique phonetic correlate of accent is f_0 . Therefore, Yamal dialect is a stress-accent system, Malaya Zemlya is a pitch-accent system and Kanin is a duration-accent system (Beckman 1986, van der Hulst 2011).¹⁹ (In the Malaya Zemlya dialect, duration is used as initial prominence; see below).

The phonetic correlates of accent in the Yamal, Kanin and Malaya Zemlya dialects are summarized in Table 2.4.

TABLE 2.4. *Acoustic correlates of word accent in three Tundra Nenets dialects.*

<i>Dialect</i>	<i>Duration</i>	<i>intensity</i>	<i>f_0</i>	<i>Type of system</i>
Yamal	+	+	-	stress-accent
Kanin	+	-	-	duration-accent
Malaya Zemlya	-	-	+	pitch-accent

¹⁹ The comparison of accent location in the Yamal, Kanin and Malaya Zemlya dialects, based on the phonetic studies of accentual correlates, provides empirical support for the view that accent is variable rather than fixed and, at the same time, that it falls on the same syllable across the three dialects. In other words, while cues to word accent vary depending on the dialect, accent location is the same. This appears to be all the more interesting since the Yamal dialect belongs to the Eastern dialect group while the Kanin and Malaya Zemlya to the Western group (with a further ramification), which suggests that there may be further prosodic similarities between these dialects.

In addition, Staroverov finds that, in the Malaya Zemlya dialect, the vowel in the initial syllable is significantly longer than the vowel in the second syllable, regardless of accent location. This increase in duration on the second syllable is an instance of initial phonetic lengthening, relatable to phonetic strengthening (Fougeron & Keating 1997). Therefore, two prosodic phenomena co-occur in the Malaya Zemlya dialect: the pitch rise and initial vowel lengthening.

We can say that, while the pitch rise is the correlate of word accent, initial lengthening is an instance of Edge Prominence (which, as we know, differs from word accent in that it is not the word-level prominence and in that it marks a word edge). This distinction between variable accent and word-initial Edge Prominence (see Moskal 2011 for this term) pinpoints a confound to the thesis that Tundra Nenets has fixed initial accent (Salminen 1997, 2012): in fact, the alleged “fixed initial” word accent in Tundra Nenets is an edge prominence, not word accent.

Mutual independence of accent and Edge Prominence (identified in Malaya Zemlja Nenets) supports the fundamental insight of the PAF theory, inherited by the S&P theory (its offshoot), that “stress” is not a unitary object (van der Hulst 2012, Goedemans & van der Hulst 2014). Rather, accent and Edge Prominence are separate phonological entities which therefore should be accounted for independently.

Even if it were possible to account for both primary and secondary stress using a single mechanism (as metrical theories attempt to do), this would only make us lose important knowledge gained from the analysis of languages such as Tundra Nenets. By contrast, by assigning accent and Edge Prominence separately, the S&P theory straightforwardly captures their mutual independence.

2.5.4. The phonologically unpredictable aspects of accent assignment

After this excursion into the phonetics of Tundra Nenets prosody, I will now focus on phonological weight and its role in accent assignment in this language.

As in most languages, accent in Tundra Nenets is clearly culminative: every word has at most one word-level prosodic prominence. Further, as this is the case in some languages, there are minimal stress pairs in Tundra Nenets; that is, accent is also distinctive. This is illustrated in (2.108) with examples drawn from Tereschenko (1966: 378).

(2.108)	tɛva	tail	tɛ'va	reach
	'todasʲ	throw up	to'dasʲ	warm up (by a fire)
	'βɔta(sʲ)	enclose	βa'tɔ	spare

Although minimal pairs are found in Tundra Nenets, thus suggesting that it is a lexical accent system (Staroverov 2006, Amelina 2011), I will now show that, *in underived words of particular syllable structure*, accent is predictable on phonological grounds.

I focus here on underived disyllabic words of Yamal Tundra Nenets, drawing on Amelina (2011) who provides these forms. This particular dialect is worth our attention as a relatively large set of words with phonetically ascertained accent location is available.²⁰

²⁰ Henceforth, wherever data are given without indication of the source dialect, it will be understood that these come from Yamal.

I will examine various accentual patterns in order to determine the syllable weight of different syllable types. It is worth noting that, in Tundra Nenets, words which contain the vowel /ä/ exhibit different stress patterns from words without /ä/. Let us, then, begin with words that do not contain this vowel.

To begin with, consider words of the CVCV syllable shape, common in the language. In some (but not all) CVCV words, accent is initial, as in (2.109).

(2.109) 'CV.CV

'χal'a	fish
'lata	large
'jor'a	deep
'jes'a	iron

However, in many morphologically simple CVCV nouns, accent falls on the second syllable rather than on the first. This is shown in (2.110).

(2.110) CV.'CV

no'χo	polar fox
so'χo	high knoll

jo ^l ne	waist
sje ^l χe	big snowball
ji ^l ri	grand-father
ju ^l ri ^o	fellow

Comparing (2.109) with (2.110), we conclude that, in morphologically simple words consisting of CV syllables only, accent location is not phonologically predictable, implying that the morphemes of the CVCV shape require diacritic marking.

Recall, though, that vowel height is a weight factor in certain Uralic languages. An oft-cited case is the Yaz'va variety of Komi (Lytkin 1961), genetically related to Nenets. This suggests the possibility that syllable weight in Yamal would depend on vowel height, a hypothesis that I will now check against the data.

First, compare (2.111a) and (2.112a), which have a low vowel in the first syllable and a high vowel in the second, to words in (2.111b) and (2.112b), which display the mirror sequence.

(2.111) a. 'pali	sword
'χadi	spruce
b. 'χid ^ɨ a	cup
'ti ^ɨ ja	narrow

(2.112) a. 'padu cheek

b. 'nʲunʲa loon

 'nʲurka aspen

We note here that accent location does not vary for any kind of sequence: high-low and/or low-high.

Second, we observe that, words with a high vowel in the first syllable and a low one in the second syllable, may have accent on the first syllable (2.113a)-(2.114a) or on the second one (2.113b)-(2.114b).

(2.113) a. 'sʲiwa shovel

 'jibʲa glue

 'jinʲa ribbon

 'tʲidʲa mother's youngest brother

b. sʲi'dʲa two

(2.114) a. 'χidʲa cup

 'tija narrow

b. si'ra winter

The evidence above indicates that vowel height is not a weight factor in Yamal Tundra Nenets. I then conclude that accent location in CVCV words is not phonologically predictable.

Consider now the accent patterns in morphologically simple disyllabic words consisting of a CVC syllable and a CV syllable. Both CVCCV and CVCVC words normally have accent on the CVC syllable, as one would expect (since, in many languages, closed syllables are heavier than open syllables). This is shown in (2.115) for CVCCV (with initial accent), and (2.116) for CVCVC (with accent on the second).

(2.115) 'CVC.CV

'pik.tʃ'a	thumb
'nʲurka	aspen
'pʲir.tʃʲi	bird's stomach
'lʲem'b'a	blade
'χamba	wave

(2.116) CV.'CVC

ŋu'χud	upper lip
--------	-----------

However, in (2.117), accent falls on the open syllable whereas the closed syllable is unaccented.

(2.117) 'CV.CVC

'sujik	bud
--------	-----

The form in (2.117) is the only one to have this accent pattern (at least in my corpus); as the unique, non-systematic exception, (2.117) can be disregarded in the analysis. By contrast, the patterns (2.115) and (2.116) are representative. We can safely conclude that CVC syllables are heavier than CV syllables in Tundra Nenets.

In simplex disyllabic words of the CVC.CVC syllable shape, accent may fall on either syllable depending on the word (except syllables with a glottal stop in the coda). For example, the forms in (2.118) are stressed on the second syllable:

(2.118) CVC.'CVC

tʰanʲ'gad	biceps
xal'mʲer	dead (<i>noun</i>)
tem'boj	tendon
sar'mik	beast
nʲan'duj	sharp

However, one also finds the forms in (2.119), with initial accent. (These display case allomorphy; in each pair of forms, only the form on the left, *i.e.* the one with the oblique case allomorph, is of interest.)

(2.119) 'jomzʲan ~ 'jomzʲaʔ soft, fluffy snow

'pʲibtʲin ~ 'pʲibtʲiʔ lower lip

To conclude, accent location in morphologically simple words that only consist of open or only of closed syllables is not phonologically predictable and, therefore, requires some form of lexical marking.

When there is an asymmetry in weight, accent goes predictably to the heaviest syllable.

2.5.5. The phonologically predictable aspects of accent assignment

2.5.5.1. The weight of syllables with [ʔ]

As found above, in the general case, syllables with a single consonant in the coda are neither heavier, nor lighter than syllables without the coda. However, syllables in which the coda is filled with a glottal stop are special.

Comparing CVʔ and CV syllables, there are a few words in which CV is stressed rather than CVʔ whereas the reverse pattern is not encountered in my corpus:

(2.120) 'janeʔ in-law (about one's relative)

'parʲeʔ pile warehouse

Therefore, CVʔ appears to be lighter than CV, *i.e.* CV > CVʔ.

Interestingly, Tundra Nenets is not the only language to display this greater lightness of CVʔ.

The closest cross-linguistic parallel is Hupa (Athabaskan): Gordon & Luna (2004) finds that in Hupa, the weight scale includes CVC > CV > CVʔ; this is the finding for Tundra Nenets presented here (see the scale above).

CVʔ is also lighter than CVC in Capanahua (Safir 1979) and Cayapa (Hyman 1984): in both languages, CVʔ and CV syllables are equally light, as opposed to heavier CVC. The difference with Tundra Nenets is that, in Capanahua and Cayapa, CVʔ syllables are as light as CV syllables, while, in Tundra Nenets, syllables closed by a glottal stop are lighter than open syllable.

Finally, recall that in Uspanteko, all syllables with a glottal stop in the coda repel accent; thus, CV > CVʔ in Uspanteko (Björn Köhnlein 2014).

Indeed, comparing words of the CVC.CVʔ shape, we note that CVʔ is always unaccented, witness the forms in (2.121).

(2.121) 'CVC.CV?

'tɪnzʲaʔ	lasso
'nɪnsʲiʔ	palate

Since the accent in words of this shape always falls on the initial syllable, thus avoiding CV?, we must conclude that the glottal stop makes the syllable lighter than the syllable closed by another consonant: CVC > CV?.

Given that Nenets has closed syllables, we might ask whether it only has syllables that are closed by a single consonant or syllables closed by a consonant cluster as well. Indeed, there are CVCC syllables in the dialect. All syllables of this shape in my corpus end in a glottal stop (CVC?), as in (2.122):

(2.122) χaʲjerʔ sun

According to (2.122), CVC? syllables are heavier than CV syllables (CVC? > CV).

Based on the evidence from underived words adduced above, we establish (2.123):

(2.123) a. CVC? > CV > CV?

b. CVC > CV > CV?

Unfortunately, the relative weight of CVC and CVC? cannot be established, due to the lack of CVCCVC? words in the corpus.

I now suggest to unify (2.123a,b) into the weight scale (2.124), assuming that CVC > CVC?:

(2.124) CVC > CVC? > CV > CV?

Although I am not aware of direct evidence that CVC is heavier CVC?, the repelling nature of the glottal stop (cross-linguistic and language-internal) strongly suggests that this is the case (CVC > CVC?). At the same time, there is no counter-evidence to CVC > CVC? either. That is, this assumption is consistent with the rest of the available data.

2.5.5.2. The weight of syllables with /ǣ/: phonetic evidence

Recall now our initial distinction among the underived words into those that contain /ǣ/ and those that do not. In the above discussion, we have examined the stress patterns in words without /ǣ/. Let us now consider those underived words that do contain this vowel.

Based on the experimental evidence in Amelina (2011), I will now argue with respect to /ǎ/ that accent assignment in the Yamal and Kanin dialects makes reference to vowel quality, treating the initial syllable containing /ǎ/ as light.

In Table 2.5, several words of Yamal Nenets are given, together with common potential acoustic stress correlates (duration, intensity, f_0) for each syllable.

TABLE 2.5. *Duration, intensity and fundamental frequency of vowels in underived disyllabic nouns with [ǎ] in the first syllable. The Yamal dialect of Tundra Nenets.*

(From Amelina 2011)

Word	<i>dur.syl1</i>	<i>intens.syl1</i>	<i>f₀ syl1</i>	<i>dur.syl2</i>	<i>intens.syl2</i>	<i>f₀ syl2</i>
[sǎ'wa] (“cap”)	66	83,35	206	86	81,24	187
[lǎ'b'a] (“paddle”)	63	80,61	95	96	82,16	96
[χǎ'ra] (“bend”)	62	84,05	216	161	83,45	195
[jǎ'χa] (“river”)	65	81,99	186	128	81,84	191
[jǎb'ta] (“dew”)	37	82,98	161	73	85,06	166
[χǎ'r'o] (“crane”)	46	78,67	192	185	79,56	174
[χǎ'lev] (“seagull”)	40	79,37	193	119	79,42	168
[pǎ'reʔ] (“drill”)	50	82,32	209	125	81,39	188

In Yamal words containing the vowel /ǎ/, the reliable correlate of accent is duration (rather than intensity). Indeed, as we see from Table 2.5, the duration of the second vowel is always greater than that of the first vowel. Thus, Amelina (2011: 31)

observes that the difference in duration between the two vowels in a word usually lies in the range of 30 ms – 60 ms and can even increase to 80 ms and up to 100 ms, which is considerable. Therefore, in the Yamal dialect, accent clearly falls on the second syllable of disyllabic forms that have /ǎ/ in their first syllable. These phonetic data support the conclusion that, in Yamal Nenets, those syllables that contain /ǎ/ (both open and closed) are light.

The same as above is true for Kanin (modulo the correlate of accent). Table 2.6 presents the values of major acoustic parameters (duration, intensity, f_0) for certain Kanin cognates of the Yamal words in Table 2.5.

TABLE 2.6. *Duration, intensity and fundamental frequency of vowels in underived disyllabic nouns with [ǎ] in the first syllable. The Kanin dialect of Tundra Nenets.*

(From Amelina 2011)

<i>Word</i>	<i>dur.syl1</i>	<i>intens.syl1</i>	<i>f₀ syl1</i>	<i>dur.syl2</i>	<i>intens.syl2</i>	<i>f₀ syl2</i>
[χǎ'ra] (“bend”)	127	84,44	206	135	85,18	276
[jǎ'χa] (“river”)	94	83,25	243	149	85,21	303
[jǎb'ta] (“dew”)	87	83,06	192	102	89,37	261
[χǎ'r'o] (“crane”)	121	84,36	218	152	84,56	311
[χǎ'lev] (“seagull”)	71	85,47	213	169	84,54	341

Duration is the only accentual correlate in the Kanin dialect. As Table 2.6 readily shows, in words with [ǎ] in the initial syllable, the first vowel is phonetically shorter than the second. That is, in this type of words, accent falls on the second syllable, while the initial syllable is always unaccented. Therefore, syllables containing [ǎ] are light in the Kanin dialect. Thus, accent assignment in Tudra Nenets makes reference to vowel quality.

2.5.5.3. The weight of syllables with /ǎ/: phonological analysis

I will now determine the relative weight of various syllables containing /ǎ/ in the syllable nucleus from the phonological perspective. In this section, I focus on the Yamal dialect.

To begin with, observe that open syllables with /ǎ/ are lighter than open syllables with any other vowel:

(2.125) χǎ ^l da	nail
χǎ ^l ra	turn
jǎ ^l χa	river
mǎ ^l ra	sandbank

Further, Că syllables are lighter than CVC syllables:

(2.126) χă'lew seagull

In words of the CăCV? shape, accent falls on the CV? syllable. The following near-minimal pairs make this conspicuous:

(2.127) a. 'par'e? pile warehouse for stock

b. pă're? drill

We then conclude that Că syllables are lighter than CV?. Also, the CăC syllables are lighter than CV?:

(2.128) lăm'b'a? ski

Interestingly, CăC syllables are lighter than CV, even though open syllables and closed syllables with a vowel other than /ă/, are of equal weight:

(2.129) lăm'do low

wăɾ¹ɲe crow

¹harăd house

Note also that, the word in (2.130), which consists of a CăC? and a CV syllable, CV is accented.

(2.130) ¹na.dăm? snot

Summarizing, all types of syllables with [ă] pattern together as accent-repelling. That is, these syllables behave as light. Since CVC? syllables are heavier than the light CăC? ones, I conclude that, in this case, the difference in weight does not depend on syllable structure, but on the presence of the vowel /ă/ in the syllable Nucleus.

Given that syllables with /ă/ are light in the dialect, we must now ask which syllable receives the word accent in the “light-only” disyllables. The data in (2.131) indicates that, in this class of words, accent falls on the second syllable:

(2.131) xă.¹jăl? tear

pă.¹djă bile

Thus, words in (2.131) provide evidence for final default accent in Yamal (at least, in underived words).

The vowel [ǎ] in Tundra Nenets is thus unaccentable, like the schwa in Dutch, German and English, except that polysyllabic words that only contain [ǎ] (the “all-light” words) as vowels receive an accent. This is different from Dutch which prohibits “schwa-only” words (van der Hulst 1984) to ensure obligatoriness of word accent.

2.5.5.4. Local summary

From the survey of stress patterns in morphologically simple words of Yamal Tundra Nenets, the following conclusions emerge:

(i) Bringing together the preliminary weight scale in (2.124) and the finding that all syllables containing /ǎ/ are light leads us to the following phonological weight scale for the Yamal dialect:

(2.132) CVC > CVC? > CV > CV? > Cǎ, CǎC, Cǎ?, CǎC?

(ii) All syllables which contain /ǎ/ pattern together in rejecting stress on another syllable, *i.e.* they are light; conversely, all light syllables contain /ǎ/. In other words, the source of phonological lightness in Yamal is not syllable structure, but solely vowel quality.

(iii) Since the light syllables in Yamal contain the vowel /ǎ/, the “all-light” words are those words that only contain such syllables. Accordingly, the default accent in Yamal is only found in these words.

(iv) Syllables closed by a glottal stop are lighter than syllables with the coda filled by some other consonant. This weight relation (CVC > CVʔ) is attested cross-linguistically.

(v) Accent is not phonologically predictable in those words that consist either only of CV syllables or only of CVC syllables (except for disyllabic words of these shapes with only [ǎ], in which case the (default) accent is final; see (iv) above). This implies that, in addition to phonological weight, some amount of lexical specification is required.

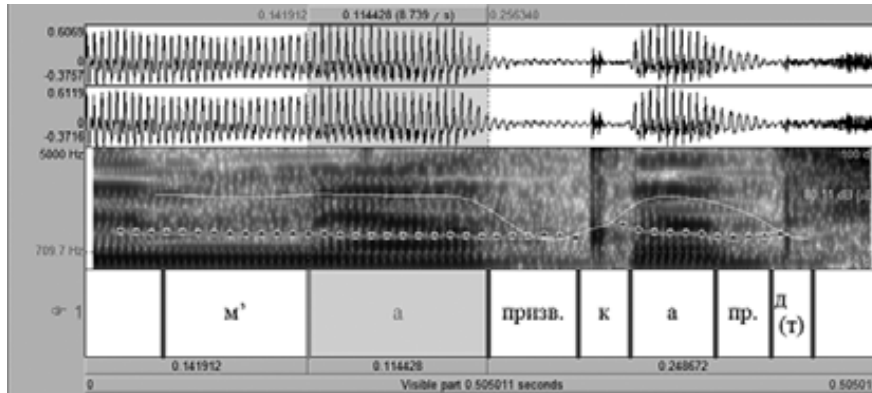
2.5.6. Diacritic weight in complex words

In the preceding section, I discussed accent and weight in morphologically simple words. This section takes up the issue of accent assignment in morphologically complex words, providing evidence that in complex words, unlike in simplex ones, accent assignment makes reference to diacritic weight.

First, consider morphologically complex words in which both the root and the suffix are diacritically heavy.

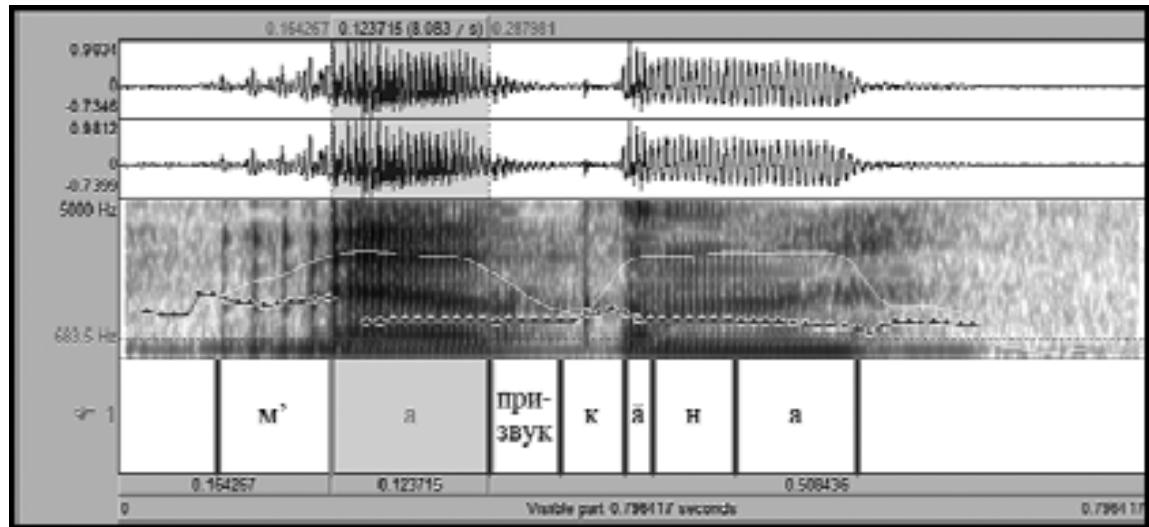
For example, if the diacritically heavy suffix */-χad/* is added to a diacritically heavy stem, such as */mʲaʔ/* “tent”, accent remains on the stem: *[ˈmʲakad]* “tent-ABL.SG”. Figure 2.4 provides evidence that accent in *[ˈmʲakad]* falls on the stem vowel.

FIGURE 2.4. *The acoustic analysis of the complex nominal form [ˈmʲakad] as produced by a Yamal speaker. (From Amelina 2011:11)*



Likewise, if the diacritically heavy root */mʲaʔ/* is combined with the diacritically heavy suffix */-χena/* “LOC.-INSTR.SG” (of which *[kăna]* is an allomorph), accent is on the stem: thus, *[ˈmʲakăna]* “tent-LOC.-INSTR.SG”, as illustrated in Figure 2.5.

FIGURE 2.5. *The acoustic analysis of the complex nominal form [l'mʲakǎna] as produced by a Yamal speaker. (From Amelina 2011: 11)*



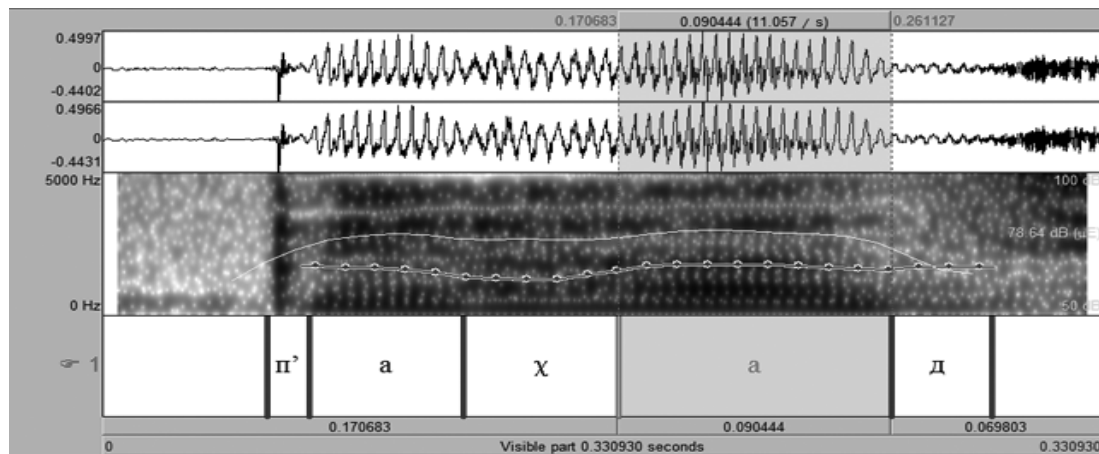
Thus, we have established that, in morphologically complex words of the Yamal dialect that contain more than one diacritically heavy morpheme, the leftmost heavy morpheme is selected for accent.

Finally, note that in Yamal words where a diacritically heavy suffix attaches to a diacritically light root, accent falls on the suffix. For example, when a diacritically heavy suffix /-χad/ “ABL.SG” is attached to a diacritically light stem, /pʲa/ (which can otherwise occur as the free accented nominal form [l'pʲa] “tree-NOM.SG”), accent falls on the suffix: [pʲa^lχad] “tree-ABL.SG”. Figure 2.6 offers phonetic evidence that this is indeed the case.²¹ Likewise, if the diacritically heavy LOC-INSTR Sg. suffix

²¹ Recall that, in the Yamal dialect, the accentual correlates of word accent are duration and intensity (see section 2.8.3).

/-χena/ is attached to a diacritically light stem like /pɛ/ “stone”, accent falls on the suffix, yielding [pɛ'χena] “stone-LOC.-INSTR.SG”.

FIGURE 2.6. *The acoustic analysis of the complex nominal form [pʲa'χad] “tree-ABL.SG” as produced by a Yamal speaker. (From Amelina 2011: 11)*



One notes that that the accentual behavior of such *light root-heavy suffix* combinations provides strong evidence against a potential “root control” analysis (in the spirit of Alderete 1999) of accent in Tundra Nenets, according to which the stem prevails over the affixes in attracting the accent.

Now, I will adduce evidence (drawing on Staroverov 2006) for the claim that, in another dialect of Tundra Nenets, namely the Malaya Zemlya dialect, accent assignment also requires reference to diacritic weight.

Staroverov reports that, when the diminutive suffix /-ko/ is added to certain stems in the Malaya Zemlya dialect, accent shifts to that suffix. For example, compare (2.133a) and (2.133b).²²

- | | | | | | |
|------------|--------|------|----|-----------|----------|
| (2.133) a. | xàsǎwá | man | b. | xàsàwà-kǒ | man-DIM |
| | ɲùdǎ | hand | | ɲùdà-kǒ | hand-DIM |

But when the diminutive /-ko/ is attached to stems of a different class, accent remains on the stem, as in (2.134).

- | | | | | |
|------------|-------|----|----------|-----------|
| (2.134) a. | hǎréd | b. | hǎréd-kó | house-DIM |
|------------|-------|----|----------|-----------|

P. Staroverov observes that this accentual behavior is straightforwardly captured if we assume that stems such as those in (2.133) are lexically unaccented whereas stems like that in (2.134) are lexically accented.

In terms of “diacritic weight”, the diminutive suffix /-ko/ attracts accent away from certain stems, as in (2.133), because this suffix is itself diacritically heavy, while the relevant stems are diacritically light. However, when a heavy stem is combined with diacritically heavy suffixes, as in (2.134), the heavy stem wins. This tells us that,

²² Recall from section 2.5.3 that the phonetic correlate of word accent in the Malaya Zemlya dialect is rising pitch. In this section, rising pitch is notated with ˇ, high pitch with ´ and low pitch with `; accordingly, the accented vowel bears the ˇ diacritic.

in the Malaja Zemlja dialect, the leftmost diacritically heavy morpheme in the word is selected for accent.

Alternatively, one might claim (with the theory of root control) that, in Malaya Zemlya, it is the stem, rather than the leftmost heavy morpheme, that wins. This theory predicts that the stems in Malaya Zemlya are accented.

However, this is not always true: for example, in light root-heavy suffix combinations, accent falls on the heavy suffix, not on the root. Therefore, it is not the case that the root attracts the accent regardless of its diacritic weight. Rather, it is accented only in case it is heavy, *i.e.* in heavy root-light suffix words and in heavy root-heavy suffix words.

(In this sense, the behavior of heavy and light roots parallels the behavior of heavy and light syllables, which is normal because diacritic weight and phonological weight are both types of weight).

I conclude that the root-control theory makes a wrong prediction regarding which morpheme type attracts the word accent in certain morpheme combinations. Therefore, the “weight approach” proposed here is superior to the root-control approach.

I have thus argued that in two Tundra Nenets dialects, Yamal and Malaya Zemlya, accent assignment makes reference to diacritic weight in morphologically complex words. Moreover, I have established for both dialects that in derived words which contain at least one diacritically heavy morpheme, the leftmost such morpheme is selected for accent.

2.5.7. The account

2.5.7.1. The grammar

Above, I have described the accentual patterns of the Yamal and Kanin dialects in morphologically simple words (sections 2.5.4-2.5.5) and looked at accent assignment in complex words in Malaya Zemlya and Yamal (section 2.5.6).

Due to the paucity of available data, some relevant data are currently unavailable; for this reason, what follows is unavoidably incomplete. Instead, my goal here will be to show that, when augmented with appropriate machinery, the Scales-and-Parameters theory is capable of capturing the patterns described above.

Let us begin by setting the Domain Size parameter. The comparison of (135a) with (135b) shows that accent can reach deeper than three syllables counting from either edge, *i.e.* the accent system of Tundra Nenets is unbounded.²³ Therefore, the Domain Size parameter is set to “Unbounded”.

- (2.135) a. ¹xasawa man
 b. xasawa-¹ko man-DIM

Further, since accent falls on the leftmost heavy morpheme in complex words of Yamal that consist of diacritically heavy morphemes, *e.g.* [¹m^jakad] (see section 2.5.6), the Select parameter is set to “Left” for complex words.

²³ Due to the limited amount of usable data, the data in (2.135) is the only evidence available to me that points to the unbounded status of the system. Suffixal accent in words consisting of a diacritically light multisyllabic root followed by a diacritically heavy suffix would offer additional evidence that the system is unbounded; however, no such forms are available to me.

As shown above, accent in morphologically simple words is assigned with reference to the phonological weight scale (2.132), repeated below for convenience.

(2.136) CVC > CVC? > CV > CV? > Că, CăC, Că?, CăC?

For those simplex words in which accent location is predictable, I extend the “Left” setting of the Select parameter (established above for complex words) to morphologically simple words, as this allows us to keep accent assignment consistent across simplex and complex words.

Now, simplex words with syllables of equal weight (in my corpus, these are CVCV and CVCCVC words) form a special case. They have accent on the first or second syllable, depending on the word. Therefore, we must treat accent as unpredictable either in words with initial accent, or in words with accent on the second syllable (or in both). What is needed, then, is some amount of lexical marking. In order to minimize the unpredictable, the analysis below limits lexical marking to simple words of CVCV and CVCCVC shapes that have accent on the second syllable, while deriving initial accent without recourse to lexical marking.

Above, I have argued at length that accent assignment in Tundra Nenets involves both phonological and diacritic weight. I will now show how these weight types are related in Tundra Nenets in terms of a single weight scale.

I submit that the morphemes of Tundra Nenets differ in diacritic weight depending on the phonological weight of syllables that form these morphemes. In other words, I propose to split the set of morphemes of Tundra Nenets into non-intersecting

classes by relativizing the weight of morphemes with respect to the weight of syllables which these morphemes contain.

Specifically, the diacritically heavy morphemes containing at least one heavy syllable (notated as h_d/h_p) are heavier than the diacritically light morphemes that contain at least one heavy syllable (notated as l_d/h_p). These, in turn, are heavier than both diacritically heavy (h_d/l_p) and diacritically light morphemes (l_d/l_p) consisting of light syllables alone. This is stated in the weight scale (2.137).

$$(2.137) \ h_d/h_p > l_d/h_p > \{h_d/l_p, l_d/l_p\}$$

Note that (2.137) is, essentially, a *diacritic* weight scale because it orders morphemes of different weight. Like the diacritic scale of Selkup, it contains diacritically superheavy morphemes and orders these over diacritically heavy morphemes, which, in turn, are heavier than diacritically light morphemes. However, unlike in Selkup, in Tundra Nenets, the diacritic weight of a given morpheme in the weight scale depends on phonological weight (heavy vs. light) of syllables that this morpheme contains.

We can say that, in Tundra Nenets, the phonological weight scale is “built into” the diacritic weight scale in that the degrees of diacritic weight represented on the scale are defined with reference to the phonological weight scale. Accordingly, I will call this type of scale a *relativized diacritic weight scale* (“relativized weight scale”, for short), in order to distinguish it from the diacritic and hybrid weight scales (see above). Thus, a relativized diacritic weight scale is a special case of a diacritic weight scale.

In order to assign accent correctly, the relativized weight scale determines which morphemes will be projected onto the Accent Grid and, therefore, may “win”.

However, the relativized weight scale does not suffice here because the presence of multisyllabic morphemes in Tundra Nenets words requires identifying an accented syllable within the relevant morphemes. Phonological weight scale allows us to identify the syllables which attract *morphemic weight*. In this way, accent is assigned with reference to both diacritic and phonological weight.

In the case of all-light words and simplex words, this mechanism “boils down” to the use of the phonological weight scale alone because the relativized diacritic weight scale does not affect accent location. This special case is (trivially) consistent with the general mechanism above.

Indeed, in words with light syllables alone, morphemes are light (morphemes lowest on the relativized weight scale), regardless of their diacritic weight; therefore, this is ignored. Diacritic weight is also ignored in morphologically simple words because the phonological weight scale suffices to determine accent location (there is only one morpheme to choose from).

Thus, weight relations in Tundra Nenets are captured in terms of two weight scales, *viz.* the relativized weight scale (2.137) and the phonological weight scale (2.136).

The scale in (2.137) translates into the Relativized Weight Grid (abbreviated as R-WG) in (2.138), while the scale in (2.136) is represented as the Phonological Weight Grid (abbreviated as P-WG) in (2.139).

(2.138) *The Relativized Diacritic Weight Grid (R-WG) for Tundra Nenets*

h_d/h_p	l_d/h_p	h_d/l_p	l_d/l_p
*	*	*	*
*	*		
*			

(2.139) *The Phonological Weight Grid (P-WG) for Tundra Nenets*

CVC	CVC?	CV	CV?	Că(C)(?)
*	*	*	*	*
*	*	*	*	
*	*	*		
*	*			
*				

Accent is assigned in Tundra Nenets by the set of parameters in (2.140) with reference to the grids in (2.138)-(2.139).

(2.140) *The parameter settings for Tundra Nenets*

Domain Size (Unbounded)

Nonfinality (No)

Weight (Yes)

Select (Left)

Project Position (Right)

Below, I provide sample derivations in order to illustrate the way in which the accentual grammar described above works.

2.5.7.2. Derivations

In Tundra Nenets, accent is assigned with reference to both diacritic and phonological weight, with the role of lexical marking reduced to a minimum. This section illustrates with sample derivations how accent is assigned in Tundra Nenets within the Scales-and-Parameters theory.

Derivationally, the phonological weight scale precedes the relativized weight scale. In the course of derivation, syllable weight, given by the phonological weight scale, is represented on the P-WG. Assuming that the heaviest syllables in the word serve as docking points for diacritic weight, the latter is placed on the R-WG over the former (located on the P-WG). Then, weight of the diacritically heaviest morphemes on the R-WG is projected onto the Accent Grid (due to the Weight Projection Principle).

In the special case of lexical marking, diacritic weight docks onto the unique (lexically marked) syllable in the morpheme. Given that the lexical mark corresponds to a (particular) syllable, I propose that it is projected onto the P-WG. In particular, in complex words, the lexical mark in the corresponding morpheme and the phonological weight in the lexically unmarked morphemes are all projected onto the same P-WG; then, diacritic weight docks on it in the same way as on the heaviest syllables.

Below, I illustrate how the resulting accentual grammar works, by giving derivations for different cases.

(i) *Complex words with phonological weight*

As an example, consider the derivation (2.141) which shows how accent in [ˈharəd-ko] (“house-DIM”).

This form consists of a diacritically heavy root which contains a phonologically heavy CV syllable (with a full vowel) followed by a light syllable (with a schwa); therefore, the root is superheavy, according to the R-WG in (2.138). The root is followed by a diacritically heavy suffix which consists of a heavy CV syllable; therefore, the suffix is also superheavy.

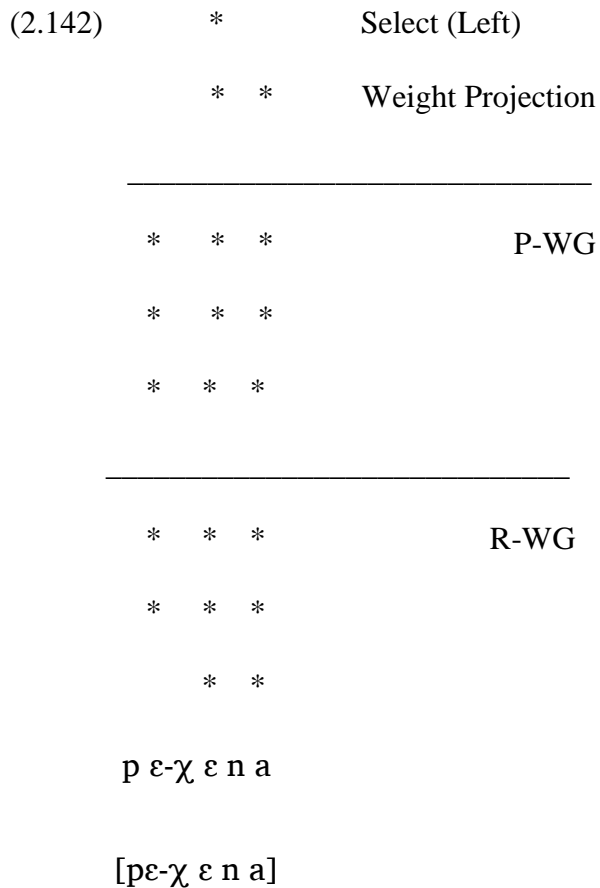
At the outset of the derivation, syllable weight for all syllables is projected onto P-Weight Grid, *i.e.* the light syllable /rəd/ receives one gridmark, while the CV syllables with full vowels /ha/ and /ko/ receive three gridmarks, as indicated by the P-WG (2.138). At the second stage, the relativized diacritic weight of each morpheme (here, superheavy) is projected onto the R-WG over the gridmarks for the heaviest syllables located on the P-WG in (2.139). Thus, syllables /ha/ and /ko/ receive three gridmarks on R-WG, while the syllable /rəd/ does not receive any gridmark on R-WG because it is lighter than the other syllable in its morpheme. In this way, the P-WG identifies the syllables onto which diacritic weight docks, resulting in a R-WG. From this, weight is projected onto the Accent Grid by placing a gridmark over the syllable /ha/ and the other for the syllable /ko/. Finally, Select (Left) chooses the leftmost gridmark, yielding the output form [ˈharədko] with initial accent.

(2.141)	*		Select (Left)
	*	*	Weight Projection
<hr/>			
	*	*	P-WG
	*	*	
	*	*	
<hr/>			
	*	*	R-WG
	*	*	
	*	*	
	harəd-ko		['harədko]

(ii) *Complex words with a CVCV morpheme (without lexical mark)*

As a second example, consider a morpheme of the CVCV syllable shape that is not lexically marked, such as the suffix /-χɛna/. For example, in the form [pɛ'χɛna], the root /pɛ/ is diacritically light and the suffix [-χɛna] is diacritically heavy. Both morphemes contain CV syllables; therefore, according to the phonological weight scale of the language, syllables in the suffix and in the root each receive three gridmarks on the P-WG. Since the root is diacritically *light* and contains a heavy syllable, it is of the type l_d/h_p. Hence, two gridmarks are placed on the R-WG over its syllable. Since the suffix is diacritically *heavy* and contains heavy syllables, it is of the type h_d/h_p, *i.e.* it is highest (superheavy) on the relativized weight scale (2.137). This means that, in the

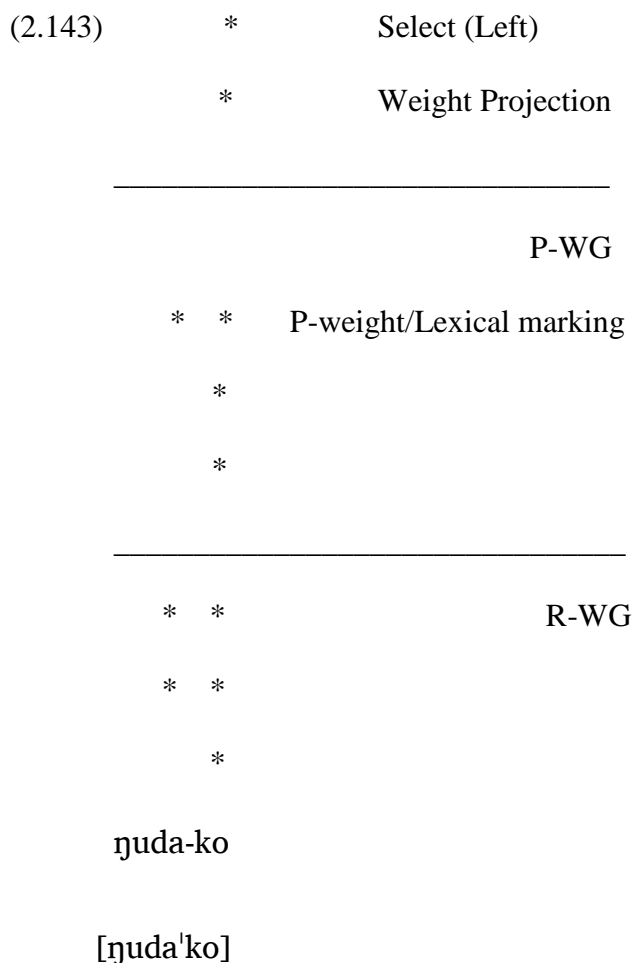
derivation, it “outwins” the accent with respect to the root. Indeed, the suffix syllables receive three gridmarks each on the D-WG, while the root syllable has only two. Therefore, the root syllables are not projected; only the suffix syllables are, resulting in two gridmarks on line 1 of the Accent Grid. Finally, Select (Left) selects the leftmost, yielding the correct output [pɛ'χɛna].



(iii) *Complex words with a lexical mark and phonological weight*

I will now consider a CVCV morpheme that is lexically marked. For example, in [ɲuda-^lko] “hand-DIM”, the root [ɲuda] “hand” is diacritically light and the suffix

[-ko] “DIM” is diacritically heavy. Note that this root consists of two CV syllables and is accented on the second syllable when it occurs as a morphologically simple word (Staroverov 2006). Since the root is diacritically light and the CV syllable is phonologically heavy (according the phonological weight scale), the root is of the type l_d/h_p on the relativized weight scale. As discussed, this case requires lexical marking on the second syllable. Since the root is l_d/h_p , it receives two gridmarks on the R-WG which dock onto the lexically marked syllable. In all other respects, the derivation runs as for words without lexical marking (*e.g.*, [‘harədko] above).



(iv) *Simplex words with heavy syllables*

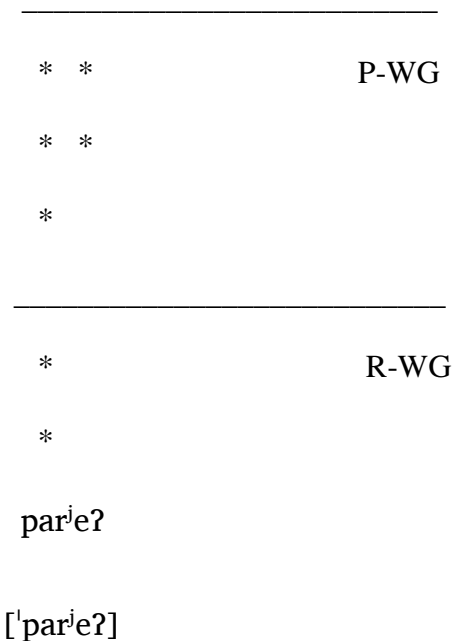
Consider the simplex form [ˈpɑːrɪeɪ] (“pile warehouse”).

Since, according to the weight scale, CV is heavier than CV?, the weight of the first syllable, but not the second, is projected onto the P-WG. Further, let us assume that the root morpheme is diacritically light.

Since light morphemes that contain at least one heavy syllable are of the type l_d/h_p on the relativized weight scale, the root receives two gridmarks on the R-WG placed over the heavier syllable /pa/ located on the P-WG. This syllable is then projected onto the Accent Grid and chosen by Select (Left), resulting in initial accent.

(2.144) * Select (Left)

* Weight Projection



(v) *Simplex words with an all-light root*

Note that, for simplex words that consist of diacritically heavy root with a heavy syllable or a lexical mark, the derivation is the same as in (2.144): all that matters is onto which syllable the diacritic weight will dock, this being chosen based on the phonological weight grid.

By contrast, if the morpheme (heavy or light) contains only light syllables, the morpheme will be h_d/l_p or l_d/l_p , respectively. Since it is lowest on the relativized weight scale, nothing is projected onto the Accent Grid. Project Position supplies the (unique) gridmark on line 1, which is then chosen by Select, resulting in the final word accent.

Since the diacritic weight of disyllabic “all-light” roots cannot be determined based on the available data, I will consider both possibilities, *i.e.* light and heavy.

First, assuming that the root in the “all-light” simplex word [pǎ'dǎ] (“bile”) is diacritically light, a single gridmark is placed on the P-WG over each syllable because these are light. Since this is a diacritically light root and all syllables in it are light, the root is lowest on the relativized weight scale (*i.e.*, it is l_d/l_p); hence, a single gridmark is placed on the R-WG over each syllable’s gridmark located on the P-WG.

Therefore, there is nothing to project onto the Accent Grid, which means the Project Position parameter inserts a gridmark over the rightmost syllable in the domain on line 1 of the Accent Grid.

This gridmark is, then, selected by Select (Left), yielding the correct output form [pǎ'dǎ] with final accent.

(2.145) * Select (L)
 * Project Position (R)

* * P-WG

* * R-WG

păd'ă

[pă'd'ă]

Suppose now that this root is diacritically heavy. The P-WG is the same as in (2.145). Since the root is diacritically heavy and all syllables in it are light, the root is lowest on the relativized weight scale (*i.e.*, it is h_d/l_p). Therefore, a single gridmark is placed on the R-WG over each syllable's gridmark located on the P-WG. As above, nothing is projected onto the Accent Grid.

The Project Position parameter inserts a gridmark over the rightmost syllable, which is, then, selected by Select (Left), yielding the same output [pă'd'ă] (with final accent) as above.

That is, the derivation runs in the same way for diacritically light and heavy all-light roots in simplex words because they are both lowest on the relativized weight scale.

(vi) *Complex “all-light” words*

Finally, in the case of morphologically complex words that consist of all-light morphemes, the approach proposed here predicts that these morphemes will be lowest on the relativized weight scale (2.137) (because they only contain light syllables). Given that my data do not contain such words, the derivation which I now provide to illustrate the prediction, is based on an “abstract” pattern.

Suppose we have the word (2.146), in which the root is diacritically heavy and the suffix is diacritically light. Since each only contains light syllables, both are lowest on the diacritic weight scale (the root is h_d/l_p and the suffix is l_d/l_p). Therefore, the derivation runs as the preceding ones, with Project Position inserting a gridmark on the rightmost syllable in the accent domain, selected then by Select (Left).

(2.146)	*	Select (Left)
	*	Project Position (Right)
<hr/>		
	* * * *	P-WG
<hr/>		
	* * * *	R-WG
	CăCă-CăCă	[CăCăCă ^l Că]

Thus, although the relevant piece of data is currently lacking, the S&P theory makes a specific testable prediction about accent location in forms of this kind, a

prediction that might be tested in the future in the event that such data come to be known.

2.5.8. Summary

In this case study, I have discussed phonological and phonetic aspects of accent in Tundra Nenets, as represented by the Yamal (Eastern Tundra Nenets) and Malaya Zemlya and Kanin dialects (Western Tundra Nenets), and offered a tentative account of accent assignment in terms of a phonological weight scale, diacritic weight, lexical specification (different from diacritic weight) and the parameter system.

The existing reports about the accent system of Tundra Nenets are fragmented and often inconsistent. There is no consensus on the accent rule among different authors. The available resources are poor: for example, we still lack descriptive grammars and a dictionary in which accent location would be systematically marked.

It is only recently that some phonetic research on Tundra Nenets dialects based on extensive fieldwork in the region, has been published.

In this section, I brought together and analyzed these interesting recent findings, in order to shed light on central questions about accent: the phonetic correlates of accent, the correct descriptive generalizations about accentual patterns and the accent-assigning mechanism in these dialects.

Thus, based on the available acoustic and perceptual evidence, I have shown here, *contra* Salminen (1997, 2012) that accent in Tundra Nenets is not fixed on the initial syllable. Salminen's widely cited accent rule (Hayes 1995; van der Hulst 2010:

822; StressTyp) turns out to be wrong: Tundra Nenets has variable word accent location.

The phonetic correlates of accent in Tundra Nenets depend on the dialect: in Yamal Nenets, the correlates of accent are duration and intensity (with duration being the more reliable correlate); in Kanin Nenets, the correlate is duration and in the Malaya Zemlya dialect, it is f_0 . This means that the Yamal dialect is a stress-accent system, the Kanin dialect a duration-accent system and the Malaya Zemlya dialect a pitch-accent system.

As noted above, in the Malaya Zemlya dialect, the vowel in the initial syllable undergoes systematic phonetic lengthening. Since pitch-accent location in Malaya Zemlya is not fixed while lengthening is always initial, we are clearly dealing with two different phonetic phenomena related to distinct phonological entities: accent, realized as pitch, and Edge Prominence, realized as initial lengthening. We thus find that, in a speech variety where duration is not an acoustic correlate of accent, duration can be used as an initial boundary marker.

This result supports the view that “stress” is not a unitary object. Rather, accent and Edge Prominence are two different phonological entities, which should be accounted for separately. This is precisely what the S&P theory does, assigning accent and Edge Prominence with separate mechanisms (and separating both from rhythm).

Summarizing, in this section, I have offered evidence that word accent in Tundra Nenets is not fixed and described the dialectal variation in phonetic correlates of accent (leaving room for Edge Prominence).

Also, analysis of the accent patterns carried out in this section has (for the first time in the literature) revealed the phonological weight scale for Tundra Nenets, given in (30). This descriptive information will enrich StressTyp records in the near future.

There is a consensus that Tundra Nenets is a lexical accent system; however, no comprehensive formal account has been offered in the literature. While lexical accent involves the binary distinction “lexically accented” vs. “unaccented”, a careful analysis in this section reveals that, in Tundra Nenets, word accent is assigned with reference to the ternary diacritic weight scale (31) which orders three morpheme classes defined with respect to phonological “heavy” vs. “light” distinction.

Thus, this scale, which I have called the relativized diacritic weight scale, combines both types of weight, so that both diacritic weight of morphemes and the weight of syllables contained in those morphemes must be considered in order to assign word accent.

Given the accent-assigning mechanism proposed in this section, accent location is derivable for most words. The only exception are words containing morphemes of the CVCV or CVCCVC shape accented on the second syllable: these must be assigned a (grid)mark in the lexical entry because accent location in these words is unpredictable (section 2.5.4). In this way, the proposed grammar reduces unpredictability to a minimum.

Thus, the S&P theory allows us to correctly derive accent location in Tundra Nenets.

Finally, due to paucity of relevant data, the account given above suffers from certain empirical gaps:

(i) Since words of Tundra Nenets consisting of diacritically light morphemes alone are unavailable, it was not possible to determine the setting of the Project Position parameter for morphologically complex words.

(ii) In the case of morphologically complex words with a diacritically heavy root consisting of phonologically light syllables alone (all-light roots), the grammar proposed above predicts that accent will fall on a light syllable of the root, *i.e.* on a syllable with schwa (/ă/). Cross-linguistically, this situation seems to be highly marked. I was unable to verify this prediction because no such words were available.

(iii) Lack of words consisting of several diacritically heavy suffixes attached to a diacritically light root did not permit me to ascertain that the Select parameter is set to “Left” in such words.

One notes, at the same time, that these gaps do not affect or invalidate our account. By discovering the missing data, future study will contribute to further development of the theory proposed in this chapter.

2.6. The Scales Approach to accentual dominance

2.6.1. Introduction

One of the fundamental concepts in accentology is that of accentual *dominance*.²⁴ An *accented dominant* morpheme is a lexically accented morpheme which wins word accent over a competing morpheme that should normally receive word accent according to the accent rule of the language. For example, Russian, Greek and Sanskrit (among others) are known to have dominant morphemes.

In this chapter, I have developed what I call the “Scales Approach” to word accent within the Scales-and-Parameters theory. How does this approach deal with accentual dominance? In this section, I will show that it affords us a straightforward account of various dominance effects and that it fares better than the Accent Deletion approach in this respect.

The section is organized as follows. First, I consider *accented* dominant morphemes and their combination (section 2.6.2); then, I turn to the *unaccented* ones (section 2.6.3). In the end, I compare the Scales and Accent Deletion approaches in how they account for various dominance effects (section 2.6.4).

2.6.2. Accented dominant morphemes

In lexical accent theories, a dominant morpheme triggers the Accent Deletion rule which deletes all lexical accents to its *left*. This implies the following:

²⁴ I wish to thank Andrea Calabrese for drawing my attention to the issues addressed below and for his valuable comments.

(i) If there is one accented dominant 2morpheme (“acc_{dom}”) in the word, while others are recessive (“recess”), then the dominant one triggers the Accent Deletion rule, which results in word accent on the leftmost dominant morpheme.

...recess 'acc_{dom} recess...

(ii) If more than one accented morpheme in the word is dominant, then the *rightmost* dominant one triggers the Accent Deletion rule and receives the word accent.

...recess acc_{dom1} 'acc_{dom2}...

Importantly, the properties (i) and (ii), traditionally packaged together under the cover term “dominance”, do not necessarily co-occur in a given language. Thus, a language may allow at most one accented dominant morpheme per word, which corresponds to the pattern (i), while not having the pattern (ii), due to the lack of words with two accented dominant morphemes.

This is exemplified by Central Selkup (see section 2.2). As discussed above, in this language, the accent-categorizing suffix *-ol* always receives word accent and can, therefore, be analyzed as an accented dominant morpheme. Under the Accent Deletion approach, *-ol* would be analyzed as triggering the Accent Deletion rule which will delete all lexical accents to its left, resulting in the word accent on *-ol*.

By contrast, the Scales Approach, analyzes this morpheme as superheavy. Since there is at most one such morpheme in a C. Selkup word, it always wins, in compliance

with the general accent rule of this language; therefore, under this approach, the morpheme *-ol* behaves regularly, not exceptionally. The Accent Deletion rule of lexical accent theories is not needed in this case.

Now, extending the scales approach to languages with both (i) and (ii) suggests that, in words containing two accented dominant morphemes, of which the second one has word accent, the latter is *heavier* than the preceding *superheavy* morpheme, *i.e.* it is “super-superheavy”.

Therefore, in this type of language, the weight scale will have four degrees:

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

To illustrate, consider the following Sanskrit form with two accented dominant suffixes.²⁵ In [dha:ra:yi¹syava] “You two will cause to bear” (UR: /dhar-ay-sa-ya-va/), 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.

In the S&P theory, we posit, instead, that *-ay* is superheavy and the suffix *-ya* is super-superheavy (which is possible because the reverse order of these suffixes is ruled out by the morphology). Obviously, *-dhar* is light and *-va* heavy.

The derivation proceeds as in (2.148) (represented here *bottom up*).

²⁵ Many thanks to Andrea Calabrese for sharing his much-needed work in progress on Vedic phonology (wherefrom [dha:ra:yi¹syava] in (2.148) is drawn).

(2.148)	*	Select (Left)
	*	Weight Projection
<hr/>		
* * * *		Weight Grid (derived)
* * *		
* *		
*		
dha:r-a:y- is a-ya-va		Ablaut
dha:r-a:y- <u>i</u> s-a-ya-va		/i/-Epenthesis
a: a:		Vowel lengthening
<hr/>		
* * * * *		Weight Grid (UR)
* * *		
* *		
*		
dhar-ay-sa-ya-va		UR
[dha:ra:yi syava]		

Thus, the Scales Approach gives a uniform account of dominance for words with exactly one and with more than one accented dominant morpheme.

In conclusion, I have argued that accented dominant morphemes do not constitute exceptions to the accent rule. The Scales Approach can account for these morphemes in the same regular way as for the other forms of the language, using a single accent-assigning mechanism that makes reference to a particular (language-specific) weight scale.

2.6.3. Unaccented dominant morphemes

Lexical accent theories distinguish between accented vs. unaccented dominant morphemes. Although languages considered in this chapter do not have unaccented dominant morphemes, the present approach leads us to reanalyze those morphemes as diacritically light dominant ones.

This notion can be illustrated with the example of Russian noun-forming suffix *-en'*, which is dominant and diacritically light. When *-en'* is attached to a noun, accent shifts to the initial syllable, *e.g.* *obo¹rot* (“turn”) vs. *¹oboroten'* (“werewolf”). This shift results in a default accent, which, in Russian, is initial, thus implying that *¹oboroten'* is an “all-light” word (Idsardi 1992). Since *obo¹rot* is known to be heavy underlyingly, we conclude that *-en'* makes *oborot* diacritically light.

I account for this behavior with a Lightning rule. This rule is triggered by a light dominant morpheme (*e.g.*, the suffix *-en'* in the Russian example above) and targets *all* morphemes to its left, regardless of their weight, making them diacritically

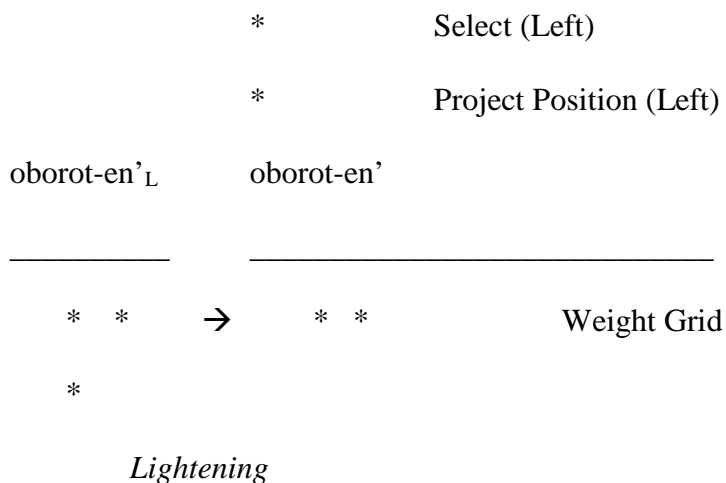
light. (It vacuously applies to light morphemes, which remain light.) That is, this is a *non-local* rule.

I will assume that lightening morphemes are marked in the lexical entry with the diacritic feature [L] (for “lightening”). Thus, the rule applies when the trigger is morpheme marked with [L].

Specifically, it applies on the Weight Grid right-to-left, deleting all gridmarks but one, in the columns of gridmarks of the target morphemes. The Lightening rule precedes Weight Projection (the projection of weight onto the Accent Grid). The latter fails to apply here because all morphemes are light. Then, the Project Position parameter inserts a {Leftmost/Rightmost} gridmark on line 1 of the Accent Grid, then selected for word accent by the Select parameter.

This is illustrated with the derivation in (2.149) for the Russian example above.

(2.149) *The Lightening rule for Russian*



Thus, I have considered above dominance effects in forms containing either accented, or unaccented dominant morphemes.

2.6.4. Comparison of the Scales and Accent Deletion approaches

Since its inception, generative phonology has been plagued by the recurrent problem of exceptions: while the theory should aim at generality and exhaustiveness, exceptions seem to require special treatment (which, in practice, is frequently *ad-hoc*).

In this chapter, I have presented a new take on this problem in the domain of accent assignment, focusing on two interesting types of exceptions related to the notion of “lexical accent”.

The first type of exceptionality concerns lexical accent systems with exceptionally behaving lexically accented morphemes which win word accent over another morpheme that would otherwise receive the accent in a regular way due to the general accent rule, *i.e.* these are accented dominant morphemes (*e.g.*, in Central Selkup and Uzbek).

Traditionally, these *dominance effects* have been analyzed as instances of “accent deletion”, whereby the dominant morpheme triggers an Accent Deletion rule that deletes all lexical accents to its left (Kiparksy 1984; Halle and Vergnaud 1987a,b; Inkelas 1997). The dominance approach has recourse to the Accent Deletion rule for accented and unaccented dominant morphemes alike, thus treating these as exceptions to the general accent rule.

By contrast, the Scales Approach to dominance reveals (through the use of diacritic weight scales) that accented dominant morphemes comply with the general accent rule and, therefore, are not exceptional (see section 2.6.2).

The second type of exceptionality concerns phonological weight-sensitive systems in which accent location is not always phonologically predictable due to the presence of certain special morphemes (*e.g.*, in Eastern Literary Mari).

In this case, the Scales Approach provides a unified account for regular and exceptional accent locations by incorporating phonological and diacritic weights into a single (“hybrid”) weight scale.

Summarizing, while the Accent Deletion approach only accounts for the first type of accent systems just mentioned, the Scales Approach can accurately derive accent location for both types of systems by accounting for different kinds of exceptions with the same accent-assigning mechanism.

Further, lexical accent theories have recourse to the Accent Deletion rule for both types of dominant morphemes (accented and unaccented), treating these as exceptions to the general accent rule.

However, we know that accented dominant morphemes differ from the unaccented dominant ones in that the former attract word accent, while the latter repel it. This suggests that the two types of morphemes may be treated differently.

As already emphasized, accented dominant morphemes are accounted for in the same way as regularly behaving (not exceptional) due to the use of a diacritic weight scale (see section 2.6.2). By contrast, for unaccented dominant morphemes, a *non-local*

Lightening *rule* is invoked in order to capture how those morphemes assign the default initial accent, and this *long-distance* process calls for a non-local operation.

In conclusion, treating accented vs. unaccented dominant morphemes as forming different classes allows us to account for the behavior of *accented* dominant morphemes without invoking an across-the-board accent deletion and to *restrict* the application of the Lightening rule to unaccented dominant morphemes.

In this, the Scales Approach stands in sharp contrast to lexical accent theories, which posit dominance as a primitive.

2.7. Cyclicity in the Scales-and-Parameters theory?

The reader may have noticed that the accentual theory formulated in the first two chapters does not involve morphology. A core role in studies of morphology-phonology interaction is played by *cyclicity*. We will now examine the potential link between cyclicity and the Scales-and-Parameters theory.

The notion of a *cycle* came to occupy a central place in the generative theories of 1960s-1980s. The idea was that, rather than applying only once, a block of linearly ordered rules may reapply to a form in a cyclic mode. Following early proposals (Chomsky 1967; Chomsky & Halle 1968), a framework of Cyclic Phonology developed, with pioneering works by Brame (1974), Mascaró (1976) and Kiparsky (1973, 1979).

In Lexical Phonology (Kiparsky 1982, 1985), cyclicity is associated with morphology: rules reapply cyclically after each application of a morphological rule

(thus, phonology and morphology act “in tandem”). The theory sought to properly constrain cyclic rule application and to locate the cyclic rules within the overall organization of the grammar. In this, morphological rules are located at different levels of the lexical phonology. Levels are ordered. Phonological rules are restricted, or not, to certain levels.

Further, under this view, phonological component of the grammar is divided into two subcomponents, lexical and postlexical. The former is located in the lexicon; the latter is applied to the output of syntax. The lexical/postlexical status of a rule is determined based on different criteria (automaticity, reference to word-internal structure, application across word boundaries, speech rate effects, and so on).

In a later development (Booij and Rubach 1987; Halle and Vergnaud 1987a,b), phonologists came to distinguish cyclic *vs.* non-cyclic rule application.

I will adopt here the standard assumption that all cyclic rules are ordered before all non-cyclic (hence, “postcyclic”) ones. In the cyclic component, each morphological operation (*e.g.* affixation) triggers its own cycle. Since postcyclic lexical rules apply to the output of the cyclic component, they necessarily apply after the last morphological rule, *i.e.* at the *word level*.

Under this assumption, how can we determine whether a given phonological rule is cyclic?

Note that establishing the cyclic character of a rule clearly requires positive evidence (Harry van der Hulst, *p.c.*, 2016). I, then, submit that the phonological rule R is cyclic in a language L only if L contains positive evidence for this. In the absence of

such evidence, we must assume that R is non-cyclic. Let us call this statement the *Evidence Condition for Cyclicity (ECC)*.

Assuming ECC, if, in a given language, both cyclic and non-cyclic accounts are possible and there is no evidence for cyclic rule application, then the non-cyclic account should be selected.

I will now illustrate with an example from Uzbek (see section 2.3) the proposal that some accent systems can be captured in both cyclic and non-cyclic approaches, which, will, then, lead us to the question which approach must be chosen, based on the ECC.

Recall that, in the S&P theory, relative weight is represented on the Weight Grid as gridmark columns of different height. I propose that these are built cyclically by *Weight Grid Construction*. In addition, the grammar of Uzbek also contains the Gridmark Insertion rule (triggered by light preaccenting morphemes) that makes the preceding morpheme diacritically heavy (see section 2.3.4.7). Since it reapplies every time a preaccenting morpheme is attached, it can be treated as cyclic.

Thus, cyclic operations reapply every time an affix is attached, resulting in a derived Grid *for the entire word*. This implies that Weight Projection, which projects the heaviest units from this derived Weight Grid onto line 1 of the Accent Grid, applies already at the word level; therefore, it is post-cyclic. Since, in the S&P theory, weight is projected onto the Accent Grid only once (for the entire form), then it is may not be cyclic, in principle. I conclude that Weight Projection is a post-cyclic operation. Also, since Select and Project Position are ordered after Weight Projection, which is postcyclic, they must be postcyclic as well.

The derivation (2.150a) illustrates how the cyclic approach would work in the S&P theory with the example of the Uzbek form [kel-sin-lar-^ldi-mi] (“come-3-Pl-PAST-IMPER”) from section 2.3.4.7, (2.52) on Uzbek. In the non-cyclic approach, the derivation runs as in (2.150b).

(2.150) /kel-sin-lar-di-mi/ (“come-3Prs-Pl-PAST-IMPER”)

/kel/: h_d; /-sin/: l_d; /-lar/: l_d; /-di/: l_d preacc; /-mi/: l_d preacc

a. *A cyclic approach*

/kel/

Cyclic (lexical) component

Cycle 1

*

Weight Grid Construction

*

N/A

Gridmark Insertion

[[kel] sin]

WFR

Cycle 2

* *

Weight Grid Construction

*

N/A

Gridmark Insertion

[[[kel] sin] lar]

WFR

Cycle 3

* * *

Weight Grid Construction

*

N/A

Gridmark Insertion

[[[[kel] sin] lar] di]

WFR

Cycle 4

* * * *

Weight Grid Construction

*

* * * *

Gridmark Insertion

* *

[[[[[kel] sin] lar] di] mi]

WFR

Cycle 5

* * * * *

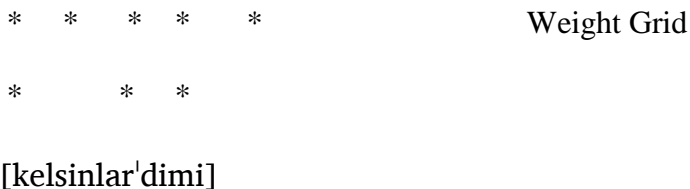
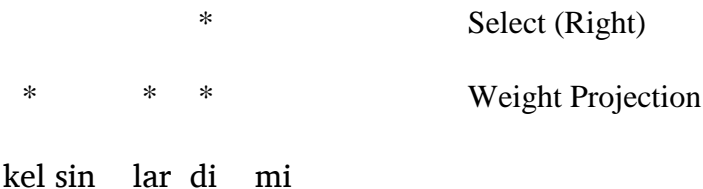
Weight Grid Construction

* *

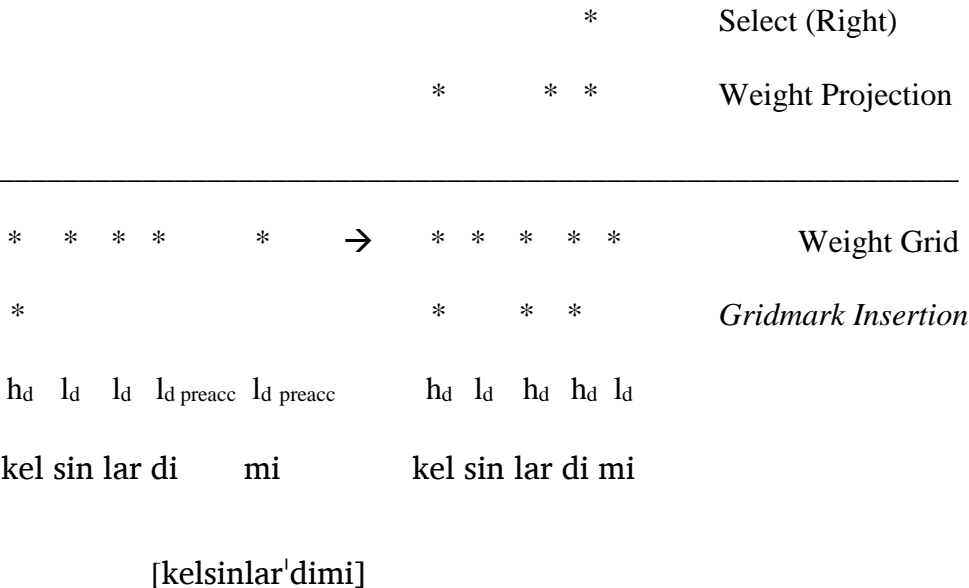
* * * * *

Gridmark Insertion

* * *



b. The non-cyclic approach



*

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*

*

Weight Grid

Gridmark Insertion

h_d l_d l_d l_d preacc l_d preacc h_d l_d h_d h_d l_d

kel sin lar di mi kel sin lar di mi

[kelsinlar'dimi]

I must add that, under the non-cyclic approach, the Gridmark Insertion rule may, but does not need to, be iterative. Thus, in (2.150b), it applies to /-lar/ (triggered by /-di/) and to /-di/ (triggered by /-mi/) simultaneously (non-iteratively), making both heavy. (If it applied first to /-lar/, then to /-di/, the output would be the same.)

As we see from (2.150), the cyclic and non-cyclic approaches derive the same correct output. This is representative of the Uzbek accent assignment, in general. Which approach, then, should be preferred in such a case?

According to the previously stated ECC, if a language lacks evidence for the phonological cycle, the cyclic account is unavailable for that language and the non-cyclic account must be adopted. Thus, due to the ECC, the non-cyclic account is chosen for Uzbek.

Finally, note that, as the Uzbek example indicates, the S&P theory allows for a cyclic treatment of certain phonological operations, *e.g.* Weight Grid Construction, while Weight Projection, Project Position and Select, only apply at the word level and are, therefore, post-cyclic.

2.8. Chapter conclusions

In this chapter, I have presented case studies in accent assignment from several understudied languages (Samoyedic and Turkic) in which word accent is assigned with reference to lexical accents.

The case studies are based on detailed descriptions of accentual patterns, documented with a wealth of reliable data. In addition, certain findings informing the theory developed in this chapter received support from acoustic-phonetic investigation of accentual correlates reported in the literature.

The point of departure was the evident fact that, in lexical accent systems, certain morphemes are capable of attracting word accent, while others are not. This capacity may be viewed as their *diacritic weight*, rather than as lexical accent (van der Hulst 1999).

Adopting this view, I have proposed that, in systems where diacritic weight distinctions are scalar, rather than binary, accent is assigned with reference to a *diacritic weight scale*, a special type of language-specific weight scales in which sets of morphemes are ordered according to their diacritic weight, as in Central and Southern Selkup (Vaxman 2015 a,b, 2016a,b, subm.).

Further, some accent systems are sensitive to *both* phonological and diacritic weight. Thus, in Eastern Literary Mari, accent assignment makes reference to a *hybrid weight scale*, a scale that orders phonological and diacritic weight (Vaxman 2014, 2015b, 2016b, subm.).

Another important type of weight scale is the *relativized diacritic weight scale*, as found in Tundra Nenets. In this scale, the degree of diacritic weight assigned to a given morpheme depends on the phonological weight of syllables that this morpheme contains. In this way, diacritic weight of morphemes is relativized with respect to the weight of individual syllables.

While the hybrid and relativized diacritic weight scales both involve phonological and diacritic weight, they differ in that, in the hybrid weight scale, these weights are ordered disjunctively, whereas in the relativized diacritic weight scale, they act in conjunction.

These different types of scales are translated into a *Weight Grid* (introduced here), a phonological representation which encodes differences in relative weight. Under this proposal, the Weight Grid, not the weight scales, has a formal status in the theory and plays a role in accent assignment. This implies that weight scales always have to be translated into Weight Grids. For all weight scales, this translation is possible and straightforward.

The case study of Uzbek also offers evidence for a special *Gridmark Insertion rule*, which accounts for preaccenting. This rule operates on the Weight Grid, adding a gridmark to a diacritically light morpheme (thus making it heavy), if this is immediately followed by a preaccenting morpheme, resulting in a new Weight Grid.

Summarizing, the accentual grammar of the Scales-and-Parameters theory consists of a single parameter system, a small number of Weight Grids and two rules (*Gridmark Insertion*, *Lightening*).

As the case studies in this chapter have revealed, the Scales-and-Parameters grammar effectively allows for a *uniform* account of different types of accent systems (*i.e.* phonological WS systems, lexical accent systems and systems with both phonological weight and lexical accent) in terms of a *single* accentual grammar, thus integrating morphologically-conditioned exceptions with the accent rule of the language.

An important advantage of this new approach is that it can *reveal predictable aspects* of accent patterning (as in Tundra Nenets) in systems previously analyzed in terms of lexical accents (diacritic, by definition), thereby reducing the amount of unpredictable information in the lexicon.

Chapter 3

From accentual typology to parameter setting in the Scales-and-Parameters theory

From accentual typology to parameter setting in the Scales-and-Parameters theory

3.1. Introduction

According to the S&P theory, the accentual grammar includes the Select and Project Position parameters, with different combinations of settings yielding different (sets of) languages.

The question arises whether the Select and/or Project Position parameters may be unset (*i.e.* not be set). This question has already been addressed in van der Hulst (2012) and is further developed here.

In order to answer this question, I investigate two central typological properties of word accent: Obligatoriness and Culminativity. The traditional claim about word accent is that there is one, and only one, accent per word (or, at least, per content word), which Hyman (2006, 2009) splits into two distinct properties: “Obligatoriness” (there must be *at least* one accent per word) and “Culminativity” (there must be *at most* one accent per word). Obviously, languages which have exactly one accent per word satisfy both Obligatoriness and Culminativity.

A language that violates Culminativity would have multiple (primary) accents in a word; indeed, some such systems have been reported. On the other hand, violation of Obligatoriness implies that not all words have an accent, *i.e.* (at least) some words of the relevant language are unaccented. In the limit, a language that violates Obligatoriness lacks word accent altogether.

Culminativity and Obligatoriness stand in a particular relation to the Select and Project Position parameters of the S&P theory. Indeed, when set, the Project Position parameter guarantees Obligatoriness by inserting a gridmark in “all-light” words, resulting in word accent. The Select parameter guarantees Culminativity by choosing a single heavy syllable for word accent.

I analyze here a number of different languages in order to determine their place in the accent typology, relating their accentual type to the setting of the Select and Project Position parameters.

In particular, I will conclude that:

- (i) for all accentual WS languages, the Select parameter is set;
- (ii) in languages which lack word accent, neither Select nor Project Position is set;
- (iii) if the Select parameter is set, then the Project Position parameter is set for at least some “all-light” words;
- (iv) if a language contains a class of unaccented words, then it is a pitch-accent language.

The chapter is organized as follows. In section 3.2, I consider whether word accent is always culminative, sketch the reanalyses of certain systems reported as “multiple stress” systems and discuss the ways of reanalyzing the multiple stress systems. In section 3.3, I argue that Obligatoriness is violable, based on empirical evidence from languages in which some words are unaccented. In section 3.4, I turn to systems without word accent, *i.e.* those for which neither Select, nor Project Position is

set. I examine here certain systems with post-lexical accent. I also address here the complex case of Seneca, reported to have multiple stress and unaccented words. I argue that Seneca lacks word accent, reanalyzing prosodic prominence in this language in terms of tone and rhythm. In section 3.5, I mention a special case where the Project Position parameter cannot be set in principle. The results of sections 3.2-3.5 are brought together in section 3.6. Section 3.7 addresses a separate typological issue: according to Ahn (2000), there would be an asymmetry between bounded and unbounded accent systems with respect to weight criteria. Based on empirical evidence from several languages, I conclude that this claim is not accurate. The results of this chapter are summarized in section 3.8.

3.2. Is Culminativity universal?

3.2.1. Introduction

In this section, I will address the question whether word accent is always culminative, *i.e.* whether there is always at most one accent in a word. I provide here reanalyses of some languages traditionally believed to exhibit multiple primary stresses such as Yuma (section 3.2.2.1) and Central Alaskan Yupik (section 3.2.2.2). I then discuss why certain languages that have one primary stress are viewed as having multiple stresses and suggest ways to reanalyze such systems. I also mention a number of other candidates for reanalysis (which falls out of the scope of this dissertation). Based on these results, I will conclude that accent is always culminative.

3.2.2. Examples of “multiple stress” systems

I will now examine several cases of alleged “multiple stress” systems in order to check whether these languages indeed exhibit multiple word accent. These sketches are intended to illustrate that the “multiple stress” phenomenon should not be taken at the face value: phonological reanalysis should be attempted (wherever possible) and the stress reports repeatedly, but often uncritically, reproduced from one publication to the next, should not always be granted credit.

3.2.2.1. Yuma

Yuma, or Quechan (Hokan; Ft Yuma Reservation, SE California), is commonly believed to have multiple primary accents. Thus, Hyman (1977:38) reports that “there are some restricted or exceptional cases where a word may have two (even adjacent) phonemic primary stresses” (Hyman 1977:38). The StressTyp contains essentially the same information.

However, in describing the language, Halpern (1946a,b) takes explicitly one of the accents in such words to be primary, treating the other accent as secondary:

When a word contains two accents, the first accent in the word is always primary. Thus all vowels in the pre-accentual position are unaccented, while vowels in the post-accentual position may be unaccented or may bear a secondary accent. (Halpern 1946a:30)

Halpern, thus, considers that Yuma words have one accent. The analysis that I will sketch below will lead me to the same overall conclusion that accent in Yuma is culminative.

Halpern proposes that certain suffixes are accented because they are marked with a lexical accent. For example, the suffix /-u/ in (3.1b) is lexically accented, and this accent surfaces on the suffix. Halpern considers this suffixal accent as secondary stress (*i.e.* as a rhythmic beat) while the stem-final stress is, for him, always the primary accent. (Note, however, that he does not distinguish between the degrees of stress in his transcription, using everywhere the mark for primary stress.)

- (3.1) a. ka'na:vək he tells
- b. ka'na:'vu let him tell

While Halpern did not flesh out his analysis, he makes certain valuable observations. The following one applies to (3.1a).

The word thus may contain one accent, that of the last vowel of the stem, or two accents, the first being that of the last vowel of the stem and the second that of an accented suffix. In a word containing only one accent, the accented vowel is pronounced on a high falling tone.

Halpern adds:

In a word containing two accents, the first accented vowel is pronounced on a high tone, the second on a high falling tone.

This applies to (3.1b).

That is, in every word of Yuma, exactly one syllable is characterized by high-falling pitch; in particular, words with one accent have high-falling pitch on the accented vowel. However, not every word has, in addition, level high pitch; only two-accent words have it. Therefore, I take high-falling pitch to serve as a diagnostic of primary accent and high pitch (which only co-occurs with high-falling pitch) to diagnose a rhythmic beat.

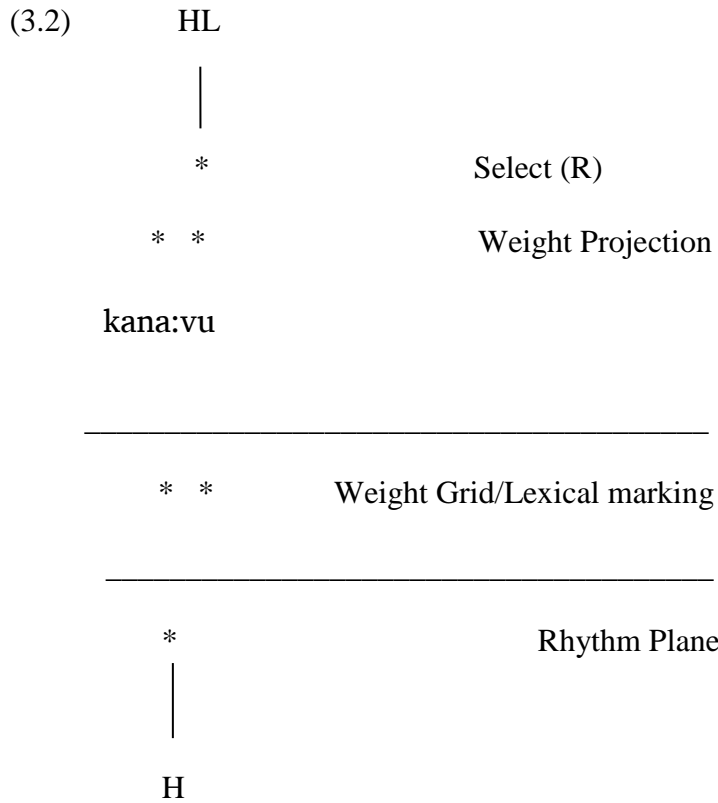
It must be noted that the HL tone, diagnostic of word accent, is always the rightmost tone in the word, *i.e.* in words with both the HL and H tones, HL is always to the right of H. Word accent is thus associated with the rightmost tone, which indicates that, in Yuma, the Select parameter is set to “Right”.

I propose the following two-step account of accent and (non-contrastive) tone assignment in Yuma. As a first step, since the stem-final syllable always has some prosodic prominence, this syllable must be lexically marked with a gridmark in every stem. This gridmark is then placed on line 1 of the Accent Grid. In morphologically simple words, Select (Right) chooses this gridmark by placing a gridmark over it on line 2, yielding stem-final word accent. If a word is morphologically complex, consisting of a stem plus a suffix, the stem will, again, be lexically specified on its final syllable, while the suffix attached to it may be specified or not (depending on the

particular suffix). Since Select (Right) promotes the righthmost specified syllable in the word, the suffixal syllable gets the accent if it is lexically specified. The lexically specified stem-final syllable gets a rhythmic beat. Unlike the Select parameter, the Project Position parameter is not set in Yuma since every stem is lexically specified and this excludes any “all-light” environment necessary for the Project Position parameter to apply.

As a second step, a HL tone docks onto the syllable bearing the word accent. This explains why, in morphologically complex words, the high-falling pitch is on the accented syllable of the suffix while, in morphologically simple words, it is on the stem-final syllable. The reason is that in both types of words, the rightmost special syllable has word accent. In complex words with a rhythmic beat, the stem-final syllable which bears the beat is associated with a H tone.

The derivation in (3.2) shows accent assignment in [ka₁na:-¹vu], as I reanalyze the form [ka¹na:¹vu] in (3.1b). Note that the stem-final syllable receives a rhythmic beat on a Rhythm Plane, a dedicated plane for representing rhythm. (We will encounter the Rhythm Plane again later in the chapter). Specifically, the H tone docks onto the gridmark assigned to the stem-final syllable on the Rhythm Plane.



In conclusion, the rightmost lexically specified syllable in the word surfaces with the word accent. Accent is marked in Yuma with a high-falling tone, the rhythmic prominence with a high tone.

In other words, there is a single (primary) accent in Yuma word, *i.e.* Yuma does not violate culminativity of accent.

Possibly, improper transcription contributed to the view of Yuma as a multiple-stress language. Recall that in his influential descriptions, Halpern (1946a,b) transcribes all accents with the unique stress mark ['] (traditionally indicative of primary stress).

That is, even though Halpern was aware of primary *vs.* secondary stress distinction in Yuma, his transcription does not reflect this.

3.2.2.2. Central Alaskan Yupik

Traditionally, Yupik languages (Eskimo-Aleut) are thought of as multiple-stress systems. They are often said to have more than one *primary* stress in some words (*e.g.* C. Rice 1990:107 about Alutiiq; Kager 2001:9 about Central Alaskan Yupik).

Thus, in the account of Yupik prosody by Hayes (1995), the derivations stop at the foot layer and the word layer is missing. Moreover, all stresses in his examples are marked with [']. This shows that B. Hayes does consider Yupik as having multiple primary stresses.

Yupik languages are, thus, commonly held to display multiple primary stresses. However, I suspect that they are, in fact, typologically well-behaved systems that have a unique word accent and rhythm. I will argue for this position on the example of Central Alaskan Yupik.

According to the descriptions in Miyaoka (1985:65) and S. Jacobson (1979:94), in Central Alaskan Yupik, the first syllable of the word receives stress if it has a long vowel or if it is closed (3.3a); otherwise, stress falls on the second syllable (3.3b). The following stresses fall rightwards every second syllable after the first stress (3.4). The final syllable is systematically unaccented, even when this results in a lapse. (Examples are from Miyaoka 1985:65).

(3.3) a. 'anja'mi:ni

in his own boat

b. qa'ja:mini

in his own kayak

- (3.4) a. 'quzŋiɣ'ŋalŋux'paxtaŋ'qɔxsuy'naxquq there seems to be a big goat
- b. ma'qi:qa'ta:ʔi'ni:luni apparently being about to take a
steam bath
- c. qa'yaxpax'taŋqɔ'ʔi:niuq (now I see) there is a big kayak

In several Yupik dialects, including Central Alaskan Yupik, a special segmental process makes it evident that the location of the first stress in a word depends on syllable weight. With respect to Central Alaskan Yupik, the process in question is described in Miyaoka (1985:66-67) as follows: if the Rhyme of the word-initial syllable is filled with a short vowel, then (under specific phonological conditions) the onset of the following syllable geminates, closing the initial syllable. As a result, this (initial) syllable gets stressed (3.5). Hayes (1995:245) analyzes this process in terms of Pre-Long Strengthening, a metrically-constrained rule which makes heavy a light syllable that immediately precedes a CVV syllable. The result of application of Pre-Long Strengthening is illustrated in (3.5).

- (3.5) /akiani/ ['ak:i'a:ni] across it

Thus, Pre-Long Strengthening provides additional evidence that if the word-initial syllable is CVC, then it is stressed, *i.e.* the leftmost stress in the word is assigned with reference to syllable weight.

The examples in (3.4) indicate that the stresses fall on every second syllable to the right of the first stress (except the word-final syllable) and thus provide evidence that the words of the dialect display a regular weight-insensitive rhythmic alternation. The alternation in Central Alaskan Yupik is fully automatic (exceptionless), pointing to its postlexical nature.

The data in (3.4) also provide evidence that, in the dialect, rhythm is assigned with reference to the location of the first stress. Thus, if the initial syllable is heavy, it is stressed, with the following stresses falling on odd syllables (3.4a); but if the first syllable is light, stress falls instead on the second syllable, with the following stresses falling on even syllables thereafter (3.4b,c). In other words, the leftmost stress is WS (CVC heavy), as opposed to the following stresses, which are WI, regularly alternating and which respect the location of the leftmost stress.

In conclusion, the distributional differences between the leftmost stress and the other stresses clearly indicate that they are different prosodic entities: the former is the word accent and the latter is rhythm. Therefore, Central Alaskan Yupik is not a multiple stress system.

3.2.2.3. Maung

According to Capell & Hinch (1970), the words of Maung (Yiwaidjan, Arnhem Land, Australia), which consist of two or three syllables have *equal* stresses on their initial and second syllable, as evidenced by the data in (3.6). This stress report is also reproduced in StressTyp (where Maung is described as a P; A/P system).

- (3.6) a. 'gum'bil chest
 b. 'ba'ladi bag
 c. 'ma'mila clam shell

However, those stresses that were impressionistically reported as equal do not necessarily have the same phonological status. Indeed, note that the initial syllable is stressed, regardless of its syllable structure: the initial CVC syllable in (3.6a) and the initial CV syllable in (3.6b,c) are all stressed, indicating that initial stress is not sensitive to syllable weight. I suggest, then, that the apparent initial “stress” is here a beat aligned with the left word edge (an instance of “edge prominence”: see Moskal 2011, van der Hulst 2012) thus delimiting the word. Under this analysis, the second stress can be viewed as word accent.

Capell and Hinch observe that, in words of more than three syllables, as in (3.7), accent is penultimate, unless there is a closed syllable (CVC, CVCC) to the left of the penultimate syllable, in which case this closed syllable is accented (3.8).

- (3.7) jini'wunjan he cooked it
 awuni'lanun he was eating them
- (3.8) a. jini'wudbunjan he started it (the engine)
 b. jinimi'jarmanun he was wanting it

Accent on the closed syllable suggests that Maung is a WS system; further, the example (3.8b) suggests that Maung might be unbounded (because accent reaches out of the right-edge window). Thus, the accentual pattern of longer words in Maung (whose unique accent is WS) suggests that, in shorter forms with two “stresses” in (3.6), the right-hand accent is sensitive to weight (recall that the left-hand one is, in fact, a WI edge prominence).

I suggest, then (to the extent permitted by the scant material available), that Maung is not a “multiple stress” system, but a well-behaved (perhaps, unbounded) WS system with edge prominence.

Regrettably, Capell & Hinch (1970:27) do not sufficiently illustrate the relevant stress patterns: they offer very little data and no supporting phonetic evidence. Thus, the “Stress” section of Capell & Hinch’s monograph holds in 8 lines. At the same time, there seems to be no other source on Maung prosody.

Given the scarcity of available information and a possible reanalysis above, the view that Maung is a multiple-stress language is (at least) not well supported and plausibly erroneous.

3.2.2.4. Local summary

In conclusion, the case studies sketched above have shown that even if, in some language, prosodic prominences are phonetically alike and therefore “equal”, these are not necessarily equal phonologically. This suggests that the alleged multiple stress systems should be held suspect and handled with caution.

3.2.3. Multiple stress systems?

As mentioned above, some languages were described in the literature as having more than one accent in certain words (K. Pike & Kindberg 1956, E. Pike 1974); accordingly, they were dubbed “multiple stressed” systems. However, the very name of these systems indicates that they violate the Culminativity of word accent and calls for reanalysis.

One possible approach is based on phonological behavior and typological properties of accent and rhythm, as illustrated above for Central Alaskan Yupik. In particular, the appearance of multiple accents might be due to regularly alternating, rhythmic, beats. Assuming (with the S&P approach) that rhythm is phonetic or post-grammatical, and therefore, “automatic” (exceptionless), it could be tested whether we are dealing with rhythm or accent.

Alternatively, a multiple stress language could possibly be analyzed as a tone system by showing that prosodic prominence traditionally described as stress in this system does not meet the typological criteria for accent and that it exhibits tone-like behavior (see K. Pike & Kindberg 1956, E. Pike 1974). Plurality of “primary stresses” violates culminativity while there is no such requirement on tone, which provides an argument for the tonal view of “multiple stress” systems. Note that it is hardly accidental that languages violating culminativity can typically be described as pitch-accent systems.

One example of a reported multiple-stress system that in fact involves pitch-accent is Yuma (see section 3.2.2.1). As another example, Waffa had originally been

described as a “multiple stress” language because some of its words display more than one prosodic prominence (Stringer & Hotz 1973):

- (3.9) a. ku¹a:¹nu: spit
 b. ¹na:¹m:e: type of tree
 c. ¹ka¹ma round taro

However, since the prosodic prominence displays accent-like behavior and since Waffa is genetically related to pitch-accent languages, Hendriks (1996) analyzes this language as a pitch-accent system, which eliminates the multiple stress interpretation.

Summarizing, I suggested here two ways of reanalysing the so-called “multiple stress” systems: the “tonal” approach and the “rhythmic” approach. Upon examination, Culminativity appears as an inviolable, universal property of word accent.

Finally, I would like to add a word of caution: the “multiple stress” phenomenon should not be taken for granted. Indeed, for most systems in which multiple stress has been reported, such as Maung (Capell & Hinch 1970, discussed above), Ndyuka (Hutter & Hutter 1994), Auca (K. Pike 1964, Hayes 1995) and Anguthimri (Crowley 1981), the primary sources typically contain insufficiently detailed stress descriptions and, often, little evidence to support them. In addition, certain facts or an entire system are described in a single publication, which makes such

reports rather unreliable for a careful theoretician, all the more when these barely contain any information on word prosody (*e.g.* Capell & Hinch 1970 on Maung).

In conclusion, it is difficult to draw correct descriptive generalizations based on the scarce information available, which lays considerable doubt on many reports of multiple stresses.

3.3. Obligatoriness is violable

In section 3.2, upon examination of putative violations of Culminativity, I have reached the conclusion that those instances were either spurious (because amenable to reanalysis) or simply unreliable (due to paucity of trustable primary sources). Based on these representative cases, culminativity emerges as an inviolable, universal property of word accent.

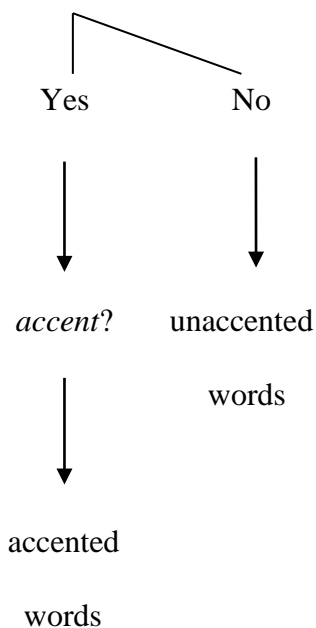
On the other hand, some accent systems in which high f_0 is the only phonetic correlate of accent, have a class of unaccented words, as this is the case in Tokyo Japanese. Therefore, accent is not obligatory in these pitch-accent languages, which implies that, for a subset of words of the language, the Project Position parameter is not set. Unlike these pitch-accent languages, the stress-accent languages never have unaccented words, suggesting that unaccentedness is a diagnostic property of the pitch-accent systems.

In order to explain the “unaccented phenomenon” above, Hirst & Di Cristo (1998) propose that, *e.g.* in Japanese, both tone and accent are involved, with accent being dependent on tone, in the sense that tone assignment is a prerequisite for accent

assignment and that tone is assigned before accent. Assuming further that some morphemes are assigned H tone in the lexicon, while other morphemes are toneless, and that the H-toned morphemes are accentable, Daniel Hirst and Albert Di Cristo conclude that words containing H-toned morphemes are accented. By contrast, since accent depends on the presence of H tone, toneless words cannot receive an accent and, therefore, surface unaccented.

This can be summarized in a following tree diagram (based on Hirst & Di Cristo 1998:11).

(3.10) *H tone?*



Summarizing, Tokyo Japanese is an example of a language in which (only) some words are unaccented, thus revealing that Obligatoriness is violable. In such languages, the Project Position parameter is not set for a subset of words.

3.4. Systems without word accent

3.4.1. Introduction

As noted in Gordon (2014), metrical theory of stress does not draw a clear distinction between accent at the word level and the higher-level prosodic prominence. In describing the prosody of words uttered in isolation, prosodic prominence perceived in a single-word utterance may in fact characterize a larger prosodic domain than a single word, which just happens to be co-extensive with a single word (Gussenhoven 2004; Gordon 2014). Thus, such prosodic prominences tend to be intonational; accordingly, they may be attributed to boundary tones, pitch-accents and the focal accent. This predicts the existence of a language that lacks word accent, but displays prosodic prominence at some higher prosodic level. One such language is Standard French, which was described as lacking word accent, but having phrase-level accent (Pulgram 1970, Fox 2000, Gussenhoven 2004:253-272, Post 2000). The latter is realized acoustically as a rising tone associated with the last full syllable of the Accentual Phrase (Jun & Fougeron 2000, 2002).

Below, I consider four languages (Standard Korean, Indonesian, Betawi Malay and Ossetic) in support of the view that a language can have post-lexical prominence, but lack word accent. I also examine the case of Seneca, in which both unaccented words and “multiple stress” occur, and show that (like the languages with post-lexical accent above) Seneca lacks word-level accent altogether. Prominence in Seneca is reanalyzed in terms of tone and rhythm, which naturally explains the “multiple stress” phenomenon: unlike accent, tone and rhythm are not constrained by Culminativity. The account of prosodic prominence in Seneca offered in this section can be viewed as a

modification of the approach to Seneca accent in Prince (1983) where Seneca was given a partially tonal analysis.

3.4.2. Korean

Consider first the prosodic system of Standard Korean (Altaic, Korea). One, rather influential view holds that Standard Korean has no word-level accent, but displays phrase-level prosodic prominence.

Evidence for absence of word accent in Korean comes from the perception test in Jun (1995a), as reported in Jun (2005). As this experiment involves the notion *Accentual Phrase*, I briefly digress to describe its properties. As a prosodic constituent, the Accentual Phrase received substantial empirical support. It is characterized by converging properties both phonological and phonetic in nature:

(i) It is different from phonological words because it is characterized by specific tonal patterns, unlike phonological words, which are not;

(ii) Unlike an Intonational Phrase, an AP is never followed by a pause (except if it is the last phrase of an IP);

(iii) The AP is a prosodic domain relevant for the application of segmental rules: for example, in Korean, a lenis obstruent following another lenis obstruent is realized as tense only if both belong to the same AP. In the case where an AP boundary intervenes between the two lenis obstruents, no tensing takes place;

(iv) Phonetic studies (T. Cho and Keating 2001) reveal that the VOT lag for a segment is systematically longer in the beginning of an AP than in the middle of it and that the magnitude of the VOT lag for an AP is greater than that for a word;

(v) Duration of the initial sound of an AP in Korean is consistently longer than AP-internally (T. Cho & Keating 2001).

By varying the position of a particular word within the Accentual Phrase (AP), Jun discovered experimentally that prosodic prominence, realized as an f_0 peak, was perceived (by non-native speakers of various languages) on a word only if it was the first word of the AP; otherwise (i.e. if the word was AP-medial or AP-final), no prosodic prominence was perceived. Jun concluded that what some researchers (H.-Y. Lee 1990) viewed as “word stress” was instead a prosodic prominence at the level of the Accentual Phrase associated with its initial syllable.²⁶ As emphasized in van Heuven et al. (2008), the prosodic prominence in question is a boundary tone and the impression of a word stress is thus due to a boundary tone rather than a phrasal accent.

As Jun (2005: 203) concludes,

The f_0 modulation over an utterance is not specific to a certain syllable of a word, but is a property of a sentence.

²⁶ Following Jun 2005, I assume that the hierarchic representation of prosody in Korean involves a tree in which an IP immediately dominates one or more APs and each AP, in turn, immediately dominates one or more phonological words (that may include clitics or postpositions). See also Jun (1998). I also assume that prosodic categories (APs, phonological words) are parsed exhaustively (Strict Layering) as supported for Korean by research on intonational phrasing (Jun 1990, 2005).

In this respect, Korean is fundamentally different from familiar systems like English and German. In the latter, the *f₀* peaks characterize the accented (as well as rhythmically prominent) syllables of individual *words*, whereas in Korean, pitch-accents “do not link to any specific syllable of a word but to a certain location of a phrase” (Jun 2005:203). That is, Korean lacks word accent.

My hypothesis is, then, that, like Korean, some other languages do not assign accent lexically, but only post-lexically (assuming that phonology is split into a lexical and a post-lexical component; see Kiparsky 1982, 1983, 1985; Kaisse & Shaw 1985; Booij 2005).

I will now review evidence from Indonesian and Betawi Malay in support of this hypothesis.

3.4.3. Indonesian

According to traditional descriptions, accent in Indonesian (Austronesian, Indonesia) falls on the final syllable, unless it contains /ə/; in the latter case, the penultimate syllable is accented (Laksman 1994; Odé 1994). However, as recent perceptual studies indicate, there is no word accent in Indonesian and the alleged word accent is in fact a higher-level prosodic prominence.

As observed in van Heuven & van Zanten (2007), “all ‘stress positions’ seem to be acceptable to Indonesian listeners”. Thus, based on a perceptual experiment using a gating paradigm (with a forced-choice task), van Zanten & van Heuven (1998)

conclude that “Indonesian listeners as a group failed to identify target words at a rate greater than chance”. That is, the Indonesian words supplied in the experiment were not reliably identified using acoustic information about the prosodic prominence which was traditionally described as “word stress”.

A judgment test by van Zanten et al. (2003) also supported the hypothesis that there is no word accent Indonesian. In this test, a syllable of the stimulus word was given acoustic prominence relative to the other syllables but the participants failed to consistently choose that syllable as felicitous.

One may also add that, according to Halim (1974:111-113), an L1 speaker of Indonesian, this language has no word accent (see van Zanten & van Heuven 1998:130; van Heuven & van Zanten 2007:194).

The movements of f_0 at the end of a phrase in Indonesian, which realize the phrase-final boundary tones, might have been confused with word accent (van Zanten, Stoel and Remijsen 2010 and Gordon 2014). If this is the case, then the prosodic prominences in Indonesian are clearly phrasal. Indonesian thus has post-lexical prominence, but lacks word accent.

3.4.4. Betawi Malay

In Betawi Malay (Malayo-Polynesian; Jakarta), there is no word accent, but there is sentence-level prosodic prominence, as argued in the detailed phonetic study of sentence accent in this language by van Heuven et al. (2008). This view echoes with the report on Betawi prosody in Wallace (1976):

Importantly, the accent shift to the final syllable in (3.12) is optional. Also, the contours and alignment of pitch configurations are highly variable. This implies that accent assignment cannot be captured with a deterministic mechanism. Since optionality and gradience are post-lexical properties (see Kiparsky 1985:86, 94; Kaisse & Shaw 1985:6) and accentual generalizations relate to sentences rather than words, Betawi accent is post-lexical.

Summarizing, Betawi Malay lacks word accent, while having higher-level prosodic prominence.

3.4.5. Ossetic

Ossetic is an Iranian language (Indo-European), spoken in Ossetia (a region of the Caucasus, situated in Georgia and in the Russian Federation).

According to Bagaev (1965:19), Ossetic has the vowel system in (3.13). Bagaev (1965:16) describes /i/ and /ə/ as reduced; indeed, both are central.

(3.13) *Ossetic vowel system*

i	ɨ	u
e	ə	o
a		

In Ossetic, accent is sensitive to vowel quality: syllables containing full vowels are heavy, those with the reduced vowels (/ə/ or /i/) are light.²⁷

In words uttered in isolation, prosodic prominence is observed. However, when words are grouped into an Accentual Phrase, only one word in this phrase has accent, with all other words being unaccented, which suggests that the prominence is phrasal. In order to establish that prominence is phrasal, I will now compare this seemingly word-level prominence and phrasal accent in terms of their distribution.

The apparent word-level prominence falls within a bisyllabic window at the left edge of the word. In words uttered in isolation, the first syllable is prominent, if heavy (3.14a,b); otherwise the second syllable is prominent (3.14c,d).

(3.14) a. *heavy-heavy*

¹ axodən	breakfast
¹ axston	nest
¹ ragon	ancient
¹ fidawin	show off
¹ udaj'in	wet

²⁷ Hayes (1995:26) states that, in Ossetic, “stress falls on the first vowel of a phrase if it is long, otherwise on the second vowel”. However, as discussed above, the accent system of Ossetic is sensitive to vowel quality (full vs. reduced). In principle, though, one could attempt to make a case for vowel length as a weight factor in Ossetic by reanalyzing the vowel quality distinction as one of length.

b. *heavy-light*

'xuriskəsən	East
'uləfin	breathe
'sidin	call

c. *light-heavy*

əx'sargard	saber
dzin'dzaləg	name of a plant
əx'sidin	boil

d. *light-light*

ti'risa	flag
əf'simər	brother
mə'ləg	thin
əm'bəlin	meet

Also, when words are prefixed, the prominence shifts left into the bisyllabic left-edge window and behaves according to the accent rule. Thus, the accent rule receives additional support.

Let us now examine prominence at the phrase level. When, at a higher prosodic level, words group into an Accentual Phrase (AP), all prominences but one delete; the one that persists, behaves exactly like the apparent word-level prominence, but at the phrase level. Namely, it falls within the bisyllabic window located at the left edge of the AP, as described by the accent rule for words: it falls on the first heavy syllable, otherwise on the second syllable. This leads me to the conclusion that Ossetic lacks word accent and the apparent word-level prominence is, in fact, phrasal.

According to Bagaev (1965), certain NP, the PostP, the QP with numerals and the combinations of a VP with certain additional elements form Accentual Phrases (APs).

Thus, NPs containing modified nouns group into APs that have exactly one accent (3.15). In particular, the data in (3.15c) provides evidence that there is one accent per Accentual Phrase (located near AP's left edge) regardless of the AP's complexity.

(3.15) a. wɪ ^l risag əvzag	Russian language
b. ^l xorz tʃinig	good book
c. ^l tʃisil læppuji tʃinig	little boy's book
^l læppuji tʃisil tʃinig	boy's little book
nə ^l xi læppuji tʃinig	our boy's book
nə ^l xi tʃisil læppuji tʃinig	our little boy's book

Prosodically, the VP groups with negative particles (3.16a), pronouns (3.16b) and adverbs (3.16c), together with intervening clitic pronouns (3.16c), into an Accentual Phrase. The data in (3.16) provides evidence that the AP has a single accent located in the bisyllabic window at the left edge of the AP. The precise location of the accent is as described by the accent rule.

Importantly, accent is assigned within the phrase, not within the word, as evidenced by (3.16d,e): while the particular word which bears accent differs between (3.16d) and (3.16e), accent remains in the same position *within the AP*, viz. the second syllable in the AP.

- | | |
|-----------------------|------------------------|
| (3.16) a. nə 'amonin | do not show |
| b. 'nitʃi radzirdta | no-one told |
| c. 'nikəd əj fedton | (I) never saw him |
| d. nə 'axwɪr kənin | (I) do not study |
| e. nə 'ta axwɪr kənin | (I) do not study again |

Postpositional phrases and quantifier phrases with numerals also correspond prosodically to APs and display the same accentual properties as the NPs and VPs discussed above.

Summarizing, the observed prominence location at the word and phrase level is the same. Therefore, Ossetic has phrasal accent, but lacks word accent.

In the following section, I examine the complex prominence pattern of Seneca and show that it also lacks word-level accentuation.

3.4.6. Seneca

3.4.6.1. The description

Seneca (Iroquoian; Ontario and NY) is a WS count system in which closed syllables are heavy (see Gordon 2006:286). Seneca relies on a single phonetic cue for distinguishing accented and unaccented syllables. Based on her interpretation of the partially tonal analysis in Prince (1983), Melinger (2002) argues that the existence of “multiple accents in a single word makes a tonal analysis unlikely” (because of a violation of the No Crossing Lines condition). I hold an opposite view in this respect: since Seneca has unaccented words and the unique acoustic correlate of prosodic prominence in Seneca is an increase in fundamental frequency, then this is, clearly, a pitch-accent language, which points to the possibility of a (partially) autosegmental analysis. I begin with a set of descriptive accentual generalizations, based on data from Melinger (2002).

(i) Heavy even-numbered syllables are prominent, if non-final (3.17).

- | | |
|------------------------------|-----------------|
| (3.17) a. (a.ge)(ga.'ye')qh | I'm willing |
| b. (a.ge)(ni.'yas)(da.ye') | I have it on me |
| c. (o'.dis)(wa.de)(nye:.doh) | you (Pl.) waded |

The final syllable is always closed; it is never prominent, whether even (3.17b,c) or odd (3.17a).

(ii) If the word has no heavy non-final even-numbered syllables, then the light (open) even-numbered syllable that immediately precedes this heavy non-final syllable (3.18a,b) is prominent. An even-numbered open syllable followed by another open syllable is never prominent (3.18c).

- | | |
|-------------------------------------|----------------------------|
| (3.18) a. (khe.'no)(weh.dəh) | I didn't believe them |
| b. (ha.'ya)(do'.gwas) | He's digging a hole |
| c. (de.o)(nə.da)(dye.'nə)(wə'.se:h) | They're helping each other |

Note, however, that an even-numbered open syllable that is immediately followed by an odd-numbered heavy syllable in final position is not prominent (3.19).

Seneca has a vowel lengthening process (Even Penult Lengthening) which lengthens the vowel in the even penultimate syllable unless the vowel is followed by a glottal consonant (/ʔ/, /h/). Since syllables which undergo Even Penult Lengthening are not prominent, the derived length of penult vowels blocks prosodic prominence (Melinger 2002:294).

- | | |
|-------------------------------|------------------|
| (3.19) (da.'ga)(de'.ha:)sdə:' | I exerted myself |
|-------------------------------|------------------|

This leads me to conclude that the final syllable is *extrametrical* because it is never prominent. Moreover, it does not cause the preceding syllable to receive stress when it is odd-numbered.

Therefore, the necessary and sufficient condition for a word to be prosodically prominent in Seneca is the presence of a word-internal closed syllable. Hence, unaccented words in Seneca are exactly those that lack a word-internal closed syllable.

The data in (3.20) (drawn from Foster 1982:68) illustrates the conditions under which words are unaccented. For example, the words in (3.20a) are unaccented because all syllables but the last one are open and the last one, although closed, is unaccentable (extrametrical). In (3.20b), the penult is lengthened and, for this reason, may not be prominent; the remaining syllables are all open (except the last one, which is extrametrical). This explains the lack of accent in (3.20b). In (3.20c), the only non-final closed syllable is word-initial, not word-internal, and, therefore, cannot carry prosodic prominence.

(3.20) a. onōtate?	a hill
dēgadenjeodē?	I'll put a necktie on
agegwenjō:h	I'm able to
b. shagoge:das	he hates her
dewagadē:nō:d	I'm wishing it would happen
hada:khe?s	he's running about

c. akde:nyõ:h I've changed it

oʔgĩõ:djõ:h it's snowing

Summarizing, whenever the conditions of the accent rule are not met, no prominence is assigned, thus violating Obligatoriness. Therefore, there is no default accent in Seneca: the “all-light” words do not receive any prosodic prominence.²⁸

By contrast, every syllable that satisfies the conditions of the accent rule is stressed. Indeed, although Chafe (1967), Prince (1983), Hayes (1995) and other authors assumed a single accent in Seneca words, it was recently found that Seneca has words with more than one prosodic prominence, witness (3.21) (see Melinger 2002:292).

(3.21) de'wageʔ'nigõhq:ʔ I long to be somewhere else

de'yõkhi'yaʔdo'wehdanih they deliberated for us

de'wageʔnyoda'geʔqh I'm busy

oʔ'kheyasheda'wiʔhq:ʔ I gave them numbers

²⁸ In a different framework, Hayes (1995:225) arrives at a similar conclusion regarding the lack of the default accent in Seneca: “high tone docks first onto the rightmost non-final closed syllable, then may flop leftward into an adjacent metrically strong syllable. *In words lacking non-final closed syllables, H tone cannot dock at all; these words are described by Chafe as accentless*” [italics mine – AV]. Melinger (2002) notes: “The existence of words without any high pitched syllable has been reported repeatedly by Chafe (1967, 1977, 1996). These words are produced with a relatively even low tone throughout the word”. (It is understood that the absence of high tones alongside low tones in these words amounts to the absence of prosodic prominence at the word-level.)

deʔyago ¹ yaʔdos ¹ gaʔah	she's pregnant (<i>lit.</i> "it's not her body anymore")
deyqgwa ¹ dehat ¹ heʔdahgqh	that which gives us light
waqwq ¹ diyaʔ ¹ dqʔne:k	they removed them

To conclude, Seneca is a pitch-accent language (in the sense of Beckman 1986) which has both unaccented words and words with (at least, apparent) "multiple stress", which I analyze below as rhythm, rather than accent.

3.4.6.2. The account

I will now propose an account of prosodic prominence patterns in Seneca. Since, as we know, the (unique) phonetic correlate of word accent in Seneca is high pitch (it is a pitch-accent language), a tonal reanalysis of the language is possible.

Following Prince (1983) and Hayes (1995), I propose that Seneca has both tone and rhythm, similar to Japanese, which has both tone and a lexical accent system. However, unlike the lexically specified tone of Tokyo Japanese, tone in Seneca is derived: its H tone is sensitive to weight, being only associated to closed syllables (except the last one, which, I suggest, is extratonal).

In addition, Seneca has iambic rhythm, assigned left-to-right, which results in strength of even-numbered syllables. Thus, if an odd-numbered syllable is associated with a H tone, then this H spreads leftwards onto the preceding even-numbered syllable because it is rhythmically strong (then, H delinks from its original location since an

odd-numbered position has no rhythmic beat and, therefore, cannot be prominent in the output form). This spread of the H tone leads to multiple rhythmic beats, realized as high pitch, thus creating an erroneous impression of “multiple accent”.

Rather, as just described, Seneca is a system that *has both rhythm and tone*, but *lacks accent*; that is, it is not an accent system altogether.

The following derivations illustrate how prominence is assigned in Seneca.

To begin with, consider the case in (3.22a) where the heavy syllables are even-numbered. The form is assigned iambic WI rhythm, represented on a separate plane. The last heavy syllable is associated with a high tone. At the next stage, the high tone spreads onto the preceding heavy syllable, yielding two high pitches in the output form. In (3.22b), a high tone is first associated with an odd-numbered heavy syllable, then spread onto the preceding rhythmically strong syllable and, finally, delinked. In (3.22c), the high tone associates with the initial heavy syllable, but cannot spread leftwards because it is already leftmost. Finally, since the high tone is associated with the rhythmically weak (odd-numbered) syllable, Delinking applies, deassociating the tone from the syllable, like in (3.22b). This yields a toneless output form.

Since Seneca is a pitch-accent language, high tone is implemented as relatively high pitch in the phonetic component, whereas the lack of tone (Ø) on toneless words is implemented as a non-high, (*i.e.* lower) pitch.

The line graph shows a sharp increase in the number of people in the workforce from 1970 to 1980, followed by a sharp decline. The x-axis represents years from 1970 to 1980, and the y-axis represents the number of people in the workforce. The line starts at a low point in 1970, rises steeply to a peak in 1980, and then falls sharply.

H Spread H to heavies

l h l h <l>

* * * * *

* * * * *

Weight Grid

* *

* *

* *

* *

Rhythm Plane

11 h 1 <h>

Spread H to beat

l l h l $\langle h \rangle$

H Delink H

$$1 \quad 1 \quad h \quad 1 \quad \langle h \rangle$$

* * * * *

* * * * *

* * * * * Weight Grid

* *

* *

* *

* *

* *

* *

Rhythm Plane

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c. H	Associate H	Spread H	H	Delink H	
		N/A	 		
h l l l <h>			h l l l <h>		
<hr/>					
* * * *	*		* * * *	*	Weight Grid
*	*		*	*	
<hr/>					
	*	*		* *	Rhythm Plane

Output: h l l l h (reported as “unstressed”)

Based on “multiple stress” patterns, Melinger (2002) rejects the partly tonal treatment of Seneca in Prince (1983), on the grounds that spreading a H tone from one heavy syllable to the next would cross the association line of an intervening default L tone (thus violating the No Crossing Lines Condition). This leads her to prefer her own purely metrical analysis. However, recall that Seneca is pitch-accent language, witness the *fó* as the unique correlate of prosodic prominence and the class of unaccented words), suggesting that a tonal approach is to be preferred.

In this section, I have analyzed the pattern of prosodic prominence in Seneca as a privative tone system that involves H tone opposed to Ø. In this way, association lines of the H and L tones do not cross simply because there are no L tones in the phonology of Seneca, in the first place.

In conclusion, Seneca has tone and rhythm, but no word accent. Accordingly, the burden of explanation lies here on autosegmental operations, whereas the accentual

parameters (in particular, Select and Project Position) are not set for Seneca because this is not an accentual system.

3.5. A special case: an accent system without the default

A peculiar case that deserves to be mentioned here is Southern Sierra Miwok (Penutian, California).

This is a WS bounded accent system in which accent falls on the leftmost heavy syllable (CVV, CVC) within the left-edge bisyllabic window. Broadbent (1964:16) reports that at least one of the first two syllables in words of Southern Sierra Miwok is always either CVC or CVV, hence the two syllables in the bounded (bisyllabic) accent domain are never both light.

This is illustrated with the examples in (3.23) (drawn from Broadbent 1964; K. Rice 2010:182; Stonham 1994).

(3.23) hi ^l ʃa:k	to hiss
^l hu:ʃuʔ	buzzard
ha ^l ka:ʃaʔ	golden cup oak
^l to:koʃuʔ	ear
ka ^l la:ŋ	to dance

Since the accent domain of every word contains a heavy syllable, the situation where the Project Position parameter would apply never arises. Thus, Southern Sierra Miwok seems to be exceptional, in that this is the only language where the Project Position parameter cannot be set (due to the absence of “all-light” words).

There is a principled difference between the languages where Project Position is “not set” (*e.g.* Standard Korean or Indonesian), on the one hand, and Southern Sierra Miwok, on the other. While, in the former, the Project Position parameter is not allowed to be set (otherwise, the system would generate unattested languages), setting the Project Position parameter in the latter case cannot generate any language because the Project Position parameter only applies to “all-light” forms and those are absent from the language.

3.6. Summary

Recall that, according to the traditional definition, word accent is characterized as obligatory and culminative (Hyman 2006): word accent is “culminative” if there is *at most one* accent per word; it is “obligatory” if there is *at least one* accent per word. The traditional claim is thus that every content word has exactly one word accent, which means that accent meets both Culminativity and Obligatoriness. Thus WS and WI systems with exactly one accent both meet Culminativity and Obligatoriness.

In the S&P theory, the Project Position parameter, if it is set, guarantees Obligatoriness: in “all-light” words, a unique gridmark is inserted, resulting in word

accent. The Select parameter guarantees Culminativity by choosing a single heavy syllable for word accent.

Also, since the Select parameter makes reference to weight, it is not set for WI systems. In other words, the WS *vs.* WI distinction correlates with whether the Select parameter is set or not.

In this way, setting or not the Select and Project Position parameters predicts the language types described in Table 3.1.

TABLE 3.1. *Possible accentual types predicted by the combinations of settings of Select and Project Position.*

<i>Select</i>		
<i>Project Position</i>	SET	NOT SET
SET	1. The usual WS systems. Exactly one accent per word. 2. WI systems: all words in the language are “all-light”. Project Position feeds into Select to assign “fixed” accent.	“Multiple stress” systems without unaccented words.
NOT SET <i>for <u>some</u> “all-light” words</i>	Systems where some “all-light” words are unaccented.	“Multiple stress”: some words are unaccented.
NOT SET	All “all-light” words are unaccented.	Languages without word accent.

In this chapter, I offered the analyses of several languages in order to establish the typological classes of prominence depending on whether the Select and Project Position parameters of the S&P theory are set. Table 3.2 below relates the various accentual types to the setting of the Select and Project Position parameters.

TABLE 3.2. *Setting the Select and Project Position parameters based on the presented accentual typology.*

SELECT			
PROJECT POSITION	SET	NOT SET <i>for <u>some</u> all-light words</i>	NOT SET
SET	1. “Usual” WS systems 2. WI systems (“fixed” accent) 3. “Multiple stress” languages, reanalyzed: <i>e.g., Yuma, Central Alaskan Yupik, Maung, Waffa</i>		
NOT SET <i>for <u>some</u> all-light words</i>		Systems where some “all-light” words are unaccented: 1. Pitch-accent languages with accent dependent on tone: <i>e.g., Tokyo Japanese</i>	

		2. Pitch-accent at the right word edge as an intonational prominence in all-light words: <i>e.g., in Turkish, the boundary tone at the right edge of the PhP</i>	
NOT SET			1. Languages without word accent, with post-lexical prominence: <i>e.g., Indonesian, Betawi Malay, Standard French, Standard Korean, Ossetic</i> 2. Pitch-accent languages with prominence due to tone and rhythm (words lacking high tone do not have prominence): <i>e.g., Seneca</i>

Based on Table 3.2, I conclude that (i) for all accentual WS languages, the Select parameter is set; (ii) in languages which lack word accent, neither Select, nor Project Position is set; and (iii) if the Select parameter is set, the Project Position parameter should be set for at least some “all-light” words.

This chapter briefly looked at a range of languages described in Table 3.3, which summarizes the results in terms of the Select and Project Position parameters and of the type of prosodic prominence involved.

TABLE 3.3. *Some languages analyzed in this chapter and their prominence profiles.*

<i>Is Select/Project Position set?</i>	<i>Language name</i>	<i>Prominence profile</i>
Select (<i>Yes</i>) Project Position (<i>Yes</i>)	Yuma	Word accent plus rhythmic beats
	Central Alaskan Yupik	Word accent plus regular rhythmic alternation
	Maung	Word accent plus edge prominence (polar beat)
	Sekani	Word accent sensitive to tone and syllable weight
Select (<i>Not Set</i>) Project Position (<i>Not Set</i>)	certain Bantu languages	Regular tonal alternation analyzed as rhythm. No word accent.
	Seneca	Rhythm plus tone. No word accent.
	Standard Korean	Intonational prominence at the Accentual Phrase level. No word accent.
	Betawi Malay	Phrase-final intonational prominence that qualifies as post-lexical. May be due to a boundary tone. No word accent.
	Indonesian	Intonational prominence near the right edge of the phrase due to the right-edge boundary tone or phrasal accent. No word accent.
	Standard French	Intonational prominence at the end of the Accentual Phrase. No word accent.

Select (<i>Yes</i>) Project Position is <i>not set</i> for a subset of “all- light” words	Tokyo Japanese	Diacritic weight: accent falls on the leftmost diacritically heavy morpheme in the word, hence Select (L). The class of “all-light” unaccented words is derivable by not setting Project Position for exactly those words.
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3.7. A weight restriction on unbounded systems?

3.7.1. Introduction

In this section, I address several theoretical issues relating to phonological weight in US. Examples of usual phonological weight criteria are vowel length, syllable closure, as well as vowel height and vowel “fullness”/peripherality (as opposed to vowel reduction/centralization).

I will now address the issue whether criteria of phonological weight for accent in unbounded systems differ from those in bounded systems. Thus, I reconsider a typological thesis in Ahn (2000) that there would be a specific asymmetry between bounded and unbounded systems whereby the CVC syllables are heavy in some bounded systems, but never in unbounded ones. Below, I offer a number of counter-examples to Ahn’s thesis presented here and conclude that it is incorrect.

3.7.2. Against the “Weight Asymmetry” thesis

Based on a large cross-linguistic survey of syllable weight (136 languages, including 23 unbounded), Ahn (2000) establishes the generalization that while CVV syllables are heavy in both bounded and unbounded systems, CVC syllables may be

heavy or light in BS, but are always light in US. In this short section, I argue that Ahn's thesis is incompatible with empirical evidence from several languages.

To begin with, in Amele, which is a WS unbounded system, both CVV and CVC syllables are heavy. Indeed, the stress rule of the language refers to closed syllables as special, indicating thus that they are heavy:

In monomorphemic forms, stress falls on the first closed syllable. If there is no closed syllable, then on the first syllable. (Roberts 1987:357)

Data in (3.24) offers evidence that, in Amele, CVC syllables are accent-attracting and, therefore, heavy.

- | | |
|-----------------|---------------------|
| (3.24) a. du'an | cold |
| b. iti'tom | righteous |
| c. ja'walti | wind from the North |
| d. 'isdoc | to avoid |
| e. i'waldoc | his teacher |

I conclude that heaviness of closed syllables in Amele represents a direct counter-example to Ahn's thesis.

Closed syllables are also heavy in two other unbounded accent systems: Yukaghir (isolate; Kamtchatkan Peninsula) and Kenuzi-Dongola (Nilo-Saharan, N. Sudan), not mentioned in Ahn (2000).

Here is how the accent rule of Yukagir is described in Maslova (2003):

Polysyllabic roots fall into two groups: if a root contains at least one stress attracting syllable, that is a syllable of structure (C)VC or (C)V:, the stress is placed on the last stress attracting syllable. If a root contains no stress attracting syllables, generally the final syllable is stressed. (Maslova 2003: 82)

This accentual behavior, exemplified in (3.25), indicates that both syllable closure and vowel length make syllables heavy in Yukagir.

(3.25) le ^l gul	food
a ^l ro:je	kind of fish

Likewise, in Kenuzi-Dongola, both CVV and CVC syllables are heavy (except word-finally), as reported in Armbruster (1960:95). Also, as Ahn (2000) admits, CVC syllables are heavy in Yana, on a par with CVV syllables.

Summarizing, I have pointed above to several US in which CVC syllables are heavy. The claim about weight asymmetry between BS and US with respect to the weight of closed syllables seems not to hold.

3.8. Chapter conclusions

In this chapter, I have addressed several critical issues in accentual typology.

Generally, word accent is held to be (both) culminative and obligatory. However, as I have argued based on (re)analysis of a range of accentual systems, while Culminativity is effectively a universal, Obligatoriness is violable and, therefore, not a universal property of word accent.

These results lead us to the following conclusions about the Select and Project Position parameters for WS systems (see section 3.6):

- (i) Select is set;
- (ii) in languages lacking word accent (*i.e.* non-accentual languages), neither Select, nor Project Position is set;
- (iii) if Select is set, then Project Position is set for at least some “all-light” words;
- (iv) if a language has a class of unaccented words, then it is a “pitch-accent system”.

Lastly, evaluating Ahn’s (2000) claim that a special type of weight asymmetry holds between BS and US, I have argued, based on counter-evidence from several (genetically unrelated) languages, that the claim in question is inaccurate.

Chapter 4

An overview of the Scales-and-Parameters theory

An overview of the Scales-and-Parameters theory

4.1. Introduction

The present chapter brings together the main theoretical proposals and findings of this dissertation.

Section 4.2 presents the notion of “diacritic weight”. This leads me to introducing new types of weight scales (section 4.3) in addition to phonological ones (section 4.3.1), *i.e.* diacritic (section 4.3.2) and mixed (section 4.3.3) weight scales, the latter being of two types, *i.e.* hybrid weight scales (section 4.3.3.1) and relativized diacritic weight scales (section 4.3.3.2). In section 4.4, I present the “Weight Grid”, which is a representational encoding of a weight scale. In the section 4.5, it is proposed that only the heaviest units (syllables, morphemes), as defined by the Weight Grid, are projected onto the Accent Grid. Therefore, the parameters of the S&P grammar only manipulate the projections of the heaviest units in the accent domain. In section 4.6, the Gridmark Insertion rule is described, an additional component of the S&P grammar that formally captures preaccenting. Section 4.7 presents the Lightening rule intended to capture (non-local) effects of the so-called “unaccented dominant” morphemes. The next two sections present the parameter system of the S&P grammar: section 4.8 defines the parameters themselves; section 4.9 describes the ordering and dependency relations among the parameters. Section 4.10 summarizes the S&P grammar as a whole by bringing together the various components discussed in the previous sections.

Finally, in section 4.11, sample derivations illustrate how the S&P grammar works for different cases and for different types of weight scales.

4.2. Diacritic weight

In many languages, morphemes can attract or repel word accent. Following van der Hulst (1999), I have proposed to treat these abilities as a type of weight by extending the notion of *weight* from syllables (phonological weight) to morphemes (diacritic weight). We say, then, that morphemes that attract accent are diacritically heavy, while the accent-repelling ones are diacritically light.

Interestingly, this generalized notion of weight allows accent to be assigned with reference to any type(s) of weight: diacritic, phonological or some combination of the two.

4.3. Weight scales

4.3.1. The phonological weight scale

In many WS systems, syllable weight distinctions are scalar, rather than binary: syllable weight is organized into phonological weight scales, typically involving differences in vowel length, syllable closure and/or vowel quality (Gordon 2006). In such systems, accent is assigned to the heaviest syllable within the accent domain (Kager 2012:1461).

4.3.2. The diacritic weight scale

Similar to WS accent systems with a phonological weight scale, there are systems with a *diacritic weight scale*. The latter is a language-specific scale on which several levels of weight are defined and in which a particular set of morphemes is associated with every weight level. Note that diacritic weight scales do not involve phonological weight.

An example of a diacritic weight scale is given in (4.1), as attested in Central and Southern Selkup. This scale orders diacritically superheavy morphemes (sup_d) morphemes over diacritically heavy morphemes (h_d) over diacritically light ones (l_d).

(4.1) *A diacritic weight scale*

$$\text{sup}_d > \text{h}_d > \text{l}_d$$

4.3.3. Scales containing both phonological and diacritic weight

4.3.3.1. The hybrid weight scale

A hybrid weight scale is a language-specific weight scale which orders phonological and diacritic weight.

For a hybrid weight scale, given a morpheme and a syllable co-extensive with this morpheme, only one type of weight (phonological or diacritic) is taken into account.

An example of a hybrid weight scale is given in (4.2), as attested in Eastern Literary Mari. This scale orders diacritically heavy morphemes (h_d) over

phonologically heavy syllables (h_d) over diacritically light morphemes (l_d) and phonologically light syllables (l_p), with the latter two mutually unordered.

(4.2) *A hybrid weight scale*

$$h_d > h_p > \{l_d, l_p\}$$

Since hybrid systems have both morphemic and syllable weight, the question arises when accent refers to morphemes and when to syllables contained in those morphemes. This is determined based on the hybrid weight scale: accent assignment only makes reference to the heaviest units (morpheme, syllable) in a word, to the exclusion of other degrees of weight. For example, in ELM, in a word containing heavy morphemes, one of these receives the accent because it is heaviest on the weight scale (4.2). In words that do not contain diacritically heavy morphemes, but contain phonologically heavy syllables, accent falls on a heavy syllable.

In this sense, hybrid weight scales are “disjunctive”: only one type of weight is relevant for accent assignment, namely the heaviest unit according to the hybrid weight scale.

4.3.3.2. The relativized diacritic weight scale

A relativized diacritic weight scale (or a “relativized scale” for short) is a language-specific *diacritic* weight scale which contains both the diacritic weight of morphemes and the phonological weight of syllables contained in those morphemes. In

this scale, degrees of diacritic weight are *relativized* with respect to phonological weight.

For example, Tundra Nenets has the phonological weight scale in (4.3). (As usual, the lowest-ranked elements in a scale are light; all higher-ranked elements are heavy.)

(4.3) *The phonological weight scale for Tundra Nenets*

$$\text{CVC} > \text{CVC?} > \text{CV} > \text{CV?} > \text{C}\check{\text{a}}(\text{C})(?)$$

In addition to the scalar phonological weight distinction, Tundra Nenets also has a binary diacritically heavy *vs.* diacritically light distinction ($h_d > l_d$).

A relativized diacritic weight scale orders morphemes of different weight depending on the weight of syllables which these morphemes contain. For example, the relativized diacritic scale in Tundra Nenets is given in (4.4).²⁹

(4.4) *The relativized diacritic weight scale for Tundra Nenets*

$$h_d/h_p > l_d/h_p > h_d/l_p, l_d/l_p$$

²⁹ The scale in (4.4) employs the following notation. As usual, “ h_d ” stands for “diacritically heavy” and “ l_d ” for “diacritically light”. The slash (“/”) stands for “which contains”. A slash following diacritic weight and preceded by phonological heaviness means “containing” at least one heavy syllable. For example, “ l_d/h_p ” means that a diacritically light morpheme is heavy if it contains at least one heavy syllable; “ h_d/h_p ” means that a diacritically heavy morpheme is superheavy if it contains at least one heavy syllable. If “/” is followed by a light syllable, then it reads “containing *only*” light syllables. Thus, diacritically heavy and diacritically light morphemes are light (lowest on the scale) if they only contain light syllables (“ h_d/l_p ”, “ l_d/l_p ”).

It consists of three classes of morphemes: diacritically heavy morphemes that contain *at least* one heavy syllable, which are heavier than diacritically light morphemes that contains *at least* one heavy syllable, which, in turn, are heavier than diacritically heavy and diacritically light morphemes that contain light syllables only. (Obviously, light syllables on the phonological weight scale (4.3) are the lowest-ranked ones; all higher-ranked syllable types are heavy.)

In order to assign accent correctly, the relativized weight scale determines which morphemes will be projected onto the Accent Grid and, therefore, may “win”.

However, the relativized weight scale does not suffice because the presence of multisyllabic morphemes in Tundra Nenets words requires singling out an accented syllable within the relevant morphemes. The phonological weight scale allows us to identify those syllables that attract morphemic weight. In this way, accent is assigned with reference to both diacritic and phonological weight.

In the case of all-light words and simplex words, this mechanism boils down to the phonological weight scale alone because the relativized diacritic weight scale does not affect accent location. This special case is (trivially) consistent with the general mechanism above. Indeed, in words which only contain light syllable, morphemes are light (these morphemes are lowest on the relativized weight scale), regardless of their diacritic weight; therefore, this weight is ignored. Diacritic weight is also ignored in morphologically simple words because the phonological weight scale suffices to determine accent location (there is only one morpheme to choose from).

Comparing the hybrid and relativized weight scales, the former is “disjunctive” in that it always requires a choice between morphemes and syllables: accent assignment

refers to the heaviest unit on the scale, either morpheme or syllable, with the scale defining the heaviest relevant unit. By contrast, the relativized diacritic weight scale is “conjunctive” in that accent assignment requires reference to *both* diacritic and phonological weight.

Sample derivations will be provided in section 4.11 to illustrate this approach.

4.4. The Weight Grid

The weight grid is a representation of weight relations defined on a weight scale. It translates the weight degrees from the scale into columns of gridmarks, with the relative height of each column encoding a weight degree.

All types of weight scales (phonological, diacritic, mixed) can be represented as a weight grid. As an example, the weight grid in (4.5) encodes the diacritic weight scale of Central and Southern Selkup (4.1) in section 4.3.2.

(4.5) *The Diacritic Weight Grid for Selkup*

sup _d	h _d	l _d
*	*	*
*	*	
*		

Another example is the weight grid in (4.6), which encodes the hybrid weight scale of Eastern Literary Mari (4.2) in section 4.3.3.1.

(4.6) *The Hybrid Weight Grid for Eastern Literary Mari*

h_d	h_p	l_d	l_p
*	*	*	*
*	*		
*			

The relativized diacritic weight scale for Tundra Nenets (4.4) in section 4.3.3.2 translates into the Relativized (Diacritic) Weight Grid in (4.7).

(4.7) *The Relativized Weight Grid for Tundra Nenets*

h_d/h_p	l_d/h_p	h_d/l_p	l_d/l_p
*	*	*	*
*	*		
*			

4.5. Weight Projection

The Weight Grid and the Accent Grid belong to separate planes, called the “Weight Plane” and the “Accent Plane”, respectively. Weight is projected from the Weight Grid onto the Accent Grid on which the S&P parameters operate.

Weight Projection is constrained by the Weight Projection Principle, which states that only the heaviest units (morpheme, syllable) in the word must be projected onto line 1 of the Accent Grid, *i.e.* only those units that have the highest column of

gridmarks on the Weight Grid among all relevant units in that word. If all units in the word are light (*i.e.* if each unit receives only one gridmark on the Weight Grid), then nothing is projected onto the Accent Grid. Instead, Project Position (Left/Right) inserts a gridmark onto line 1 at the corresponding (Left/Right) word edge. At the last stage, the Select parameter promotes the gridmark(s) from line 1 to line 2.

In this way, the Weight Projection Principle controls the interface between the Weight Grid and the Accent Grid, acting as a “filter”.

4.6. The Gridmark Insertion rule

In terms of lexical accent theories, preaccenting morphemes are those that place a lexical accent on the last syllable of the immediately preceding morpheme which, therefore, may surface with an accent. In other words, a preaccenting morpheme makes the preceding syllable accentable.

In the S&P theory, preaccenting morphemes are “diacritically light” because they do not attract accent onto themselves; rather, they make an adjacent diacritically light unit accentable, that is, diacritically heavy. The effect of preaccenting is captured in this theory with the Gridmark Insertion rule which operates on the Weight Grid.

(4.8) *The Gridmark Insertion rule*

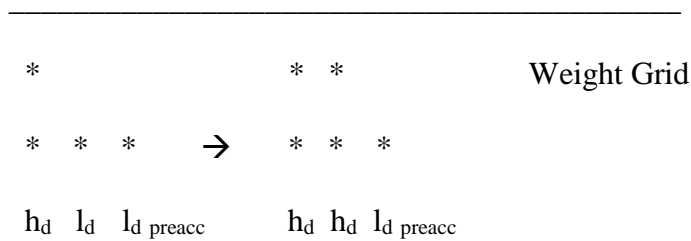
Insert a gridmark on line 2 of the Weight Grid over the final syllable of a light morpheme if this is immediately followed by a preaccenting morpheme.

Further, it is assumed here that

- (i) After the application of the Gridmark Insertion rule, triggered by a preaccenting morpheme, the trigger loses its preaccenting ability;
- (ii) Preaccenting morphemes can act on the preceding morpheme as long as they are light.

In (4.9), I illustrate the application of the Gridmark Insertion rule. For example, in the Uzbek form [boʃˈlami], where /boʃ/ is diacritically heavy, /-la/ light and /-mi/ preaccenting, Gridmark Insertion applies to /boʃ-la-mi/ (“begin-VERBALIZ-INTERR), making [la] heavy. Thus, in (4.9), it adds a second gridmark over /-la/ on the Weight Grid to the right of the arrow, thus making it heavy.

(4.9) boʃ la mi boʃ la mi



When more than one preaccenting morpheme is successively attached, the Gridmark Insertion rule, triggered by the leftmost such morpheme, assigns a gridmark to the preceding morpheme (if this is light), thus making it heavy. Then, the rule

reapplies, triggered by the right-adjacent morpheme, and makes the preceding light morpheme (which now lost its preaccenting ability) heavy. (The rule reapplies as many times as there are successive preaccenting morphemes.)

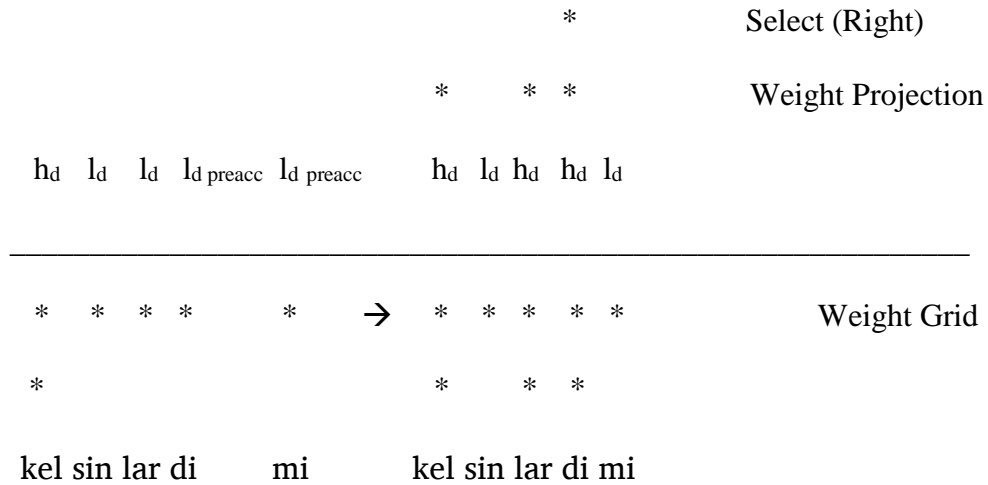
For example, in the case of [kel-sin-lar-^ldi-mi] (“come-3-Pl-PAST”), in which /kel/ is diacritically heavy, /-sin/ and /-lar/ diacritically light, /-di/ and /-mi/ preaccenting, Gridmark Insertion, triggered by the pre-accenting particle /-di/, adds a gridmark over /-lar/ in /kel-sin-lar-di-mi/, making it heavy. Then, it reapplies, triggered by /-mi/, and adds a gridmark over /-di/. As a result, /-lar/ and /-di/ each have a column of two gridmarks on the Weight Grid which encode their heaviness. This is shown in (4.10).

(4.10) kel-sin-lar-di kel-sin-lar-di kel-sin-lar-di - mi

																	Weight Grid
*					*			*			*	*	*				
*	*	*	*	→	*	*	*	*	→	*	*	*	*	*			
h _d	l _d	l _d	l _d	l _d preacc	h _d	l _d	h _d	l _d	l _d preacc	h _d	l _d	h _d	h _d	l _d	l _d preacc		

Alternatively, [kelsinlar^ldimi] can be derived by two simultaneous applications of the Gridmark Insertion rule, whereby /-di/ makes /-lar/ heavy and /-mi/ makes /-di/ heavy *at the same time*.

(4.11) *Simultaneous applications of the Gridmark Insertion rule*



I will not arbitrate here between the ordered and unordered approaches because, in this case, they yield the same correct output.

4.7. The Lightning rule

Another kind of exceptional morphemes was also considered in Chapter 2, *viz. light dominant* morphemes. These morphemes trigger what I have called the *Lightening* rule, illustrated in Chapter 2 with the behavior of the Russian noun-forming suffix *-en'*.

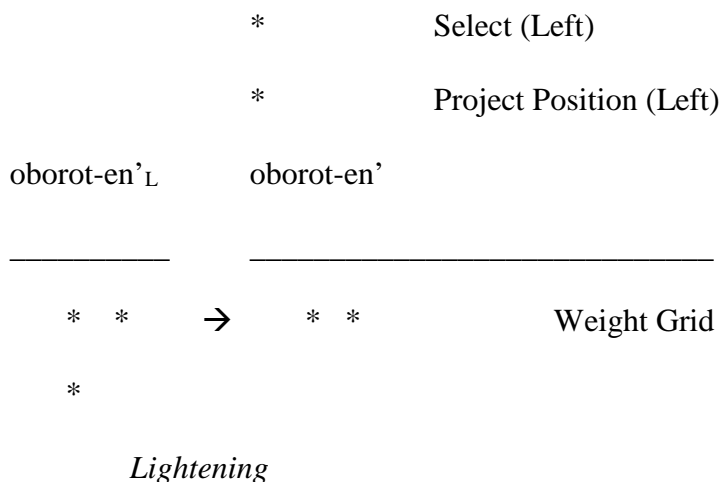
When *-en'* is attached to a noun, accent shifts to the initial syllable, *e.g. obo¹rot* (“turn”) vs. *o¹boroten'* (“werewolf”). This shift results in a default accent, which, in Russian, is initial, thus implying that *o¹boroten'* is an “all-light” word (Idsardi 1992). Since *obo¹rot* is known to be heavy underlyingly, we conclude that *-en'* makes *oborot*

diacritically light. We can account for this behavior if we assume that *-en'* is dominant and light and that, as such, it triggers the Lightning rule.

This rule is triggered by light dominant morphemes and targets *all* morphemes to its left, regardless of their weight, making them diacritically light. (It vacuously applies to light morphemes, which remain light.) That is, the Lightning rule is *non-local*.

Technically, I posit that lightening morphemes are marked in the lexical entry with the diacritic feature [L] (for “lightening”). Thus, the rule applies when the trigger is morpheme marked with [L]. Specifically, it applies on the Weight Grid right-to-left, deleting all gridmarks but one, in the columns of gridmarks of the target morphemes, which results in an all-light form (nothing to project onto the Accent Grid). Then, the Project Position parameter inserts a {Leftmost/Rightmost} gridmark on l. 1 of the Accent Grid, which is then selected for accent by the Select parameter. The application of the Lightning rule is shown in (4.12) for the Russian form *'oboroten'* above.

(4.12) *Lightening*



4.8. The parameter system

In the S&P theory, the accentual grammar contains two major components: a set of weight scales and a set of parameters. In the preceding sections, I have presented the former, so now I will focus on the latter. The parameters of the S&P grammar are listed and defined in (4.13).

(4.13) *Parameters of the Scales-and-Parameters theory*

- a. The Domain Size parameter: the accent domain is {Bounded/Unbounded}.
- b. The Domain Edge parameter: a bounded accent domain is formed at the {Left/Right} word edge.
- c. The Nonfinality parameter: the peripheral element at the right word edge is not allowed to receive accent. (Yes/No)
- d. The Nonfinality Unit parameter: the NF Unit is a {syllable/ segment}.
- e. The Weight parameter: the language has weight distinctions.³⁰ (Yes/No)
- f. The Project Position parameter: project {Leftmost/Rightmost} position in the word onto line 1 of the Accent Grid.
- g. The Select parameter: choose the {Leftmost/Rightmost} grid mark on line 1 by placing a gridmark over it on line 2.

Note that the Nonfinality parameter in (4.13c) allows for the choice between an extrametrical *vs.* accentable *final* unit. Comparing Nonfinality to EM in the PAF theory, we can see that Nonfinality (Yes) is equivalent to EM (Right). EM (Left) of the

³⁰ For any type of weight (phonological and/or diacritic), the Weight parameter is set to “Yes”. The “No” setting corresponds to WI systems, *i.e.* those without phonological and diacritic weight.

PAF theory and of various metrical theories is not recognized by the S&P theory. This choice is empirically motivated, given that the handful of languages reported to have initial extrametricality can be successfully reanalyzed (see Chapter 1).

4.9. Parameter ordering and parameter dependencies

The parameters of the S&P theory form the partial order in (4.14)-(4.15).

(4.14) *Parameter ordering*

- a. Nonfinality < Nonfinality Unit
- b. Nonfinality Unit < Domain Size
- c. Domain Size < Domain Edge
- d. Domain Edge < Weight
- e. Weight < Select
- f. Weight < Project Position

In addition, we obtain (by transitivity):

(4.15) a. $[[NF < NF \text{ Unit}] \ \& \ [NF \text{ Unit} < DS]] \rightarrow NF < DS$

b. $[[DS < DE] \ \& \ [DE < W]] \rightarrow DS < W$

The parameters also enter into dependency relations. In (4.16), I list the “intrinsic” dependencies, *i.e.* that follow by the content of the parameters and, therefore, are not contingent on empirical verification.

(4.16) *Intrinsic parameter dependencies*

- a. Nonfinality (No) → Nonfinality Unit “not set”
- b. Domain Size (Unbounded) → Domain Edge “not set”

See the tree in the Appendix representing all types of accent systems generated by the S&P parameter system, which includes the parameter ordering and the dependencies described above.

Recall that the parameter dependencies rule out certain systems as impossible, which results in a significant reduction of the parameter space: the S&P grammar generates 16 WS systems and 5 WI systems, if NF Unit (syllable). Setting NF Unit (segment) yields 4 additional WS systems plus 1 WI system. The total is then 26 accent systems.

The parameter ordering and parameter dependencies in (4.14)-(4.16) either follow from the definitions of the parameters, or are their consequences, or are simply postulated. In this sense, these dependencies are “intrinsic” to the parameter system, rather than an empirical result.

By contrast, the dependencies in (4.17) may be called “empirical dependencies” because these are *testable, falsifiable* hypotheses about parametric dependencies.

(4.17) a. Domain Size (Unbounded) \rightarrow Weight (Yes)

b. *Accent Locality*: [[Weight (Yes) & Nonfinality (Yes)] \rightarrow Select (Right)]

According to the Accent Locality Hypothesis (4.17b), in weight-sensitive systems with a final extrametrical unit (syllable or segment), accent falls on the rightmost heavy (non-extrametrical) unit. From (4.17b), a prediction can be drawn that there are no languages characterized by {Weight (Yes), Nonfinality (Yes), Select (Left)}. This prediction is borne out: a careful study of StressTyp data in this dissertation revealed that no such languages are attested.

Finally, we are led to a dependency between the Select and Project Position parameters because they are related in a special way.

In *WS systems*, Select and Project Position are independent because they are set for complementary sets of words (forms with heavies for Select, all-light forms for Project Position).

In *WI systems*, Select might be set freely to any setting (“Left” or “Right”) because these systems lack forms with heavies based on which Select could be set. In that case, for each setting of Project Position, two settings of Select would be available, with both combinations of settings yielding the same accent location.

In order to rule out this parametric ambiguity, I have proposed that, for *WI systems*, the Select parameter receives its setting from the Project Position parameter; therefore, the former is dependent on the latter in the following way:

(4.18) [W (No) \rightarrow [[PP (Left) \rightarrow Sel (Left)] & [PP (Right) \rightarrow Sel (Right)]]]

4.10. The grammar

The accentual grammar of the S&P theory contains:

(i) *Weight Grids*

A Weight Grid is a phonological representation that encodes relative weight of morphemes and/or syllables specified by a language-specific *weight scale* (phonological, diacritic, hybrid, relativized diacritic) (see section 4.3);

(ii) *The parameter system*: a set of parameters (see section 4.8) over which particular *ordering* and *dependency* relations are defined (see section 4.9);

(iii) *The Weight Projection Principle*

In a WS system, only the heaviest unit (syllables, morphemes) in a form are projected from the Weight Grid onto the Accent Grid (see section 4.5);

(iv) *Rules* operating on the Weight Grid: the *Gridmark Insertion* rule (see section 4.6) and the *Lightening* rule (see section 4.7).

4.11. Derivations

Below, I illustrate with sample derivations how the S&P grammar actually works.

(i) *The Diacritic Weight Grid*

In C. and S. Selkup, accent is assigned with reference to the Diacritic Weight Grid (4.20) into which the diacritic weight scale (4.19) translates.

$$(4.19) \text{ sup}_d > \text{h}_d > \text{l}_d$$

(4.20) *The Diacritic Weight Grid for C. and S. Selkup*

sup _d	h _d	l _d
*	*	*
*	*	
*		

a. For example, the derivation for the Napas Selkup form [tvelgu] (“steal-INF”) runs as in (4.21).

(4.21) /tvel-gu/: *heavy root* /tvel/, *heavy suffix* /-gu/

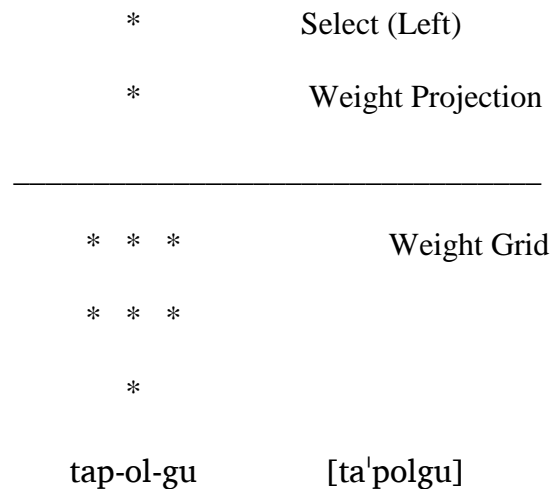
*	Select (Left)
* *	Weight Projection
<hr/>	
* *	Weight Grid
* *	
tvel-gu	[tvelgu]

In this case, each heavy morpheme in the accent domain is projected onto the Accent Grid. Then, Select (Left) chooses the leftmost gridmark in the word.

b. In a word with a superheavy and two heavy morphemes, the superheavy morpheme, which is the heaviest one in the word, is projected onto line 1 of the Accent Grid and, is, then, assigned a gridmark on line 2 by Select (Left), resulting in accent on [-ol].

This is shown in (4.22).

(4.22) /tap-ol-gu/: *heavy root /tap/, superheavy suffix /-ol/, heavy suffix /-gu/*



c. In words that only consist of diacritically light morphemes (all-light words), there is nothing to project. In this case, Project Position (Left) applies, inserting a gridmark on line 1 over the word-initial syllable, which is then chosen by Select (Left), yielding initial accent.

This is illustrated with the derivation (4.23) for the form [ˈlar-em-bu-gu] (“fear-INF”) in the Chaya variety.

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

*	Select (Left)
*	Project Position (Left)
<hr/>	
* * * *	Weight Grid
lar-em-bu-gu	[ˈlarembugu]

The grammar for Uzbek contains the same weight grid as Central and Southern Selkup and, in addition, the Gridmark Insertion rule in order to account for preaccenting. The derivation for words with a preaccenting suffix runs as follows:

(4.24)						*			Select (Right)	
						*			Weight Projection	
<hr/>										
h_d	l_d	l_d	l_d	l_d preacc	\rightarrow	h_d	l_d	h_d	l_d	Weight Grid
*	*	*	*			*	*	*	*	
*						*		*		
paxta-kor-lar-gina						paxta-kor-lar-gina				

As shown in (4.24), in a word with a preaccenting morpheme, such as [paxta-kor-'lar-gina] (“cotton-worker-PI-RESTRICT”), the Gridmark Insertion rule, triggered by the preaccenting diacritically light suffix /-gina/), makes the preceding light suffix /-lar/ heavy by adding a gridmark to its column on the Weight Grid. As a result, the suffix /-lar/ became heavier than the morphemes to its left and the suffix /-gina/ (diacritically light because preaccenting). Therefore, /-lar/ is the only unit in (4.24) to project weight from the Weight Grid (resulting from the application of Gridmark Insertion) onto the Accent Grid. Then, Select (Right) chooses the gridmark over /-lar/, thus making it accented.

(ii) *The Hybrid Weight Grid*

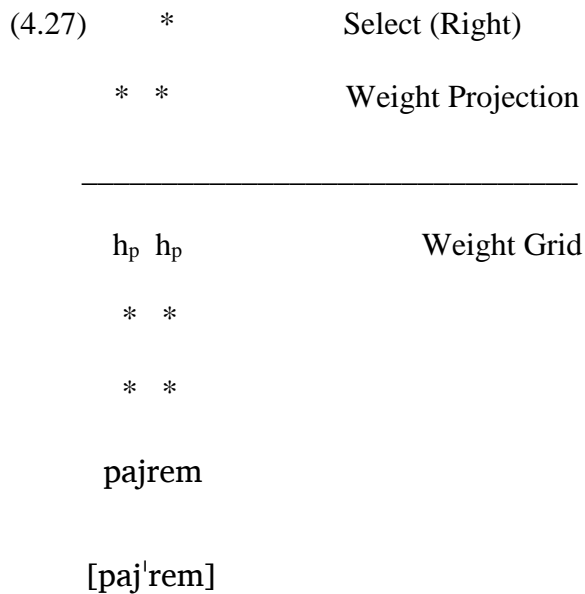
An example of a hybrid weight scale is that of Eastern Literary Mari, given in (4.25). Accordingly, accent is assigned in this language with reference to the Hybrid Weight Grid (4.26).

$$(4.25) h_d > h_p > \{l_d, l_p\}$$

(4.26) *The Hybrid Weight Grid for ELM*

h_d	h_p	l_d	l_p
*	*	*	*
*	*		
*			

a. In the simplex form [paj^lrem] (“holiday”) consisting of two heavy syllables, the second syllable is accented. Since the syllables have the same weight, both are projected onto line 1 of the Accent Grid. Then, Select (Right) chooses the rightmost of the two gridmarks on line 1, yielding accent on the second syllable.



b. In [pørt-em-^lge] (“house-1Sg.POSS-COMIT”), which consists of the phonologically heavy syllables /pørt/ and /em/, and of the diacritically heavy Comitative suffix /-ge/, accent falls on /ge/. Since, in Eastern Literary Mari, diacritically heavy morphemes are heavier than phonologically heavy syllables, the suffix /-ge/ is the heaviest element in the word. Therefore, it is projected on line 1 of the Accent Grid, while the syllables are not. Then, Select (Right) chooses the gridmark on line 1, yielding accent on /-ge/.

(4.28) * Select (Right)
 * Weight Projection

h _p	h _p	h _d	Weight Grid
*	*	*	
*	*	*	
		*	
pørt-em-ge			[pørtem ¹ ge]

c. In [ˈpələʃla] (“ear-COMPAR”), which consists of the root /pələʃ/ (“ear”), containing two light syllables, and of the diacritically light Comparative suffix /-la/, default accent falls on the initial syllable. Since, in ELM, light syllables and light morphemes are equally light, nothing is projected from the Weight Grid, resulting in an empty line 1. Project Position (Left) inserts a gridmark on line 1 over the word-initial syllable. The gridmark is, then, chosen by Select (Right), yielding the default accent.

(4.29) * Select (Right)
 * Project Position (Left)

l _p	l _p	l _d	Weight Grid
*	*	*	
pələʃ-la			[ˈpələʃ-la]

(iii) *The relativized diacritic weight scale*

In some languages, *e.g.* Tundra Nenets, the weight of morphemes may differ depending on the weight of syllables contained in these morphemes.

For example, in Tundra Nenets, the set of morphemes is split into non-intersecting classes by relativizing the diacritic weight of morphemes with respect to the weight of syllables which they contain. Diacritically heavy morphemes with at least one heavy syllable (notated as h_d/h_p) are heavier than diacritically light morphemes that contain at least one heavy syllable (notated as l_d/h_p). These, in turn, are heavier than both diacritically heavy (h_d/l_p) and diacritically light morphemes (l_d/l_p) consisting of light syllables alone.

This is expressed in the “relativized diacritic weight scale” in (4.30).

(4.30) *Relativized diacritic weight scale for Tundra Nenets*

$$h_d/h_p > l_d/h_p > h_d/l_p, l_d/l_p$$

The scale in (4.30) translates into the Relativized Weight Grid (4.31).

(4.31) *The Relativized Weight Grid for Tundra Nenets*

h_d/h_p	l_d/h_p	h_d/l_p	l_d/l_p
*	*	*	*
*	*		
*			

The three weight levels in this grid are constructed with reference to phonological weight. The phonological weight scale for this language is given in (4.32).

(4.32) *The phonological weight scale for Tundra Nenets*

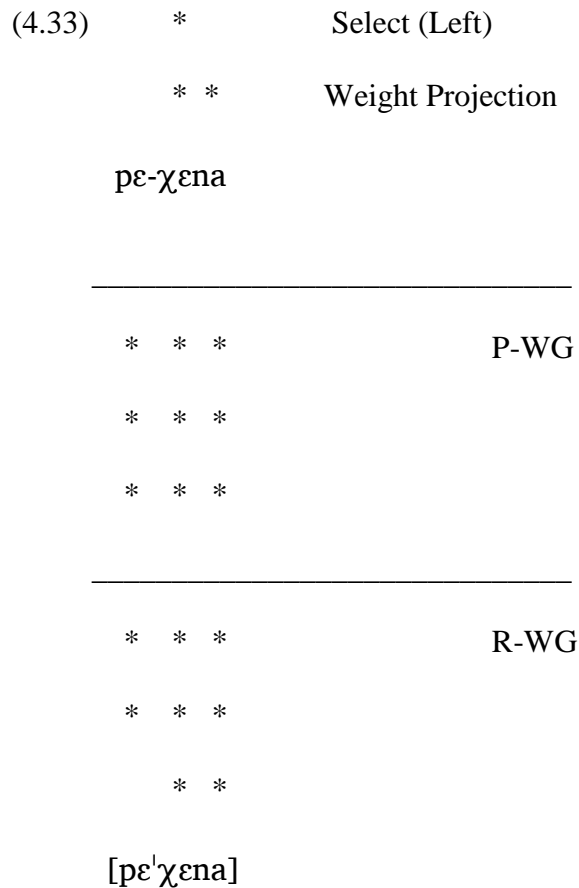
$$\text{CVC} > \text{CVC}\text{?} > \text{CV} > \text{CV}\text{?} > \text{C}\check{\text{a}}(\text{C})\text{?}$$

In this way, the phonological weight scale is an auxiliary device that participates in accent assignment only indirectly in that it serves to classify the morphemes with different diacritic weights depending on the weight of syllables in them. Note that, in Tundra Nenets, the relativized diacritic weight scale for Tundra Nenets makes reference to the *binary* “heavy” vs. “light” weight distinction (where only the lowest element on the scale is light); in other words, *n*-ary phonological weight distinctions involved in the phonological weight scale above are not used in the relativized weight scale. By contrast, the phonological weight scale plays a role in the construction of the Phonological Weight Grid which participates in the derivation.

As an example, in the Tundra Nenets form [pɛ'χɛna] (“stone-LOC.-INSTR.SG”), the root /pɛ/ is diacritically light and the suffix /-χɛna/ is diacritically heavy. The root and the suffix each contain open syllables. Therefore, according to the phonological weight scale of the language, syllables in both morphemes each receive three gridmarks on the Phonological Weight Grid (P-WG).

Since the root is diacritically *light* and contains a heavy syllable, it is of the type l_d/h_p ; therefore, *two* gridmarks are placed on the Relativized Weight Grid (R-WG) over

its (only) syllable. Since the suffix is diacritically *heavy* and contains heavy syllables, it is of the type h_d/h_p , *i.e.* it is highest (superheavy) on the R-WG (4.31). Therefore, the suffix syllables each receive three gridmarks on the R-WG in (4.33). Since the root syllable has only two gridmarks, the root syllable is not projected; only the suffix syllables are. Therefore, a gridmark is on line 1 of the Accent Grid over each suffix syllable. Finally, Select (Left) selects the leftmost gridmark, yielding the correct output $[pɛ'χɛna]$.



4.12. Chapter conclusions

In this chapter, I have described the major ingredients of the Scales-and-Parameters theory, which aims at a uniform account of accent assignment in different types of systems in terms of a single accentual grammar.

The S&P theory is an offshoot of the PAF theory (van der Hulst 1996, 2010, 2012). Both are parametric non-metrical theories based on separation of accent and rhythm.

One important difference between the S&P parameter system and the parametric grammar of the PAF theory is that, only in the former, dependency (and ordering) relations hold between certain parameters. As a result, the S&P grammar reduces the parameter space in such a way that, for phonological accent systems, it neither under-, nor overgenerates. Also, unlike the PAF theory, the S&P theory can account for systems that involve lexical accent.

The first step towards this goal is to extend the notion of weight from syllables (phonological weight) to morphemes (diacritic weight), as previously suggested in van der Hulst (1999). This, in turn, allows for novel types of weight scales which involve either diacritic weight alone (diacritic weight scales), or some combination of diacritic and phonological weight (“mixed”, *i.e.* hybrid and relativized diacritic weight scales).

Together with the parameter system, these scales, translated into Weight Grids, *uniformly* capture accent location in different types of accent systems, namely phonological WS systems, “pure” lexical accent systems and mixed systems. Crucially, all these types of systems are uniformly accounted for using *the same* type of device, *viz.* the weight scale, and *the same* parameter system.

Another advantage of the Scales Approach proposed in this dissertation is that it reveals *predictable aspects* of accentual behavior in certain systems traditionally dealt with in terms of lexical accent alone, provided those systems are shown to involve some phonological weight distinction(s) as well (as in Tundra Nenets). The amount of unpredictable information and, therefore, of *diacritic marking in the lexicon* is, thereby, significantly reduced.

Chapter 5

Conclusions and prospects for future research

Conclusions and prospects for future research

5.1. Introduction

In this dissertation, I have presented the Scales-and-Parameters theory, a new parametric theory of accent and weight.

I will briefly recapitulate in this final chapter the main conclusions we have reached (section 5.2), then address the limitations of the theory in its current form (section 5.3); lastly, I will outline some interesting prospects for future research (section 5.4).

5.2. A short summary of the dissertation

The Scales-and-Parameters theory consists of two major components: a parameter system and a small number of weight scales of several types (depending on the language).

The parameter system of the S&P theory results from a substantial revision of the parametric grammar of the PAF theory. The goal is to correctly derive cross-linguistic differences in accent patterns, using a small number of parameters related by dependencies. While many parameter dependencies in the S&P parameter system are “intrinsic” (they follow from the definition of the parameters themselves), I have also proposed the “empirical” (testable and falsifiable) Accent Locality Hypothesis (5.1),

which leads to a dependency of the Select parameter on the Nonfinality and Weight parameters.

(5.1) *The Accent Locality Hypothesis*

If a WS system has nonfinality, then, in words with heavy syllables, accent must fall on the heavy syllable closest to the right edge of the word.

A careful analysis of StressTyp data strongly supports the Accent Locality hypothesis for both BS and US.

Another innovation in the parameter system is the Nonfinality parameter (Yes/No) which captures cross-linguistic variation with respect to final extrametricality. The positive setting of this parameter makes the word-final syllable invisible to accent assignment; its negative setting allows this syllable to receive the accent. Comparing Nonfinality of the S&P theory to EM in the PAF theory, Nonfinality (Yes) is equivalent to EM (Right); as for EM (Left), recognized in the PAF theory, as well as in many metrical theories, it is not part of the S&P parameter system. This decision is empirically motivated: there appears to be no true initial extrametricality; as shown in Chapter 1, the handful of languages reported as having initial EM can be reanalyzed.

As a result, relative to the PAF grammar, the S&P parameter system strongly reduces the parameter space and overgenerates significantly less, as can be seen in Table 5.1.

TABLE 5.1. *The number of generated, attested, unattested and missed types of weight-sensitive systems for the PAF and S&P grammars, respectively.*

<i>Grammar</i>	<i>Generated</i>	<i>Attested (after reanalysis)</i>	<i>Overgenerated</i>	<i>Undergenerated</i>
PAF	36	16	20	0
S&P	16	16	0	0

Summarizing, the PAF grammar does not undergenerate. However, it massively overgenerates: 20 languages out of 36, *i.e.* more than a half of the languages generated by the PAF grammar, are unattested. By contrast, the S&P grammar neither under-, nor overgenerates: it generates all, and only, those languages that are effectively attested. I conclude that the S&P grammar significantly reduces the parameter space and attains the level of descriptive adequacy. Therefore, the S&P grammar seems to attain descriptive adequacy with respect to WS systems.

However, in some accent systems, accent location is not fully predictable on phonological grounds because it is affected by accent-attracting and accent repelling morphemes. Traditionally, this behavior is encoded in the lexicon in terms of diacritics termed “lexical accents”.

Interestingly, different languages involve lexical accent to a variable degree. Thus, “pure” lexical accent systems (*e.g.*, Russian, Selkup, Abkhaz) are not sensitive to syllable weight and word accent is assigned solely with reference to lexical accents. By contrast, certain systems (which I call “mixed”) combine lexical accents and syllable weight: for example, in Mattole (Athabaskan), accent typically falls on the lexically

accented stem, but shifts to the immediately preceding lexically accented prefix under specific conditions.

In pure lexical accent systems, accentual behavior of certain morphemes may be exceptional in that it does not respect the lexical accent rule. In “mixed” systems as well, some lexically marked morphemes behave exceptionally in violating the phonological accent rule. Thus, both pure lexical accent systems and mixed systems have exceptional morphemes. Any successful account of these systems must treat exceptional morphemes uniformly.

A first step towards an account for such systems is to extend the notion of weight from syllables (“phonological weight”) to morphemes (“diacritic weight”). I have proposed that, in systems where diacritic weight distinctions are scalar, rather than binary, accent is assigned with reference to a diacritic weight scale, a special type of language-specific scale in which sets of morphemes are ordered according to their diacritic weight, as in Central and Southern Selkup.

Further, some accent systems are sensitive to *both* phonological and diacritic weight. Thus, in Eastern Literary Mari, accent assignment makes reference to a “hybrid” weight scale, a scale that orders phonological and diacritic weight. Another important type of weight scale is the relativized diacritic weight scale, as found in Tundra Nenets. In this scale, the degree of diacritic weight assigned to a given morpheme depends on the phonological weight of syllables that this morpheme contains. In this way, diacritic weight of morphemes is *relativized* with respect to the phonological weight of syllables. While both the hybrid and relativized diacritic weight scales (together called “mixed”) involve phonological and diacritic weight, they differ

in that, in the former, the two types of weight are ordered disjunctively, but, in the latter, they participate in conjunction in accent assignment.

It must be said, however, that weight scales serve a descriptive purpose, only, and do not have a formal status in the S&P theory. All types of weight scales are, then, translated into a Weight Grid, a phonological representation that encodes differences in degrees of weight. This translation is always possible.

Further, some languages have preaccenting morphemes. In the S&P theory, preaccenting is captured by a special Gridmark Insertion rule, triggered by a preaccenting morpheme and operating on the Weight Grid to add a gridmark to an immediately preceding diacritically light morpheme, thus making it heavy. This operation results in a new, derived Weight Grid. The point here is that, since the Weight Grid can be affected by a rule, it qualifies as a genuine *phonological representation*, rather than a mere graphical translation of a weight scale.

The S&P grammar computes accent location in a serial derivation on ordered phonological planes: the Weight Plane and the Accent Plane, which contain the Weight and Accent Grids, respectively. The Weight Plane is ordered before the Accent Plane: the derivation always runs first on the Weight Plane. Then, following the Weight Projection Principle, only those units (syllables, morphemes) characterized as heaviest on the Weight Grid are projected onto the Accent Grid. In this way, the Weight Projection Principle serves as a filter on the output of the Weight Grid. Rhythm is assigned on a separate plane from the Accent Plane, but respecting, and with reference to, accent location; that is, rhythm assignment is ordered after accent assignment.

Thus, phonological planes in the S&P theory resemble independent, but interacting mini-modules each with its own purposes and formal devices. In this modest sense, the S&P grammar may be said to have a modular architecture.

Summarizing, the accentual grammar of the Scales-and-Parameters theory consists of a single parameter system, a small number of Weight Grids and two rules (Gridmark Insertion and Lightening) affecting the Weight Grids. It allows for a uniform account of different types of accent systems: phonological WS systems, lexical accent systems and “mixed” systems (“hybrid” and “relativized diacritic”).

An important advantage of this new approach is that it reveals predictable aspects of accent patterning in systems such as Tundra Nenets that were previously analyzed with lexical accents (which are, by definition, lexical diacritics). The amount of unpredictable information which has to be specified in the lexicon is thereby significantly reduced.

Note that, for systems that involve lexical accent, metrical theory does not provide a uniform, integrated account of the accent rule and systematic exceptions and does not employ a single accent-assigning mechanism for different languages. Rather than having, as in metrical theories, different ways of assigning accent depending on the language, the S&P theory supplies, for such systems, a *unique* small “toolkit”, consisting of a parameter set and four types of weight scales (plus two rules) which allows to account for different types of accent systems using limited means.

Another research question, addressed in this dissertation through a broad study in prosodic typology, is whether, and under what conditions, the Select and Project position parameters may remain unset.

The traditional typological claim about word accent is that there is one and only one accent per (content) word. Hyman (2006, 2009) splits this into two distinct properties: “Obligatoriness” (there must be *at least* one accent per word) and “Culminativity” (there must be *at most* one accent per word). Then, in languages that have exactly one accent per word, both Obligatoriness and Culminativity are met.

If a language violates Culminativity, then it would allow for multiple word accents. Effectively, such (allegedly) “multiple stress” systems have been reported. On the other hand, if a language violates Obligatoriness, then at least some of its words are unaccented. In the limit, a language that violates Obligatoriness will have no word accent.

Clearly, Culminativity and Obligatoriness are somehow related to the Select and Project Position parameters. When set, the Project Position parameter guarantees Obligatoriness by inserting a gridmark in “all-light” words, resulting in word accent. The Select parameter guarantees Culminativity by “picking out” a single heavy syllable for word accent.

In this dissertation, I have analyzed a range of (genetically unrelated) languages in a typological perspective in order to find out for which types of languages the Select and/or Project Position parameters can be set. (For the list of languages examined, see the Appendix.)

In particular, I have suggested that the so-called “multiple stress” systems may be reanalyzed in terms of tone (Yuma, Waffa) or rhythm (Central Alaskan Yupik), while also noting that reports of “multiple stress” in the literature are frequently unreliable. If such generalizations result from wrong description and analysis, then

Culminativity would be validated as a universal property of word accent. The consequence for the theory is, then, that the Select parameter, which guarantees Culminativity, must be set (for accentual languages).

TABLE 5.2. *Setting Select and Project Position based on accentual types.*

SELECT			
PROJECT POSITION	SET	NOT SET <i>for <u>some</u> all-light words</i>	NOT SET
SET	1. The usual WS systems 2. WI systems (“fixed” accent) 3. “Multiple stress” languages, reanalyzed: <i>e.g., Yuma, Central Alaskan Yupik, Maung, Waffa</i>		
NOT SET <i>for <u>some</u> all-light words</i>		Systems where some “all-light” words are unaccented: 1. Pitch-accent languages with accent dependent on tone. <i>e.g., Tokyo Japanese</i> 2. Pitch-accent at the	

		right word edge as an intonational prominence in all-light words: <i>e.g., in Turkish, the boundary tone at the right edge of the PhP</i>	
NOT SET			<p>1. Languages without word accent, with post-lexical prominence: <i>e.g., Indonesian, Betawi Malay, Standard French, Standard Korean, Ossetic</i></p> <p>2. Pitch-accent languages with prominence due to tone and rhythm (words lacking high tone also lack prominence): <i>e.g., Seneca</i></p>

Based on Table 5.2, the following conclusions can be made:

- (i) For all languages with word accent, the Select parameter is set;
- (ii) For languages that lack word accent, the Select and Project Position parameters
are not set;

- (iii) For a given language, if the Select parameter is set for at least some all-light words, then the Project Position parameter is set for at least some “all-light” words.

An additional typological implication of note is that, if a language has a class of unaccented words, then it is a pitch-accent system (as opposed to stress-accent system); the converse is not true because, in some pitch-accent systems, all words are accented.

Distribution of various prominence profiles in terms of the settings of Select and Project Position is given in Table 5.3, along with the names of languages examined in Chapter 3.

TABLE 5.3. *Languages analyzed in Chapter 3 and their prominence profiles.*

<i>Is Select/Project Position set?</i>	<i>Language name</i>	<i>Prominence profile</i>
Select (<i>Yes</i>) Project Position (<i>Yes</i>)	Yuma	Word accent plus rhythmic beats
	Central Alaskan Yupik	Word accent plus regular rhythmic alternation
	Maung	Word accent plus edge prominence (polar beat)
	Sekani	Word accent sensitive to tone and syllable weight
Select (<i>Not Set</i>) Project Position (<i>Not Set</i>)	certain Bantu languages	Regular tonal alternation analyzed as rhythm. No word accent.
	Seneca	Rhythm plus tone. No word accent.
	Standard Korean	Intonational prominence at the Accentual Phrase level. No word accent.
	Betawi Malay	Phrase-final intonational prominence qualifying as post-lexical. May be due to a boundary tone. No word accent.

	Indonesian	Intonational prominence near the right edge of the phrase due to the right-edge boundary tone or phrasal accent. No word accent.
	Standard French	Intonational prominence at the end of the Accentual Phrase. No word accent.
Select (<i>Yes</i>) Project Position is <i>not set</i> for a subset of “all- light” words	Tokyo Japanese	Diacritic weight: accent falls on the leftmost diacritically heavy morpheme in the word, hence Select (L). The class of “all-light” unaccented words is derivable by not setting for exactly those words.

5.3. Limitations of the Scales-and-Parameters theory

Alongside with important advantages, the S&P theory (in its current formulation) also suffers from certain limitations.

5.3.1. Two accent domains within a single system

In this section, I present the case of Witsuwit'en, a language in which accent assignment cannot be captured by the parameter system of the S&P theory because the Domain Size parameter is set to “Bounded” on a particular *subset* of the Lexicon, but to “Unbounded” on its *complementary* set.³¹

As shown in Hargus (2011), Witsuwit'en has the phonological weight scale in (5.2).

³¹ Witsuwit'en is a dialect of Babine-Witsuwit'en (Athabaskan) “spoken in communities extending between New Hazelton and Grassy Plains”, British Columbia, Canada (Hargus 2005). The data and descriptive generalizations in this section are from Hargus (2005, 2011); the analysis is mine.

(5.2) $CVV > CV_f, CV_fC > CəC > Cə$

Since, in this language, prefixes attract accent, while stems do not, prefixes are diacritically heavy and stems are diacritically light. Therefore, in prefixed words, the stem never influences accent location and may be ignored for accent assignment.

Henceforth, I will only pay attention here to phonological weight and accentual patterns in prefix syllables. In this section, I will focus on prefixed words.³²

Let us begin with words in which there is at least one full vowel in the prefixes. In this set of words (S_1), accent is not restricted to a bisyllabic window: it may be assigned to a syllable deeper into the word (5.3). Therefore, the Domain Size parameter is set to “Unbounded” for S_1 . The Select parameter, which chooses the heaviest syllable according to the scale in (5.2), is set to “Left”, as evidenced by (5.4).

(5.3) $\text{newe}^1\text{c}^1\text{oo}_1\text{ʔits}$	they shouldn't rest
$^1\text{həbə}^1\text{yeweszit}$	it does not come to them
$^1\text{səyədə}^1\text{c}^1\text{aninye}$	he took off on me
$^1\text{ts}^1\text{enen}_1\text{dzət}$	he woke up
$^1\text{wetos}_1\text{qets}$	it (vehicle) shouldn't go

³² It is possible to construct a relativized weight scale for Witsuwit'en, based on the diacritic weight distinction and on the phonological weight scale in (5.2). However, since this is not important for explaining why the Domain Size parameter must be set to both settings, I do not include this scale here.

(5.4) $ts'ene^1weeba\dot{a}dzit$	they haven't woken them up
$nininGi$	it's dried out
$s\dot{a}y\dot{a}'sendeh$	marry me
$\text{ʔ}end\dot{a}'nist,gey$	I made mistake (speaking)

If there is no full vowel in the prefixes, but it contains at least CəC syllable the leftmost heaviest syllable (recall that CəC > Cə) in the left-edge bisyllabic window is accented. Thus, in (5.5a,b), accent falls on the only CəC syllable near the left word edge. In words that begin with two CəC syllables, the leftmost CəC is accented (5.5c). Therefore, the Select parameter is set to “Left” for these words.

Importantly, in words that have schwa in all prefixes (S₂), a prefix CəC syllable anywhere to the bisyllabic window is never accented, although it is heavy. This confirms that the Domain Size parameter is set to “Bounded” for S₂.

(5.5) a. $n\dot{a}'g\dot{a}l,wes$	I'm hot
$h\dot{a}'b\dot{a}z\dot{d}\dot{a}t,l'\dot{a}s$	we're painting them
$n\dot{a}'n\dot{a}x^wz\dot{a}x^w\dot{a}k^w\dot{a}z$	you (Pl) drove us around
b. $q'\dot{a}nc'\dot{a},y\dot{a}z$	she's breaking things in two
$n\dot{a}nd\dot{a},n\dot{a}lt,l'\dot{a}$	she's shaking his head

c. 'nəx^wnəs₁ts'ət

I'm scratching you (Pl) on the face

'dəzdəl₁dəs

we're shivering

In prefixed words where first two prefix syllables (S_3) are light, accent is initial (5.6). Therefore, the Project Position parameter is set to “Left” for this language (at least, in prefixed words). Note that, when there is a heavy prefix syllable further to the right, it is invisible to accent assignment and accent is initial. This confirms that the Domain Size parameter is set to “Bounded” for S_3 .

(5.6) 'nəc'ənəqəj'

she's sewing something

'bəc'əts'əwə₁ljex

we're punishing him

'həbə₁γənwə₁ljex

he's making fun of them

If the set of all words with prefixes is notated with W , then $W = S_1 \cup S_2 \cup S_3$, where S_1 , S_2 and S_3 do not intersect. Select (Left) is defined on S_1 and S_2 . The Domain Size parameter is set to “Unbounded” on S_1 and to “Bounded” on S_2 . Project Position (Left) is defined on S_3 where Domain Size is set to “Bounded”. Thus, the Domain Size parameter assumes both settings simultaneously.

An alternative to the S&P analysis above, one should mention *cophonologies*. As shown above, Domain Size, Select and Project Position are set for those words in which all vowels in the prefixes are schwa (the union of S_2 and S_3). For

the set of words S_1 , Domain Size is set to “Unbounded” and Select is set to “Left”. Project Position may not be set on S_1 because this set does not contain words with “all-light” prefixes.

It seems possible, then, to analyze this system in terms of cophonologies. Proposed within the framework of OT, notably for Japanese, Turkish and Finnish (*e.g.* Ito & Mester 1995; Inkelas 1999; Inkelas & Orgun 1998, 2003, Anttila 2002), cophonologies involve different re-rankings on a set of OT constraints. Each cophonology is associated with its own layer of the lexicon.

An analog of this idea within the parametric approach of the S&P theory might be to split the parameter system into two subsets of parameters (“cophonologies”), each associated with its own portion of the lexicon.

5.3.2. Unaccentedness

Another challenge to the Scales-and-Parameters theory is posed by those accentual languages in which some words are unaccented.

As noted in Chapter 3, this is frequently the case in “pitch-accent” systems, understood here (following Beckman 1986, van der Hulst 2011) as languages in which an increased fundamental frequency is the only phonetic correlate of accent, as opposed to stress-accent languages, where accent is realized phonetically by some *combination* of duration, intensity and fundamental frequency, but not by fundamental frequency alone.

It is well-known that some pitch-accent languages have a class of “all-light” unaccented (content) words, *e.g.* Tokyo Japanese (Poser 1984, Haraguchi 1999, Kawahara 2015), Coastal Bizkaian Basque (Hualde 2012), Cherokee (Johnson 2005). For an overview, see Riad (2012).

However, the Project Position parameter of the S&P theory may be either set, or not for *all* words of a language (the latter is shown to be possible in Chapter 3). Both cases make an incorrect prediction for languages in which (only) *some* all-light words are unaccented.

Note, however, that this is not an exclusive drawback of the S&P theory: parametric theories in which parameters are defined over the entire lexicon all face the same issue.

5.3.3. Summary of limitations

Summarizing, I have pointed out some limitations of the Scales-and-Parameters theory with respect to its parameter system.

First, empirical evidence suggests that, in a language, a parameter may be set to both values simultaneously, as in Witsuwit'en (section 5.3.1).

Second, in systems where a subset of all-light words is unaccented, the Project Position parameter cannot be set correctly: since parameters are defined over the entire lexicon, it is unclear how a parameter could be blocked from applying to only some words (section 5.3.2).

Note, though, that the “unaccentedness phenomenon” is restricted to pitch-accent systems: some such systems have unaccented words, while stress-accent systems never do. In Chapter 3, I have suggested that some pitch-accent systems can be reanalyzed as tonal. Treating pitch-accent systems with unaccented words as tonal would automatically eliminate the problem for the Project Position parameter. I am leaving this problem for future study.

While the Scales-and-Parameters theory does present certain limitations, it also offers valuable venues for future research, to which I now turn.

5.4. Prospects for future research

It is well-known that, in certain systems, accent assignment interacts with tone. Traditionally, “tonal accent” systems were analyzed either in purely autosegmental terms or as a result of interaction between the accent- and tone-assigning mechanisms (Prince 1983, de Lacy 2002), for example, with tones docking to previously assigned accents and, then, undergoing autosegmental rules. (For discussion, see van der Hulst 2011).

Building on the “scales approach” put forth in this dissertation, tone can be viewed as an accent attractor on a par with weight. I, then, suggest that weight and tone might be ordered in a single “strength” scale.

To illustrate, based on the description in Hargus (2005, 2011), the accent rule (5.7) of Sekani (Athabaskan) displays a complex interaction of syllable weight and tone.

(5.7) *The accent rule of Sekani*

Accent the H syllable of the (only) LH in the word.

Otherwise,

If the word ends in a CVC syllable (where final C is not /ʔ/) and contains a H tone (specifically, a H, HL or HHL contour), accent falls on the final CVC syllable (even if this has a L tone);

Otherwise (in the absence of a H tone in the word), accent freely varies between the initial and final syllables;

Otherwise (*i.e.* if the word ends in a CV or CV? syllable), then accent is penultimate (regardless of the tonal contour).

From (5.7), we can see that several factors affect accent location in Sekani: LH tone, heavy final syllables in presence/absence of H tone in the word and light final syllables (independently of tone).

Further, these factors intervene in a specific order: the LH tone is preferred for accent assignment over any other (non-tonal) factor; in the absence of LH, syllable weight plays a role, with a heavy/light distinction conditioned by syllable structure and the type of coda segment. This order of preference suggests that accent assignment in this language makes reference to the strength scale $LH > CVC > \{CV, CV?\}$.

Thus, extending weight scales to include tones may allow us to account for a larger, more varied range of systems, in particular accent-tone systems, and lead to a better understanding of the nature of weight scales.

Another interesting aspect of this dissertation involves empirical study of the quality of linguistic data. It is often understood (albeit rarely voiced) that data used to support certain theoretical statements in the literature are unreliable or insufficient (Gordon 2014): these may be fragmented, incorrectly collected, observed, reported or analyzed. Moreover, certain claims are based on descriptions for which no data is available, *e.g.*, Roro (see Chapter 1). What further plagues linguistic research is the reluctance of certain theoretical linguists to systematically consult primary sources, simply reproducing the already available quotes and, in this way, perpetuating the inherited errors.

I have carefully checked the data against primary sources, rather than repeating cursory second-hand quotes. Detailed information, in particular about critically endangered languages (Selkup, Tundra Nenets), comes here from phonological descriptions and instrumental-phonetic studies based on extensive fieldwork (Maria Amelina 2011; *p.c.*, 2014-2015; Normanskaya 2011, 2012; Normanskaya et al. 2011; Staroverov 2006; Šešenin 2011).

This new information about various languages, verified and corrected data, and the generalizations resulting from reanalyses present a clear practical significance and will be added to the StressTyp database in the near future. The reader is referred to the Appendix for a list of languages examined in this dissertation.

Thus, our findings rely on firm descriptive generalizations. Some of these might, in fact, be grounded in phonetics. One interesting line of future research would be, then, to discover phonetic motivation behind accentual behavior by means of instrumental-phonetic investigation.

For example, as we know, syllables containing /ǎ/ behave as light in Tundra Nenets (Chapter 2). While the phonetic characteristics of /ǎ/ are still unclear, it seems to be a schwa (because it repels the accent).

In order to experimentally verify this hypothesis, I am currently carrying a pilot study of the spectral properties of [ǎ], based on field recordings generously shared by Maria Amelina (Russian Academy of Sciences). As a preliminary result, the F_1 for [ǎ] suggests that this is a central vowel; additional data is needed in order to determine F_2 .

Another intriguing research question relates to the nature of the glottal stop in Tundra Nenets where CV? syllables are lighter than CVC syllables. The question arises which phonetic properties of [ʔ] make the former lighter than the latter. We also need a comprehensive typology and a formal account of cross-linguistically variable effects of the glottal stop in the coda position on syllable weight.

While these issues must be left for future research, it is hoped that the key notions of the theory of word accent proposed in this dissertation, such as *parameter dependency*, *diacritic weight* and *weight scales (diacritic and mixed)*, will contribute valuable insights into other phonological phenomena as well, in particular tone and vowel harmony.

Appendix

***A tree representing the generation of language types by the S&P
parameter system***

1. Parameters

Nodes are labelled with parameter names. The label on an edge corresponds to the relevant setting of the parameter.

2. Ordering

$A \rightarrow B$ The parameter B is ordered after (follows) the parameter A.

E.g., $DS \rightarrow DE$ Domain Edge (DE) is ordered after (follows) Domain Size (DS).

3. Dependency

3.1. “A (Ø)” indicates that the parameter A is unset (*i.e.* not set to any setting).

E.g., “NF Ut (Ø)” indicates that NF Ut is unset (because NF Ut is dependent on NF).

3.2. A “Ø” symbol under a terminal node indicates that the relevant path does not yield any language type: at least one setting of some parameter on the path is “blocked” by a parameter dependency.

E.g., the terminal node of the following path is associated with a “Ø”:

NF (Yes) \rightarrow NF Ut (Syll) \rightarrow DS (B) \rightarrow DE (R) \rightarrow W (No) \rightarrow PP (L) \rightarrow Sel (R) \rightarrow Ø

This path does not yield any language type because Sel (R) is incompatible with W (No) and PP (L).

4. Path conflation

A path containing some parameter P from which descends a branch labelled with two settings of P (*e.g.*, L/R) results from path *conflation*.

E.g., in the leftmost path, the branch connecting the NF Ut and DS nodes is labelled with Syll/Seg. This path represents two paths conflated here (for reasons of space):

4.1. NF (Yes) → NF Ut (**Syll**) → DS (B) → DE (R) → W (No) → PP (L) → Sel (L)

4.2. NF (Yes) → NF Ut (**Seg**) → DS (B) → DE (R) → W (No) → PP (L) → Sel (L)

5. Numbers under the terminal nodes

The number under a terminal node corresponds to the number of language types generated for a given (potentially, conflated) path.

E.g., Paths in 4.1 and 4.2 each yield exactly 1 language type; hence, the conflated path yields 2 language types (as displayed on the graph):

NF (Yes) → NF Ut (**Syll/Segm**) → DS (B) → DE (R) → W (No) → PP (L) → Sel (L) → 2



Languages examined in the dissertation

Amele
Arabic, Negev Bedouin
Basque, Hondarribia
Basque, Zeberia
Bhojpuri
French, Standard
Gorowa
Hopi
Indonesian
Japanese, Tokyo
Kashaya
Kenuzi-Dongola
Korean, Standard
Malay, Betawi
Mari, Eastern Literary
Maung
Miwok, Central Sierra
Miwok, Southern Sierra
Ossetic
Roro
Russian
Sanskrit, Vedic
Sekani
Selkup, Central (Parabel, Napas)
Selkup, Southern (Chaya)
Seneca
Tahitian
Tundra Nenets (Yamal, Kanin, Malaya Zemlya)
Uzbek, Standard
Yukaghir
Yuma
Yupik, Central Alaskan
Waffa

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