"Polysynthesis, stress uniformity, and the opposite-to-anchor stress system in Ese Ejja"

Abstract:

This chapter presents a study of stress uniformity in Ese Ejja. In morphologically simplex words, inflectional suffixes assign accent to a position in the stem, which is mapped to primary stress. This accent-to-stress algorithm results in an 'opposite-to-anchor' system whereby the location of primary stress is towards the left edge but the triggering suffix is towards the right. In contrast to simplex forms, this mapping does not occur with complex forms, e.g. verbs with both inflectional and derivational morphology. Because Ese Ejja is a polysynthetic language, a large number of derivational morphemes can intervene between the root (at left) and triggering suffixes (at right), which may result in 'long-distance anchor dependencies'. Ese Ejja conspicuously avoids this situation by suspending accent-to-stress mapping in sufficiently complex forms. Instead, a kind of 'stress uniformity' is employed whereby complex forms copy the stress from an equivalent simplex form (i.e. [[ROOT]-INFL]*x* → [[[ROOT]-DERIV]-INFL]*x*, where *x* = identical stress). This chapter relates these aspects of Ese Ejja stress to the rarity of opposite-to-anchor systems generally (such as 'count systems'), and the general bias in stress systems for default-to-same-edge properties.

Keywords:
stress, accent, morphologically-conditioned prosody, polysynthesis, paradigm uniformity, transparadigmatic uniformity, inflection vs. derivation, Amazonian languages, Ese Ejja

1 Introduction

This chapter examines stress in Ese Ejja (Tacanan: Bolivia/Peru), a polysynthetic language which frequently exhibits verb forms of great morphological complexity. In Ese Ejja, all verbs must appear with overt inflection. The position of stress in inflected verbs is morphologically-assigned, conditioned by one (or more) inflectional suffixes. In the example set below, the position of primary stress on the root *towaa* 'jump' is on the first syllable with the inflectional suffix *-kyae* POT2, on the second with *-nahe* PAS, and on the third with *-chana* APRH. All three suffixes contain two syllables.[1]

(1) Morphologically-conditioned primary stress (Vuillermet 2012:224,237; Vuillermet field recordings)

a.	1st syllable	towaa-kyae	[ˈ**to**.wa.a-kya.e]
		jump-POT2	'(I) might jump'
b.	2nd syllable	towaa-nahe	[to.ˈ**wa**.a-na.he]
		jump-PAS	'(I) jumped'
c.	3rd syllable	towaa-chana	[to.wa.ˈ**a**-cha.na]
		jump-APRH	'watch out not to jump'

Previous research has accounted for these differences by attributing pre-accenting properties to inflectional suffixes, e.g. *-nahe* assigns an accent to two syllables before it (Vuillermet 2012, Rolle 2017, 2018a,b, Rolle & Vuillermet 2019). A crucial step in this algorithm involves

[1] Ese Ejja glosses in this chapter are the following: 3A third person agreement, ABS absolutive, ALL allative, APRH apprehensive ('watch out'), AUX.I intransitive auxiliary, CL clitic, DEPR depreciative ('the best one given the circumstances'; Spanish *como sea*), DES desiderative ('want to'), ERG ergative , FUT future, GEN genitive , IMP imperative, INCL inclusive 1st plural, INSTR instrumental, IPFV imperfective, ITER iterative, IV intransitive verb, LOC locative, MID middle voice, PAS past, PL plural, POT1 potential mood, PRES present tense, PRIV privative ('without X, X-less'), REDUP detransitivizing reduplication, TEL telicity marker, and TV transitive verb.

mapping morphological accent to surface primary stress, shown in (2). Here, the suffix *-me* (POT1) assigns accent to the preceding syllable of the stem *ishe'a-ka* (wake.up-3A). From this position, rhythmic iterative feet are formed and the leftmost accented foot is mapped to surface primary stress.

(2) ishe'a-ka + (○ó)-me → ishe('a-**ká**)-me → (i.**shé**).('a.**ká**).me → [iˈ**she**'akame]

Under this mapping, the location of primary stress will be at the left edge of the word, but the anchoring accent and its triggering suffix will be towards the right edge. In less complex forms as in (1), the distinction between accent and stress is minor: accent and primary stress are either isomorphic or appear one foot away. However, because Ese Ejja is a polysynthetic language, a large number of intervening morphological slots appear between the root at the left edge and inflectional suffixes towards the right edge. These intervening positions are occupied by numerous derivational affixes and constructions (e.g. incorporation).

If the accent-to-stress mapping applied transparently in such cases, this would create a 'long-distance anchor dependency' between the anchoring accent at the *right* edge and primary stress at the *left*. In this chapter, I show that Ese Ejja conspicuously avoids this situation by suspending the accent-to-stress mapping algorithm in all forms which contain derivational morphology. The result is that while the mapping applies transparently with inflected verbs ('simplex' forms), it does not apply if derivational morphology is added ('complex' forms).

Instead, with complex forms the position of primary stress is copied from the position of stress in the equivalent simplex form. This is illustrated in (3). The simplex form (a.) consists of a root *ijya* 'eat' plus suffix *-sa* DESIDERATIVE, and primary stress falls on the third syllable from the left. This can be generated by the accent-to-stress algorithm above. However, compare complex forms (b.-d.) which contain intervening derivational morphology. Stress is always on the third syllable, copying the position in the simplex form. These data cannot be generated from the accent-to-stress algorithm.

(3) Stress uniformity w/ complex forms (Vuillermet 2012:382,384,389; Vuillermet field recordings)

a.	[ijya-ˈ**sa**]	eat-DES	'wants to eat'
b.	[ijya-ˈ**'yo-**sa]	eat-TEL-DES	'wants to eat completely'
c.	[ijya-ˈ**hya-**'yo-sa]	eat-away-TEL-DES	'…and carelessly'
d.	[ijya-ˈ**he**yo-hya-'yo-sa]	eat-finish-away-TEL-DES	'wants to finish eating (them) completely and carelessly'

I refer to this dependency as 'transparadigmatic stress uniformity', which I support with evidence from four derivational contexts: *-hya* 'go, away', *-'yo* TELICITY ('completely'), detransitivizing root reduplication, and root incorporation. I interpret uniformity here as a response to avoid a long-distance anchor dependency between accent assigned by inflectional suffixes towards the right edge and stress at the left edge. Instead, primary stress is simply copied over from a simpler counterpart. I overtly tie this to the rarity of opposite-to-anchor systems general, and see stress uniformity as supporting the default-to-same-edge bias in stress systems (van der Hulst 1984, 1996, 2012, Goedemans 1998, Gordon 2000, 2002, Staubs 2014a,b, *inter alia*).

The structure of this chapter is as follows: section 2 presents a typology of possible opposite-to-anchor systems, section 3 shows Ese Ejja as a polysynthetic language, section 4 shows the distinct stress assignment algorithms in simplex versus complex forms, section 5 provides discussion tying these parts together, and section 6 provides a conclusion. An appendix provides additional data.

2 Opposite-to-anchor systems

This chapter will show that in Ese Ejja, the triggering morpheme of the stress pattern appears towards the *right* edge of the phonological word, but the actual realization of that stress pattern appears towards the *left* edge. I refer to such patterns as demonstrating an '**opposite-to-anchor system'**, defined below:

(4) **Opposite-to-anchor system**: A stress system where the anchor governing (primary) stress and the location of that (primary) stress are at opposite sides of the prosodic domain (e.g. the phonological word)

Before turning to the Ese Ejja system, I first situate it by contrasting three types of opposite-to-anchor systems.

2.1 Three types of systems

The first two opposite-to-anchor systems are (i) **edge-based** and (ii) **weight-based**. This is schematized with toy data in Table 1. Hypothetical roots are in bold in input, while the position of surface primary stress is in bold in the output. Throughout this paper, 'accent' refers to a phonological notion whereby certain syllables are marked with a diacritic, while 'stress' is strictly a phonetic notion.

Anchor type	Sample input (**root**)	Iteration (L→R)	Output (Rightmost)
Edge-based	/**kala**-sa-ta-ma/	(ká.la).(sá.ta).(má)	[ka.la.sa.ta.ˈ**ma**]
(e.g. left-edge)	/**pasaka**-sa-ta-ma/	(pá.sa).(ká.sa).(tá.ma)	[pa.sa.ka.sa.ˈ**ta**.ma]
Weight-based (e.g.	/**kala**-sa-ta-ma/	(ká.la).(sá.ta).(má)	[ka.la.sa.ta.ˈ**ma**]
leftmost heavy σ)	/**marfa**-sa-ta-ma/	(már).(fá.sa).(tá.ma)	[mar.fa.sa.ˈ**ta**.ma]

Table 1: Edge-based and weight-based opposite-to-anchor systems (mapping accent to stress)

Let us examine how accent is mapped to stress here. In 'edge-based' systems, the anchor where footing begins is the left edge of the phonological word. In the table this is illustrated with a 2σ root /kala/ and 3σ root /pasaka/, each shown with the same set of suffixes. Iterative trochaic feet are formed left-to-right from the left edge, with degenerate feet allowed. A rightmost constraint maps the rightmost accented syllable to primary stress. The result is that odd-syllabled words have final stress while even-syllabled words have penultimate stress (a distribution often discussed in terms of 'word parity'). This is an opposite-to-anchor system in that the edge which governs surface prosody is the left edge of the word, but where it is realized is at the right edge.

The logic of a second type – weight-based systems – is parallel to the first type. The table above shows two root shapes: a root with two light syllables /kala/ and a root with a heavy and light syllable /marfa/. In this system type, the leftmost heavy syllable (már) forms its own foot, and acts as the anchor for iterative trochaic feet; otherwise anchoring is to the left edge. The final column again illustrates the rightmost constraint, which maps the rightmost accent to primary stress. This results in final stress with an all-light-syllable root, but stress on the penult if the root begins with an initial heavy syllable.

Empirically, edge-based opposite-to-anchor systems are very rare, established at least since van der Hulst (1984:178-180). Hayes (1995:54-61) is one prominent source which establishes their existence, whereby the edge of primary prominence (in his typology 'end rules') is an independent parameter from the anchor where iteration begins (in his typology 'direction of parsing'). Such cases are often referred to as '**count systems**' in the literature (e.g. van der Hulst 1996, 2012, *inter alia*).

Several Australian Aboriginal languages illustrate this pattern. One well-known example is Warrgamay [wgy] (Dixon 1981, analyzed in Hayes 1995:140).[2] In (5) below, (a.) shows a 4-syllable word and (b.) shows a 5-syllable word. The iteration anchor is the right edge of the word from whence iterative trochaic feet are formed. In the even-syllabled word (a.), this results in stress on the initial syllable, while in the odd-syllabled words this results in stress on the second syllable (b.).

(5) Warrgamay – Example of an edge-based opposite-to-anchor system

a.	(x .)	b.	(x .)
	(x .) (x .)		. (x .) (x .)
	gíɟa**wú**lu		ɟu**ɽá**gay-**mí**ri
	[ˈ**gi**ɟaˌwulu]		[ɟuˈ**ɽa**gayˌmiri]
	'freshwater jellyfish'		'Niagara-Vale-from' (a place name)

Goedemans (1998:123ff.) notes additional Australian languages with this property, such as Malakmalak [mpb] (Birk 1975:69-71, 1976), Nangikurrunggurr [nam] (Hoddinott & Kofod 1988), and Nyawaygi [nyt] (Dixon 1983).

A weight-based opposite-edge system in the literature is Creek [mus] (Muskogean: USA - Haas 1977, Martin & Johnson 2002, Martin 2011; Hayes 1995:64 for discussion). Briefly, in Creek words with all light syllables, iambic feet are formed starting from the left edge but the foot at the opposite edge receives primary stress. However, these feet are anchored to a left-edge heavy syllable if one exists. Compare the four-syllable pairs [(wa.na).(yi.ˈ**ta**)] 'to tie' with all light syllables versus [(al).(pa.ˈ**to**).ci] 'baby alligator' with an initial heavy syllable (Martin 2011:75-76, Martin & Johnson 2002:30).[3]

We can compare these to the third type: **accent-based opposite-to-anchor systems**. This is split into two subtypes, one lexically-based and the other morphologically-based.

Accent-based type	Sample input (**root**)	Iteration (L→R)	Output (Rightmost)
Lexically-based	/**kála**-sa-ta-ma/	(ká.la).(sá.ta).(má)	[ka.la.sa.ta.ˈ**ma**]
(e.g. inherent accent)	/**mafá**-sa-ta-ma/	ma.(fá.sa).(tá.ma)	[ma.fa.sa.ˈ**ta**.ma]
Morphologically-based	/bo◌́-**kala**-sa-ta-ma/	bo.(ká.la).(sá.ta).(má)	[bo.ka.la.sa.ta.ˈ**ma**]
(e.g. assigned accent)	/mo-**kala**-sa-ta-ma/	(mó.ka).(lá.sa).(tá.ma)	[mo.ka.la.sa.ˈ**ta**.ma]

Table 2: Accent-based opposite-to-anchor systems

In our toy lexically-based system, there are two input root types: one with inherent accent on the initial syllable (/kála/) and one with an inherent accent on the second syllable (/mafá/). Trochaic feet are anchored to this inherent accent, which results in primary stress on the final syllable with the first example ([ka.la.sa.ta.ˈ**ma**]) but on the second syllable with the second example ([ma.fa.sa.ˈ**ta**.ma]).

The morphologically-based sub-type is parallel to the lexically-based type. In the toy example above, there are two types of prefixes: one which assigns an accent to the first syllable

[2] Note that despite its fame, there is only scant discussion of stress in the original source on Warrgamay, which to my knowledge is Dixon (1981:20-21).

[3] There are two complications in Creek worth noting. First, the domain of primary stress is restricted to the verbal stem (root + certain suffixes), which Guekguezian (2016) classifies as the minimal prosodic word (PWd_{min}). Second, Creek is classified as a tone language, and stress is realized as a "high pitch [that] begins on the first stressed syllable and extends through the last stressed syllable" (Martin 2011:76), resulting in high tone plateauing. Thus the cues for primary stress and secondary stress are identical, namely high pitch. Therefore, this is not straightforwardly a window in which the primary cue for prominence is restricted to one edge.

of the root /kala/ (i.e. /bó-kala/ → bo-kála), and one which assigns no accent (/mo-kala/). In the former, the assigned accent acts as the iteration anchor, which results in primary stress on the final syllable. In the latter, the iteration anchor is the left-edge (by default), and primary stress falls on the penult.

Such accent-based types are virtually unattested. In what follows, however, I argue that Ese Ejja is a true example of an accent-based opposite-to-anchor system (starting at section 4.1).

2.2 Opposite-to-anchor systems and polysynthesis

Given these types, we can ask the following: does polysynthesis pose a problem for an opposite-to-anchor system? Given that (i) analytic languages generally exhibit smaller words with less affixes while polysynthetic languages exhibit larger words with more affixes, and given (ii) in opposite-to-anchor systems the anchor and primary stress are on opposite sides of a word, then it follows that (iii) the distance between the anchor and primary stress has the potential to be *greater* on average in polysynthetic languages. The question holds whether we interpret this as a great number of intervening syllables or of intervening morphemes.

Based on this question, consider the toy edge-based system in Table 3 and the toy accent-based systems in Table 4. Here, the anchor where iteration starts is at the right edge of the word, boxed in the underlying forms. Forms in the leftmost columns are smaller (fewer syllables and/or morphemes), resulting in a smaller distance between the anchor and primary stress. In contrast, in the rightmost columns there is greater distance between the anchor and stress because there are three intervening suffixes/syllables (in gray). When the anchor and its dependent primary stress appear on opposite sides of a word at a distance (crossing some threshold), we can say they form a '**long-distance anchor dependency**'. As above, primary stress is in bold in the output.

Smaller anchor dependency		Long-distance anchor dependency	
/σσσ-$\boxed{\sigma_1}$/		/σσσ-σσ-σ-$\boxed{\sigma_1}$/	
(σ́.σ).(σ́.σ)	[ˈ**σ**σσ-σ_1]	σ.(σ́.σ).(σ́.σ).(σ́.σ)	[σˈ**σ**σ-σσ-σ-σ_1]
/σσσ-$\boxed{\sigma\sigma_2}$/		/σσσ-σσ-σ-$\boxed{\sigma\sigma_2}$/	
σ.(σ́.σ).(σ́.σ)	[σˈ**σ**σ-$\sigma\sigma_2$]	(σ́.σ).(σ́.σ).(σ́.σ).(σ́.σ)	[ˈ**σ**σσ-σσ-σ-$\sigma\sigma_2$]
/σσσ-$\boxed{\sigma\sigma\sigma_3}$/		/σσσ-σσ-σ-$\boxed{\sigma\sigma\sigma_3}$/	
(σ́.σ).(σ́.σ).(σ́.σ)	[ˈ**σ**σσ-$\sigma\sigma\sigma_3$]	σ.(σ́.σ).(σ́.σ).(σ́.σ).(σ́.σ)	[σˈ**σ**σ-σσ-σ-$\sigma\sigma\sigma_3$]

Table 3: Distance between anchor and primary stress (edge-based toy system)

Smaller anchor dependency		Long-distance anchor dependency	
/σσσ-$\boxed{\acute{\sigma}\sigma\sigma_1}$/		/σσσ-σσ-σ-$\boxed{\acute{\sigma}\sigma\sigma_1}$/	
σ.(σ́.σ).(σ́.σ).σ	[σˈ**σ**σ-$\sigma\sigma\sigma_1$]	(σ́.σ).(σ́.σ).(σ́.σ).(σ́.σ).σ	[ˈ**σ**σσ-σσ-σ-$\sigma\sigma\sigma_1$]
/σσσ-$\boxed{\sigma\acute{\sigma}\sigma_2}$/		/σσσ-σσ-σ-$\boxed{\sigma\acute{\sigma}\sigma_2}$/	
(σ́.σ).(σ́.σ).(σ́.σ)	[ˈ**σ**σσ-$\sigma\sigma\sigma_2$]	σ.(σ́.σ).(σ́.σ).(σ́.σ).(σ́.σ)	[σˈ**σ**σ-σσ-σ-$\sigma\sigma\sigma_2$]
/σσσ-$\boxed{\sigma\sigma\acute{\sigma}_3}$/		/σσσ-σσ-σ-$\boxed{\sigma\sigma\acute{\sigma}_3}$/	
σ.(σ́.σ).(σ́.σ).(σ́)	[σˈ**σ**σ-$\sigma\sigma\sigma_3$]	(σ́.σ).(σ́.σ).(σ́.σ).(σ́.σ).(σ́)	[ˈ**σ**σσ-σσ-σ-$\sigma\sigma\sigma_3$]

Table 4: Distance between anchor and primary stress (accent-based toy system)

Table 3 shows that the position of primary stress will depend on whether there are an even or odd number of syllables. In Table 4, there are three suffixes here (1-3), each of which has lexical accent on a different syllable. Based on the position of the accent, primary stress is mapped to either the first or second syllable.

I now turn to the Ese Ejja data to provide a concrete case of these issues.

3 Ese Ejja as a polysynthetic language

To sufficiently illustrate the complications from long-distance anchor dependencies in Ese Ejja, we must (i) establish it as a polysynthetic language, and (ii) minimally describe the stress system.

To begin, Ese Ejja [ese] is a Tacanan language spoken in Bolivia and Peru. The data in this study come from fieldwork by Marine Vuillermet on the Madidi dialect (largely Vuillermet 2012[4]), and further analyzed in Rolle (2017, 2018a,b) and Rolle & Vuillermet (2019). The language is classified as polysynthetic due the numerous morphological affixal slots in the verbal template, and the frequency in which they are filled in context by numerous inflectional and derivational affixes. A standard metric for polysyntheticity, this includes productive root incorporation (Vuillermet 2017). Figure 1 below shows the verbal word has at least fifteen morphological slots, three before the (head) root (in gray), and eleven after the root (modified from Vuillermet 2012:366).

-3	-2	-1	0	+1	+2	+3	+4	+5	**+6**	+7	**+8**	+9	+10	**+11**
Tense/ Mood	Valency	Incorpor-ated noun	Head verbal root	Verbal root 2	Manner adj. root	Adverbials	Valency	Associated motion / Adverbials	**Argument indexation**	Associated motion	**Tense/ Mood**	Adverbials	Aspect	**Tense/ Mood**

Figure 1: Ese Ejja verbal template (head root in grey, slot 0)

Those slots in bold represent inflectional categories, at least one of which must be filled; in this sense, inflection is obligatory. These include tense and mood affixes in slots [-3], [+8], and [+11]. The other inflection is 3rd person subject agreement, classified as argument indexation in [+6] (no other agreement markers exist). All others slots are derivational, and optional. Inflectional suffixes in slots [+6], [+8], and [+11] assign an accent within the verbal word, and therefore act as anchors as defined above.[5]

An example illustrating this table is in (6), which is representative of polysynthetic structure in Ese Ejja. The head root is *haha* 'cut', in bold. As stated, Ese Ejja has frequent root incorporation. Nominal roots appear directly before the head verbal root (morphological slot [-1]) while verbal and manner adjectival roots appear after the head root (slots [+1] and [+2]). After the incorporation complex, there are two derivational suffixes: -*hya* DEPRECIATIVE 'the best one can given the circumstances' (Spanish: *como sea*) and -*'aja* 'in vain'. This is followed by inflectional -*nahe* PAST TENSE.[6]

[4] Vuillermet (2012) is a grammar of Ese Ejja which includes an extensive study of stress and is where the majority of the empirical data comes from. Her study involved analysis of approximately 2,000 elicited verbal forms across scores of roots, controlling for all relevant variables. The patterns show remarkable uniformity. See the original study for complete findings, and other details in Rolle & Vuillermet (2019).

[5] A reviewer asks for explicit criteria for distinguishing inflection versus derivation in Ese Ejja. As I see it, the most compelling are (i) the semantic differences between the two sets, (ii) distributional evidence in terms of occupied slots (Figure 1), and (iii) the obligatoriness of at least one inflectional marker which does not hold with derivational morphology. See also extensive discussion of all morphology in Vuillermet (2012). I have no actual stake in whether these are 'truly' inflectional and derivational categories, which I take to be language-specific. The main point here is that one group of affixes patterns one way with respect to accent and stress, while another patterns a different way. The labels are less interesting than their behavior and relative positions.

[6] Spelling conventions for the Ese Ejja data used here which do not comply with the IPA are /tʃ/ <ch>, /ʔ/ <'>, /ɓ̥/ <b>, /ɗ̥/ <d>, /ʃ/ <sh>, /χ/ <j>, /ɲ/ <ñ>, and /j/ <y>. For the sake of simplicity, I write the orthographic spelling within analytic representations / / and [ ] in many places in this chapter. Note that there are several orthographic systems for Ese Ejja, in part due to being split across the Peru/Bolivia border. In Vuillermet (2012)'s grammar, /χ/ is written as <x> and /h/ as <j>. In the name 'Ese Ejja', <jj> also stands for /χ/.

(6) *Mahoya eyaa oya ekwebaaa sap**ahaha**wejahya'ajanahe.*
mahoya eyaa oya ekwe=baa=a
then 1SG.ERG 3ABS 1SG.GEN=machete=INSTR
sapa-**haha**-weja-hya-'aja-nahe
head-**cut-**open-DEPR-in.vain-PAS
'Then I tried to violently cut its head off with my machete.' (Vuillermet 2012:273 - KaPey.040)

Further, (7) below shows the morphological complex *ja- -ki* expressing MIDDLE voice. This circumfixes around the entire root complex (with two incorporated roots).

(7) *Esho'i **ja**dojojanijikwyasaha**ki**nahe.*
e-sho'i **ja**-dojojaniji-kwya-saha-**ki**-nahe
child **MID**-rib-press-break.in.two-**MID**-PAS
'The child broke his rib.' (Vuillermet 2017:186)

Each morphologically complex word constitutes a single phonological word, evidenced by the fact that there is only one primary stress (= primary prominence) in these complexes (Vuillermet 2012:273). For example, in the verb in (6) above, a single primary stress appears on the second syllable of the first morpheme *sapa* 'head':

(8) Single phonological word with one primary stress
($_{\omega}$ *sa*[**ˈpa**]*hahawejahya'ajanahe*)

Finally, that Ese Ejja is polysynthetic is typical of the languages in western South America, considered an areal feature. Other polysynthetic families include Quechuan, Aymaran, 'Jivaroan', Peba-Yagua, Arawakan (e.g. the Campan branch), Mapudungun, Nambiquaran, and several other isolates.

4 The basic case: Stress in Ese Ejja nouns

This section shows Ese Ejja as an opposite-to-anchor system, with an accent-to-stress mapping algorithm. I start here with the more straightforward facts in Ese Ejja nouns, before moving on to the more complex verbal system and its interaction with polysynthesis (section 5). The goal of this section is to introduce the role of morphology in determining surface stress patterns in Ese Ejja, but to also demonstrate its limitations when one moves from more simplex to more complex forms. Such complications warrant the introduction of a principle of 'primary stress uniformity', which plays an important role in both noun and verb phrases. Note also that while verb accent is controlled by inflectional affixes, in nouns it is controlled by clitics.

4.1 Ese Ejja as an opposite-to-anchor system with accent-to-stress mapping

We can begin first with a terminological note concerning the use of 'accent' versus 'stress'. I exclusively use '**accent**' to refer to a phonological notion, in which certain syllables are marked with a diacritic. One accent type is encoded in the underlying representation of a morpheme. Following designations in Table 2 above, I refer to '**lexical accent**' as pre-specified inherent accent on a syllable within a morpheme, and refer to '**morphological accent**' as accent assigned by some morphological context onto a neighboring syllable (e.g. pre- or post-accenting). Another accent type is purely derived, which I refer to as '**iterative accent**'. This accent is assigned iteratively starting from lexical or morphological accent as its anchor, e.g. outward to every other syllable. I exclusively use an acute diacritic for accent: **σ́**.

In contrast, the term ‘**stress**’ is strictly a phonetic notion, indicating the location of primary prominence within the word (whose primary acoustic correlates are higher pitch and greater intensity – see Vuillermet 2012:199). This chapter deals only with primary stress and leaves secondary stress aside. I exclusively use a stress mark for stress: ˈ**σ**.

Default stress in nouns is discernable from their pronunciation in isolation. Primary stress falls on the penultimate syllable, or on the ultima if monosyllabic. The example below illustrates this with 1-4σ roots, including hypothetical underlying forms (with no accent), and default accent and stress provided to its right.

(9) Stress on unmodified nouns (Vuillermet 2012:200)

a.	1σ	/ke/	**ké**	[ˈ**ke**]	‘field’
b.	2σ	/daki/	**dá**.ki	[ˈ**da**ki]	‘clothes’
c.	3σ	/bawicho/	ba.**wí**.cho	[baˈ**wi**cho]	‘rat’
d.	4σ	/iñawewa/	i.ña.**wé**.wa	[iñaˈ**we**wa]	‘dog’

Note throughout that stress assignment in Ese Ejja is quantity-insensitive.

Certain enclitics and suffixes systematically alter the position of primary stress in nouns (Vuillermet 2012:201ff.). One context are nouns modified by case enclitics, e.g. =*ho* LOCATIVE, =*a* INSTRUMENTAL, and =*a* ERGATIVE, =*byaxe* ‘on’, *inter alia*. Case enclitics as a class assign a morphological accent to the final syllable of the stem to which it attaches, as shown in the table below. I refer to these as ‘**pre-accenting enclitics**’.[7]

	Isolation	Noun + case clitic (e.g. =*ho* LOC, =*a* ERG, etc.)		
1σ	[ˈ**σ**]	/**σ́** = CL/	(**σ́**).σ	[ˈ**σ**σ]
	[ˈ**ke**]	/**ké** = ho/	(**ké**).ho	[ˈ**ke**ho]
2σ	[ˈ**σ**σ]	/σ**σ́** = CL/	(σ.**σ́**).σ	[σˈ**σ**σ]
	[ˈ**da**ki]	/da**kí** = a/	(da.**kí**).a	[daˈ**ki**a]
3σ	[σˈ**σ**σ]	/σσ**σ́** = CL/	σ.(σ.**σ́**).σ	[σσˈ**σ**σ]
	[baˈ**wi**cho]	/bawi**chó** = a/	ba.(wi.**chó**).a	[bawiˈ**cho**a]
4σ	[σσˈ**σ**σ]	/σσσ**σ́** = CL/	(σ.**σ́**).(σ.**σ́**).σ	[σˈ**σ**σσσ]
	[iñaˈ**we**wa]	/iñawe**wá** = a/	(i.**ñá**).(we.**wá**).a	[iˈ**ña**wewaa]

Table 5: Accent assignment with pre-accenting enclitics

From the location of this morphological accent, iambic iterative feet are formed right-to-left, resulting in iterative accents. The accent of the leftmost foot is mapped to primary stress. I refer to this as ‘**accent-to-stress mapping**’, defined below:

(10) **Accent-to-stress mapping**: A prosodic algorithm which maps the position of primary stress based on some relation to an accented syllable

With 1σ-3σ roots, accent and stress are isomorphic. The crucial case is with the 4σ root, where we see evidence for the opposite-to-edge system: although morphological accent is assigned to the *fourth* syllable in /iñawe**wá** = a/, stress surfaces on the *second* syllable [iˈ**ña**wewaa].

In order to account for the data, the algorithm requires that iterative feet be iambic. If they were trochaic, then the intermediate representation of a cliticized 3σ word for example would be (**σ́**.σ).(**σ́**.σ) ~ (**bá**.wi).(**chó**.a). This would erroneously predict that primary stress would be on the

[7] Note that other nominal suffixes/enclitics do not alter default stress in nouns, e.g. compare -*kwana* PLURAL with 1σ roots [ˈ**ke**-kwana] ‘fields’ (not *[ke-ˈ**kwa**na]), 2σ [ˈ**pe**yo-kwana] ‘snakes’, and 3σ [moˈ**to**ne-kwana] ‘motors’.

first syllable *[ˈ**ba**wichoa], contrary to fact. In total, the accent-to-stress mapping results in stress always falling on the first, second, or third syllable of the word, constituting a typologically rare left-edge 3σ stress window.

Similar patterns are seen with the suffix *-má* PRIVATIVE 'X-less/with no X/have no X'. This suffix is analyzed as having inherent lexical accent, and forms iterative iambs right-to-left. When *-má* occurs with 1-2σ nominal roots, as below, it occurs with primary stress. In contrast, with 3-4σ roots primary stress falls on the 2nd and 3rd syllables respectively. This is accounted for if we assume iterative iambs from the anchor, plus the leftmost constraint.[8]

	Isolation	Noun + *-ma* PRIV '-less'		
1σ	[ˈ**σ**]	/σ-**σ́**/	(σ.**σ́**)	[σˈ**σ**]
	[ˈ**ke**]	/ke-**má/**	(ke.**má**)	[keˈ**ma**]
2σ	[ˈ**σ**σ]	/σσ-**σ́**/	σ.(σ.**σ́**)	[σσˈ**σ**]
	[ˈ**da**ki]	/daki-**má/**	da.(ki.**má**)	[dakiˈ**ma**]
3σ	[σˈ**σ**σ]	/σσσ-**σ́**/	(σ.**σ́**)(σ.**σ́**)	[σˈ**σ**σσ]
	[baˈ**wi**cho]	/bawicho-**má/**	(ba.**wí**).(cho.**má**)	[baˈ**wi**choma]
4σ	[σσˈ**σ**σ]	/σσσσ-**σ́**/	σ(σ.**σ́**).(σ.**σ́**)	[σσˈ**σ**σσ]
	[iñaˈ**we**wa]	/iñawewa-**má**/	i.(ña.**wé**).(wa.**má**)	[iñaˈ**we**wama]

Table 6: Accent assignment with inherently accented suffix *-má*

Based on these facts, Ese Ejja is an example of an accent-based opposite-to-anchor system: accent is on a position towards the right edge of the word, and maps to stress towards the left-edge. Further evidence comes from possessive proclitics, which also assign accent resulting in stress-'shifting' patterns. I refer to these as '**post-accenting proclitics**', and include *ekwe*= 1SG.GEN 'my', *eseha*= 1INCL.GEN 'our', *mikye*= 2SG.GEN 'your', *oha*= 3.GEN 'his/her/its/their', *inter alia*.[9] Examples with *ekwe*= 'my' below illustrate that these proclitics assign a morphological accent to the first syllable of the root. This is seen most clearly with 3σ and 4σ roots, where primary stress now falls on the root-initial syllable. [Note that '=/ʔ/, and adjacent vowels form separate syllables, e.g. in *tawoo*.]

	Isolation	Possessive proclitic + N		
1σ	[ˈ**σ**]	/CL=**σ́**/	σ.(σ.**σ́**)	[σσˈ**σ**]
	[ˈ**ke**] 'field'	/ekwe=**ké**/	e.(kwe.**ké**)	[ekweˈ**ke**]
2σ	[ˈ**σ**σ]	/CL=**σ́**σ/	σ.(σ.**σ́**).σ	[σσˈ**σ**σ]
	[ˈ**'a**'i] 'elder sister'	/ekwe=**'á**'i/	e.(kwe.**'á**).'i	[ekweˈ**'a**'i]
3σ	[σˈ**σ**σ]	/CL=**σ́**σσ/	σ.(σ.**σ́**).(σ.**σ́**)	[σσˈ**σ**σσ]
	[taˈ**woo**] 'bottle'	/ekwe=**tá**woo/	e.(kwe.**tá**).(wo.**ó**)	[ekweˈ**ta**woo]
4σ	[σσˈ**σ**σ]	/CL=**σ́**σσσ/	σ.(σ.**σ́**).(σ.**σ́**).σ	[σσˈ**σ**σσσ]
	[iñaˈ**we**wa] 'dog'	/ekwe=**í**ñawewa/	e.(kwe.**í**).(ña.**wé**).wa	[ekweˈ**i**ñawewa]

Table 7: Accent-to-stress mapping with possessive proclitics (Vuillermet 2012:202)

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[8] A reviewer points out that these data involve accent assignment from a derivational morpheme, and asks whether this runs counter to the general argument of the paper. While the argument may not necessarily hold with *-má* here, it does hold for those affixes introduced later when discussing verb accent. Data is not available showing how *-má* constructions interact with other accent assignment.

[9] Vuillermet (2012:342-346) decomposes these proclitics into two parts, an analysis not adopted here. The first is a person/number morpheme *e* 1SG, *ese* 1INCL, *mi* 2SG, and *o* 3, based on their independent use as absolutive markers. The second is a genitive case allomorph: =*kwe* with 1st person, =*kye* with 2nd, and =*ha* as the default genitive marker. Clitics =*kwe* and =*kye* are only found in the context of *mi* and *o* respectively, while =*ha* is frequently found on other hosts. For the purposes of this chapter, I analyze proclitics as portmanteau morphs, i.e. /ekwe/ (*/e+kwa/).

The only 3σ post-accenting proclitic is *eseha*= 1INCL.GEN ‘our’. The morphological accent from this 3σ proclitic is assigned outside of the initial three-syllable window, predicting stress to ‘shift’ onto the proclitic. Although data at this point is limited, from the available recordings this is confirmed. An example I have extracted from a text is provided in (11). The pitch track in Figure 2 shows that stress is indeed on the rhythmically dependent position (the 2nd σ), as predicted from the accent-to-stress mapping.

(11) eseha = **bá**ba = kwana (e.**sé**).(ha.**bá**).(ba.**kwá**).na [eˈ**se**ha = baba = kwana]
1INCL.GEN=grandfather=PL ‘our ancestors’ (Vuillermet 2012:708 – T4.3)

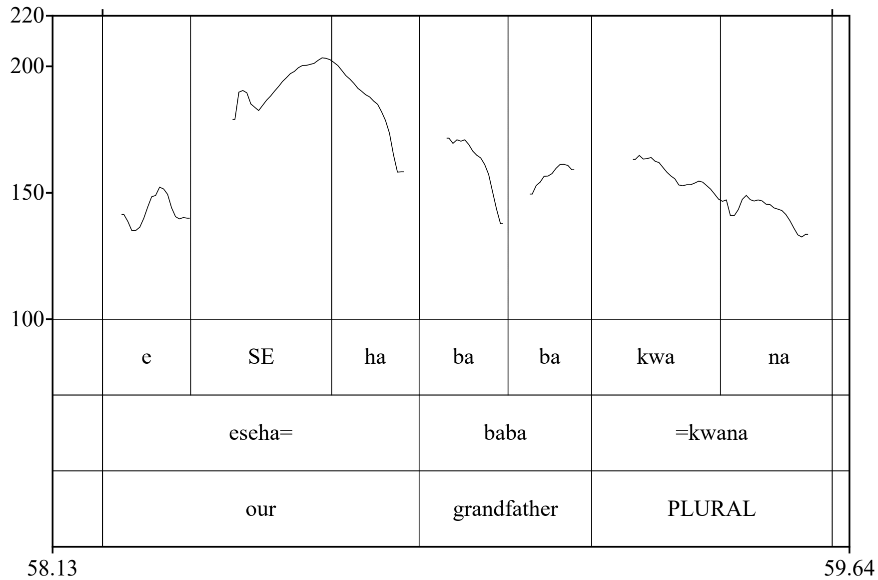

Figure 2: Pitch track for [eˈ**se**ha = baba = kwana] ‘our ancestors’ (*y*=pitch, *x*=time)

4.2 Stress in 'complex' noun forms: A preview of transparadigmatic uniformity

Let us now examine complications when post-accenting proclitics and pre-accenting enclitics co-occur. The purpose here is to establish the concept of stress uniformity, in anticipation of its greater presence in complex verb forms analyzed in the next section.

Surface patterns when the proclitic *ekwe*= ‘my’ and a case enclitic co-occur are in the table below. In each case, primary stress is uniformly realized on the second syllable of the word, falling on the proclitic. This happens regardless of the syllable count of the root.

	CL=N=CL	Attested patterns		Translation
1σ	/e**kwé** = ke = ho/ my = field = LOC	(σ.**σ́**).(σ.**σ́**) (e.**kwé**).(ke.**hó**)	[σˈ**σ**σσ] [eˈ**kwe**keho]	‘in my field’
2σ	/e**kwé** = ’a’i = ke/ my = elder.sister = ALL	(σ.**σ́**).(σ.**σ́**).σ (e.**kwé**).(’a.**’í**).ke	[σˈ**σ**σσσ] [eˈ**kwe**’a’ike]	‘to my elder sister’
3σ	/e**kwé** = tawoo = ho/ my = bottle = LOC	(σ.**σ́**).(σ.**σ́**).(σ.**σ́**) (e.**kwé**).(ta.**wó**).(o.**hó**)	[σˈ**σ**σσσσ] [eˈ**kwe**tawooho]	‘in my bottle’
4σ	/e**kwé** = iñawewa = ke/ my = dog = ALL	(σ.**σ́**).(σ.**σ́**).(σ.**σ́**).σ (e.**kwé**).(i.**ñá**).(we.**wá**).ke	[σˈ**σ**σσσσσ] [eˈ**kwe**iñawewake]	‘to my dog’

Table 8: Patterns when both proclitics and enclitics (Vuillermet 2012:203)

This pattern is distinct from proclitics and enclitics occurring without the other, where accent always fell on the root (Table 5 and Table 7).

These data are unexpected given the accent-to-stress mapping laid out in (10) above. Two telling examples are with 1σ and 3σ roots, shown below.

	Attested with CL=N=CL	Expected with enclitic (but unattested)	Expected with proclitic (but unattested)
1σ	[σˈ**σ** = σ = CL] [eˈ**kwe =** ke = ho]	e(kwe **= ké**) = ho *[ekwe = ˈ**ke** = ho]	e(kwe **= ké**) = ho *[ekwe = ˈ**ke** = ho]
3σ	[σˈ**σ** = σσσ = CL] [eˈ**kwe =** tawoo = ho]	e(kwe **= tá**)(wo**ó**) = ho *[ekwe = ˈ**ta**woo = ho]	e(kwe **= tá**)(wo**ó**) = ho *[ekwe = ˈ**ta**woo = ho]

Table 9: Attested vs. unattested position of primary accent with clitics

With 1σ *ke* 'field', in isolation the root has stress [ˈ**ke**], as it does with enclitics (e.g. [ˈ**ke** = ho]) and proclitics (e.g. [ekwe = ˈ**ke**]). However, in the context of both types of clitics, primary stress unexpectedly 'shifts' to the proclitic. Parallel facts are found with 3σ *tawoo* 'bottle', where primary stress is expected to be on the root, but appears uniformly on [ˈ**kwe**]. We can conclude that the normal accent-to-stress algorithm does not apply here as it does with simplex stems.

What therefore dictates where stress surfaces in complex noun forms? The answer becomes clear if we return to the encliticized forms from Table 5. The first morpheme *daki* 'clothes' in a. below has two syllables, and stress falls on the second syllable. In the complex forms in b. and c., the first morpheme *ekwe* also has two syllables, and stress also falls on the second syllable.

(12) a. [σˈ**σ** = CL]
[daˈ**ki** = a]
clothes=ERG

b. [σˈ**σ** = σσ = CL]
[eˈ**kwe** = 'a'i = ke]
my=elder.sister=ALL

c. [σˈ**σ** = σσσ = CL]
[eˈ**kwe** = tawoo = ho]
my=bottle=LOC (Vuillermet 2012:203)

The generalization that emerges is that it is the shape of the *initial morpheme* (i.e. number of syllables) which dictates where the morphological accent appears. It is as if the intervening morpheme were invisible in accent assignment.

Confirmation of this comes from the 3σ proclitic *eseha*= 'our'. In a 3σ encliticized noun, stress falls on the third syllable (a. below). As expected from the generalization, primary stress also falls on the third syllable *of the first morpheme* (b.). This is parallel to its appearance on the final syllable of 2σ proclitics.

(13) a. [σσˈ**σ** = CL]
[bawiˈ**cho** = a]
rat=ERG

b. [σσˈ**σ** = σσ = CL]
[eseˈ**ha** = baba = a]
our=grandfather=ERG 'our ancestors' (Vuillermet 2012:709)

The number of intervening syllables does not affect the pattern. While the examples above are relatively short, other tokens are longer. Consider the example below from a text, where intervening between the clitics is a 5σ noun (with an initial prefix *e-* of complicated semantics and distribution, outside of our scope).

(14) *Eseha ehyojijokoho, ese ishwa po haani.*
(ω ese'**ha** ehyojijoko**ho**) (ω ese 'ishwa) (ω po 'haani)
eseha= e-hyojijoko =**ho** ese ishwa po haa-ani
1INCL.GEN= PFX-threshing =**LOC** 1INCL wait.for AUX.I lie.IPFV-sit.IPFV
'In our threshings, (the vipers) lie (in the process of) waiting for us.'
(Vuillermet 2012:534 - KaPey.034)

Primary stress falls on the final syllable of the proclitic. Measurements of pitch and intensity confirm stress on this syllable, shown in Figure 3 below (cf. Figure 2 above where stress falls on [e'**se**ha] when no enclitic appears).

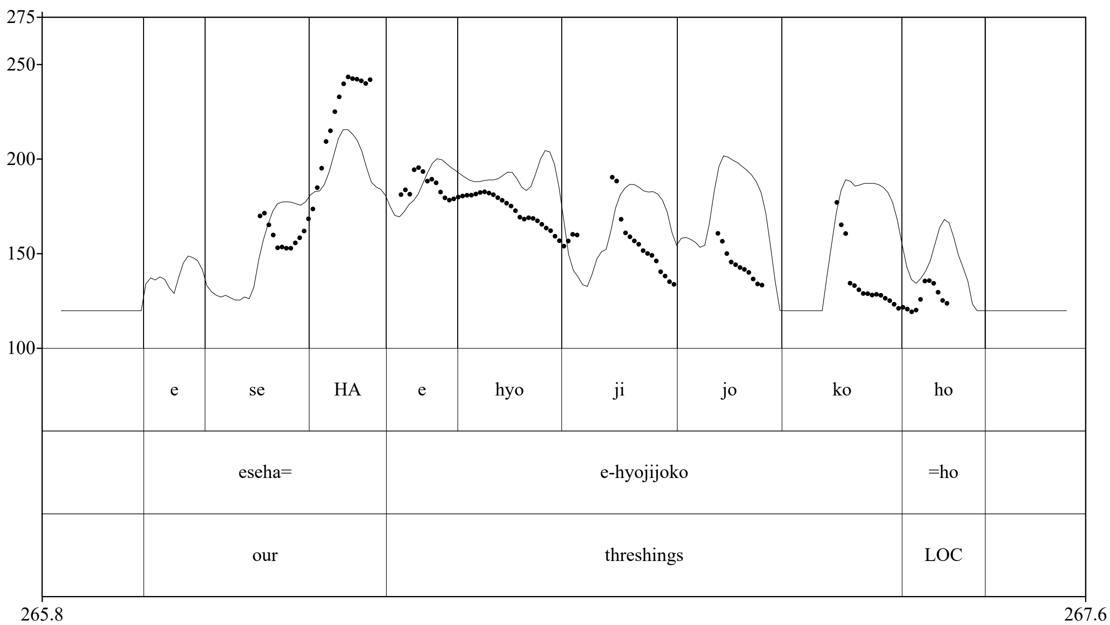

Figure 3: Pitch (speckles) and intensity (line) for [ese'**ha** = e-hyojijoko = ho] 'in our threshings'

We can again conclude that the 'normal' stress algorithm is bypassed and there is no discernable effect of iterative footing and the leftmost accent-to-stress mapping. To illustrate, consider (15) below which shows what it would look like if the accent-to-stress mapping were applied transparently. Such a form would constitute a long-distance anchor dependency, and is conspicuously avoided here.

	Accent assignment	Iterative footing	Mapping to primary stress
(15)	*eseha = e-hyojijo**kó** = ho	*(e.**sé**).(ha.**é**).(hyo.**jí**).(jo.**kó**).ho	*[e'**se**ha = e-hyojijoko = ho]

Two analyses can capture these data. The first is that the enclitic assigns an accent directly to the first morpheme, and skips over the intervening morpheme (here, the root). The second is paradigm uniformity, adopted in this chapter (sections 5.2-5.4). Under this analysis, a more complex word (the 'derivative') inherits some phonological pattern of a less complex word to which it is morpho-phonologically related (the 'base'). We can theory-neutrally refer to this as '**primary stress uniformity**'. An abstract schema is provided in (16) with a derivative and base.

		Derivative		Base
(16)	**Primary stress uniformity:**	$[\alpha\sigma]_{M1}[\ldots]_{M2} = \text{CL}$	↔	$[\alpha\sigma]_{M1} = \text{CL}$

The base here consists of an encliticized morpheme of an unspecified number of syllables, designated as [ασ]. The derivative is a word with the structure $[\alpha\sigma]_{M1}[\ldots]_{M2}{=}CL_i$ (two morphemes before the enclitic), in correspondence with a base $[\alpha\sigma]_{M1}{=}CL_i$ (only one morpheme before). What this means is that an encliticized 1σ-root $[{}^{\text{ˈ}}\boldsymbol{\sigma}]_{M1} = CL_i$ will be the base for an encliticized complex noun *with an initial 1σ morpheme*, encliticized 2σ-roots are bases for complex nouns with initial 2σ morphemes, and so on. The data from (13) is repeated in (c.) below, fit into this schema.

(17)	Derivative		Base
a.	$[{}^{\text{ˈ}}\boldsymbol{\sigma}]_{M1}[\sigma\sigma]_{M2} = CL_i$	↔	$[{}^{\text{ˈ}}\boldsymbol{\sigma}]_{M1} = CL_i$
b.	$[\sigma{}^{\text{ˈ}}\boldsymbol{\sigma}]_{M1}[\sigma\sigma]_{M2} = CL_i$	↔	$[\sigma{}^{\text{ˈ}}\boldsymbol{\sigma}]_{M1} = CL_i$
c.	$[\sigma\sigma{}^{\text{ˈ}}\boldsymbol{\sigma}]_{M1}[\sigma\sigma]_{M2} = CL_i$	↔	$[\sigma\sigma{}^{\text{ˈ}}\boldsymbol{\sigma}]_{M1} = CL_i$
	$[\text{ese}^{\text{ˈ}}\textbf{ha}]_{M1}[\text{baba}]_{M2} = \text{a}_i$	↔	$[\text{bawi}^{\text{ˈ}}\textbf{cho}]_{M1} = \text{a}_i$

The position of primary stress in the base is straightforwardly generated by the accent-to-stress mapping. From there, the stress of this base is copied over to the corresponding derivative resulting in stress uniformity, uniformity which is parasitic on this base-derivative correspondence based on the syllable count of the initial morpheme.

There are several ways to further formalize this model. Paradigm uniformity is often formalized via Output-Output Correspondence (Benua 1997, *inter alia*).[10] Such an approach is pursued in Rolle (2018a,b), who details how a derivative correctly picks out the correct base within a large 'base pool' (all potential bases, given some limiting criterion). Stress uniformity in Ese Ejja in unique in that (1) the bases and derivatives are abstracted into schematic representations with variables, rather than solely consisting of concrete morphs[11], and (2) correspondence is based around both a morphological criterion (sharing the same enclitic) and also a phonological criterion (the first morpheme having the same number of syllables. Further details of this fall outside of the present chapter, and we encourage the reader to consult previous theoretically-oriented work in Rolle (2018a,b).

5 Stress in Ese Ejja verbs

In total, the data from nouns shows that (1) accent-to-stress mapping applies transparently in (more) simplex noun forms, but (2) fails to apply in complex noun forms (i.e. cl=N=cl). Instead, stress uniformity applies which copies over the stress from a morpho-phonologically related form. I now turn to the main focus of this chapter, which is explicating stress uniformity as it applies in simplex and complex forms. This sections shows that like nouns, accent-to-stress applies straightforwardly with 'simplex' verbs in Ese Ejja (verbs forms with inflection only) but not with 'complex' verbs (verb forms with both inflection and derivation).

5.1 Stress in 'simplex' verb forms

As stated, simplex verb forms consist of verb roots and inflectional morphology, but no derivational morphology. The number and location of inflection affixes is much smaller than the range exhibited by derivational affixes, resulting in comparatively smaller words on average.

[10] One commonly cited example of paradigm uniformity is the contrast between *capi*[ɾ]*alistic* realized with flap versus *mili*[tʰ]*aristic* realized with aspiration, despite the fact that their stress patterns are identical. This can best be explained by reference to a morphologically-related base, namely the underived roots *capi*[ɾ]*al* and *mili*[tʰ]*ary* in which the [ɾ]/[tʰ] allophony is transparently derived based on stress and footing (Withgott 1983, Steriade 2000, Davis 2005).

[11] See Pariente (2012) for a similar analysis in Hebrew, discussed in Rolle (2018a:4).

Many of these patterns have been previously established in Vuillermet (2012), Rolle (2017, 2018a,b), and Rolle & Vuillermet (2019).

The two most important aspects of Ese Ejja stress to keep in mind from this point forward are (i) inflectional affixes control the position of primary stress and (ii) primary stress is restricted to a three-syllable stress window at the left-edge of the prosodic word. As stated above, accent is a phonological notion (acute accent σ́), which ultimately maps to primary stress (a phonetic notion, indicated as [ˈσ]). Also note that while sub-patterns exist, the accentual class is an idiosyncratic property of the suffix and cannot be predicted from its phonological shape.

Most verb roots in Ese Ejja are 1-2 syllables in length, with a small number having 3 syllables. One major parameter which governs prosodic behavior is the transitivity of roots (compare stress on *shiye* in intransitive [ˈ**shi**ye-nahe] '(I) smelled good' versus transitive [shiˈ**ye**-nahe] '(I) perfumed (something)'). Rolle & Vuillermet (2019) capture the effect of transitivity by placing an inherent lexical accent on the final syllable of transitive roots, as shown below. This accent is not found on intransitive roots.[12] Note *kwya* is one syllable [$k^{wj}a$].

(18)		1σ roots		2σ roots		3σ roots	
a.	Intransitive	pa-	'cry'	besa-	'bathe'	towaa-	'jump'
b.	Transitive	**kwyá**-	'hit (X)'	ba**ná**-	'sow (X)'	ishe**'á**-	'wake up (X)'

Verb roots must appear with inflectional affixes. All inflectional affixes analyzed at this point assign an accent (and thus co-vary with specific primary stress patterns). We can begin by examining the effects of inflectional tense/mood suffixes co-occurring with intransitive roots. This is a useful starting point because intransitive roots have no inherent accent, and therefore the prosodic effects from inflectional affixes can be determined without complication.

Tense/mood suffixes are classified into accentual classes based on (i) whether they assign accent to the ultima or penult of the stem, (ii) whether the accent forms iambic or trochaic feet[13], and (iii) their behavior when multiple accents compete for realization. Note that the use of the term 'stem' here is meant to be theory-neutral, and simply designates the constituent to which the affix attaches. In most cases this will be isomorphic with the root, but in some cases may be larger. In all cases where the 'root' and the 'stem' can be differentiated, accent is assigned to the stem.

There are three tense/mood accentual classes, labeled classes 1, 2, and 4 following Rolle & Vuillermet (2019) (a third class 3 also exists, not discussed in this chapter). The accentual classes are exemplified in Table 10 with the roots from (18), with the accentual class 1 *-me* POT1 (POTENTIAL MOOD 1) 'may, might', class 2 *-nahe* PAS (PAST TENSE), and class 4 *-he* FUTURE.

[12] An alternative to lexical accent on transitive roots would be to derive this via an abstract transitive verbal head, which would assign morphological accent to roots. Note, however, only three verbs are found to be ambitransitive (Vuillermet 2012:245), so this would not be a productive process.

[13] Ese Ejja thus constitutes what Goedemans & van der Hulst (2013) refer to as a 'dual rhythm' language, a rare type of system exhibiting both iambic and trochaic patterns. Dual rhythm systems have been noted in nearby Panoan languages as well (Bennett 2013, González 2016).

Class	1σ	2σ	3σ	T/M suffix	Accent	Foot
1	(**pá**)-me [ˈ**pa**me]	(be.**sá**)-me [beˈ**sa**me]	to.(wa.**á**)-me [towaˈ**a**me]	(◌◌́)-me POT1	Ultima	Iamb
2	(**pá**-na).he [ˈ**pa**nahe]	(**bé**.sa)-(ná.he) [ˈ**be**sanahe]	to.(**wá**.a)-(ná.he) [toˈ**wa**anahe]	(◌́◌)-nahe PAS	Penult	Trochee
4	(**pá**-he) [ˈ**pa**he]	(**bé**.sa)-he [ˈ**be**sahe]	to.(**wá**.a)-he [toˈ**wa**ahe]	(◌́◌)-he FUT	Penult	Trochee

Table 10: Tense/mood accentual classes (1, 2, 4) with intransitive roots

Pattern 1 suffixes place morphological accent on the ultima of the stem and form iambic feet, while patterns 2 and 4 place accent on the penult and form trochaic feet. In the examples above, primary stress is isomorphic with morphological accent.

Additionally, another morphologically-assigned accent is found with the suffix *-ka* 3A, which encodes third person agreement ('argument indexation') and appears in morphological slot [+6] (see Figure 1 above). The suffix *-ka* assigns an accent to the initial syllable of the stem. This neutralizes the distinction between transitive and intransitive roots, and is consequently classified as 'dominant' (following Kiparsky & Halle 1977, Kiparsky 1984, Inkelas 1998). In all contexts in the examples below, the stem appears with an initial accent. [Note that these are hypothetical intermediate forms, never seen on the surface].

(19) Morphological accent with suffix #◌́…-*ka*

		Intransitive			Transitive		
a.	1σ	pa- + #◌́…-ka	→	**pá**-ka-	kwyá- + #◌́…-ka	→	**kwyá**-ka-
b.	2σ	besa- + #◌́…-ka	→	**bé**sa-ka-	baná- + #◌́…-ka	→	**bá**na-ka-
c.	3σ	towaa- + #◌́…-ka	→	**tó**waa-ka-	ishe'á- + #◌́…-ka	→	**í**she'a-ka-

We now have the ingredients to illustrate three stem types which can be modified by tense/mood suffixes: (i) intransitive roots (with no accent), (ii) transitive roots (with accent on final syllable), and (iii) roots with agreement *-ka* (with accent on the initial syllable). In the table below, for each stem and accentual class, both 2σ and 3σ roots are exemplified (note that *towaa* 'jump' and *ishe'a* 'wake up' are three syllables each, where '=[ʔ]).

	Stem type	Input: stem + T/M affix	Accent resolution	Iterative footing	Primary stress
1	Intrans.	besa + (◌◌́)-me	be**sá**-me	(be.**sá**).me	[beˈ**sa**me]
		towaa + (◌◌́)-me	towa**á**-me	to.(wa.**á**).me	[towaˈ**a**me]
	Trans.	ba**ná** + (◌◌́)-me	ba**ná**-me	(ba.**ná**).me	[baˈ**na**me]
		ishe**’á** + (◌◌́)-me	ishe**’á**-me	i.(she.**’á**).me	[isheˈ**’a**me]
	Root + *-ka*	**bá**na-ka + (◌◌́)-me	bana-**ká**-me	ba.(na.**ká**).me	[banaˈ**ka**me]
		íshe’a-ka + (◌◌́)-me	ishe’a-**ká**-me	(i.**shé**).(’a.ká).me	[iˈ**she**’akame]
2	Intrans.	besa + (◌́◌)-nahe	**bé**sa-nahe	(**bé**.sa).(ná.he)	[ˈ**be**sanahe]
		towaa + (◌́◌)-nahe	to**wá**a-nahe	to.(**wá**.a).(ná.he)	[toˈ**wa**anahe]
	Trans.	ba**ná** + (◌́◌)-nahe	ba**ná**-nahe	ba.(**ná**.na).he	[baˈ**na**nahe]
		ishe**’á** + (◌́◌)-nahe	ishe**’á**-nahe	(**í**.she).(’á.na).he	[ˈ**i**she’anahe]
	Root + *-ka*	**bá**na-ka + (◌́◌)-nahe	**bá**na-ka-nahe	(**bá**.na).(ká.na).he	[ˈ**ba**nakanahe]
		íshe’a-ka + (◌́◌)-nahe	**í**she’a-ka-nahe	(**í**.she).(’á.ka).(ná.he)	[ˈ**i**she’akanahe]
4	Intrans.	besa + (◌́◌)-he	**bé**sa-he	(**bé**.sa).he	[ˈ**be**sahe]
		towaa + (◌́◌)-he	to**wá**a-he	to.(**wá**.a).he	[toˈ**wa**ahe]
	Trans.	ba**ná** + (◌́◌)-he	ba**ná**-he	ba.(**ná**.he)	[baˈ**na**he]
		ishe**’á** + (◌́◌)-he	ishe**’á**-he	(**í**.she).(’á.he)	[ˈ**i**she’ahe]
	Root + *-ka*	**bá**na-ka + (◌́◌)-he	ba**ná**-ka-he	ba.(**ná**.ka).he	[baˈ**na**kahe]
		íshe’a-ka + (◌́◌)-he	ishe**’á**-ka-he	(**í**.she).(’á.ka).he	[ˈ**i**she’akahe]

Table 11: Iterative feet with leftmost foot receiving primary stress

The input consists of the stem (intransitive/transitive/root + *-ka*), plus a tense/mood suffix. If the stem and affix both sponsor an accent, only one may survive and the two accents compete. For tense/mood affixes of classes 1 and 4, the accent which would be rightmost in the output is the winner. For example, compare intransitive (a.), transitive (b.), and root + *-ka* (c.) stems with the class 4 suffix *–he* FUTURE. In (b.), if lexical accent were retained, the result would be ba**ná**-he; if we retained the affix’s morphological accent it would be **bá**na-he. The form whose accent would be rightmost in the output wins, namely ba**ná**-he.

(20)	Input		Accent competition (classes 1,4)				Winner	
a.	/besa + (◌́◌)-he/	→	**bé**sa-he			→	**bé**sa-he	(rightmost)
b.	/ba**ná** + (◌́◌)-he/	→	ba**ná**-he	vs.	**bá**na-he	→	ba**ná**-he	(rightmost)
c.	/**bá**na-ka + (◌́◌)-he/	→	**bá**na-ka-he	vs.	ba**ná**-ka-he	→	ba**ná**-ka-he	(rightmost)

The same logic holds for the minimally different input /**bá**na-ka + (◌́◌)-he/ in (c.), which comes in with initial accent on the stem. Resolution also favors the rightmost resulting in ba**ná**-ka-he.

In contrast, with the accentual class 2 suffix *-nahe* PAS, its morphological accent is only assigned if the stem has no accent already (a. below). If there is either lexical or morphological accent already present (b.-c.), then *-nahe* automatically loses its accentual properties, regardless of rightmost considerations. This type of behavior is classified as ‘recessive’ (Kiparsky 1984, Inkelas 1998), characterized as a pre-ordained ‘loser’ under accent competition (cf. dominant accent, which is the pre-ordained ‘winner’).

(21)	Input		Accent competition (class 2)			Winner
a.	/besa + (◌́◌)-nahe/	→	**bé**sa-nahe		→	**bé**sa-nahe
b.	/ba**ná** + (◌́◌)-nahe/	→	ba**ná**-nahe	(recessive pattern)	→	ba**ná**-nahe
c.	/**bá**na-ka + (◌́◌)-nahe/	→	**bá**na-ka-nahe	(recessive pattern)	→	**bá**na-ka-nahe

A summary of the morphologically sponsored accents introduced is in Table 12, which shows where accent is assigned to, which type of foot is formed (if applicable), and what its behavior is when there is accent competition. The circled numbers at left edge indicate the order in which these accents are assigned.

	Type		Example	Accent on	Foot	Competition behavior
①	Transitive		…◌́#	Ultima	-	-
②	Indexical		#◌́…-ka	Initial	-	Dominant (overrides inner accent)[14]
③	Tense/ Mood	1	(◌◌́)-me	Ultima	Iamb	Rightmost (rightmost accent wins)
		2	(◌́◌)-nahe	Penult	Troc.	Recessive (loses to any other accent)
		4	(◌́◌)-he	Penult	Troc.	Rightmost (rightmost accent wins)

Table 12: Summary of morphologically sponsored accents

With these properties in mind, we can return to Table 11. Following accent competition, iterative footing proceeds from the position of the winning accent, which acts as the anchor. After iterative footing, the leftmost accent is mapped to primary stress. From this mapping, primary stress always falls on the first, second, or third syllable of the word, and thus results in a L3σ stress window.

In total, verbs also demonstrate the same accent-to-stress mapping as nouns did in the previous section (albeit with more complicated accent competition). This algorithm derives the correct surface position of primary stress in the Ese Ejja simplex verb paradigm. Part of the attractiveness of this analysis of verb stress is that it uses a combination of familiar accent/stress principles: inherent accent, morphological accent assignment, multiple accent resolution, foot formation, and primary stress derived from an edgemost constraint. And crucially for this study, it shows several cases where primary stress appears on a position rhythmically dependent on the anchoring accent, e.g. ishe'a-**ká**-me mapping to [iˈ**she**'akame]. We now turn to complications of this system from complex verbs involving derivational morphology.

5.2 Stress in 'complex' verb forms: The role of transparadigmatic uniformity

In all of the data we have seen thus far, the domain to which accent is assigned are stems that contain only the root (of 1-3σ) or a root plus the inflectional agreement affix *-ka* 3A. These stems are relatively simplex and contain only one to two morphemes. Because Ese Ejja is a polysynthetic language, these stems are considerably smaller than the upper bound of morphemes which are allowed in a single stem. This occurs when the verb appears with derivational morphology, which is ubiquitous in the language both in terms of number of affixes/constructions and the frequency of occurrence on individual verb form tokens.

As stated, as a shorthand I call such stems with derivational morphology 'complex' and contrast this to 'simplex' forms with only inflectional morphology. I use the simplex vs. complex label only to differentiate these types of stems in terms of linear/structural size, and do not imply anything else about their complexity. As seen below, derivational morphology in complex forms increases the distance between primary stress at the *left* edge of the stem and the accent that stress is anchored to which is assigned by inflection towards the *right* edge.

[14] The fact that *-ka* is not dominant over outwardly-located inflectional affixes is in line with the general property of dominant phonological patterns to scope over only inwardly-located material. See Rolle (2018c) for a summary of relevant references, and a theoretical account.

(22) Shorthand labels for verb form classification:
  a. Simplex verbs: [STEM]-INFLECTION
  b. Complex verbs: [[STEM]-DERIVATION]-INFLECTION

The accent-to-stress mapping systematically does *not* apply in these complex verbs with derivational morphology.

Vuillermet (2012) originally pointed out that many derivational affixes have no direct effect on the position of stress (or have other anomalous effects). Let us first consider the derivational morphemes *-hya* and *-’yo* in (23).[15] Refer to Figure 1 for the template of morphological slots.

(23)	Deriv. affix	Gloss	Translation	Morphological slot
a.	*-hya*	go.away	associative motion marker (‘go, away’)	[+5]
b.	*-’yo*	TEL	telicity marker (‘completely’)	[+9]

To illustrate how the normal stress algorithm fails here, consider the data in Table 13. From this point forward, we will use several suffixes belonging to one of the three established accentual classes. Their semantics do not concern us here, only their phonology, which is identical within each class.

Example a. below shows *-hya* with the root *sipo* ‘blow (air)’ and the inflectional suffix *-me* POT1 ‘may, might’. Example b. shows *-’yo* with the root *kekwa* ‘pierce’ and the inflectional suffix *-kwe* IMP (IMPERATIVE).[16] Both are from accentual class 1 which assigns an accent to the ultima of the stem. Based on the accent-to-stress mapping, we expect the rightmost accent to win out during accent competition, followed by mapping to the expected stress position. In both cases, this predicts stress on the third syllable. However, such forms *[sipoˈ**hya**me] and *[kekwaˈ**’yo**kwe] are unattested; instead the surface forms are [siˈ**po**hyame] and [keˈ**kwa**’yokwe] (designated with a check mark below the unattested forms).

	Input (accentual class 1)	Expected Rmost	Expected footing	Expected stress
a.	si**pó** + -hya + (◌◌́)-me blow + go.away + POT1	*sipo-**hyá**-me	*si.(po.**hyá**).me	*[sipoˈ**hya**me] (cf. ✓ [siˈ**po**hyame])
b.	ke**kwá** + -’yo + (◌◌́)-kwe pierce + TEL + IMP	*kekwa-**’yó**-kwe	*ke.(kwa.**’yó**).kwe	*[kekwaˈ**’yo**kwe] (cf. ✓ [keˈ**kwa**’yokwe])
cf.				
c.	towaa + (◌◌́)-me	towa**á**-me	to.(wa.**á**).me	[towaˈ**a**me]
d.	ishe**’á** + (◌◌́)-me	ishe**’á**-me	i.(she.**’á**).me	[isheˈ**’a**me]
e.	**bá**na-ka + (◌◌́)-me	bana-**ká**-me	ba.(na.**ká**).me	[banaˈ**ka**me]

Table 13: Expected position of primary stress given algorithm from simplex verbs (class 1)

These three-syllable stems with derivational morphology (a.-b.) can be compared to other three-syllable stems in (c.-e.). In these latter cases, primary stress appears on the expected third syllable. This happens both in with stems consisting of 3σ roots (c.-d.), as well as stems with a 2σ root plus *–ka* 3A (e.).

The complications with derivational morphology are equally found with affixes of accentual classes 2 and 4. In Table 14 below, a. shows a stem with derivational *-’yo*. From the stress algorithm, we expect stress on the second syllable with class 2 *-nahe* (cf. b.). Instead it appears on the first syllable. Likewise, examples c.-d. show stems with both derivational *-hya* and

[15] Extended discussion on the meaning and function of these derivational morphemes is found in Vuillermet (2012:233,250-251,667ff.) for *-hya*, and (2012:194,251ff.,379,485) for *-’yo*.
[16] Together, *kekwa-’yo* means ‘kill (by piercing)’ (Vuillermet 2012:485).

inflectional -*ka*. These are shown with class 4 affixes -*he* FUTURE and -*aña* PRESENT, which have the same accentual behavior. With a 4σ stem (2σ root + DERIV + -*ka*), we expect stress to be on the first syllable in these cases (cf. e.). Instead it is found on the second syllable.

Class		Input	Expected footing	Expected stress
2	a.	besa + -'yo + (◌́◌)-nahe	be**sá**-'yo-nahe	*[beˈ**sa**'yonahe]
		bathe + TEL + PAS	be.(**sá**.'yo).(ná.he)	(✓ [ˈ**be**sa'yonahe])
	Cf.		tow**á**a-nahe	
	b.	towaa + (◌́◌)-nahe	to.(**wá**.a).(ná.he)	[toˈ**wa**anahe]
4	c.	**ó**ja + -hya + ka + (◌́◌)-he	oja-**hyá**-ka-he	*[ˈ**o**jahyakahe]
		spit + go.away + 3A + FUT	(**ó**.ja).(hyá.ka).he	(✓[oˈ**ja**hyakahe])
	d.	**sí**po + -hya + ka + (◌́◌)-aña	sipo-**hyá**-ka-aña	*[ˈ**si**pohyakaña]
		blow + go.away + 3A + PRES	(**sí**.po).(hyá.ka).(á.ña)	(✓[siˈ**po**hyakaña])
	Cf.		ishe**'á**-ka-he	
	e.	**í**she'a-ka + (◌́◌)-he	(**í**.she).('á.ka).he	[ˈ**i**she'akahe]

Table 14: Expected position of primary stress (classes 2, 4)

To account for these complex forms, we can employ stress uniformity as established for nouns already. The surface position of stress in complex forms with both inflectional and derivational morphology is identical to the position of stress in the equivalent simplex form which appears without derivational morphology. 'Equivalency' here is defined as (i) sharing the exact same inflection, and (ii) being a root of the same phonological and morphological type (i.e. same number of syllables, being transitive vs. intransitive). Here, we refer to it as '**transparadigmatic stress uniformity**'. This can be schematized as below:

(24) Ese Ejja transparadigmatic stress uniformity

a. Transparent application: Base [ROOT$_{\alpha\sigma}$]$_x$-INFL$_i$

b. Stress pattern copied from base: Derivative [ROOT$_{\alpha\sigma}$-DERIV]$_x$-INFL$_i$

[where ασ stands for roots of the same syllable count (and transitivity), *x* for identical primary stress, and *i* for identical inflection]

The first form is the base, where the accent-to-stress mapping is derived transparently. The second form is the derivative, which copies the pattern from the base if it shares an equivalent root of the same number of syllables (ασ) and the same inflection (INFL$_i$).

To see how this accounts for the surface stress patterns, consider the data in Table 15 below with accentual class 1 suffix -*me* (class 1). This table is split into two parts: the base and the derivative. Given that roots of the same syllable count and transitivity behave identically with respect to stress patterns, we can therefore render the base an abstract schematic representation, rather than an actual form (i.e. a base [σˈ**σ**-SFX$_1$] rather than a form like [siˈ**po**-me]). In this table, derivative surface forms such as [siˈ**po**-hya-me] and [sipo-ˈ**hya**-ka-me] match the position of stress in their counterpart bases [σˈ**σ**-SFX$_1$] and [σσ-ˈ**ka**-SFX$_1$] *without* derivational morphology.

Base (simplex verb – inflectional affixes only)		**Derivative** (derivational and inflectional affixes) **Attested form** (predicted from transpar. uniformity)	**Incorrect form** (predicted from accent-to-stress mapping)
Class 1 (◌◌́)-SFX1	[σˈ**σ**-me] (2nd syllable)	[siˈ**po**-hya-me]	*[sipo-ˈ**hya**-me]
		[daˈ**sya**-'yo-me]	*[dasya-ˈ**'yo**-me]
	[σσ-ˈ**ka**-me] (3rd syllable)	[sipo-ˈ**hya**-ka-me]	*[siˈ**po**-hya-ka-me]
		[ishwa-ˈ**ka**-'yo-me]	*[iˈ**shwa**-ka-'yo-me]

Table 15: Transparadigmatic uniformity predicts correct outputs[17]

The same results hold for all other portions of the verb paradigm, such as with inflectional suffixes *-nahe* (class 2), and *-he* (class 4). Class 2 examples show transparadigmatic uniformity with disyllabic intransitive and transitive roots, and the class 4 examples show uniformity with a disyllabic root with *-ka*.

Base (simplex - inflection only)		**Derivative** (complex – deriv. + infl.) **Attested form**	**Incorrect form**
Class 2 (◌́◌)-SFX2	Intrans: [ˈ**σ**σ-nahe] (1st syllable)	[ˈ**be**sa-'yo-nahe]	*[beˈ**sa**-'yo-nahe]
	Trans: [σˈ**σ**-nahe] (2nd syllable)	[baˈ**na**-'yo-nahe]	✓
Class 4 (◌́◌)-SFX4	[σˈ**σ**-ka-he] (2nd syllable)	[oˈ**ja**-hya-ka-he]	*[ˈ**o**ja-hya-ka-he]

Table 16: Transparadigmatic uniformity predicts correct outputs

Moreover, stress uniformity is equally present with multiple derivational markers, e.g. forms with both *-hya* and *-'yo*, shown below with class 2 *-nahe*:

Base (simplex verb)		**Derivative** (derivational and inflectional affixes)
Accentual class 2 (◌́◌)-SFX2	Trans: [σˈ**σ**-nahe] (2nd syllable)	siˈ**po**-hya-'yo-nahe woˈ**o**-hya-'yo-nahe oˈ**ja**-hya-'yo-nahe
	[ˈ**σ**σ-ka-nahe] (1st syllable)	ˈ**si**po-hya-ka-'yo-nahe ˈ**wo**o-hya-ka-'yo-nahe ˈ**o**ja-hya-ka-'yo-nahe

Table 17: Transparadigmatic uniformity with co-occurring derivational *-hya* and *-'yo*

A larger set of data which support transparadigmatic uniformity is provided in Table 25-Table 27 in the appendix. Taken all together, transparadigmatic uniformity accounts for the attested position of stress, but the 'normal' accent-to-stress algorithm predicts incorrect forms. This holds across stems of different syllable counts, the presence/absence of *-ka*, different derivational suffixes in distinct morphological slots, and the three accentual classes of tense/mood affixes.

[17] Roots in Table 15-Table 17 are *bana* 'sow X' (TV), *besa* 'bathe' (IV), *dasya* 'lie to X' (TV), *ishwa* 'wait for X' (TV), *oja* 'spit' (TV), *sipo* 'blow (air)' (TV), and *woo* 'get drunk' (IV).

5.3 Theoretical aspects of transparadigmatic stress uniformity

There are a number of important theoretical issues which transparadigmatic stress uniformity brings up. I briefly discuss some of them here, but cannot do them justice given their complexity. At various points, I refer the reader to relevant related literature.

First, I have dealt mainly in correspondence between a complex form consisting of root-derivation-inflection – i.e. [[[R]-D]-I] – and an equivalent simplex form [[R]-I]. A straightforward interpretation of these structures is that the linear order reflects morpho-syntactic hierarchy (Baker 1985); as such, the root is the most embedded unit and inflection the least. If we assume this basic structure, a reviewer asks at which point in the derivation (converting these hierarchical structures to phonological strings) does transparadigmatic stress uniformity apply?

Explicating this process is the focus of Rolle (2018a), employing Output-Output Correspondence (OO-Corr – Benua 1997, *inter alia*), and Rolle (2018b) incorporating OO-Corr with 'Agreement by Projection' (Hansson 2014), an offshoot of 'Agreement by Correspondence' (Rose & Walker 2004). In short, all outputs have the possibility of being in correspondence with morpho-phonologically related outputs from other derivations. But such a correspondence must be triggered by some morpheme within the input. Thus, in a structure [[[R]-D]-I], it is some idiosyncratic diacritic on 'I' which triggers the presence of a base [[R]-I] (or all members of this class 'I' – i.e. the tense/mood suffixes). Given correspondence between both structures, a constraint [αStress_Melody]$_{[\sqrt{\text{ROOT}}][\alpha\text{INFL}]}$ assesses uniformity of the stress melody; see Rolle (2018b) for detailed formalization and references. This constraint is assessed whenever the phonological mapping takes place which includes inflection. This could be cyclically (i.e. after internal [R] and [[R]D] cycles have applied), or non-cyclically.

Importantly, to refer *only* to cyclicity is insufficient to capture the Ese Ejja stress uniformity facts, e.g. via Stratal OT (Bermúdez-Otero 2008, Kiparsky 2015, *inter alia*). Rolle (2017) shows why strictly using cyclicity is unattractive for Ese Ejja derivational forms. First, in the data above it is the inflectional suffixes which assign accent to stems – they are accent triggers – while the derivational suffixes do not – they are inert/neutral. In Table 9, the derivative [sipo-ˈ**hya**-ka-me] corresponds to a base [σσ-ˈ**ka**-me]. In this example, stress is maintained on the third syllable, even though it falls on distinct morphemes (the derivational morpheme *–hya* versus the inflectional morpheme *–ka*). This demonstrates that derivational morphemes are *inert* but are still *visible* for prosodic operations, and therefore cannot be considered internally 'extrametrical'.

Given this, under strict cyclicity, this would imply the following set of operations. The root merges with inflection, and inflectional morphemes assign various accents to the root/stem subject to accent resolution. Next, this 'inflectional stem' merges with derivational morphemes. Although this merge order would be typologically marked, it is not completely unwarranted given that inflectional and derivational morphology are interleaved in Ese Ejja. However, secondary merger of derivational morphemes would require derivational morphemes to be both merged late *and* be interfixed between the root and inflectional material. Moreover, derivational morphemes would only be interfixed on the segmental tier and would not disrupt the suprasegmental tier (stress must be maintained on the third syllable). These three components – merging inflection before derivation, interfixing derivation, and interfixing strictly on the segmental tier – would be rare individually and exceptional if together. In Rolle (2017), this alternative is therefore rejected.[18]

[18] Additionally, a reviewer asks whether it is problematic that the morphological identity of affixes as 'derivational' or 'inflectional' must be still visible to the phonology. I contend that it is not, a position held by many across disparate theories. For one, sensitivity to morphosyntactic~morphological features is required for triggering allomorphy, even after phonological content has been inserted at the triggering morpheme (e.g. Gribanova & Harizanov 2017). Secondly, research at the phonology-phonetics interface has shown that string-identical but

5.4 More empirical support for transparadigmatic stress uniformity

Further empirical support for transparadigmatic stress uniformity involves verbal root reduplication, which functions to detransitivize transitive roots (Vuillermet 2012:246,437ff.). I refer to this as detransitivizing reduplication (glossed as REDUP). It appears in morphological slot [+1], directly adjacent to the head root. For example, *kwakwa* is a transitive verb 'to cook (something)', but under reduplication it has an intransitive meaning 'to be cooking (generally)'. In (25) below, intransitivity is reflected by the lack of 3rd person agreement *-ka* on the verb, and the absolute form of the argument (as opposed to one with ergative *=a*).

(25)	Ekwe = 'a'i	kwakwa-**kwakwa**-ani.	*Ekwe'a'i kwakwakwakwani*.
	my=elder.sister(ABS)	cook-**REDUP**-PRES	'My sister is cooking.' (Vuillermet 2012:437)

Detransitivizing reduplication all conform to transparadigmatic stress uniformity. This is shown in Table 18 with various 1σ and 2σ roots, where the reduplicant is boxed. In all cases, the position of primary stress on the equivalent base is matched in the detransitivizing reduplication. Note that in these cases the base is an intransitive root because the derivative is intransitive. No transitive base is possible.

	Base	Detransitivizing reduplication
	[ˈ**σ**-SFX1]	[ˈ**hyo**-hyo-me]
Class 1	[σ-ˈ**ka**-SFX1]	[hyo-ˈ**hyo**-ka-me]
(◌◌́)-SFX1	[σˈ**σ**-SFX1]	[kwaˈ**kwa**-kwakwa-me]
	[σσ-ˈ**ka**-SFX1]	[kwakwa-ˈ**kwa**kwa-ka-me]
Class 2	Intrans: [ˈ**σ**σ-SFX2]	[ˈ**kwa**kwa-kwakwa-nahe]
(◌́◌)-SFX2	[ˈ**σ**σ-ka-SFX2]	[ˈ**kwa**kwa-kwakwa-ka-nahe]
Class 4	Intrans: [ˈ**σ**σ-SFX4]	[ˈ**kwa**kwa-kwakwa-he]
(◌́◌)-SFX4	[σˈ**σ**-ka-SFX4]	[kwaˈ**kwa**-kwakwa-ka-he]

Table 18: Further support for transparadigmatic stress uniformity (detransitivizing reduplication)

More data involving detransitivizing reduplication is in the appendix.

Second, I introduce here new support based on sound recordings and data available in Vuillermet (2012), not previously established. These come from root incorporation, sometimes classified as verb compounds (Vuillermet 2012:369). Consider the complex transitive verb *okwekwahi* 'chase (someone), run after (someone)' in Table 19 below, which most likely derives historically from *o-* '3rd person (?)' + *kwe* 'come' + *kwahi* 'run' or 'quick' (Vuillermet 2012:498). In the modern grammar, this acts like a compound *okwe-kwahi*. As expected from stress uniformity, this compound copies the stress pattern of a 2σ transitive verb, shown below.

semantically unrelated morphs have phonetic differences (Plag *et al.* 2017, Seyfarth *et al.* 2018), e.g. English *–s* PLURAL vs. *–s* 3SG vs. *'s* POSS. This suggests that morphological identity is still available to the phonetics, and thus by extension the phonology. Moreover, distinguishing morphological identities is a major aspect of several theoretical developments, e.g. Colored Containment which "allows phonology to 'see' the morphological affiliation, i.e. the morphological color, of phonological elements" (Revithiadou 2007:151, also van Oostendorp 2007), Morphological Alignment (McCarthy & Prince 1993), and Indexed Constraint Theory (Pater 2000, 2007, among others).

Class	Base (2σ transitive root)			Incorporation: *okwe-kwahi* ‘chase (X)’
1	[σˈ**σ**-SFX1]	e.g.	[baˈ**na**-chana]	[oˈ**kwe**-kwahi-chana]
	[σσ-ˈ**ka**-SFX1]		[bana-ˈ**ka**-chana]	[okwe-ˈ**kwa**hi-ka-chana]
2	[σˈ**σ**-SFX2]		[baˈ**na**-nahe]	[oˈ**kwe**-kwahi-nahe]
	[ˈ**σ**σ-ka-SFX2]		[ˈ**ba**na-ka-nahe]	[ˈ**o**kwe-kwahi-ka-nahe]
4	[σˈ**σ**-SFX4]		[baˈ**na**-aña]	[oˈ**kwe**-kwahi-aña]
	[σˈ**σ**-ka-SFX4]		[baˈ**na**-ka-ani]	[oˈ**kwe**-kwahi-ka-ani]

Table 19: Support for transparadigmatic stress uniformity from incorporation

Table 20 further corroborates these findings involving a number of contexts with incorporates[19]. The leftmost column is the base (the equivalent simplex form with only inflectional morphology), shown for multiple types of stems and accentual classes. The right columns illustrate incorporated roots, which always appear in [-1] slot directly before the verbal root. Incorporated roots include verbs (*woo* ‘get drunk’, *haha* ‘cut’), nouns, and category-fluid roots (*kiyo* ‘hot’, ‘heat’, ‘be hot’). The rightmost column shows structures with both incorporates and other derivational morphology. All of these data support stress uniformity. The position of primary stress in the incorporated derivative precisely matches that of the base.[20]

	Base (2σ root)	Incorporation (+ -’yo)
Class 1	[σˈ**σ**-SFX1]	[daˈ**wa**-sasa-me]
(◌◌́)-SFX1	[σσ-ˈ**ka**-SFX1]	[dawa-ˈ**sa**sa-ka-’yo-me]
Class 2	Intrans: [ˈ**σ**σ-SFX2]	[ˈ**wo**o-mano-’yo-nahe]
(◌́◌)-SFX2	Trans: [σˈ**σ**-SFX2]	[daˈ**wa**-sasa-’yo-nahe]
	[ˈ**σ**σ-ka-SFX2]	[ˈ**da**wa-sasa-ka-’yo-nahe]
Class 4	Intrans: [ˈ**σ**σ-SFX4]	[ˈ**wo**o-mano-’yo-ani]
(◌́◌)-SFX4	Trans: [σˈ**σ**-SFX4]	[daˈ**wa**-sasa-aña]
	[σˈ**σ**-ka-SFX4]	[haˈ**ha**-weja-ka-’yo-ani]

Table 20: Further support for transparadigmatic stress uniformity (incorporation)

These data emphasize the main point here: if the stress algorithm applies to the complex input (e.g. the last form /haha-weja-ka-’yo-ani/ above) as it does in simplex forms, it predicts the wrong form. This is demonstrated in the step by step derivation below. If the accent-to-stress algorithm is applicable only to the simplex form /σσ-ka-ani/ (the base), stress on the morphologically-related complex form (the base) is accounted for by simply copying the position of primary stress. An incorrect surface form would be generated if the accent-to-stress algorithm were to apply transparently here.

[19] This is an abridged version of Table 28, found in the appendix. The meanings of the roots are provided there.
[20] A minority of tokens of incorporated [ROOT-ROOT] constructions show unexpected stress patterns. One is *sowi-kwaya* word-go.out(IV) which idiomatically means ‘to sing’ (Vuillermet 2012:518), whose stress patterns are below:
(i) Accentual class 1 [sowi-ˈ**kwa**ya-me] [sowi-ˈ**kwa**ya-ka-me]
(ii) Accentual class 2 [soˈ**wi**-kwaya-nahe] [ˈ**so**wi-kwaya-ka-nahe]
(iii) Accentual class 4 [soˈ**wi**-kwaya-ani] [ˈ**so**wi-kwaya-ka-ani]
Here, the position of primary stress does not match 2σ stems with intransitive or ditransitive roots. I leave these data aside. Importantly, they equally do not support transparent application of the accent-to-stress algorithm either. For example, class 1 in (i) is expected to be *[soˈ**wi**-kwaya-me] (cf. [iˈ**she**’a-ka-me] in Table 11).

	Base		Derivative (copying)	cf. Incorrect form
Morphemes:	σσ-ka-ani		haha-weja-ka-’yo-ani	haha-weja-ka-’yo-ani
Accents:	**σ́σ́**-ka-ani			**há**ha-weja-**ká**-’yo-ani
Rmost wins:	σ(**σ́**-ka)-ani		↓	haha-weja-(**ká**-’yo)-ani
Iterative feet:	σ.(**σ́**-ka)-(**á**.ni)			(**há**.ha)-(**wé**.ja)-(**ká**-’yo)-(a.ni)
Primary stress:	[σˈ**σ**-ka-ani]	→	[haˈ**ha**-weja-ka-’yo-ani]	*[ˈ**ha**ha-weja-ka-’yo-ani]

Table 21: Derivation of form with root incorporation

Another important observation should be made. In most of the examples of incorporation above, both the incorporate and the head root are two syllables, typical of Ese Ejja roots in general. However, there are several cases where the first is 1σ and the other 2σ, or vice versa. Examples are shown below:

(26) [1σ-2σ] compounds

a. *na-kwaya* blood-go.out ‘spit out blood’

b. *kwya-isa* hit-break ‘destroy’

c. *ba-’aja* see-in.vain ‘look for’ (lit. ‘try to see’)[21]

d. *ye-’aja* spy.on-in.vain ‘spy on’

(27) [2σ-1σ] compounds

shawa-ba spirit-see ‘remember, judge, consider, think, miss’

(e.g. also part of *ja-shawa-ba-ki* ‘to think about’)

These two compound types exhibit different stress patterns from one another, and both paradigms are distinct from stems with 3σ transitive and intransitive roots (cf. Table 11 above). In 1σ + 2σ compounds (Table 22), the correct base is a 1σ transitive verb. This is shown below with compounds *ye-’aja* ‘spy on’ and *sa-’aja* ‘look for’.

Class	Base: 1σ transitive verb		Derivative: [1σ-2σ] compound	
1	[ˈ**σ**-SFX$_1$]	[ˈ**kwya-**chana]	[ˈ**ye-**’aja-chana]	[ˈ**sa-**’aja-me]
	[σ-ˈ**ka**-SFX$_1$]	[kwya-ˈ**ka-**chana]	[ye-ˈ**’a**ja-ka-chana]	[sa-ˈ**’a**ja-ka-me]
2	[ˈ**σ**-SFX$_2$]	[ˈ**kwya-**nahe]	[ˈ**ye-**’aja-nahe]	[ˈ**sa-**’aja-nahe]
	[ˈ**σ**-ka-SFX$_2$]	[ˈ**kwya-**ka-nahe]	[ˈ**ye-**’aja-ka-nahe]	[ˈ**sa-**’aja-ka-nahe]
4	[ˈ**σ**-SFX$_4$]	[ˈ**kwya-**he]	[ˈ**ye-**’aja-he]	[ˈ**sa-**’aja-he]
	[ˈ**σ**-ka-SFX$_4$]	[ˈ**kwya-**ka-he]	[ˈ**ye-**’aja-ka-he]	[ˈ**sa-**’aja-ka-he]

Table 22: 1σ + 2σ compound

These patterns equally hold in complex forms with derivational morphemes -*hya* or -*’yo*, e.g. [ˈkwya-isa-hya-ka-nahe] (*kwya-isa* hit-break) or [ˈkwya-joha-ka-’yo-ani] (*kwya-joha* hit-peel).

Compare this to the [2σ-1σ] compounds. Here, the base is a *two*-syllable transitive verb for the compound *shawa-ba* spirit-see ‘remember’ (Table 23).

[21] I treat -*’aja* ‘in vain’ in these examples as a bound root. It is glossed as FRUSTRATIVE in Vuillermet (2012).

Class	Base: 2σ transitive verb		Derivative: [2σ-1σ] compound
1	[σˈ**σ**-SFX$_1$]	[baˈ**na**-chana]	[shaˈ**wa**-ba-chana]
	[σσ-ˈ**ka**-SFX$_1$]	[bana-ˈ**ka**-chana]	[shawa-ˈ**ba**-ka-chana]
2	[σˈ**σ**-SFX$_2$]	[baˈ**na**-nahe]	[shaˈ**wa**-ba-nahe]
	[ˈ**σ**σ-ka-SFX$_2$]	[ˈ**ba**na-ka-nahe]	[ˈ**sha**wa-ba-ka-nahe]
4	[σˈ**σ**-SFX$_4$]	[baˈ**na**-(a)ña]	[shaˈ**wa**-ba-(a)ña]
	[σˈ**σ**-ka-SFX$_4$]	[baˈ**na**-ka-ani]	[shaˈ**wa**-ba-ka-ani]

Table 23: 2σ + 1σ compound

As above, these patterns equally hold with -*hya*/-*'yo*, e.g. class 2 [shaˈ**wa**-ba-'yo-nahe] and [ˈ**sha**wa-ba-ka-'yo-nahe].

In this table, the verb *ba* 'see' is monosyllabic. Note that the base is disyllabic. This demonstrates that the identity of verbal root is not the relevant predictor of what will be the base. Instead, it is the first morpheme (the incorporated 2σ nominal root *shawa* 'spirit') which triggers the 2σ transitive verb base, even though it is not the head root.[22] Again, this pattern is predicted with the right characterization of transparadigmatic uniformity between simplex bases and complex derivatives.

5.5 Prospects and problems with stress uniformity

Given its success, transparadigmatic stress uniformity acts as the null hypothesis for further exploration of other derivational morphology. It is useful in making clear predictions for future research, and crucially it is falsifiable. The hypothesis is repeated below:

(28) Ese Ejja transparadigmatic stress uniformity
  a. Transparent application: Base [ROOT$_{\alpha\sigma}$]$_x$-INFL$_i$
  b. Stress pattern copied: Derivative [ROOT$_{\alpha\sigma}$-DERIV]$_x$-INFL$_i$

As it stands, the majority of derivational morphemes in Ese Ejja (which are extensive) have not been assessed with respect to this hypothesis.

At this point, there appear to be certain data which support stress uniformity, and other recalcitrant data which defy it. One potential piece of supporting evidence is from -*sá* DES (DESIDERATIVE) 'to want to'[23], which has inherent accent, as in (29) below (-*sá* triggers an auxiliary construction with *a*- 'do'):

(29) meemee owaya ijya-sa a-ka-ani. [...ijya-ˈ**sa**...]
  bee 3ERG eat-DES do-3A-PRS 'He wants to eat the bees.'
  (Vuillermet 2012:382 – SoFWA.029)

When further derivational material is added between the root and -*sá*, stress remains on the third syllable in all constructions. This is expected under transparadigmatic uniformity.

[22] No verb *shawa* exists in Vuillermet's (2012) grammar, nor is it found in her Ese Ejja toolbox lexicon.
[23] At this point, it is unclear whether -*sa* should be considered derivational or inflectional.

(30) Stress uniformity (Vuillermet 2012:382,384,389; Vuillermet field recordings)

a.	[ijya-ˈ**sa**]	eat-DES	'wants to eat'
b.	[ijya-ˈ**'yo**-sa]	eat-TEL-DES	'wants to eat completely'
c.	[ijya-ˈ**hya**-'yo-sa]	eat-away-TEL-DES	'…and carelessly'
d.	[ijya-ˈ**he**yo-hya-'yo-sa]	eat-finish-away-TEL-DES	'wants to finish eating (them) completely and carelessly'

Another place of potential support is with associated motion suffixes -*ki* 'go to do' and -*wa* 'come to do', whose stress patterns are sketched in Vuillermet (2012:251ff.).

On the other hand, certain patterns do *not* comply with transparadigmatic stress uniformity, such as the causative -*mee* CAUS, and the middle voice valency-decreasing circumfix *ja-…-ki*. I suspect their anomalous behavior may (in part) be attributed to transitivity-triggered accent changes, which we have established as a core factor governing surface stress. Crucially, neither of these patterns supports straightforward stress assignment either, whether of the accent-to-stress algorithm, stress uniformity, or some other transparent process.[24]

6 Discussion: Connecting polysynthesis, stress uniformity, and long-distance anchor dependencies

There are multiple streams in this chapter, namely polysynthetic structure, transparadigmatic stress uniformity, opposite-to-anchor systems, and long-distance anchor dependencies. They can be connected as in the table below. Imagine a hypothetical polysynthetic language with an stress window at some edge. The first part of this table states that simplex forms are expected to be more common in analytic languages, and complex more common in polysynthetic ones (i.). With respect to locality conditions, the average anchor dependency between accent and stress would be smaller in analytic systems and larger in polysynthetic languages (ii.).

		Simplex (ROOT-INFL)	Complex (ROOT-DERIV-INFL)
(i.)	Expected more common:	in analytic languages	in polysynthetic languages
(ii.)	Anchor dependencies:	(more) local	(more) long-distance
(iii.)	Stress in Ese Ejja due to:	opposite-to-anchor system	transparadigmatic uniformity
	Procedure:	accent-to-stress mapping	stress copied from simplex form

Table 24

The hypothesis I would like to propose inextricably links these parts (i.-ii.) to (iii.): stress is Ese Ejja complex forms displays transparadigmatic uniformity in complex forms in order to avoid a long-distance dependencies. This hypothesis is stated below.

(31) **Hypothesis**: Transparadigmatic uniformity in the polysynthetic language Ese Ejja is a response to avoid long-distance anchor dependencies

[24] I am aware of several tokens involving the derivational morphology introduced in this chapter which also do not conform to the predictions of stress uniformity. Some variation is expected given the complexity of this system and its interacting factors. Some examples with unexpected stress are the following:

(i) [haa-ˈ**ba**-ñaki-nahe] lie-look.at-come.to.do-PAS (Vuillermet materials – KaPey.039)
(uniformity predicts stress on 1st σ)

(ii) [ˈ**hyo**ji-kea-ka-ani] foot-cover.TV-3a-PRES 'block (our) trail' (Vuillermet 2012:273 – KaPey.032)
(uniformity predicts stress on 2nd σ)

(iii) [ˈ**do**ho-mahamaha-pahya-ka-ani] take-ITER-stop-3A-PRES (Vuillermet materials – elicited)
(uniformity predicts stress on 2nd σ)

Vuillermet also points out atypical stress patterns with the 4σ root *homishoka* 'rest' (2012:232), and several other irregularly-stressed roots (Vuillermet 2012:253ff.).

In other words, the presence of transparadigmatic uniformity in exactly those contexts where they would (on average) exhibit greater long-distance dependencies is *not* taken to be incidental.

To unpack the reasoning here, let us return to the more familiar opposite-to-anchor systems: the Australian Aboriginal 'word parity' stress systems, where the position of primary stress depends on if there is an odd or even syllable count. Recall the famous example from Warrgamay in (5) above, which shows stress on the 1st syllable with a 4σ-word (e.g. (**gíɟ**a)(**wú**lu) → [ˈ**giɟ**aˌwulu]), but stress on the 2nd syllable in a 5σ-word (e.g. ɟu(**ɽá**gay)-(**mí**ri) → [ɟuˈ**ɽa**gayˌmiri]).

As stated in section 2.1, it is well known that opposite-to-anchor systems are very rare, established at least since van der Hulst (1984:178-180). Across the literature, it is widely accepted that there is significant correlation between "the edge at which footing starts and the edge at which main stress is located" (Goedemans 1998:124). We can refer to this as a **'default-to-same' bias** in stress systems. This bias is demonstrated in several publications laying out typological findings in a large cross-linguistic surveys (e.g. Gordon 2002, various incarnations of *StressTyp* – Goedemans *et al.* 1996, Goedemans & van der Hulst 2009, *inter alia*). For example, in a sample of 155 languages in Goedemans (2010), the majority showed alignment between the side of primary stress and the direction of parsing (shown to be statistically significant in Staubs 2014a). Most exceptions are "bidirectional stress systems", whereby a foot is placed opposite the start of iteration, and other feet iterate towards this "opposite-edge" foot (Staubs 2014a:428-429). Importantly, in such cases there are no word-parity effects. Eliminating bidirectional systems leaves only "15 of 158 iterative stress languages included in StressTyp", several of which are Arabic varieties (e.g. Negev Bedouin Arabic [avl] – Blanc 1970, Hayes 1995:226ff.).

Staubs (2014a,b) proposes an account to explain the default-to-same bias via a probabilistic, learning-based model (implemented in Maximum Entropy – Goldwater & Johnson 2003). A critical part of his argumentation involves the role of 'learning biases' in stress typology, which he explains as follows (Staubs 2014a:430):

> *"Languages obeying the primary first tendency have an advantage in learning: stress data is more self-consistent…. Biases in learning can lead to biases in typology. One way in which this could happen is iterated learning (e.g. Kirby et al., 2007; Griffiths & Kalish, 2007). In this perspective learners impose their learning bias on the data they receive from teachers and then pass this biased result on to future generations. Successive generations receive biased data and bias it still further, eventually yielding languages which can be very dissimilar from the starting patterns. The languages which are likely to survive or be innovated in such a model are those which are better learned, accounting for greater typological frequency for such patterns."*

In short, Staubs' main point is that patterns may be more accurately learned and replicated if they are more 'self-consistent', and inconsistent systems would be more likely to be purged. Plausibly, such a scenario playing out over numerous languages and linguistic generations would eventually result in a set of systems which exhibit a default-to-same bias. This matches the typological findings.[25]

Staubs' learning-based models are aimed at edge-based opposite-to-anchor systems, the details of which I will not lay out here. Importantly, if we accept his interpretation as sketched

[25] The default-to-same bias is part of a general trend for prosodic systems to refer to the same edge of a word. For example, compare our discussion to another type of opposite-edge phenomenon (also rare): 'default-to-opposite' quantity-sensitive stress systems (Zoll 1997, Gordon 2000, 2002), in which the default side for assigning stress depends on whether a syllable is heavy or light. As characterized by Gordon (2000:101), these are said to be languages "with default-to-opposite stress place stress on the *rightmost* heavy syllable, otherwise on the *leftmost* syllable in words with only light syllables" (italics mine), or vice versa. Gordon explicitly reanalyzes the known cases of default-to-opposite systems, raising serious doubt regarding the existence of such systems generally.

above, we can characterize such opposite-to-anchor systems as being typologically unstable. If such systems are unstable, then it seems reasonable to conclude that those systems additionally involving non-local accent anchors (as in Ese Ejja) would be equally if not more unstable. This would especially be the case given the many 'moving parts' of Ese Ejja stress, e.g. morphologically-conditioned iambic/trochaic contrast, morphologically-conditioned accent resolution, *etc*. It is therefore reasonable to conclude that some learners would simply regularize the stress patterns in a part of their grammar and avoid this situation (hence the rarity of a system like Ese Ejja).

It is reasonable to conclude therefore that in some point in the history of Ese Ejja, there was (i) a desire to keep the accent-assigning properties of inflectional suffixes, but also (ii) a desire to avoiding long-distance dependencies which they might produce. The resolution was that complex words with derivational and inflectional morphology crossed a threshold where simply copying stress from a more simplex form was favored. In contrast, simplex words with only inflection did not rise to this level.

Importantly here, what I am sketching is a diachronic development in the language. Specifically, this development targeted all members within the relevant class. In other words, *all* complex forms began to pattern one way and *all* simplex forms another way. To explain, consider the data in (32). The simplex form (a.) contains only inflection, while the complex form (b.) has mixed inflectional (-*kwe*) and derivational morphology (-*'yo*). They are equally long in terms of number of morphemes, and the simplex from is in fact longer in terms of number of syllables (6 vs. 3).

(32)

a.	Simplex:	ishe'a-ka-chana	[iˈ**she**'a-ka-chana]
		wake.up-3A-APRH	'watch out, he might wake up'
b.	Complex:	pwe-'yo-kwe	[ˈ**pwe**-'yo-kwe]
		come-TEL-IMP	'come!'

Regardless of size, the accent-to-stress mapping applies the same to larger simplex forms as to smaller ones. Likewise, stress uniformity applies the same to smaller complex forms as to larger ones (i.e. uniformity to [ˈ**pwe**-kwe]; cf. 2σ simplex [beˈ**sa**-kwe]). The application of one prosodic algorithm or another is *not* decided based on the length of the word on a case-by-case basis[26].

In a way, the suspension of the accent-to-stress model in more complex forms complies with the top-down 'Primary First' model of van der Hulst (1984, 1996, 2012, *inter alia*). This model proposes that primary stress is assigned first, with secondary rhythmic beats assigned only afterwards, parasitic on this primary stress position. While the accent-to-stress algorithm in simplex forms clearly contradicts the Primary First model (being a bottom-up 'count system'), it is possible to interpret transparadigmatic stress uniformity as actually being in line with it. Under uniformity, primary stress is 'first' in the sense that it bypasses all other prosodic conditions: stress is assigned simply by copying that of another form.

7 Conclusion

This chapter has asked the following question: can the size of a word affect which stress algorithm applies to it? I presented a case from Ese Ejja which answers this in the affirmative: morphologically simplex words are subject to one stress algorithm, while equivalent but morphologically complex words are subject to another. These differences are due to internal morphological structure and not some other factor (e.g. phonology).

[26] I thank an anonymous reviewer for emphasizing this point to me.

I have shown that in Ese Ejja, in simplex forms one (or more) inflectional affixes assign accent to a position in the stem, which is systematically mapped to primary stress. Within this accent-to-stress mapping, the location of primary stress will be at the left edge of the word but the triggering suffix will be towards the right edge. I characterized this as an ‘opposite-to-anchor’ system.

In contrast, this mapping does not occur with sufficiently complex forms, here constituting those words with both inflectional and derivational morphology (cf. simplex with only inflection). Because Ese Ejja is a polysynthetic language, a large number of intervening morphological slots appear between the root at the left edge and inflectional suffixes towards the right edge, filled with derivational morphology. If the accent-to-stress mapping applied transparently in such cases, this would have the propensity to create ‘long-distance anchor dependencies’. This chapter has argued that Ese Ejja conspicuously avoids this situation by suspending accent-to-stress mapping in all sufficiently complex forms.

For example, (a.) below is a simplex form, where the accent-to-stress algorithm proceeds transparently. In an equivalent complex form with derivational morphology in (b.), instead of the accent-to-stress mapping applying, the surface position of primary stress is simply copied over from (a.).

(33)	a.	ha**há**-nahe	→	ha.(**há**-na).he	→	[haˈ**ha**-nahe]	‘(I) cut’ (PAST)
	b.	sapa-haha-weja-hya-’aja-nahe			↘	[saˈ**pa**-haha-weja-hya-’aja-nahe]	
		head-cut.TV-open-DEPR-in.vain-PAS				‘…tried to violently cut its head off…’	

I referred to this as ‘transparadigmatic stress uniformity’, and interpreted its presence in complex Ese Ejja forms as a response to avoid long-distance anchor dependency. This avoidance was tied to the rarity of opposite-to-anchor systems (such as ‘count systems’) in general, and the general bias in stress systems for default-to-same-edge properties (van der Hulst 1984, 1996, 2012, Goedemans 1998, Gordon 2000, 2002, Staubs 2014a,b, *inter alia*).

As it stands, given the success of transparadigmatic stress uniformity in accounting for forms with derivational morphology in Ese Ejja, I take it to be the null hypothesis for future research, as it makes clear predictions and is falsifiable. It is my hope that this chapter might inspire such an undertaking.

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10 Appendix

Table 25-Table 27 below provide additional evidence for transparadigmatic uniformity in Ese Ejja. Derivational morphology below are detransitivizing root reduplication REDUP, the associative motion marker -*hya* 'go, away', and the telicity marker -*'yo* TEL 'completely'. They are boxed to easily identify such suffixes. In each case, primary stress is in bold.

	Base (simplex verb – inflection only)	**Derivative** (derivational and inflectional affixes) ROOT$_{[0]}$-DER$_{[+1]}$-DER$_{[+5]}$-INFL$_{[+6]}$-INFL$_{[+8]}$-DER$_{[+9]}$-INFL$_{[+11]}$	
		Attested form (predicted from transparadigmatic uniformity)	**Incorrect form** (predicted from accent-to-stress mapping)
Accentual class 1 (◌́◌)-SFX$_1$	[ˈ**σ**-SFX$_1$] (1st syllable)	[ˈ**hyo**-hyo-me]	*[ˈhyo-ˈ**hyo**-me]
		[ˈ**hyo**-hyo-chana]	*[ˈhyo-ˈ**hyo**-chana]
		[ˈ**mo**-hya-me]	*[mo-ˈ**hya**-me]
		[ˈ**pwe**-’yo-kwe]	*[pwe-ˈ**’yo**-kwe]
	[σ-ˈ**ka**-SFX$_1$] (2nd syllable)	[hyo-ˈ**hyo**-ka-me]	*[hyo-hyo-ˈ**ka**-me]
		[hyo-ˈ**hyo**-ka-chana]	*[hyo-hyo-ˈ**ka**-chana]
		[mo-ˈ**hya**-ka-me]	*[mo-hya-ˈ**ka**-me]
		[hya-ˈ**ka**-’yo-me]	*[hya-ka-ˈ**’yo**-me]
	[σˈ**σ**-SFX$_1$] (2nd syllable)	[kwaˈ**kwa**-kwakwa-chana]	✓
		[siˈ**po**-hya-me]	*[sipo-ˈ**hya**-me]
		[oˈ**ja**-hya-chana]	*[oja-ˈ**hya**-chana]
		[daˈ**sya**-’yo-me]	*[dasya-ˈ**’yo**-me]
		[waˈ**na**-’yo-kwe]	*[wana-ˈ**’yo**-kwe]
	[σσ-ˈ**ka**-SFX$_1$] (3rd syllable)	[kwakwa-ˈ**kwa**kwa-ka-chana]	✓
		[sipo-ˈ**hya**-ka-me]	*[siˈ**po**-hya-ka-me]
		[oja-ˈ**hya**-ka-chana]	*[oˈ**ja**-hya-ka-chana]
		[ishwa-ˈ**ka**-’yo-me]	*[iˈ**shwa**-ka-’yo-me]
		[ijya-ˈ**ka**-’yo-chana]	*[iˈ**jya**-ka-’yo-chana]

Table 25: Transparadigmatic uniformity predicts correct outputs (accentual class 1)[27]

[27] Verb roots in these three tables are: *ba* ‘see X’ (TV), *besa* ‘swim’ (IV), *dasya* ‘lie to X’ (TV), *dawa* ‘grill X’ (TV), *hya* ‘throw X’ (TV), *hyo-* ‘walk’ (IV) (bound root, must be reduplicated), *ijya* ‘eat X’ (TV), *ishwa* ‘wait for X’ (TV), *kwakwa* ‘cook X’ (TV), *mo* ‘bury X’ (TV), *oja-* ‘spit’ (TV) (bound root, must appear with *-hya*), *poki* ‘go’ (IV), *pwe* ‘come’ (IV), *saha’a* ‘answer’ (TV), *sipo* ‘blow (air)’ (TV), *wana* ‘lay, marry’ (IV).

	Base (simplex verb – inflection only)	**Derivative** (derivational and inflectional affixes) ROOT[0]-DER[+1]-DER[+5]-INFL[+6]-INFL[+8]-DER[+9]-INFL[+11]	
		Attested form (predicted from transparadigmatic uniformity)	**Incorrect form** (predicted from accent-to-stress mapping)
Accentual class 2 (◌́◌)-SFX2	[ˈ**σ**-SFX2] (1st syllable)	[ˈ**hyo**-hyo-nahe]	✓
		[ˈ**mo**-hya-nahe]	✓
		[ˈ**kwya**-’yo-nahe]	✓
	[ˈ**σ**-ka-SFX2] (1st syllable)	[ˈ**hyo**-hyo-ka-nahe]	✓
		[ˈ**mo**-hya-ka-nahe]	✓
		[ˈ**kwya**-ka-’yo-nahe]	✓
	Intrans: [ˈ**σ**σ-SFX2] (1st syllable)	[ˈ**kwa**kwa-kwakwa-nahe]	✓
		[ˈ**be**sa-’yo-nahe]	*[beˈ**sa**-’yo-nahe]
	Trans: [σˈ**σ**-SFX2] (2nd syllable)	[siˈ**po**-hya-nahe]	✓
		[baˈ**na**-’yo-nahe]	✓
	[ˈ**σ**σ-ka-SFX2] (1st syllable)	[ˈ**si**po-hya-ka-nahe]	✓
		[ˈ**i**shwa-ka-’yo-nahe]	✓
	Trans: [ˈ**σ**σσ-SFX2] (1st syllable)	[ˈ**sa**ha’a-’yo-nahe]	✓
	[ˈ**σ**σσ-ka-SFX2] (1st syllable)	[ˈ**sa**ha’a-ka-’yo-nahe]	✓

Table 26: Transparadigmatic uniformity predicts correct outputs (accentual class 2)

	Base (simplex verb – inflection only)	**Derivative** (derivational and inflectional affixes) ROOT[0]-DER[+1]-DER[+5]-INFL[+6]-INFL[+8]-DER[+9]-INFL[+11]	
		Attested form (predicted from transparadigmatic uniformity)	**Incorrect form** (predicted from accent-to-stress mapping)
Accentual class 4 (◌́◌)-SFX4	[ˈ**σ**-SFX4] (1st syllable)	[ˈ**hyo**-hyo-ani]	✓
		[ˈ**hyo**-hyo-he]	✓
		[ˈ**mo**-hya-he]	✓
		[ˈ**pwa**-he-’yo]	✓
	[ˈ**σ**-ka-SFX4] (1st syllable)	[ˈ**hyo**-hyo-ka-ani]	*[hyo-ˈ**hyo**-ka-ani]
		[ˈ**hyo**-hyo-ka-he]	*[hyo-ˈ**hyo**-ka-he]
		[ˈ**ba**-ka-’yo-ani]	*[ba-ˈ**ka**-’yo-ani]
	Intrans: [ˈ**σ**σ-SFX4] (1st syllable)	[ˈ**kwa**kwa-kwakwa-ani]	✓
		[ˈ**kwa**kwa-kwakwa-he]	✓
		[ˈ**po**ki-he-’yo]	✓
	Trans: [σˈ**σ**-SFX4] (2nd syllable)	[siˈ**po**-hya-aña]	✓
		[oˈ**ja**-hya-he]	✓
	[σˈ**σ**-ka-SFX4] (2nd syllable)	[kwaˈ**kwa**-kwakwa-ka-ani]	✓
		[kwaˈ**kwa**-kwakwa-ka-he]	✓
		[oˈ**ja**-hya-ka-he]	*[ˈ**o**ja-hya-ka-he]
		[siˈ**po**-hya-ka-aña]	*[ˈ**si**po-hya-ka-aña]
		[daˈ**wa**-hya-ka-ani]	*[ˈ**da**wa-hya-ka-ani]
		[keˈ**kwa**-ka-he-’yo]	✓

Table 27: Transparadigmatic uniformity predicts correct outputs (accentual class 4)

Further, Table 28 provides support for transparadigmatic stress uniformity from root incorporation.

	Base	Incorporate	Incorporate + -hya/-’yo
Class 1 (○○́)-SFX1	[σˈ**σ**-SFX1] (2nd syllable)	[daˈ**wa**-woje-kwe] [daˈ**wa**-sasa-me]	[none available]
	[σσ-ˈ**ka**-SFX1] (3rd syllable)	[dawa-ˈ**sa**sa-ka-me] [dawa-ˈ**wo**je-ka-chana]	[dawa-ˈ**sa**sa-ka-’yo-me] [dawa-ˈ**wo**je-ka-’yo-me]
Class 2 (○́○)-SFX2	Intrans: [ˈ**σ**σ-SFX2] (1st syllable)	[ˈ**sa**pa-’oshe-nahe] [ˈ**ki**yo-wo’o-nahe]	[ˈ**wo**o-mano-’yo-nahe]
	Trans: [σˈ**σ**-SFX2] (2nd syllable)	[daˈ**wa**-sasa-nahe]	[daˈ**wa**-sasa-’yo-nahe]
	[ˈ**σ**σ-ka-SFX2] (1st syllable)	[ˈ**da**wa-sasa-ka-nahe]	[ˈ**da**wa-sasa-ka-’yo-nahe] [ˈ**da**wa-hoka-ka-’yo-nahe] [ˈ**ha**ha-weja-ka-’yo-nahe]
Class 4 (○́○)-SFX4	Intrans: [ˈ**σ**σ-SFX4] (1st syllable)	[ˈ**ne**ki-diyo-ani]	[ˈ**wo**o-mano-’yo-ani]
	Trans: [σˈ**σ**-SFX4] (2nd syllable)	[daˈ**wa**-sasa-aña] [haˈ**ha**-poho-aña]	[none available]
	[σˈ**σ**-ka-SFX4] (2nd syllable)	[daˈ**wa**-sasa-ka-ani]	[haˈ**ha**-seja-hya-ka-ani] [iˈ**sa**-weja-hya-ka-ani] [iˈ**ña**-jata-ka-’yo-ani] [haˈ**ha**-weja-ka-’yo-ani]

Table 28: Support for transparadigmatic stress uniformity from root incorporation[28]

[28] Compounds in this table are: *dawa-woje* grill-? ‘to light’ (e.g. of candles), *dawa-sasa* grill-destroy ‘to singe, scorch’, *sapa-’oshe* get.white.hair-be.white ‘white-haired’, *kiyo-wo’o* heat-be.red ‘become red from heat’, *woo-mano-’yo* get.drunk-die, *dawa-hoka* grill-be.dry, *haha-weja* cut.apart-open, *neki-diyo* stand-?, *haha-poho* cut-divide ‘cut and divide’ (e.g. of firewood), *haha-seja* cut-pull.apart, *isa-weja* tear-open, *iña-jata* grab-press ‘squeeze’ (e.g. of fruit).