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RESEARCH ARTICLE

The three degrees of metrical strength in Strict CV metrics, a theory without parsing

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Abstract

Typology establishes three degrees of metrical strength. Foot-based theories designate the intermediate degree as that of UNPARSED syllables, i.e. syllables that are not part of a foot. However, this denotation of PARSING mispredicts massively; moreover, there is no real reason why such unparsed syllables should be of intermediate prosodic strength (as opposed to the weakest or strongest). This paper presents an alternative account in Strict CV metrics (Ulfsbjorninn 2014, Faust & Ulfsbjorninn 2018). The correct three-way hierarchy follows from the basic operation of the theory, namely INCORPORATION, whereby one nucleus becomes prominent by incorporating metrical significance from another nucleus. Examples come first from the more classical cases of Dutch and English and then from three test-cases provided by unrelated languages: St'át'imcets (Lillooet Salish), Burmese, and Tiberian Hebrew. No appeal is made to the notion of parsing.

1. Introduction

The concept of PARSING is almost ubiquitous in mainstream analyses of stress assignment. Syllables, moras, and segments can be either parsed into feet or not, and the latter option is regarded as undesirable.

For instance, Becker (2022) discusses the input /muʃkila/ 'problem' in Egyptian Arabic. Two candidates are compared:[(múʃ)kila] and [(muʃ)(kíla)] (brackets stand for feet, acute accent for stress). The first candidate violates a constraint PARSE-σ (McCarthy & Prince 1993, Prince & Smolensky 2004), because the last two syllables are not footed. It is therefore dispreferred. Elsewhere in that paper, and indeed in the metrical literature on optimality theory, candidates with unparsed syllables, moras, or segments do emerge as optimal. The claim in this literature is therefore that while segmental and prosodic material may remain UNPARSED in some circumstances, all other considerations being equal, it *should* be fully parsed into feet.

At the same time, the literature on the interaction of stress and segment strength designates unparsed syllables as *stronger* than parsed ones, when the latter are foot dependents. Possibly the most famous example of this is the following data point from Dutch, which van Oostendorp (2000) attributes to Booij (1976). The orthographic *fonologie* is always pronounced with initial and final stresses, the latter being more prominent. The two intervening, unstressed syllables can be fully pronounced [fònoloɣí] or fully reduced [fònələɣí]. Another option is for only the second vowel to be reduced [fònəloɣí]. The fourth, conceivably possible, option *[fònoləɣí] is nevertheless ungrammatical. van Oostendorp (2000: 147) cites Kager (1989: 313) as providing the following footing /(fòno)lo(ɣí)/; the second syllable is a foot dependent, the third unparsed. Kager proposes the three-way hierarchy of metrical strength in (1), which we will dub the hierarchy of prosodic strength (HPS):

(1) The HPS in terms of feet
Foot head > Unfooted > Foot dependent

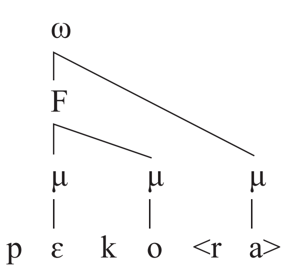
It follows from this hierarchy that the reduction of the unfooted syllable implies the reduction of the foot dependent, ruling out the unattested *[(fòno)lə(ɣí)].

The HPS and Parse-σ seem to make different predictions. If the preference is for prosodic material to be footed, then *unfooted* syllables are somehow non-optimal. Given an input like Arabic /katabu/ 'they wrote' that must have initial stress (as in many Arabic dialects), avoidance of unfooted syllables – that is, Parse-σ – should be able to result in an output without the unfooted syllable [(kátab)]. The HPS in turn suggests that such a result should never be possible, because a process of deletion targets an unfooted syllable but not a dependent one. Instead, [(kát)bu] is expected. The former option – deletion of the vowel of unparsed syllables – does not clearly occur in any Semitic language, whereas the latter is common. Parse-σ mispredicts.

To be sure, the problem is of course much wider than Semitic. Parse-σ predicts all kinds of weakening effects in unparsed syllables, which simply do not seem to occur. For instance, one can imagine a language in which all consonants in unfooted syllables, medial or final, must be placeless; no such language exists (to the best of our knowledge). Other mispredictions of Parse-σ are (i) a language in which all words, complex or simplex, have an even number of syllables on the surface, thereby avoiding unparsed syllables (or degenerate feet) anywhere in the language; (ii) a language with final epenthesis only in words with odd number of syllables; and (iii) a language in which entire syllables are systematically deleted when unparsed (/katabu/ => [káta], /katabunimi/ => [kàtabúni]; etc.).

While the HPS seems to be more on the right track, it too suffers from being partially unmotivated. Consider the representation of the Italian word [pɛ́kora] 'sheep' in (2), taken from Krämer (2009). The final syllable is unfooted – it is associated directly to the level of the phonological word. Both [ra] and [ko] are dependents, and neither is stressed, what in this representation makes [ko] weaker than [ra]?

(2) Representation with final unfooted syllable



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While the moraic representation of unfooted syllables does point to them being *different* from syllables in the foot-dependent position, it does not express which of the two is stronger than the other.

Given the above, a model of the relevant phenomena must do two things: (a) express the HPS and (b) do so in a way that follows from the representation. Preferably, this goal must be achieved without massively mispredicting like Parse-σ.

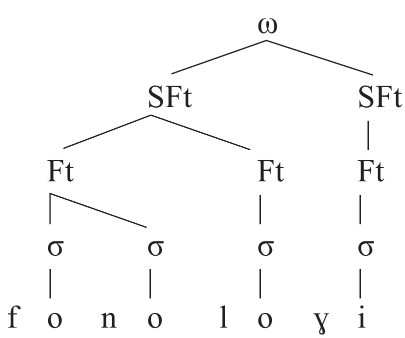
This is what the present paper aims to do. The next subsection outlines two attempts that have been made in the past to capture the HPS. It then introduces our own proposal, within the framework of Strict CV metrics. The rest of the paper then consists of three test cases, each in its own subsection. The first two subsections cover cases for which the difference between footed and unfooted syllables has been proposed in the past. Section 3 looks at (some) final syllables in St'át'imcets (Lillooet Salish) (Caldecott 2009). It is shown that our proposal presents the best fit for the data. Section 4 moves on to Burmese minor syllables (Green 2005), which feature in the type of prosodic shape called sesquisyllables. The third case (Section 5) is that of Tiberian Hebrew (TH) [i]~[ə]~Ø alternation, which we believe is also best understood using this distinction – though no study known to us has implemented this in the past. In all three cases, the HPS holds, and it is derived in a non-arbitrary manner from the representations of Strict CV metrics. The concept of parsing is shown to be unnecessary in this approach, which therefore does not carry its mispredictions. Section 6 concludes.

2. Motivating the hierarchy of prosodic strength

2.1. Two previous attempts

van Oostendorp (2000:147 *et passim*) discusses the Dutch data reviewed above, which Kager analyzed as involving unfooted syllables /(fòno)**lo**(ɣi)/. van Oostendorp, in turn, provides the fully parsed representation in (3), in which SFt refers to superfoot.

(3) Superfeet



Crucially for the present purpose, the proposed structure does express the part of the HPS that remains unexplained by Kager: whereas the weaker /no/ is a foot dependent, the stronger /lo/ heads its own non-branching foot. This difference is used in order to derive the higher resistance of /lo/ to weakening, in an analysis whose details are too intricate to present here.

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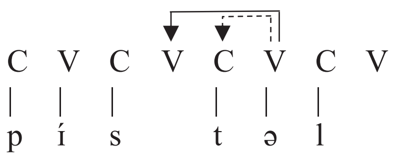
However, why /lo/ is weaker than /fo/ is now not so clear – both are foot heads and neither carries the main stress (indeed, the assignment of secondary and main stresses to the first and last syllables respectively is not accounted for by the structure). We will return to this proposal in the next subsection; as we will see, it is not a good fit for the data of that subsection.

Balogné Bérces (2011) addresses a similar asymmetry in English, this time regarding the famous consonant lenition process known as flapping. It has long been noted (see references in the original paper) that /t/ is more likely to lenite into a flap immediately after the stressed vowel than when separated from that vowel by an unstressed syllable. The chief example is orthographic *competitive*, which can be pronounced [kʰəmpʰéɾəɾɪv] or [kʰəmpʰéɾə**tʰ**ɪv], but not *[kʰəmpʰé**tʰ**əɾɪv]. Like in the Dutch example, lenition in the second syllable after the stress implies lenition in the immediately posttonic syllable.

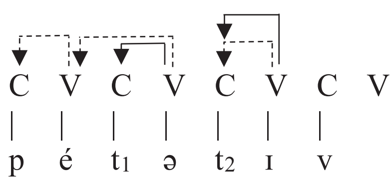
Balogné Bérces, like the present paper, uses Strict CV (Lowenstamm 1996, Scheer 2004). The basic tenet of this framework is the following: all words are represented with a skeletal tier, and that skeletal tier consists of a single, repeated unit, the CV unit. Thus, the English word [pɪ́stəl] 'pistol' in (6) involves an empty V-slot between the consonants [s] and [t] and also ends in an empty V-slot. Every contentful V-slot entertains two lateral relations with preceding positions: government and licensing. Government inhibits realization; licensing enhances it. Contentful V-slots preferably govern preceding empty V-slots (full arrow), allowing them to remain empty. They also license their onsets, if there is one (dashed arrow), allowing them to be unlenited. According to Scheer (2004), both government and licensing must be dispensed.

(4) English [pɪ́stəl] 'pistol'



Balogné Bérces proposes that *stressed vowels in open syllables require licensing from a following vowel.* In (5), /ə/ licenses [é]. This leaves /t_1/, the onset of licensor /ə/, unlicensed. Conversely, /t_2/ is both governed and licensed from the following nucleus. Both /t/s are weak, since both are governed, but /t_2/ is stronger because it is also licensed. Balogné Bérces further assumes that *stressed vowels do not govern their onsets*; /p/ is consequently only licensed, not governed, and is therefore always realized as fortis [pʰ] – stronger than either of the /t/s. A three-way strength distinction is derived: (onset of) foot head > unfooted > foot dependent.

(5) English *(com)petitive*: [pʰéɾəɾɪv] or [pʰéɾətʰɪv], but not *[pʰétʰəɾɪv]



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Based on the two assumptions above, this account derives the three-way strength distinction in consonants mainly from lateral relations. A major limitation that we find is that, while the parallel between the Dutch and English facts is certainly real, the account does not straightforwardly carry over to vocalic strength. As we will see below, our own proposal can cover both vocalic and consonantal strength.

2.2. Strict CV metrics

The first systematic study examining stress assignment in Strict CV was Scheer & Szigetvári (2005). It proposed that depending on the language, empty nuclei could be metrically significant, as signaled by the grid mark in the Italian word in (6).[1]

(6) Italian [pɔrko] 'swine'

	*		*		*
C	V	C	V	C	V
p	ɔ	r		k	o

Scheer & Szigetvári equated metrically significant empty nuclei to moraic codas. And since empty V-slots are independently necessary in Strict CV, they concluded that within this approach, only V-slots, empty or full, project.[2] Mora-projecting consonants are redundant in Strict CV. With these tools, Scheer & Szigetvári showed that many weight-sensitive languages are in fact simpler cases of fixed-stress systems. However, there remained many truly weight-sensitive languages that resist such a treatment.

True weight-sensitivity was first given a principled treatment in this framework by Ulfsbjorninn (2014). Ulfsbjorninn assumed that universally, nuclei occupied by full vowels project to L2; metrically significant empty nuclei, in turn, project to L1, as in (7a) (L1, L2 etc. are projection levels). Then, in a process dubbed INCORPORATION, the metrical potential of the empty nucleus ($*_{\alpha}$) is amassed with that of the nucleus to its left, as depicted in (7b). Incorporation results in a prominent initial syllable.[3]

(7) Incorporation in a CVCCV sequence: Italian [pɔrko] 'swine'

a.

L3						
L2		*				*
L1		*		$*_{\alpha}$		*
	C	V	C	V	C	V
	p	ɔ	r		k	o

→

b.

	$*_{\alpha}$				
	*				*
	*		$*_{\alpha}$		*
C	V	C	V	C	V
p	ɔ	r		k	o

[1] For important precursors of this idea see Yoshida (1999), Harris & Gussmann (2002) and Charette (2008).

[2] According to Alexei & Ulfsbjorninn (2022), the fact that the system operates on CV-units rather than syllables is crucial to understanding languages like Romanian, where the metrical window is defined not as three standard syllables but three CV units.

[3] Such subscripts on grid marks are not diacritics; they are used only for graphic purposes.

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As later proposed by Faust (2023), the process of incorporation is motivated, in this case, by the impossibility of realizing metrical significance on an empty position. This logic featured prominently in Faust & Ulfsbjorninn (2018), an account of the quantity-sensitive systems of Cairene and Palestinian Arabic. Other studies that use and develop the mechanism of incorporation include Ulfsbjorninn (2021), Faust (2023), Faust & Ulfsbjorninn (2024) and Shikunova (2024).

Since the only metrically significant constituent is the nucleus (full or empty), Strict CV likens heavy syllables (CVV, CVC), which always involve an empty V-slot dependent, to the classic two-syllable, binary foot (Ulfsbjorninn 2014). Faust (2023) formally unites these two configurations under the mechanism of incorporation, which he proposes can hold between two contentful nuclei. For instance, in words with three open syllables and no lexical stress, such as Rioplatense Spanish [kaméʃo] 'camel', the underlying representation corresponds to (8a). This representation lacks prominence – and every content word in Spanish must have at least one prominent syllable. In order to achieve prominence, by default one grid mark from the final vowel is incorporated into the penultimate one as in (8b), making the latter prominent.

(8) Incorporation in a CVCVCV sequence: Rioplatense Spanish [kaméʃo] 'camel'

a.

L3						
L2		*		*		*
L1		*		*		*
	C	V	C	V	C	V
	|	|	|	|	|	|
	k	a	m	e	ʃ	o

→

b.

			$*_\alpha$		
	*		*		$*_\alpha$
	*		*		*
C	V	C	V	C	V
|	|	|	|	|	|
k	a	m	e	ʃ	o

Thus, incorporation underlies both the prominence of closed syllables over open ones and the arrangement of syllables into alternating <weak, strong> pairs.

Strict CV metrics differs from the mainstream moraic theory on several grounds. First, feet (syllabic or moraic) are not a primitive of the system: they are derived by incorporation.[4] Second, metrical significance is more fine-tuned than with moras. The higher a vowel projects, the more prominent it is; in moraic theory, a segment either projects a single mora or it does not. Third, and most importantly, incorporation is a zero-sum process: what one nucleus wins in prominence through incorporation is taken from the other.

Because of the last two properties, the system derives three types of realized nuclei – in (8b), unincorporated [ka], incorporator [me] and incorporatee [ʃo].[5] These correspond to what moraic theory identifies as unfooted, foot head, and foot dependent, respectively. However, unlike in moraic theory, the respective strengths of the three types of nuclei follow from the representation. In (8b), incorporated nuclei project to L1 and are therefore weaker than unincorporated ones, which project to L2. These in turn are naturally weaker than incorporators, which project to L3. Strict CV metrics therefore manages to do exactly that

[4] Incorporation distinguishes Strict CV metrics from the family of grid-based approaches to meter (Halle & Vergnaud 1987; Idsardi 1992, 2009; Halle & Idsardi 1995; van der Hulst 2009).

[5] We use unincorporated only for non-incorporators.

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which was defined as necessary in the introduction: (a) express the HPS and (b) do so in a way that follows from the representation.

Strict CV metrics easily derives the Dutch case. Assume all vowels except the stressed one start out projecting to L2 (9a; like van Oostendorp 2000, we abstract away from the assignment of main stress to the final vowel). Incorporation in Dutch proceeds from left to right to resolve lapse, defined as two adjacent nuclei projecting to the same level. /no/ is incorporated, assigning prominence to /fo/ (9b). Since /ɣi/ bears main stress, /lo/ does not pose the problem of a lapse and remains unincorporated.

(9) Incorporation derives the HPS in Dutch vowel reduction

a.

L3								*
L2		*		*		*		*
L1		*		*		*		*
	C	V_1	C	V_2	C	V_3	C	V_4
	|	|	|	|	|	|	|	|
	f	o	n	o	l	o	ɣ	i

→

b.

	$*_\alpha$						*
	*		$*_\alpha$		*		*
	*		*		*		*
C	V_1	C	V_2	C	V_3	C	V_4
|	|	|	|	|	|	|	|
f	o	n	o	l	o	ɣ	i

The phonetic interpretation of this strength asymmetry follows causally from the representation in (9b). Either there is no schwa reduction: [fònoloɣí], or speakers may reduce only /o/ 's that project only to L1 (such as V_2): [fònəloɣí]. They may also reduce /o/'s that project even to L2 (V_3), but if they do, they must simultaneously reduce the /o/'s at L1 (V_2) also: [fònələɣí]. The inverse, reducing V_3 but not V_2 *[fònoləɣí], would be incoherent with (9b).

Incorporation-based metrics can derive the consonantal asymmetry of English in the same manner. The stressed vowel /e/ incorporates one of the grid-marks of the following V-slot, becoming prominent. The next vowel /ɪ/ in V_3 is not an incorporator because it is final (and the final empty nucleus is not metrically significant in English [Burzio 1994]), nor does it need to be incorporated because it does not pose the problem of a lapse. One may now say that onsets are obligatorily weakened before nuclei that project to L1 (V_2), and optionally so before nuclei that project to L2 (V_3). Again, the latter configuration clearly implies the former but not vice versa.

(10) Incorporation derives the HPS in English flapping

a.

L3								
L2		*		*		*		
L1		*		*		*		
	C	V_1	C	V_2	C	V_3	C	V_4
	|	|	|	|	|	|	|	
	p	e	t	ə	t	ɪ	v	

→

b.

	$*_\alpha$						
	*		$*_\alpha$		*		
	*		*		*		
C	V_1	C	V_2	C	V_3	C	V_4
|	|	|	|	|	|	|	
p	e	t	ə	t	ɪ	v	

It seems to us that incorporation-based Strict CV metrics transparently derives both asymmetries.

Before we continue, it is important to add that in this system, there is no need at all for the concept of parsing. This, it seems to us, is a welcome result, as we saw that Parse-σ mispredicts massively, implicating the existence of whole phenomena that are unattested. Instead, unincorporated nuclei – the equivalent of unfooted or unparsed syllables in moraic theory – are not a problem in principle, because there is no requirement to parse anything: only to create prominence asymmetries.

The rest of the paper further illustrates the application of this approach to data sets from three unrelated languages with very different phonological systems, all requiring the three-way distinction above. The first of the three is a Salish language.

3. The extrapod, the ternary foot, and incorporation

In this subsection, we show that Strict CV metrics is a better fit for the unfooted syllable of St'át'imcets (Lillooet Salish) than any of the previously proposed formalizations.

Caldecott (2009) carefully examines the prosodic structure of St'át'imcets. Descriptively, the language has a trochaic pattern and – in words with more than one foot – the head of the rightmost foot bears primary stress (Caldecott 2009:115). Codas do not contribute weight.

(11) Iterative trochaic footing in St'át'imcets

a.	(čún)	'to order'
b.	(čún-ɬkax^{w})	'you ordered him'
c.	(čún-tu)muɬ	'order us'
d.	(čùn-tu)(múɬ-kax^{w})	'you ordered us'

Much of Caldecott's dissertation is devoted to a particular and regular structure in the language, namely final syllables after a foot, e.g. [(čún-tu)**muɬ**] 'order us'. Caldecott refers to these as EXTRAPODS and shows that they behave unlike either foot heads or foot dependents.

Extrapods are distinct from foot heads in their prosodic behaviour. The language has a strict prosodic condition by which the final foot of a phrase gets a H(igh) boundary tone followed by a L(ow) tone. If that foot is disyllabic and aligned to the right edge, the H tone rests on the foot head and the low tone on the foot dependent (12a). If the final word is monosyllabic, the only foot must be a degenerate foot, and the entire HL contour rests on the only syllable (12b). In contrast, if the last syllable in the phrase is an extrapod, the HL prosody ignores it and is realized on the preceding foot (12c). Caldecott concludes that the extrapod cannot be the head of a degenerate foot, or it would behave like the only syllable of phrase-final monosyllabic words. The footing differences between (12a) and (12c) is due to preceding material.

(12) H boundary tone assignment

a.	/ats'xˈnana/	→	[ats'x(ná^{H}nə^{L})]	'I see'
b.	/sqlaw'/	→	[(sqlá^{HL}w')]	'beaver'
c.	/ats'xenas/	→	[(á^{H}ts'xe^{L})nas]	'he saw'

Recall that van Oostendorp's proposal, (3) above, designated the second syllable after stress as a degenerate foot under a superfoot. That also cannot be the correct analysis for the St'át'imcets data, or the HL prosody would appear on the extrapod.

If extrapods are not degenerate feet, maybe they are foot internal, i.e. they are somehow a dependent of the foot that precedes them? There are two ways in which this can be expressed: (a) the ordinary ternary foot of Nespor & Vogel (1986) (13a) or (b) with an internally layered foot (ILF) (13b) (cf. Ladd 1986; Martínez-Paricio 2013; Martínez-Paricio & Kager 2015, 2016; Kager & Martínez-Paricio 2018; Martínez-Paricio & Torres-Tamarit 2018).

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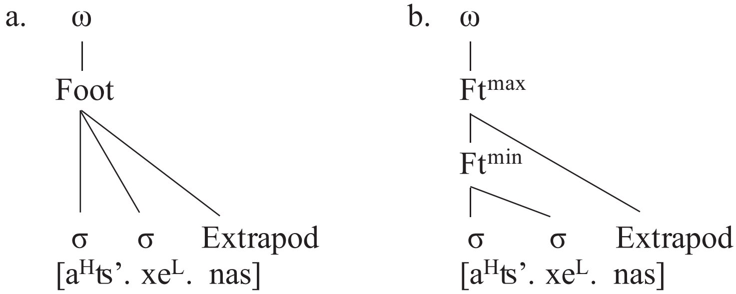
(13) Extrapod position in ternary feet, ordinary and internally layered



Using the diagnostic of vowel reduction, Caldecott shows that neither of the two ternary approaches fits the facts. In St'át'imcets, a general process reduces unstressed /a/ to [ə] in all unstressed syllables except the extrapod (Caldecott 2009:58, 62).

(14) /a/-reduction in St'át'imcets

a. /šupkin'uš**a**m/	[(šùpki)(n'úš**ə**m)]	'I'm scratching my forehead'
b. /šupkin'uš**a**m = ɬk**a**n/	[(šùpki)(n'úš**ə**m)ɬk**a**n]	'I scratched my forehead'

The ordinary ternary foot does not distinguish structurally between the two non-heads, wrongly predicting that both should be equally weak; the vowels of both syllables should be reduced, contrary to facts. Similarly, in the ILF both unstressed V-slots are foot final, so both should exhibit non-head status; while only the extrapod is foot final in the *maximal* foot, that difference is not straightforwardly translatable into a difference in strength. To this one might add that both approaches are further challenged if one considers that prosodic strength is licensed by the foot head (Itô 1988, Harris 1997), and the further away from the foot head, the weaker a position should be. If anything, approaches that admit ternary feet should predict that the extrapod would be even weaker than the non-head of the minimal foot.

Since the extrapod is different from both the foot dependent and the foot-head, Caldecott concludes that it is neither. It is simply an extrapod – an unfooted syllable. Since this unfooted syllable is more resistant to reduction than the foot dependent, one may conclude that Caldecott has arrived at the HPS: Foot head > Unfooted > Foot dependent. And like any other work in moraic theory that arrived at this conclusion, while the conclusion fits the facts, it is not straightforwardly expressed by the theory. Why would an unfooted syllable associated to the prosodic word be stronger than the foot dependent? Why is it not *weaker* than the foot dependent? The intermediate strength of the extrapod does not follow from its representation in such accounts.

In stark contrast, the strength of extrapods as compared to foot dependents is straightforwardly derived by Strict CV metrics. In St'át'imcets, as mentioned, codas do not contribute weight. In Strict CV metrics, this means that empty nuclei are all metrically insignificant. Consequently, a sequence like [šùpkin'úšam] 'I'm scratching my forehead' is underlyingly represented as in (15a), with all and only full nuclei projecting, all to L2. The lapses have to be resolved, and this is done through incorporation. Incorporation proceeds from left to right, such that a grid mark of every even vowel is incorporated into the preceding vowel, resulting in (15b). The final /a/ projects to L1. An /a/ that projects to L1 is reduced to [ə]. The HL contour can be construed to target the last L3 projector.

(15) /šupkin'uš**a**m/ → [šùpkin'úš**ə**m] 'I'm scratching my forehead'

a.

	*				*		*		*		
	*				*		*		*		
C	V	C	V	C	V	C	V	C	V	C	V
|	|	|		|	|	|	|	|	|	|	
š	u	p		k	i	n	u	š	a	m	

b.

	*α						*β				
	*				*α		*		*β		
	*				*		*		*		
C	V	C	V	C	V	C	V^H	C	V^L	C	V
|	|	|		|	|	|	|	|	|	|	
š	u	p		k	i	n	u	š	a	m	

But if the vowel /a/ is in an odd syllable (counting from the left edge), it will not be incorporated, as is shown in (16) (only the post-incorporation stage is shown). Accordingly, it will remain an L2 projector, and therefore, it will not reduce to [ə]. Again, no lapse is incurred by leaving this final vowel unchanged, since the previous nucleus has been incorporated. In other words, the final syllable is not unparsed, unfooted, or associated to the prosodic word; it is only untouched by incorporation.[6]

(16) /šupkin'uš**a**mɫkan/→ [šùpkin'úš**ə**mɫk**a**n] 'I scratched my forehead'

		*β										
		*		*β						*		
		*		*						*		
…	C	V^H	C	V^L	C	V	C	V	C	V	C	V
	|	|	|	|	|		|		|	|	|	
	n	u	ʃ	a	m		ɫ		k	a	n	

To summarize, extrapods are unincorporated, non-incorporator nuclei. Strict CV metrics automatically derives not only the existence such nuclei but also their intermediary position in the HPS. Mainstream moraic accounts, while they do identify this relative strength, fail to motivate it in their representations.

[6] The insignificance of empty nuclei in such languages sheds additional doubt on the possibility of extending the account in Balogné Bérces (2011) to vocalic weakness, since that account relies on lateral relations.

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4. Sesquisyllables

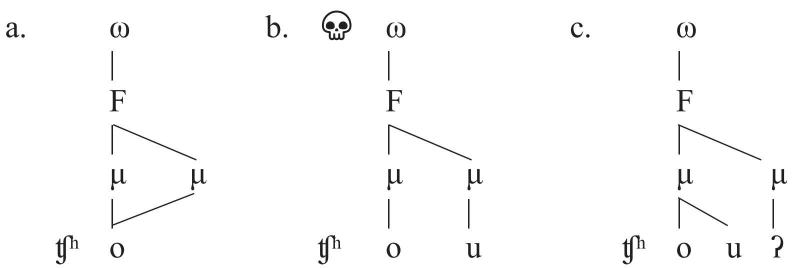
Many languages, especially in Southeast Asia, exhibit a distinction between minor and major syllables. Words in these languages usually combine one minor and one major syllable, with virtually all examples exhibiting the order minor–major. This combination has previously been referred to as quasi-disyllables, or sesquisyllables, 'a syllable and a half in length' (Matisoff 1973:86). It is particularly recurrent in Austroasiatic, where it constitutes the canonical word structure (Michaud 2012:2). However, it is found in other language families too, such as the Sino-Tibetan language Burmese, which we will consider here. The data and foot-based analysis below come from Green (2005).

Green proposes that the differences between the two syllables depend on parsing: minor syllables are unfooted and unparsed; major syllables are footed and parsed. In what follows, after presenting the relevant facts and Green's take on them, we show that Strict CV metrics derives the differences between major and minor syllable without reference to feet or parsing.

Burmese has eight monophthongs [a, i, u, e, ɛ, o, ɔ, ə], four diphthongs [aj, ej, ow, aw], and four tones [á, à, a̰, aʔ] (high, low, creaky, and checked). Major syllables may contain any vowel except [ə]; they may be open or closed, but only [ʔ] and placeless N can close a syllable; they must bear tone; and they may have simple (C) or complex (CG) onsets (G = glide).[7] Minor syllables in Burmese contain only [ə]. They never involve codas, tone, or complex onsets. A word may contain only a major syllable but not only a minor syllable.

Monophthongs may occur with or without N or ʔ, but diphthongs are always followed by either [ʔ] or [N]. Green analyzes this as a result of two interacting requirements. First, a major syllable must be bimoraic. Second, the right edge of a syllable may not bear independent place features. Monophthongs may occupy two moras without violating this ban (17a), because the features in the second mora are dependent on those of the first; but bimoraic diphthongs violate it (17b). Only monomoraic diphthongs are therefore allowed in major syllables, and they always have to be followed by a placeless coda (17c; codas are moraic in Burmese).

(17) Moraic representations of major syllables



The best illustration of the restrictions on minor syllables is found in the so-called REDUCING COMPOUNDS. These combine two major syllables, leading to the reduction of the first of the

[7] For more on the phonetics of Burmese, see Watkins (2001).

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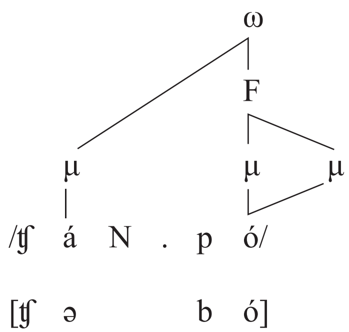
two into a minor one. As shown in (18), that syllable loses its tone, its vowel quality, its coda (18a, c) and the glide of its branching onset (18d).

(18) Reducing compounds
  a. ʧáN + pó → [ʧəbó] ‘floor + insect’ → ‘bug’
  b. ŋá + ʔṵ → [ŋəʔṵ] ‘fish + egg’ → ‘fish-spawn’
  c. n̥iʔ + l̰a → [n̥əl̰a] ‘two + month’ → ‘two months’
  d. θwá + jè → [θəjè] ‘tooth + juice’ → ‘saliva’

Green argues that the restrictions on minor syllables follow from their monomoraic, unfooted status as well as the place ban mentioned above. Simplex words and reducing compounds may not involve more than one right-aligned foot, and feet in Burmese must be monosyllabic. In (19), the major syllable involves a bimoraic monophthong, which makes for the monosyllabic foot. Accordingly, the first syllable /ʧaN/ may not keep its coda, because there is no mora to host it. Consequently, its vowel is at the right edge of the syllable and is subject to the place ban, such that it loses all features and is reduced to [ə].[8]

(19) Representation of a reducing compound according to Green (2005)



The explanation for tone loss is less insightful, involving conflicting ad hoc constraints. One constraint militates for all feet to carry a tone (‘a foot is associated with tone’ [Zec 1999]), and another for there not to be tone at all (*Tone); the result is that only the tone of the footed vowel survives.

The loss of the glide of initial clusters is accounted for in the following manner. There is a high-ranked constraint against syllable-initial clusters. When a syllable is footed, the first C can be ‘associated directly to the foot level’ (20a), such that the cluster is not really syllable-initial, so the constraint is not violated. But a minor syllable is not footed, so such extrasyllabicity is not possible (20b). One of the two consonants must be left unassociated and cannot be pronounced, and it is systematically the glide (20c):

[8] We abstract away from several aspects of Green (2005), such as the existence of major, footed syllables before the final major syllable in non-reducing compounds.

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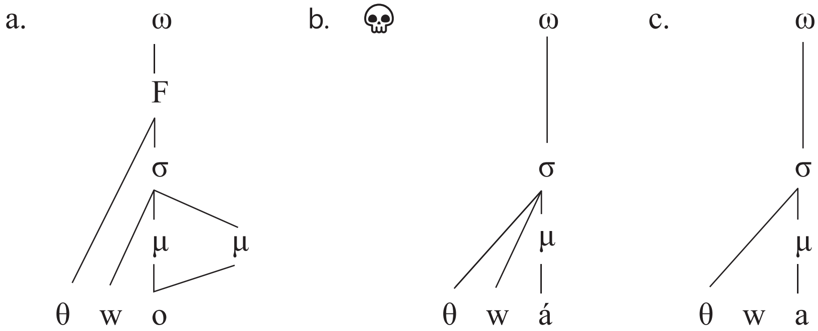
(20) Retention of CG clusters on in major syllables due to extrasyllabicity

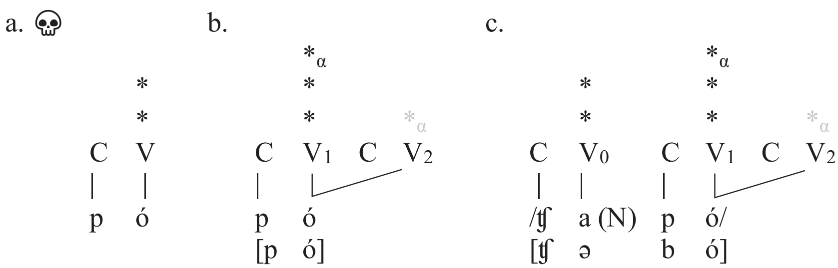


Extrasyllabicity, in our opinion, only sidesteps the problem and introduces other issues. First, one would like to see phonological reflexes that correspond to this status – for instance, a C associated directly to the foot being realized as weaker or stronger than one associated to the syllable. No such effects are reported – for Burmese or for any other language to the best of our knowledge. Moreover, the problem in (20b) *can* in fact be solved by another type of extrasyllabicity: like unparsed syllables, the /θ/ can be associated directly to the prosodic word.[9]

Nevertheless, we do understand why Green, working within a foot-based approach, designates the minor syllable as unfooted. As for St'át'imcets, other variants of this approach cannot capture the facts. A ternary foot, whether flat or layered, will designate the first and third moras as equally weak, leading to incorrect predictions; and an approach that regards the first syllable as a degenerate foot would be unable to explain the reduced contrast in such feet.

Consider now the following account in Strict CV metrics. Assume that all vowels project only to L2 lexically, but words must contain an L3 projection. The representation in (21a) is thus ill-formed, whereas that in (21b) is well-formed, because the vowel reaches L3 through incorporation. The representation in (21c), in turn, contains the three types of nuclei of Strict CV metrics: unincorporated, incorporator, and incorporatee. It is also well-formed in terms of the above principles. To understand why V_0 in (21c) can only host [ə], whereas V_1 may host any vowel, it suffices to look at their projection levels, and state that only V-slots projecting to L3 may host full vowels.

(21) Sesquisyllabicity in Strict CV metrics



[9] Incidentally, like syllables or segments associated directly to the prosodic word, the parsing in (20) further relaxes the Strict Layering Hypothesis (Selkirk 1984), to the point of undermining the predictive power of the entire Prosodic Hierarchy. For an example of this relaxation taken to its logical conclusion, see the multifarious representations in Kiparsky (2003).

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Reducing compounds and other non-compound words can be defined as entries having a single L3 projection. Similarly to the reasoning for vowel reduction, one may state that only V-slots projecting to L3 may carry tone. This principle is indeed found in the many languages where functional items – which can be construed as projecting only to L2 – may not carry independent tone (see for instance Duanmu 2007:72 for Mandarin).

The distribution of consonants in the word follows from previously established principles of Strict CV. It is well-known in Strict CV that there is a hierarchy between nuclei in terms of their licensing potential (Charette 1990, 1992; Cyran 2010; Ulfsbjorninn 2017; Cavirani & van Oostendorp 2019; Balogné Bérces & Ulfsbjorninn 2023). V-slots with full vowels license more features than V-slots with reduced vowels, which in turn license more than empty nuclei:

(22) Hierarchy of licensing strength[10]
Full-V > ə > Empty-V

In the Strict CV metrics analysis of Burmese, this hierarchy can be motivated by the level to which each nucleus projects. The second V-slot of the major syllable (V_2) does not project at all and therefore can only license placeless occupiers of the preceding C-slot, /ʔ/ or /N/. It also cannot license a glide, which would be a placeful segment associated to the C (23a). Diphthongs are therefore monopositional (23b); consequently, the C-slot following them must be occupied, or the entire CV would have no motivation, incorporation would not occur, and the word would be subminimal.

(23) Illicit and licit representations of diphthongs

a. 💀

	$*_\alpha$		
	$*$		
	$*$		$*_\alpha$
C	V_1	C	V_2
|	|	|	
ʧ	o	u	

b.

	$*_\alpha$		
	$*$		
	$*$		$*_\alpha$
C	V_1	C	V_2
|	|\\	|	
ʧ	o u	ʔ	

In contrast, the first consonant of the minor syllable in (21c) above is licensed by a stronger V-slot, one that projects to L2, and therefore may host any of the consonants of the language. At the same time, V_0 has less licensing power than V_1, which projects to L3: V_0 may not license branching onsets.

To summarize, sesquisyllabic structures like those of Burmese are easily explainable using Strict CV metrics. The three projection levels underlie the different licensing strengths

[10] This hierarchy is crucial, for instance, in stress assignment. In many languages, schwa can be stressed but only when it is the only vowel-type in the word; incidentally, this is so in St'át'imcets (Caldecott 2009:19). Such cases can either be attributed to 'sonority driven stress' (although see discussion in Rasin 2017), or the schwa can be analyzed as the phonetic implementation of an unsilenced V-slot (Kaye et al. 1990, Charette 1991, Scheer 2004). Accordingly, in these systems the important distinction is between filled vs. empty V-slots, with a further subdivision for realized vs. silenced empty V-slots.

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of their nuclei, accounting for the distribution of consonants and tone in the word as well as for possible and impossible word shapes. No appeal is made either to otherwise unmotivated concepts, such as unparsedness or extrasyllabicity, or to constraints such as counter-factual *Tone.

5. Schwa in Tiberian Hebrew

In this last subsection, we show that the three-way distinction between incorporator, unincorporated, and incorporatee is handy in understanding the distribution and realization of Tiberian Hebrew (TH) schwa. The facts of this language are interesting in that, unlike in the two previous test-cases, the position of the unincorporated nucleus is not dependent on the position of the prominent, stressed vowel of its word.

5.1. The facts

The orthography of the Hebrew of the Jewish Bible initially lacked many symbols that would instruct one regarding the precise pronunciation of the written text. After Hebrew ceased to be spoken (around the second century CE), several traditions emerged in order to establish a stable pronunciation of that text. By far the most widespread today is the system developed by a group of scholars in the city of Tiberias between the eighth and tenth centuries CE, hundreds of years later. The pronunciation that these scholars aimed to establish is called TH. Thus, TH is not a spoken language; it is a pronunciation tradition of an annotated script, preserved through minute annotations. TH phonology depends on interpretations of these annotations. Despite these historical complications, Bat-El (2023) convincingly argues that a great many of the phonological patterns attested in TH are natural linguistic patterns.

The most up-to-date phonological interpretation of TH annotation seems to be Khan (2020). The facts in this subsection follow that study (with some minor deviations). The analysis, in turn, owes much to Bat-El (2023).

According to Khan, vowels were lengthened in open unstressed syllables and in any stressed syllable (stress is generally final). Here we will be concerned only with the vowel transliterated with the symbol schwa. This symbol takes the form of two perpendicular dots under the letter, e.g. אְ. Based on Khan's description, the vowel that it stands for can be defined first and foremost by what it does not do. It is never stressed, and it is never lengthened.

The realization of schwa is less straightforward. Two additional aspects of that realization are illustrated by the forms in (24), all concerning the CC-initial stem /ʃmor/ 'keep.nonpst'. The first C of the stem in (24a–c) is annotated with a schwa symbol (henceforth, all consonants annotated with schwa are in bold). In (24a), the stem is preceded by a prefix. In this case, the following cluster is not broken – the schwa is not pronounced – and the vowel of the prefix is in a closed syllable. When the same stem occurs without a prefix in (24b), the first two consonants are separated by [ə], creating a short initial open syllable (TH did not allow for initial clusters). One may conclude that the schwa symbol is pronounced [ə] in open syllables.[11] Before a V-initial suffix, for reasons that will not concern us here, the stem loses

[11] Khan argues that the schwa symbol in such cases was pronounced as a short [ă]. However, so was /a/ in a closed syllable, which was lengthened in open syllables. For clarity, we follow Bat-El (2023) in transcribing the realized schwa as [ə].

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its vowel (24c, d). The second stem consonant, here /m/, is then also annotated with a schwa. If that loss creates an internal triconsonantal cluster (24c), the schwa symbol on the middle consonant is realized [ə] (here, too, it is in an open syllable). But if the cluster resulting from the syncope is triconsonantal and word-initial, the stem vowel is completely syncopated (24d), and the first letter is not annotated with a schwa symbol, but with the vowel symbol called HIREK, which elsewhere corresponds to the vowel [i].

(24) TH facts: verbs with CC-initial stems

		PREFIXED			UNPREFIXED	
UNSUFFIXED	a.	ti-**ʃ**móːr	'2-keep. ¬PST'	b.	**ʃ**əmóːr	'keep.¬PST'
SUFFIXED	c.	ti-**ʃm**ər-íː	'2-keep. ¬PST-F'	d.	ʃ**im**r-íː	'keep.¬PST-F'

To summarize, the schwa symbol is not realized unless it has to be. In such cases, it corresponds to [ə] in an open syllable, and in closed syllables, it alternates with the symbol otherwise pronounced [i].

A fact that Bat-El does not discuss is the following. The prefix in (24) surfaces as [i] and is in a closed, unstressed syllable, like the first vowel of the stem in (24d). It is therefore ambiguous between a lexical /i/ and a schwa in a closed syllable. The facts in (25) argue for the latter view: when the prefix occurs on a CV-initial stem and is therefore in an open syllable, it is annotated with schwa and realized [ə] (25b, d).

(25) TH facts: prefixed verbs verbs with CC-initial and CV-initial stems

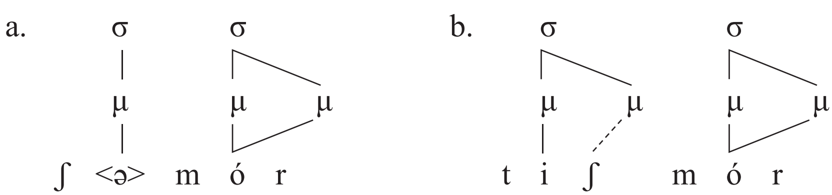
		CC STEM			CV STEM	
UNSUFFIXED	a.	ti-**ʃ**móːr	'2-keep. ¬PST'	b.	**t**ə-ta**r**géːm	'2-translate.¬PST'
SUFFIXED	c.	ti-**ʃm**ər-íː	'2-keep. ¬PST-F'	d.	**t**ə-ta**rg**əm-íː	'2-translate.¬PST-F'

The next subsection discusses Bat-El's take on the data.

5.2. Bat-El (2023)

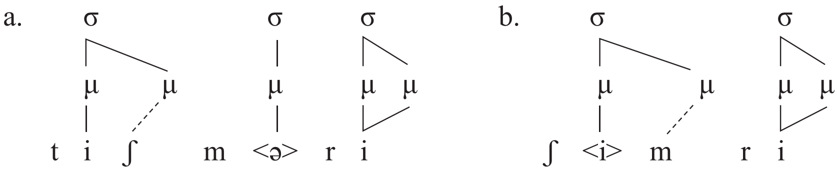
According to Bat-El (2023), schwas represent 'empty moras', i.e. moras that are unassociated to a vocalic nucleus (she cites Anderson 1982 on French schwa for this idea). These empty moras are realized through epenthesis, unless they can be associated to a consonant in coda position. To illustrate, the first consonant of the CC-initial stems carries such an empty mora. In (26a), since the consonant is initial, it cannot be a coda, and epenthesis ensues in order to realize the mora. But in (26b), since the consonant can be a coda, the mora is associated to it and no epenthesis is called for. (Note, again, that we are not concerned here with the representation of the final, stressed syllable.)

(26) Bat-El (2023): Schwa as an empty mora – 1



The metrification of the first empty mora as a coda is true for the stem-initial mora in (27a), too. But this form also carries a suffix, and as shown above, in such cases the stem loses its vowel. According to Bat-El, the original mora of that vowel is nevertheless retained and becomes an empty mora. Since the preceding consonant /ʃ/ is already a coda, the /m/ cannot be syllabified as a coda, and epenthesis ensues in order to realize the empty mora. Finally, the form in (27b) has two consecutive empty moras. The first must be realized through <i> epenthesis – this quality will be discussed presently – and therefore the second can be syllabified as a coda.

(27) Bat-El (2023): Schwa as an empty mora – 2



In order to explain the different qualities of epenthesis in (26a) and (27b), Bat-El puts forth a principle according to which [ə] should be followed by a mora associated to a full vowel. If, as in (27), it is followed by a moraic coda, the empty mora must be realized as [i].

While we believe the empty mora analysis is definitely on the right track, we also think it presents two shortcomings. First, empty moras are not arbitrarily distributed in the language, so they should be derivable in a more principled manner. Bat-El asserts that all empty moras originate in syncopated full vowels, like the second stem mora above. However, this is clearly not so for the first mora of the CC-initial stem: if it originated in a full vowel, we would expect that vowel, not [ə], in (26). Second, the principle proposed for the realization of the empty mora as [i] is also arbitrary. Why should the realization [ə] be followed by a mora associated to a full vowel? Note, that simply banning [ə] from closed syllables would have the same effect but would be as arbitrary.

We submit that these two shortcomings can be eliminated, and the facts better understood, if examined in Strict CV – specifically through the lens of the three-way distinction of incorporator, incorporate, and unincorporated.

5.3. Tiberian Hebrew schwa in Strict CV metrics

Bat-El's empty moras do not require independent motivation in Strict CV: they are the empty V-slots of the theory, present after any consonant that is not followed by a realized vowel. The forms [**ʃ**əmóːr, ʃi**m**ríː] are therefore represented as in (28): in the former V_1 is empty and V_2 is full; in the latter both are empty (the syncopated stem vowel is represented in parentheses and unassociated, principally as a mnemonic).

(28) Empty moras are empty V-slots in Strict CV – without projection

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As in Burmese, empty nuclei are metrically significant and project to L1, while associated full vowels project to L2. The representations in (29) show the situation before the application of incorporation. Final empty nuclei do not project.

(29) Empty moras are empty V-slots in Strict CV – before incorporation

a. /ʃmor/

```
               *
      *        *      *
C     V1   C   V2  C  V   C   V
|          |   |______    |
ʃ          m   o          r
```

b. /ʃ**m**ri/

```
                               *
      *        *               *      *
C     V1   C   V2      C       V   C  V
|          |           |       |______
ʃ          m   (o)     r       i
```

As discussed above, incorporation is motivated by two considerations: (a) the creation of prominence and (b) the expression of metrical significance of empty nuclei. In (29a), there is no problem of prominence. The first V-slot (V_1) is empty and significant, yet it cannot be incorporated, as there is no nucleus to its left. This, we submit, is the reason for its realization as [ə], as shown in (30a). In (29b), in turn, both problems arise: there are two metrically significant empty nuclei (V_1 and V_2), and they are consecutive, creating a lapse – a lack of prominence. Incorporation solves both problems: the second nucleus is incorporated into the first (30b). The result is an empty nucleus projecting to L2. In other words, V_1 projects to the same level as a lexical vowel. Accordingly, we submit, it is realized with a lexical vowel quality /i/, as opposed to the non-lexical quality [ə].

(30) One and two empty V-slots at the left edge – after incorporation

a. [ʃəmoːr]

```
               *α
               *
      *        *      *α
C     V1   C   V2  C  V   C   V
|     ↓    |   |______    |
ʃ    <ə>   m   o          r
```

b. [ʃi**m**riː]

```
                               *α
      *β                       *
      *        *β              *      *α
C     V1   C   V2      C       V   C  V
|     ↓    |           |       |______
ʃ    <i>   m   (o)     r       i
```

The difference in quality between epenthetic <ə> and <i> correlates with their projection level. Arguably, the lexical quality [i] is used *because* the nucleus projects to L2, like a lexical vowel; and the non-lexical quality [ə] is used when the nucleus projects to L1, unlike a lexical vowel. Possibly, the nuclei are realized in different stages of the derivation, too: [i] at the lexical level and [ə] at the post-lexical level.

Now, recall that the *prefix* vowel also alternates between [ə] and [i] – in Strict CV terms, it has an empty nucleus, too. Therefore, a form like [ti**ʃm**əríː] is in fact /t_ʃ_m_ri/, involving 3 consecutive empty nuclei in a row. As shown in (31), the metrical potential of the second one is incorporated into the first, and the third remains unincorporated. Their realizations follow the principles stated above.

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(31) Word-initial sequence of three empty V-slots

							*$_\alpha$		
	*$_\beta$						*		
	*		*$_\beta$		*		*		*$_\alpha$
C	V_1	C	V_2	C	V_3	C	V	C	V
|	↓	|		|	↓	|	|		
t	<i>	ʃ		m	<ə>	r	i		

The initial form /t_ʃ_m_ri/ could in principle be realized as *[təʃimri]. We assume that this is not the case because resolution of lapses proceeds from left to right: a second consecutive empty nucleus is incorporated, without regard of the status of the following nucleus.

Finally, of course, not all sequences of empty nuclei are left-aligned. The form [**t**əta**rg**əmíː], (25) above, would in Strict CV involve a medial sequence of two empty nuclei /t_-tar_g_mi/ (alongside an initial empty nucleus). The first of the two can be incorporated; thus, the second must be realized.

(32) Word-medial sequence of two empty V-slots

			*$_\beta$						*$_\alpha$		
			*						*		
	*		*		*$_\beta$		*		*		*$_\alpha$
C	V	C	V	C	V	C	V	C	V	C	V
|	↓	|	|	|		|	↓	|	|		
t	<ə>	t	a	r		g	<ə>	m	i		

It emerges from the analysis in Strict CV metrics that the schwa symbol represents empty nuclei – the main feature of Strict CV representations, amply motivated independently. In this, the analysis stands in stark contrast to Bat-El's, whose empty moras are far from uncontroversial in moraic theory. More importantly, for our present purpose, the realization of empty nuclei in our account follows the three-way distinction we argued for in St'át'imcets and Burmese: incorporator empty nuclei are realized as stronger [i], unincorporated empty nuclei as weaker [ə], and incorporated empty nuclei remain unrealized. This result provides further support for our proposal. Moreover, the TH case enriches the typology in showing how our conception of the HPS is useful in understanding phenomena that are independent of the position of the prominent, stressed vowel of the word.

Finally, let us return to the larger issue of parsing. Although parsing does not figure in Bat-El's account, we assert that the TH facts above *can* be analyzed using this notion, more or less in a manner parallel to what we have done here. It could, for instance, be claimed that unparsed empty moras – empty moras that have not found a coda – are realized through epenthesis and associated to the prosodic word. But, as in the other languages examined here, the fact that unparsed syllables get realized at all, as opposed to simply being deleted, only follows from their association to the prosodic word, which is little more than an ad hoc way of saving them from deletion. In contrast, the three-way distinction derived by incorporation renders the notion of parsing redundant. Our account of TH does not require it and otherwise follows independently established principles of realization. The fate of parsing in Strict CV metrics is sealed: it is an unnecessary tool of phonological analysis.

6. Conclusion

Typology compels one to distinguish at least three types of nuclei: strong, weak and intermediary. At the descriptive level, this three-way distinction can lead to different terms: syllables with intermediary strength have been called extrapods in St'át'imcets and Salish languages, whereas in Southeast Asian languages they constitute the minor syllables in the common syllable-and-a-half or sesquisyllabic structure.

Foot-based accounts, because they operate with binary feet, can express the three types of syllables as (i) foot head, (ii) foot dependent, and (iii) neither. The latter category is most commonly referred to as unfooted or unparsed; because the syllable is still pronounced, it is claimed to be associated to the prosodic word. But while this view indeed expresses a three-way distinction, it requires additional assumptions in order to model the intermediary strength of the unfooted syllable. In other words, it does not straightforwardly capture the HPS, repeated in foot-based terms in (33).

(33) The HPS in terms of feet
Foot head > Unfooted > Foot dependent

Other attempts within foot-based approaches are not successful either. Ternary feet, flat or layered, cannot distinguish between dependents in a way that expresses the HPS. Approaches that eschew unparsed syllables by making the otherwise unfooted syllable into a degenerate foot (associated to a superfoot) do not fit the facts of either extrapods or sesquisyllables.

Another, more general problem has to do with the way the HPS in (33) is termed, namely the designation of the syllable with intermediary strength as unfooted. Most, if not all foot-based approaches regard parsing as preferable to non-parsing, thus characterizing the unfooted status as somehow problematic or marked. Indeed, a common markedness constraint in the mainstream framework of OT is Parse-σ, which demands that all syllables be parsed into feet. But language after language, one sees that unfooted syllables are not gotten rid of, as marked configurations are expected to be. Parse-σ mispredicts.

We therefore began this paper with a challenge, namely to express the HPS in a way that follows from the representation and does not share the mispredictions of Parse-σ. We claimed that Strict CV metrics, a theory that was developed with the goal of formalizing weight-sensitive stress within Strict CV, provides the goods. The HPS was recast in the terms of that theory:

(34) The HPS in Strict CV metrics
Incorporator > Unincorporated > Incorporatee

Through the zero-sum property of incorporation, which is shared by no other metrical device to the best of our knowledge, nuclei become prominent by taking strength from other nuclei. Dependent positions are *derivationally* weakened by incorporation, a fate that does not

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equate with merely being unstressed. Unlike a foot-based model, which encodes a strength/weakness relation between head and dependent with the diacritics ‘strong’ and ‘weak’, in Strict CV metrics the mechanism which assigns prominence can only operate via phonological weakening of one V-slot in favor of the other. Unincorporated nuclei, in turn, are those that have neither incorporated a grid mark from another nucleus nor lost one to another nucleus. Therefore, they carry intermediary strength. Thus, the HPS is derived *for free*: it is a prediction of the approach, not something that requires additional assumptions.

In addition, unincorporated nuclei are not marked in any way. The theory does not have a constraint (or a principle) against unincorporated nuclei. These only pose a problem – the familiar problem of lapse – next to another unincorporated nucleus. Thus, our approach expresses the HPS in its representations, without appealing to parsing or lack thereof, and therefore it does not suffer from the mispredictions of the notion. There is no parsing in Strict CV metrics.

In Strict CV metrics, the nuclei of both extrapods and minor syllables share the property of being unincorporated – neither incorporators nor incorporatees. The two structures in (35) might superficially look dissimilar in terms of word shape, but the only significant difference is the position of the unincorporated syllable with respect to the incorporator–incorporatee sequence. The location of extrapods is to the right of that sequence, whereas the minor syllable precedes it.

(35) St’át’imcets extrapod, Burmese sesquisyllable

a. [áʦ’.xe.nas] ‘he saw’

			$*_\alpha$						
			*				*		
			*		$*_\alpha$		*		
C	V_0	C	V_1	C	V_2	C	V_5	C	V_6
	|	|		|	|	|	|	|	
	/a	ʦ’		x	e	n	a	s/	
	[a	ʦ’		x	e	n	a	s]	

b. [ʧəbó] ‘bug’

			$*_\alpha$		
	*		*		
	*		*		$*_\alpha$
C	V_0	C	V_1	C	V_2
|	|	|	|		
/ʧ	á (N)	p	ó/		
[ʧ	ə	b	ó]		

The position of the unincorporated syllable in these languages is dependent on that of the prominent syllable. But the HPS is also useful in understanding phenomena that are not related to prominence; in TH, the three-way distinction accounts for the three different realizations of empty nuclei: lexical [i] in incorporator nuclei, non-lexical [ə] in unincorporated nuclei, and Ø in empty, incorporated nuclei.

Our approach has captured different types of data from a typologically diverse selection of languages – we have cast the theoretical net wide. It remains to be seen whether other sesquisyllabic patterns, other lenition facts, and other particulars of individual languages have also been caught in it.

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