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UC Berkeley PhonLab Annual Report

Title

Ese Ejja Accent

Permalink

<https://escholarship.org/uc/item/8r59185c>

Journal

UC Berkeley PhonLab Annual Report, 9(9)

ISSN

2768-5047

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Publication Date

2013

DOI

10.5070/P78r59185c

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Ese Ejja is a Takanan language spoken in the Bolivian Amazon. This study presents a description and analysis of stress accent on nouns and verbs, arguing for a specific representation of these data, and positing a limited OT account. Data come from Vuillermets’s (2012) PhD dissertation - hereafter referred to as (V:page number) - who presents an extensive description and organization of these accent facts, documenting approximately 2,000 verb forms. Most words in Ese Ejja have a single primary accent (synonymous here with “stress”), which falls on one of the first three syllables of the word, whose consistent phonetic correlate is high pitch. Ese Ejja has distinct accent patterns on nouns versus verbs, showing phonological patterns differing by part of speech. Accent placement depends on a complex interaction of factors, based on (1) inherent accent of a word, (2) accent assignment from affixes/clitics, (3) accent assignment based on part of speech, (4) rules of accent clash resolution, (5) rules of (trochaic) footing, (6) rules of directionality, and (7) restrictions on the primary stress (word stress) window. [Transcription note: I use σ to indicate primary stress, and σ secondary, rather than ' and ,]

Relevant phonology background

Ese Ejja has four monophthong phonemes /i e a o/, and three (rising) diphthongs /ja̯ jo̯ oe/, written as <ya>, <yo>, and <we> respectively; contrastive falling diphthongs (e.g. [aĩ]) do not exist. Vowel length is not contrastive, and adjacent vowel-vowel sequences are pronounced separately (V:172). The canonical syllable structure is (C)V; underlying codas do not exist. The only surface codas are glides which result from vowel-vowel sequences, e.g. /mei/ “stone” [méj]. Cliticization reveals these vowels as underlying heterosyllabic, e.g. /mei=a/ “strone=INSTR” [meía] (*[méja]) (V:177-8).

Noun Accent²

In order to understand both noun and verb accent, we must distinguish between three types of (surface) accents. One type is an **inherent accent** on a syllable, specified in the lexical entry of a morpheme (an unpredictable accent). A second type is **assigned accent**, an accent which is assigned to a specific part of a morpheme by an accompanying affix/clitic, by construction, and/or due to its use as a particular part of speech. A third type is **footing accent**, an accent which falls on a syllable based on the trochaic footing algorithm, applying subsequent to the first and second types. These are shown in example (0). In (0a), *bishé* has inherent accent on /she/. In contrast, in (0b), the clitic =*nixe* assigns an accent to the final syllable of the noun *iñawewa*, which then based on footing assigns stress two syllables away, on /ña/.

¹ This manuscript owes much to discussion with Marine Vuillermets (first and foremost), Zach O’Hagan, and Sharon Inkelas.

² These data come from (V:200-205). I will not discuss noun compounds (e.g. noun+adj), or the *e*-noun class, e.g. *esé* “tooth”, *esháxa* “ear”, *emekíshe* “nail”, in which the *e*- here is best analyzed as extra-metrical.

As this example shows, this set of proclitics assigns an accent to the first syllable of the noun, after which footing rules apply, and the rightmost accented syllable within the 3σ-window receives word accent, shown in (5). As above, assigned accent is bold and underlined.

- | | | | | |
|----|--------------------------|---------------------------|---------------------------|---------------------------|
| 5. | [. x] _N | [. x] _N | [. x] _N | [. x] _N |
| | (x .)(<u>x</u>) | (x .)(<u>x</u> .) | (x .)(<u>x</u> .) | (x .)(<u>x</u> .) |
| | ekwe=ké | ekwe='á'i | ekwe=táwoo | ekwe=iñawewa |
| | “my field” | “my elder sister” | “my bottle” | “my dog” |

Finally, the interaction between proclitics and enclitics shows perhaps the most interesting behavior. When the proclitic *ekwe=* appears with a case/prepositional enclitic, the primary accent appears on the last syllable of the possessive proclitic, as in (6a)⁵.

- | | | | | | |
|----|----|--|----------------------|-----------------------|-------------------------|
| 6. | a. | ekwé =ke=jo | ekwé =’a’i=ke | ekwé =tawoo=jo | ekwé =iñawewa=ke |
| | | “in my field” | “to my elder sister” | “in my bottle” | “to my dog” |
| | b. | eséja=bàba=kwàna | | | |
| | | 1.incl.gen=grandfather=PL “our ancestors” (V:708) | | | |
| | c. | ese <u>jà</u> =babà=a | | | |
| | | 1.incl.gen=grandfather=ERG “our ancestors (Erg)” (V:709) | | | |

Exs (6b,c) exemplify this contrast. Example (6b) show that the 1st person inclusive genitive proclitic also assigns stress to the first syllable of the noun (after which footing rules apply, resulting in primary stress falling on the “peninitial” σ [se]); the clitic =*kwana* PL assigns no accent. In contrast, (6c) shows that stress falls on the final syllable of the possessive proclitic [ja], which I interpret as showing that case/prepositional enclitics assign accent to the first sub-constituent of the noun phrase. This entails that [1] accent assignment from the enclitic targets (non-local) sub-constituents of the noun phrase (NP), [2] the targeted sub-constituent is the leftmost one of the NP (showing these sub-constituents can be non-local), and [3] the assigned accent from the enclitic erases any accent assigned by the proclitic. An example is shown in (7); the non-attested form of the word is in (7b), whose ungrammaticality suggests accent erasure. The assigned accent in (7a) by *a=* to *eseja=* is bold and underlined.

- | | | | | |
|----|----|------------------------------|----|---|
| 7. | a. | [. x] _N | b. | |
| | | (x .)(<u>x</u> .) | | <u>x</u> |
| | | ese <u>jà</u> =babà=a | | *eséja=bàba=a ← Non attested accent from proclitic to N |

If the case marker =*a* assigned accent “blindly” to the noun phrase, we might expect it to uniformly fall on the rightmost final syllable, though (6a) above shows this is not the case.

Verb accent

The accent rules in the verbal domain are not identical as the nominal domain. As discussed in (V:224-289), the following dimensions affect the realization of verb accent: [1] transitivity of the verb, [2] the number of syllables of the verb, [3] the type of affix on the verb, [4] the presence of derivational morphemes, and [5] the presence of a the pronominal index

⁵ As noted in (V:203), this accent location appears to be the same for other possessive proclitics, e.g. *oja=* ‘his, her’ in *ojá=ano=jo* ‘at her grandmother’s’, although not all possible combinations have been confirmed.

In order to posit observationally adequate generalizations of these paradigms, I understand these data as involving a number of parameters. This is summarized in the Appendix table in (14) on page 10. One parameter which this table shows is which morphemes have inherent accents and which morphemes assign accent. I posit that transitive verbs have inherent accent on the final syllable of the verb root. We can see from Accent Paradigm 2 (Appendix, page 10) that (aside from Group 1) most forms have an accent on either the final or 2 from final syllable on the verb root. The exceptions to this are the disyllabic transitive verb root *bana*, which I will argue has to do with stress clash resolution⁷.

Further, I also posit that certain affixes assign accent. Affix group 1 assigns accent to the final σ of the micro-stem (V+*ka*), and overwrites any other accent. Affix group 2a assigns an accent to the penult of the verb root, whereas affix group 2b assigns an accent to the final syllable of the micro-stem. Both affix groups 3a and 3b assign an accent to the penult of the micro-stem. As mentioned above, these different affixes also license different types of 3σ -word accent windows. Group 1 assigns a word accent window which targets the rightmost foot accent within the window (like nominal accent seen above), whereas groups 2 and 3 assign a word accent window which targets the leftmost. Finally, I posit that the person index *-ka* can actually be split up into two types, intransitive *-ka₁* and transitive *-ka₂* (this is also suggested by the fact that they have different co-referentiality possibilities depending on transitivity of the verb). Intransitive *-ka₁* assigns an accent to the first syllable of the intransitive verb root, whereas transitive *-ka₂* does **not** assign any accent. The assignment of an accent here by *-ka₁* is possibly the most stipulative claim of this analysis; I posit it for reasons of stress clash, shown below.

Unlike group 1, both groups 2 and 3 (as well as the accent assigned by intransitive *-ka*) are sensitive to any other assigned or inherent accents. This therefore leads to a situation in which more than one assigned/inherent accent within a single verb complex, before footing. In a number of cases two assigned/inherent accents fall on adjacent syllables, such that we have adjacent accents. This results in a clash, understood as “Stress Clash”. I posit that such “Stress clash” is illegal (at the surface level) in Ese Ejja, and is resolved in a number of ways. I show this in Accent Paradigm 3 on page 11. This paradigm recasts paradigms 1 and 2 in terms of inherent and assigned accent, showing the accent assignment rules presented in Appendix table (14), page 10. A legend explaining marking conventions in this paradigm is given in this page’s footnote.

This Accent Paradigm 3 shows that the accents assigned by affixes is uniform in its location in the verb root/micro stem, as well as the accent assigned by intransitive *-ka₁*. There are a number of places in which stress clash occurs, highlighted in yellow in this paradigm, totaling 12 instances (1 more in green highlighting discussed later), i.e. where there is a $\sigma\sigma$ configuration. Within these 12 instances, I posit three types of resolution strategies: (1) delete the leftmost accent ($\acute{\sigma}\acute{\sigma} \rightarrow \sigma\acute{\sigma}$), (2) move the leftmost accent one to the left ($\sigma\acute{\sigma}\acute{\sigma} \rightarrow \acute{\sigma}\acute{\sigma}\acute{\sigma}$), and (3) move the rightmost accent one to the right ($\acute{\sigma}\acute{\sigma}\acute{\sigma} \rightarrow \acute{\sigma}\acute{\sigma}\acute{\sigma}$). This is diagrammed in ex.0.

⁷ Final accent on transitive verb roots may be assigned rather than inherent. There are certain cases of the same lexical root being used transitively and intransitively in different contexts, in which they bear distinct accent patterns, e.g. /taaa/ “to shout” in [taáa-naje] “shouted” (intrans.) vs. [táaa-naje] “shouted” (trans) (V:245). Further, Vuillermet (p.c.) notes that there may have been a historical transitivity marker, which may have been affixed to the verb and assigned an accent to the root; more research is required.

11. Stress clash resolution

Delete Leftmost	Move to right	Move to left
ba.na-je → [banáje]	tó.wa.a-ka-na.je → [tówaakanaje]	ba.na-ka-kyae → [bánakakyaē]
bé.sá-ka-je → [besákaje]	ba.na-ka-na.je → [bánakanaje]	i.she.'a-je → [íshe'aje]
5 instances	2 instances	5 instances

This data shows us a number of things. First it allows us to resolve stress clash by two mechanisms: movement and deletion. We move an accent if this is possible, either to the right or the left, to whichever syllable is able to bear an accent. In *tòwàakanaje* above, we see that the accent moves to the right (afterwhich word stress falls on [tó]), whereas on *ishè'aje*, it moves to the left (afterwhich word stress falls on [í]). If we cannot move an accent, then we delete the leftmost accent, e.g. in *bà.nà-je* → [banáje]. If this analysis is accented, a number of facts fall out nicely. First, this entails that accent cannot move onto either (1) an affix, or (2) intransitive –*ka*₁ to resolve stress clash. If it were able to fall on these elements, then we would expect *bà.nà-je* → [bánajè] above. This entails that there is another difference between the two index markers *ka*₁ and –*ka*₂: the first is not able to bear an accent from stress clash resolution, while the second one is. This is shown by the fact that in example (0), there is stress clash equally on the first two syllables of the complex: intransitive *bèsàkaje* and transitive *bànàkanaje*. In *bèsàkaje*, this is resolved by deleting the first accent, suggesting it cannot move onto *ka*₁, whereas in transitive *bànàkanaje*, this is resolved by moving the accent rightwards (resulting in [bánakanaje]), suggesting one *can* move onto –*ka*₂. If we note that [1] all suffixes and *ka*₁ assign their own accent, and [2] –*ka*₂ does not assign its own accent, and also note [3] accent is never shifted onto suffixes and –*ka*₁ but it *is* shifted onto *ka*₂, then we can posit a constraint [4] no morpheme which assigns an accent also bears an (assigned) accent (this is of course overwritten by group 1, which overwrites all accents, inherent or assigned).

Of the cells in Accent Paradigm 3 on page 11, two are not predicted, shown in highlighted green. One is a form *tòwàakaje*, in which if we assume uniform accent assignment in line with the other cells, then the first and the third syllables receive an accent, which should result in [tówaakaje]; however, a form [towáakaje] is what is found. For now, we can speculate that this form may be receiving its form not from regular accent rules, but from an identity relation to the form without the index marker, i.e. [towáaje]. The issue with this is that in bisyllabic intransitive verbs, there is not this identity relation (cf. [bésa-je] with [besákaje]). We note that this form is the only 3 syllable intransitive verb tested, and should be confirmed by other speakers and other potential 3σ intransitive verbs.

Another irregular cell is *ishe'akakyaē* → [íshe'akakyaē], rather than the expected *[ishé'akakyaē] with regular stress shift leftwards to resolve stress clash. One possible solution to this is that if we look at the other cells involving *ishe'a* and 2 and 3 group affixes (not overwriting group 1), these all have primary stress on [ísh...]. This fact may cause the “irregular” form to be more faithful to its paradigmatic form, rather than to what regular accent rules would produce. Potential support for this idea is that no other 2σ or 3σ verb type has the same degree of paradigmatic uniformity of primary accent location with the affix groups 2 and 3 (cf. intransitive *besa* for example, in which 5 cells occur on [bé] and 3 on [sá]).⁸

⁸ As noted above, I am not presenting the irregularities posed by the 4σ intransitive verb *jomishoka* until accent data are better understood as a whole.

OT account

Now that the accent facts have been established, and a working representation and a set of accent assignment/clash resolution rules have been put forward, we can posit an Optimality Theory account of the data. I will posit that the input to the EVAL tableaux involves (1) the morphemes in question, (2) the assigned and inherent accents, and (3) a specific 3 syllable word stress window which is licensed by the particular part of speech/affix (parameterized as either aligning with the rightmost or leftmost accent within the word). Affixes/clitics which overwrite accent patterns are not subject to stress clash constraints (e.g. group 1 verbal affixes), as they have altered the representation of the input. I present in table (12) the necessary OT constraints for understanding nominal and verbal accent.

12. Optimality Theory Constraints

Representation	Rule	Exceptions	Constraint	Notes
(σσ)	Trochaic feet	-	RhType=T >> RhType=I	
[x] σ σ σ σ σ	3σ word stress window	- ⁹	PrWd-Max3σ-Align-L >> PrWd-Max4σ-Align-L	There is no minimum word constraint ¹⁰
*(σ)	No degenerate	pé ekwe-pé	GrWd=PrWd >> Max-IO-(accent) >> Ft-Bin >> Parse-Syl	Do not parse σ if it would be degenerate unless has accent
σ (σ σ)	Align feet to Right edge	Those with assigned accent	Ident-IO-(accent ↔ σ) >> All-Ft-R >> All-Ft-L	Word with assigned/inherent accent do not conform
σσ → σσ σσσ → σσσ σσσ → σσσ	Stress clash resolution	*σ σ σ σ → *σ σ	*Clash >> Max-IO-(accent) >> Ident-IO-(accent ↔ σ) >> x >> All-Ft-R *σ _[AssigningAccent]	

Some of these constraints require explanation. First, a constraint “PrWd-Max3σ-Align-L” is posited, which states that a prosodic word (i.e. one which assigns word stress) is a maximum of 3 syllables, and is ranked very high. This is potentially theoretically interesting, as typically word maximum restrictions apply at both the prosodic and segmental level¹¹, whereas here I interpret the facts as showing it applies only at the prosodic level.

Further, a constraint Max-IO-(accent) states that the grammar wants the maximum number of input accents to appear in the output. This is parsed above Ft-Bin in order for monosyllabic feet to occur (e.g. ekwe=ké → (ekwe)(ké) in example 5 above, page 3). Furthermore, as shown with nouns in isolation, default stress rules align all feet to the right edge (i.e. All-Ft-R >> All-Ft-L). However, we see from the data that this constraint is violable if there is a higher ranking constraint “Ident-IO-(accent ↔ σ)”, which states that there should be an identity between the association of an accent with a particular syllable in the input, and that association in the output; in other words, don’t realign accents with other syllables.

Finally, we need a specific constraint ranking configuration to account for the resolution of stress clash. We note that there is no instance of a surface level stress clash, therefore we rank *Clash most high. Further, we rank Max-IO-(accent) >> Ident-IO-(accent ↔ σ), which states that

⁹ The few exceptions which exist are not discussed here.

¹⁰ E.g. the monosyllabic word *pwa* in *Majoya eya, escuela pwa* “Then I studied (lit. I was (at) school)” (V:704).

¹¹ A possible opposite case is in NW Bantu/Bantoid, in which there is a restriction on number of syllables, but this restriction does not hold at the prosodic level, resulting in floating edge tones.

it is better to reassociate an accent with a different syllable to avoid stress clash than to delete it. Finally, all of these are ranked with a constraint in (13).

13. $\frac{\mathbf{x}}{\sigma}$
 $*\sigma_{[\text{AssigningAccent}]}$

This states that if we have a syllable which is part of a morpheme which assigns an accent to another morpheme, this syllable cannot bear an inherent/assigned accent (though can bear an accent from footing). Basically, this allows us to capture the fact that in stress clash environments, an accent cannot move onto an affix, or intransitive $-ka_1$. This is an ad hoc constraint.

A number of tableaux are given in the Appendix section on pages 12-13. What is interesting is that the constraint All-Ft-R predicts that stress clash rules in $\sigma\sigma$ environments will delete the leftmost accent, resulting in $\sigma\sigma$, as shown throughout. In tableau 5, the input /bèsà-ka₁-je/ with stress clash is resolved as [be(sáka)je] rather than equally plausible [(bésa)(kàje)]. We can understand this as a result of All-Ft-R: the first form violates this constraint only 1 time, whereas the second form violates this 2 times. Further investigation is needed, though if this is on the right track, then OT helps us to generalize such a conspiracy of stress clash resolution and feet building directionality¹².

References. Caballero, G. 2008. “Choguita Rarámuri (Tarahumara) Phonology and Morphology”. Doctoral dissertation. University of California, Berkeley. // Vuillermét, Marine. 2012. “A Grammar of Ese Ejja, a Takanan language of the Bolivian Amazon”. Doctoral dissertation, Université Lumière Lyon 2. Available at <<http://www.marinevuillermét.com/these/complete-thesis/>> [Sound files by request]

¹² Despite this, a serious complication comes from the 3 σ transitive verb *ishe'a*. In one context, this occurs with transitive index marker $-ka_2$ and past tense marker $-naje$. Inherent stress falls on the final syllable of the verb root, and *naje* assigns stress to the penult of the root, resulting in i.she. 'a-ka-naje. From our OT tableau, we expect this will be resolved to maximize the number of right-oriented feet, and therefore expect i(shé'a)(kàna)je with 4 violations of All-Ft-R. Instead, however, we find [íshe'akanaje], corresponding to (íshe)('àka)(nàje) with 6 violations. One possibility is that when stress clash environments occur, it is more preferred to keep the inherent/assigned accent within the same morpheme, rather than move it onto a different one. If true, a constraint could be posited which eliminates a candidate i(shé'a)(kàna)je, which moves an accent to the morpheme $-ka$.

APPENDICES

ACCENT PARADIGM 1 - SUMMARY OF INTRANSITIVE VERB ACCENT							
Yellow =Not available (yet)		White = fits generalizations	Light Grey = requires intersection and resolution of generalizations		Dark Grey = Atypical, defies generalization		
Intransitive & /-ka ₁ /		Group 1 (e.g. - <i>me</i> POT “may”)	Group 2a (- <i>naje</i> PAST)	Group 2b (- <i>kya</i> e POT “might”)	Group 3a (- <i>ani</i> /- <i>aña</i> /- <i>ki</i> PRES)	Group 3b (- <i>je</i> FUT “will”)	Summary of observations
1-σ /pa/ “to cry”	∅	pá -me	pá -na.je	pá -kya.e	pá -ani	pá -je	First syllable next to affix
	-ka	pa- ká -me	n/av	n/av	n/av	n/av	
2-σσ /be.sa/ “to bathe”	∅	be. sá -me	bé .sa-na.je	be. sá -kya.e	bé .sa-ani	bé .sa-je	In 1 st 3 σ; never on affix
	-ka	be.sa- ká -me	bé .sa-ka-na.je	bé .sa-ka-kya.e	be. sá -ka-ani	be. sá -ka-je	
3-σσσ /to.wa.a/ “to jump”	∅	to.wa. á -me	to. wá .a-na.je	n/av	to. wá .a-ani	to. wá .a-je	In 1 st 3 σ; never on affix
	-ka	to. wá .a-ka-me	tó .wa.a-ka-na.je	n/av	tó .wa.a-ka-ani	to. wá .a-ka-je	
4-σσσσ /jo.mi.sho.ka/ “to have a rest”	∅	jo.mi. shó .ka-me	jo. mí .sho.ka-na.je	n/av	jo. mí .sho.ka-ani	n/av	On 2 nd or 3 rd σ of verb root (<i>never</i> on 1 st)
	-ka	jo.mi. shó .ka-ka-me	jo. mí .sho.ka-ka-na.je	n/av	jo. mí .sho.ka-ka-ani	n/av	
Summary of observations (observations in bold not easily generalizable)	presence of /-ka ₁ / alters accent	1-3σ verb: occurs 1 or 3 σ before affix 4σ: occurs on [shó] always	1σ verb: falls on verb 2-3σ: difficult to generalize 4σ: occurs on [mí] always	Occurs 1 to 3 σ before affix	1σ verb: falls on verb 2-3σ: falls on 2 or 4th σ before suffix on the micro-stem 4σ: occurs on [mí] always	1σ verb: falls on verb 2-3σ: difficult to generalize	

ACCENT PARADIGM 2 - SUMMARY OF TRANSITIVE VERB ACCENT							
Yellow =Not available (yet)		White = fits generalization s	Light Grey = requires intersection and resolution of generalizations		Dark Grey = Atypical, defies generalization		
Transitive & /-ka ₂ /		Group 1 (e.g. <i>-me</i> POT “may”)	Group 2a (<i>-naje</i> PAST “past”)	Group 2b (<i>-kyae</i> POT “might”)	Group 3a (<i>-ani/-aña/-ki</i> PRES)	Group 3b (<i>-je</i> FUT “will”)	Summary of observations
1-σ /kwyá/ “to hit X”	∅	kwyá-me	kwyá-naje	kwyá-kyae	kwyá-aña	kwyá-je	Always on verb root
	-ka	kwyá- ká-me	kwyá-ka-naje	n/av	kwyá-ka-ani	kwyá-ka-je	Falls on verb or micro-stem
2-σσ /ba.na/ “to sow X”	∅	ba. ná-me	ba. ná-naje	ba. ná-kyae	ba. ná-aña	ba. ná-je	Always on verb root
	-ka	ba.na- ká-me	bá.na-ka-naje	bá.na-ka-kyae	ba. ná-ka-ani	ba. ná-ka-je	Difficult to generalize
3-σσσ /i.she.'a/ “to wait for X”	∅	i.she.' á-me	í.she.'a -naje	í.she.'a-kyae	í.she.'a-aña	í.she.'a-je	1 st of 3 rd σ of verb root
	-ka	i. shé .'a-ka-me	í.she.'a-ka-naje	í.she.'a-ka-kyae	í.she.'a-ka-ani	í.she.'a-ka-je	1st or 2nd σ of verb root
Summary of observations	presence of /-ka ₂ / alters accent	Occurs 1 or 3 before affix	First two syllables	First two syllables	First two syllables	First two syllables	

14. Analysis - Table of representations and rules

	Verb Transitivity		Affix group					Presence of /-ka/	
	Intransitive	Transitive	1	2a	2b	3a	3b	Intr. /-ka ₁ /	Trns. /-ka ₂ /
Accent	No inherent accent	Inherent accent on final σ	Assigns to final σ of micro-stem	Assigns to Penult of verb root	Assigns to final σ of micro-stem	Assigns to Penult of micro-stem	Assigns to Penult of micro-stem	Assigns to first σ of Intr. verb root	Does not assign accent
Overwrite other accents	n/a	No	Yes	No	No	No	No	No	n/a
Domain target	n/a	n/a	Micro-stem	Verb root	Micro-stem	Micro-stem	Micro-stem	Verb root	n/a
Directionality of 3σ window	n/a	n/a	Rightmost	Leftmost	Leftmost	Leftmost	Leftmost	n/a	n/a

ACCENT PARADIGM 3 - WORKING ANALYSIS OF VERBAL ACCENT¹³

Verb root/Micro stem Type		Group 1	Group 2a	Group 2b	Group 3a	Group 3b	
Intransitive & /-ka ₁ /	1-σ /pa/	∅	pa-me [páme]	pa-na.je [pána.je]	pa-kya.e [pákyae]	pa-ani [pá(a)ni]	pa-je [páje]
		/-ka ₁ /	pa-ka-me [pakáme]	?	?	?	?
	2-σσ /be.sa/	∅	be.sa-me [besáme]	be.sa-na.je [bésanaje]	be.sa-kya.e [besákyae]	be.sa-ani [bésa(a)ni]	be.sa-je [bésaje]
		/-ka ₁ /	be.sa-ka-me [besakáme]	be.sa-ka-na.je [bésakanaje]	be.sa-ka-kya.e [bésakakyae]	be.sa-ka-ani [bésaka(a)ni]	be.sa-ka-je [besákaje]
	3-σσσ /to.wa.a/	∅	to.wa.a-me [towaáme]	to.wa.a-na.je [towáanaje]	?	to.wa.a-ani [towáa(a)ni]	to.wa.a-je [towáaje]
		/-ka ₁ /	to.wa.a-ka-me [towáakáme]	to.wa.a-ka-na.je [towaakanaje]	?	to.wa.a-ka-ani [towaaka(a)ni]	to.wa.a-ka-je [towaakaje] * [^] [towáakaje]
Transitive & /-ka ₂ /	1-σ /kwya/	∅	kwya-me [kwyáme]	kwya-na.je [kwyáme]	kwya-kya.e [kwyákyae]	kwya-aña [kwyá(a)ña]	kwya-je [kwyáje]
		/-ka ₂ /	kwya-ka-me [kwyakáme]	kwya-ka-na.je [kwyákanaje]	?	kwya-ka-ani [kwyáka(a)ni]	kwya-ka-je [kwyákaje]
	2-σσ /ba.na/	∅	ba.na-me [banáme]	ba.na-na.je [banánaje]	ba.na-kya.e [banákyae]	ba.na-aña [baná(a)ña]	ba.na-je [banáje]
		/-ka ₂ /	ba.na-ka-me [banakáme]	ba.na-ka-na.je [banakanaje]	ba.na-ka-kya.e [banakakyae]	ba.na-ka-ani [banáka(a)ni]	ba.na-ka-je [banákaje]
	3-σσσ /i.she.'a/	∅	i.she.'a-me [ish'áme]	i.she.'a-na.je [ishe'anaje]	i.she.'a-kya.e [ishe'akya.e]	i.she.'a-aña [ish'a(a)ña]	i.she.'a-je [ishe'aje]
		/-ka ₂ /	i.she.'a-ka-me [ishé'akáme]	i.she.'a-ka-na.je [ishe'akanaje]	i.she.'a-ka-kya.e *[ishé'akakyae] [^] [ishe'akakyae]	i.she.'a-ka-ani [ishe'aka(a)ni]	i.she.'a-ka-je [ishe'akaje]

¹³ Solid Red Square = σ with assigned accent from Group 1; Underlined σ = inherent accent of transitive verbs; Black dashed line Square = σ assigned stress by affix from group 2 or 3; jagged line shape = assigned accent from intransitive -ka₁; Yellow highlighting = Stress Clash; Green highlighting = Problematic occurrences; bolded σ with accent = primary stress of surface form; Superscript [^] stands for “attested” form (which was unexpected).

OT Tableaux 1-3 – Accent in the Nominal Domain

		*Clash	PrWd-Max3σ-Align-L	RhType=T	Max-IO-(accent)	Ident-IO-(accent<=>σ)	$\frac{x}{7}$ *σ _[AssigningAccent]	Ft-Bin	All-Ft-Right	Parse-Syl
1	[x] /ĩnawewà=nixe/									
a	[. x] (ĩnà)(wéwa)(nìxe)				*!				6	0
→ b	[x] i(ñáwe)(wàni)xe								4	2
c	[x] (ĩnà)(wèwa)(níxe)	*!			*				6	0
d	[x] i(ñàwe)(wáni)xe	*!							4	2
e	[. x] (ì)(ñáwe)(wàni)xe	*!					*		9	1
f	[.] x i(ñàwe)(wáni)xe	*!							4	2
g	[. x] i(ñàwe)(wáni)xe	*!							4	2
h	[x] (ĩnà)(wewà)(nìxè)			*!*					4	0
i	[x] (ĩnà)we(wàni)xe								5!	2
	[ĩnàwewanixe]									

		*Clash	PrWd-Max3σ-Align-L	RhType=T	Max-IO-(accent)	Ident-IO-(accent<=>σ)	$\frac{x}{7}$ *σ _[AssigningAccent]	Ft-Bin	All-Ft-Right	Parse-Syl
2	/ekwe=ta ^x woo/									
(→) ¹⁴ a	(èkwe)(táwo)o								4!	1
b	e(kwéta)(wò)				*!				2	1
c	e(kwetá)(wò)			*!*					2	1
d	(èkwe)(tá)(wò)	*!						*	5	0
→ e	ekwe(táwo)o								1	3
f	(ékwe)ta(wò)				*!				3	1
g	ekwe(tá)(wò)	*!						*	2	2
	[ekwetáwoo]									
3	/ekwè=tawoo=jo/									
a	(èkwe)(táwo)(òjo)				*!				6	0
b	(ekwé)(tawò)(òjo)			*!*					6	0
c	e(kwéta)(wò)jo								4!	2
d	e(kwè)(táwo)(òjo)	*!						*	6	1
e	e(kwé)ta(wò)jo							*!	5	3
→ f	e(kwéta)wo(òjo)								3	2
	[ekwétawoojo]									

¹⁴ With more phonetic data, it may turn out that the non-winning form [(èkwe)(táwo)o] should win over [ekwe(táwo)o]. We can accomplish this if we posit a constraint against adjacent unfooted syllables.

OT Tableau 4-6 – Accent in the Verbal Domain

		*Clash	PrWd-Max3σ-Align-L	RhType=T	Max-IO-(accent)	Ident-IO-(accent<=>σ)	$\frac{x}{\sigma}$ *σ _[AssigningAccent]	Ft-Bin	All-Ft-Right	Parse-Syl
4	$\frac{x}{\sigma}$ /bàná-ka ₂ -najé/									
→ a	$\frac{x}{\sigma}$ $\frac{x}{\sigma}$ (bána)(kàna)je					*			4	1
b	$\frac{x}{\sigma}$ $\frac{x}{\sigma}$ (bána)ka(nàje)					*	*.!		3	1
c	$\frac{x}{\sigma}$ (bána)(kàna)je				*!	*			4	1
d	$\frac{x}{\sigma}$ ba(náka)(nàje)				*!	*			2	1
e	$\frac{x}{\sigma}$ $\frac{x}{\sigma}$ (bá)(nà)(kàna)je	*!*					**		8	1
f	(bá)(nàka)(nàje)	*!					*		6	0
g	(bá)na(kàna)je					*	*.!		5	2
h	(baná)ka(nàje)			*!		*			3	1
	[bánakanaje]									
5	$\frac{x}{\sigma}$ /ishe'a-kà ₂ -me/									
a	(íshe)('àka)me					*!			4	1
→ b	i(shé'a)(kàme)								2	1
c	(íshe)'a(kàme)								3!	1
d	(ishé)'akàme								4!	1
e	[] $\frac{x}{\sigma}$ ishe'a(káme)		*!						0	3
f	$\frac{x}{\sigma}$ ishe('áka)me					*!			1	3
	[ishé'akame]									

		*Clash	PrWd-Max3σ-Align-L	RhType=T	Max-IO-(accent)	Ident-IO-(accent<=>σ)	$\frac{x}{\sigma}$ *σ _[AssigningAccent]	Ft-Bin	All-Ft-Right	Parse-Syl
6	$\frac{x}{\sigma}$ $\frac{x}{\sigma}$ /bésà-ka ₁ -jé/									
a	$\frac{x}{\sigma}$ $\frac{x}{\sigma}$ (bésa)(kàje) [accent shift]					*	*.!		2	0
b	(bé)(sà)(kàje)	*!*						**	5	0
c	(bé)(sàka)je	*!						*	4	1
d	(bé)(sàka)(jè)	*!						**	4	0
e	(bésa)(kàje)					*			2!	0
f	(bésa)kaje					*			2!	2
→ g	be(sáka)je					*			1	2
h	be(sá)(kàje)	*!				*		*	2	1
i	be(sá)(kajè)			*!		*		*	2	1
j	be(sáka)(jè)					*		*!	1	1
k	(besá)(kajè)			*!*		*			2	0
	[besákaje]									