

INTONATION AND FOCUS MARKING IN KAKATAIBO

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ABSTRACT¹

This paper explores experimentally the prosodic correlates, namely f_0 and pause insertion, of focus marking in the San Alejandro dialect of Kakataibo (Pano). By examining sentences with all-new focus, narrow focus (on the subject, object and adjunct) and predicate focus, it is observed that the higher f_0 falls at the beginning of the sentence in the first two types of focus sentences but occurs at the end of the sentence in predicate focus. In addition, a pause occurs after the first constituent in sentence and narrow focus, but is much less frequent in predicate focus.

KEY WORDS: Kakataibo, focus, prosody, f_0

RESUMO

O presente artigo explora experimentalmente os correlatos prosódicos chamados f_0 e inserção de pausa na marcação de foco no dialeto de San Alejandro do Kakataibo (Pano). Examinando sentenças com foco em toda a oração, com foco estreito no sujeito, objeto e adjunto, e com foco no sintagma verbal (SV), observa-se que o ponto mais alto de f_0 ocorre no início das sentenças com os dois primeiros tipos de foco, mas ocorre ao final das sentenças com foco no SV. Além disso, uma pausa ocorre depois do primeiro constituinte nas sentenças com foco estreito e na oração, mas é muito menos frequente em sentenças com foco no SV.

PALAVRAS CHAVE: Kakataibo, foco, prosódia, f_0

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1. INTRODUCTION

1.1. The Kakataibo language

Kakataibo (ISO 639, 3 code ‘cbr’) is a Panoan language spoken by approximately 1500 people (Frank 1994) in the Peruvian central Amazon region. Kakataibo has been described as using mainly syntactic means to express focus (Valle 2014), but the prosodic correlates of focus, if any, remain unknown. This paper addresses this gap by exploring f0 and pause insertion experimentally in sentences with different focus types.

Kakataibo shows a fairly free constituent order, where arguments and adjuncts move around two fixed elements, the second position clitics (2CL) =*ka* ‘validational’ and =*id* ‘second-hand information’ and the final main verb, as shown in (1). The position in which arguments occur is highly motivated by information structure (Valle 2014).

(1) (XP) 2CL (XP)*₂ V

Examples (2) have the same propositional content but vary with regard to the contexts in which they are felicitously used. Notice that the pre-field position, before the 2CL, can be left empty in predicate focus ((2), see Section 3.1.3) and verb focus sentences (2)). The verb is not allowed to occur in the pre-field position (2).

- (2) a. Noruanka chaxu waria.
Norua=n=ka=a chaxu wari-i-a
Norua=A=VAL=3A/S deer look.for-IPFV-N.PROX
‘Norua looks for a / the deer.’
- b. chaxuka Noruan waria. ‘Norua looks for a / the deer.’
- c. ka chaxu waria. ‘(He) looks for a / the deer.’
- d. ka waria. ‘(He) looks for (it).’
- e. * waria ka

Kakataibo can be characterized as a tonal language, although the domain where tonal contrasts occur is limited to a few minimal pairs involving monosyllabic lexical items having the vowel /o/, where one member shows rising f0 while the other shows non-rising pitch, e.g. *o* ‘type of parrot’ vs. *ó* ‘tapir’, *no* ‘non-Kakataibo person’ vs. *nó* ‘type of monkey’. Most words in Kakataibo receive a high pitch on the first syllable from the left (*xanu* [xá.nu] ‘woman’) unless the second syllable is closed in which case the closed syllable attracts the high pitch (*tain* [ta.ín] ‘salt’). However, some Kakataibo words may receive a lexical high pitch (*unpáxo* [um.pá.dzo] ‘type of bird’, see Zariquiey 2014:121-154 for further discussion of pitch on the Lower Aguaytia dialect of Kakataibo). Notice that underlying forms occur in italics while phonetic forms are shown inside square brackets in the examples in the examples above.

2. (XP)* means that more than one XP is allowed to occur in that position.

1.2. Focus in Kakataibo

Before characterizing the expression of focus in Kakataibo, a definition is in order due to the varied uses the term *focus* has received in the literature. In this study, focus is regarded as the element that answers an explicit or implicit question, as in (3). Thus, the focus of a sentence is regarded as an information structural category that indicates a set of alternatives that are relevant for the interpretation of a linguistic expression (Rooth 1985, 1992; Krifka 2008). In addition, according to the relation among the focus and the previous contexts, different focus types can be identified, e.g. information focus, corrective focus, selective focus, etc. This study explores the properties of information focus only.

- (3) What did John eat?
John ate [pizza]_F {John ate quinoa, John ate carrots...}

Focus can be expressed by phonological, morphological or syntactic means or a combination of these (Büring 2010). Kakataibo follows a syntactic strategy in encoding focus (Valle 2014). Narrow focus on the arguments or adjuncts is placed in the pre-field position (cf. Zariquiey 2011:713), but narrow focus on the verb occurs *in situ*. In all-new focus sentences, the subject (A/S) occupies the pre-field position and the object is adjacent to the final verb: SOV linearization pattern. Thus, narrow focus on the subject and all new focus show an isomorphism, as in (4). Focus on the predicate (VP) occurs *in situ* having the verb in final position adjacent to the object; the subject is usually omitted, as in (5). When the subject is present, it occurs after the clitic =*ka* showing optional case (see Valle 2014 for further discussion).

- (4) Narrow focus (subject) and sentence focus
Noruanka chaxu rëtëaxa.³
norua=n=ka=a chaxu rëtë-a-x-a
Norua=A=VAL=3A/S deer kill-PFV-3-N.PROX
'[Norua]_F killed a deer.' / '[Norua killed a deer]_F.'

- (5) Predicate focus
Ka (Norua) chaxu rëtëaxa.
ka=a Norua chaxu rëtë-a-x-a
VAL=3A/S Norua deer kill-PFV-3-N.PROX
'(Norua) [killed a deer]_F.'

Based on naturalistic data, Kakataibo declarative sentences with all-new focus show the highest f0 point on the constituent occurring in the pre-field or the second position clitic, and the utterance ends in a falling tone. Interrogative sentences show a similar pattern with the difference that the utterance ends in a level tone instead. However, these intonational patterns just described may only be representative of the focus types that those sentences convey. A fuller characterization of the language intonational patterns should consider a wider array of foci, assuming that all sentences have a focus (Lambrech 1996) as it is done here. This paper addresses this question for Kakataibo and aims to contribute to developing an intonational sketch of the language.

3. Abbreviations: 3 'third person', A 'subject of transitive verb', EXCL 'exclusive', IPFV 'imperfective', N.PROX 'non-proximate', PFV 'perfective', S 'subject of intransitive verb', VAL 'validational'.

2. METHODS

2.1. Participants

The data reported here comes from eight native speakers of Kakataibo (seven male). All the participants are bilingual in Kakataibo and Spanish and their ages range from 16 to 48 years. The recordings were made in the native community of Sinchi Roca (Padre Abad, Ucayali, Peru) using a Zoom H4N audio recorder at 44k Hz.

2.2. Materials

A set of 35 opening sentences from natural texts were analyzed with regard to their prosodic patterns to be used as base-line to be contrasted with the focus conditions. Five conditions were included in this experiment: subject narrow focus, object narrow focus, adjunct narrow focus, predicate focus and all-new focus. Narrow focus was broken down into three conditions with the intention of eliminating the effects of the ambiguity between narrow focus on the subject and all-new focus. Consultants were shown a set of pictures one by one from QUIS (Skopeteas *et al.* 2006) in addition to others taken in the field. After looking at a picture, a recording in Kakataibo was played asking a question aiming at one of the five conditions. Speakers were asked to give a ‘full answer’ to the question in order to avoid having a single constituent as an answer (e.g. ‘What did you eat?’ ‘Fruit.’), which is very common in conversations. Participants were instructed to repeat their answer three times; the second instance of the answer was used for analysis. Six tokens per condition per participant were recorded. Answers not involving a full sentence and/or lacking second position clitics were discarded from the analysis (Table 1). The high rate of discarded tokens in predicate focus sentences was mainly due to the lack of a second position clitic in them, which might be related to the lack of a focused constituent in the pre-field position to which the 2CL could attach.

The target words had two, three and four syllables where all syllables were open, thus, having the highest pitch on the first syllable from the left. However, a few words showing lexical pitch were registered (e.g. *sontáru* ‘soldier’) in this corpus. None of the sentences recorded contained a lexical item having a rising f_0 to avoid possible prosodic effect with pitch in the utterance.

Table 1: Tokens per experimental condition

Focus type	Recorded tokens / Discarded tokens
Sentence focus	48 / 4
Predicate focus	48 / 15
Subject focus	48 / 2
Object focus	48 / 7
Adjunct focus	48 / 9
Total	240 / 37

2.3. Analysis

The data was processed in Praat (Boersma 2001). The labeling was done at the sentence, phrase and syllable levels. Tones were marked per each phonological word at the middle of the vowel of the syl-

lable with the highest tone. Pause duration measurements were drawn from the phrase level labeling. The f0 analysis and pause duration were conducted manually.

3. RESULTS

3.1. Highest f0

3.1.1. All new focus

In all-new focus sentences, the highest f0 point falls on the stressed syllable of the first constituent or on the second-position clitic (cf. Zariquiey 2011:170). The data from both natural speech (Figure 1) and the experimental task (Figure 2), corresponding to sentences (6) and (7) respectively, show this pattern. The middle line above the tones (H, L) indicates the middle point of the stressed vowel where the f0 measurement was taken. The red arrow indicates where the highest pitch falls. Notice that the highest pitch falls on the focused constituent in Figure 1 while sentence f0 falls on the second position clitic in Figure 2 (see discussion in Section 4). These two intonational patterns are found in both natural speech and experimental data.

(6) Sentence focus (natural speech)

Chunaka	sotaxa.
chuna=ka=a	sot-a-x-a
spider.monkey=VAL=3A/S	sit.down-PFV-3-N.PROX
‘A/the spider monkey sat down.’	

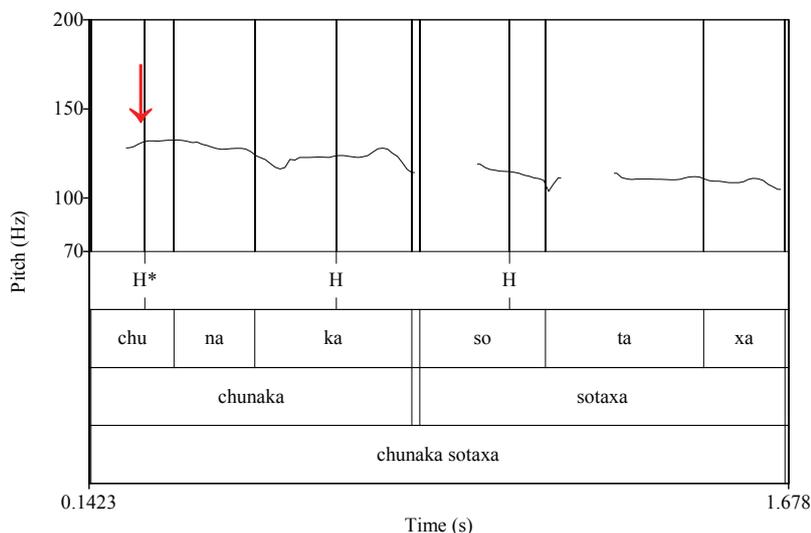


Figure 1: f0 in all-new focus sentence (f0 measured at the middle of the target vowel). Natural speech

(7) Sentence focus (experimental task)

Uninka	in	papiaxa
uni=n=ka=a	in	papi-a-x-a
person=A=3A/S	tree	carry-PFV-3-N.PROX
‘A/the man carried a/the tree.’		

3.1.3. Predicate focus

In sentences showing this focus type, the highest f0 falls on the final main verb, as in Figure 4. Instances having the highest f0 on the first constituent or the second-position clitic =ka have not been attested in the data set for this focus type.

- (9) Ka xěki media sacaín biwěsiaxa.
 ka=a xěki media saca=ín bi-wěsin-a-x-a
 VAL=3A/S corn half sack=EXCL grab-coming-PFV-3-N.PROX
 ‘(He/she) came bringing only half a sack of corn.’

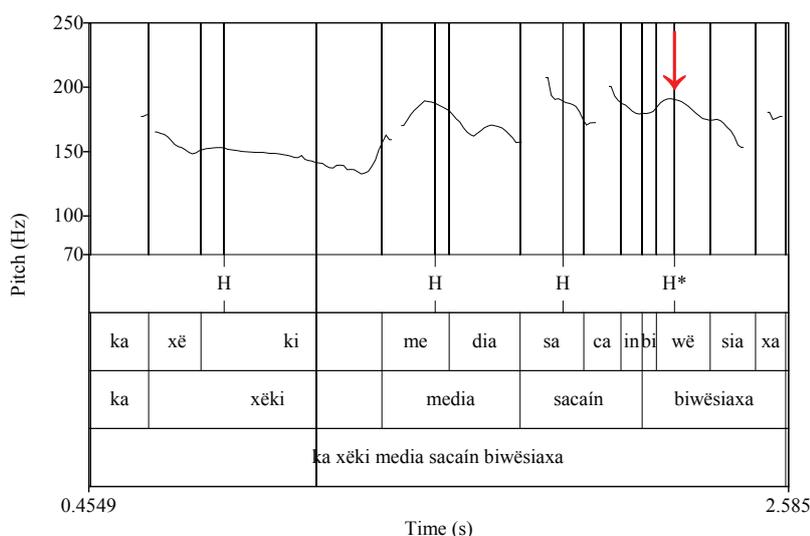


Figure 4: Predicate focus (f0 measured at the middle of the target vowel)

3.1.4. Summary of f0 and focus in Kakataibo

The relation between focus type, that in turn implies different linearization patterns for the different focus types studied here, and the position in which the highest f0 falls was found to be statistically significant by a chi-square test considering these factors as independent variables, p -value = 0.001499, ($\chi^2= 31.3396$; d.f. NA). Figure 5 displays the average f0 in the two relevant positions in the sentence, the pre-field and the final verb, for the five focus types studied here showing a clear contrast in the intonational contour between predicate focus and the other focus types. Figure 6 shows superimposed prototypical pitch tracks of sentence, narrow and predicate focus showing again the contrast between predicate focus with high f0 on the verb on one hand and sentence and narrow focus with high f0 in the pre-field position or the second-position clitic on the other hand. The circle to the left signals the pre-field position while the circle to the right points to the final main verb. These results suggest that highest f0 in a constituent is another cue, in addition to constituent order, that speakers have to identify focus in a sentence.

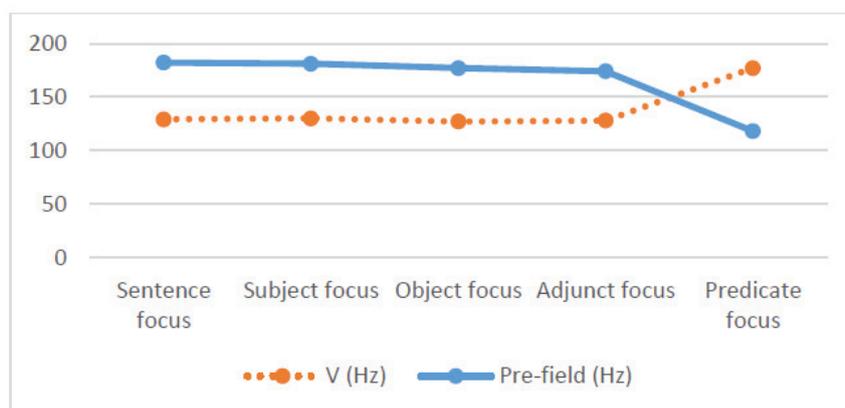


Figure 5: Focus type and f0 in the pre-field and final verb

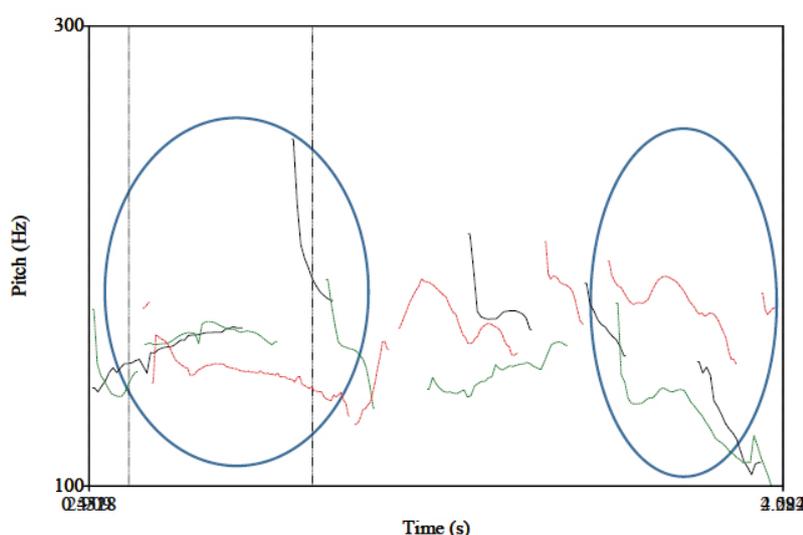


Figure 6: Super-imposed pitch tracks of sentence (black solid line), narrow (green dotted line) and predicate focus (red dashed-dotted line, reduced pitch range to 100 – 300 Hz)

3.2. Phrase boundary

Table 2 shows the percentage of occurrence of pause after the second position clitic =*ka* and the average duration of this pause in the base-line natural sentences and the different focus conditions. Sentence focus and narrow focus behave similarly in that both show a high frequency of occurrence of pauses in this context. In addition, these two focus types show a similar pause duration. These results resemble those obtained for the base-line out-of-the-blue sentences. In contrast to this pattern, predicate focus sentences show a more restricted occurrence of pauses after the clitic =*ka* and when this pause does occur, it is significantly shorter than those in the other conditions.

Table 2: Pause occurrence and duration of pause per focus type

	Base line	Sentence focus	Narrow focus (Subj, Obj, Adj)	Predicate focus
Occurrence of pause (%)	85.71	66.6	79.40	24.24
Average pause duration (secs)	2.21	1.78	1.84	0.094

4. DISCUSSION AND CONCLUSION

While the Amazon region is regarded as one of the most linguistically diverse in the world, the grammar of Amazonian languages has traditionally remained undescribed. Fortunately, this situation has been changing in the last decades, although the information structural component of Amazonian languages have remained untouched with few exceptions (Vallejos 2009 for Kokama-Kokamilla, Van Valin 2009 for Banawá, Wari' and Karitiâna, Storto 2014 for Karitiâna, among others). This paper aimed to contribute to this discussion by exploring the prosodic realization of focus in the San Alejandro dialect of Kakataibo. After characterizing the f0 realization and pause insertion after the clitic =ka in out-of-the-blue sentences, three focus type sentences were examined for comparison. A set of 238 sentences produced by 8 native speakers were analyzed for those features.

Results showed a significant value for the relation between focus type and the position where the highest f0 falls. While narrow focus and sentence focus show the highest f0 in the constituent occurring in the pre-field or the second position clitic =ka, predicate focus has the highest pitch on the final main verb. These results suggest that the neutral prosodic pattern with regard to f0 in Kakataibo is to place the highest f0 in the pre-field constituent. Given this default pattern, narrow focused constituents are placed in that position to acquire prosodic prominence in terms of f0 as predicted by Truckenbrodt's proposal (1995) that the focused constituent must be prominent in its prosodic domain. Since main clause verbs are not allowed to occur in the pre-field position because of a syntactic constraint, placing them in that position to acquire prosodic prominence is not an option. In this case, syntax takes primacy over prosody and makes the highest f0 occur in the final position where the verb is allowed. In all the focus types examined here, the highest f0 is associated with the constituent in focus. This observation suggests that *in situ* focused constituents would also receive the highest f0, although this prediction still needs to be tested.

The fact that the highest f0 in narrow and sentence focus may occur on the constituent occurring in the pre-field position or the 2CL might be seen as problematic for two reasons. First, the focused constituent does not receive prominence in itself when the highest pitch falls on the 2CL. The second problem is that there are two targets where prominence may be accomplished. Speculatively, this behavior might be explained by different phrasings of the second-position clitic with the constituent in the pre-field. Where the 2CL is highly integrated with the focused constituent, the highest pitch may fall on the 2CL. In contrast, the highest pitch falls on the focused constituent itself when the 2CL is not phrased with that constituent, which is in accordance with the need to encode prominence on the focus. Notice the fact that the highest f0 may fall on the 2CL instead of on the focused constituent can be accounted for as a case in which the focus feature percolates to the whole phrase, as argued for English where high pitch on the object is ambiguous between object focus and VP focus (Winkler 2012). Nevertheless, further research needs to confirm the conditions by which the highest f0 falls in either of these positions.

Pausing after the 2CL =ka is not as clear a cue for identifying different focus types as f0 is, but there is a strong tendency to identify sentence and narrow focus with a pause in this position and not so in predicate focus. The duration of the pause also tends to distinguish sentence focus and narrow focus

from predicate focus. It remains as an open question whether V or VP focus are separated from the rest of the utterance by a pause.

Typologically, Kakataibo can be characterized in terms of focus marking as an edge language (Büring 2010), exploiting both the right and left edge to achieve prominence. Kakataibo satisfies the information structure requirement of making the focus prominent by means of the interplay of syntax and prosody. The left periphery is used as the default prosodically prominent position for focus where arguments need to be placed, in a similar fashion to the *p-movement* to the right edge in Spanish (Zubizarreta 1998). The default Kakataibo pattern shows a rigid prosodic structure and free syntactic ordering; the non-default marking of (predicate) focus follows a free prosody but more constrained syntax. While Van Valin's (2005) typology of focusing strategies where languages make use of free vs. rigid syntax and free vs. rigid prosody captures the tendencies seen here, the Kakataibo facts call for a more fine-grained typology of focus devices based on different constructions within a single language.

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