

FOCUS PROSODY IN FIJIAN: IN-SITU FOCUS MARKING

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ABSTRACT

This paper presents an acoustic analysis of focus prosody in Fijian - a verb-first language. We analysed the pitch (f_0), intensity, and duration data of the same sentence that vary in the position of narrow focus: (i) initial, (ii) medial, and (iii) final focus, compared to the neutral focus. Compared with neutral focus, we found that narrow focus led to a general elevation of the pitch f_0 , greater intensity, and longer mean syllable duration. The only exception is for initial focus. Initial focus differs from the other two positions, with shorter mean syllable duration and no significant difference in intensity with neutral focus. We used sentences composed solely of juxtaposed NPs to elicit focus because in a verb-first language, focus is otherwise often marked by word order.

Keywords: speech prosody, focus prosody, Fijian

1. INTRODUCTION

Studying focus prosody of verb-initial languages can be difficult because non-prosodic focus markers such as fronting (i.e. moving the focussed item to the front) are often involved (see review in [1]). For example, in Samoan, fronting can be used to mark (contrastive) focus [2], alongside prosodic markers. This means that comparisons of prosodic cues among focus conditions are not based on otherwise identical utterances – a potential source of confounds. Possibly in part due to this challenge, Fijian focus prosody has yet to be empirically investigated with any systematic production experiment, making it an understudied topic in phonetics to this day.

Fijian is an Austronesian language spoken by about 400,000 as a first language [3] in Fiji. Its basic word order is often considered verb-object-subject (but note alternative accounts such as [3]). Currently, there is no published production study of Fijian focus prosody (except one pilot study [4]).

While not much is known about Fijian focus prosody, researchers have investigated a related language, verb-initial Samoan [2]. It was found that individual speakers used various focus-marking strategies. The initial phonological phrase was always the most prominent. In verb-agent-object sentences, the verb and agent were in the initial phrase. Speakers raised the pitch on the object in object focus, and

lowered it in agent focus; although they did not do this consistently. No prosodic marking of focus on the agent was found.

To gain a better understanding of the understudied Fijian language, the current research project investigating the Fijian focus prosody contains two experiments. The first is a picture description task [4], that collects and analyses data on focus marking strategies in natural Fijian speech data... The second is designed, for better experimental control, to circumvent the fronting strategy commonly used to mark focus in verb initial languages, eliciting prosodic focus markers in situ with fronting suppressed. One possible strategy to achieve this is to avoid using natural sentences, e.g. using strings such as phone numbers¹ or, in the present study, a series of items. With such a paradigm, one can answer research questions such as: (i) Is narrow focus different from neutral focus? (ii) Are different focus locations marked differently? (iii) What acoustic cues (e.g. f_0 , intensity, duration) are used to mark focus?

2. METHODS

2.1. Participants

Ten students from the University of South Pacific (5 female, 5 male) were recruited in Fiji. They are native speakers of Fijian, speaking English as an L2. They have no (history of) hearing or language impairment.

2.2. Materials

Fijian is a verb-first language where verbal suffixes are applied and focus is often marked by word order [5]. Thus, in the present study, a sentence composed of three adjacent noun phrases (NPs), i.e. *uvi, uto, dalo* ‘yam, breadfruit, taro’ was designed to elicit prosodic focus. The sentence has four focus conditions based on their positions, namely initial focus, medial focus, final focus (all of them are narrow focus), and neutral focus (Table 1). Regarding the neutral focus, as the order of items is identical to the order of the precursor question, it is in fact an echo answer to the question.

All four focus conditions of the sentence were elicited by a precursor question asked by the interviewer (a linguist and a Fijian native speaker). Altogether, we recorded 120 utterances (1 sentence *

4 focus conditions * 3 repetitions * 10 speakers). All utterances were retained for analysis.

Precursor question	Target sentence	Focus condition
<i>uto, uto, dalo?</i>	<i>Uvi, uto, dalo</i>	narrow (initial)
<i>uvi, uvi, dalo?</i>	<i>Uvi, uto, dalo</i>	narrow (medial)
<i>uvi, uto, uto?</i>	<i>Uvi, uto, dalo</i>	narrow (final)
<i>uvi, uto, dalo?</i>	<i>Uvi, uto, dalo</i>	neutral

Table 1: Summary of stimuli used

2.3 Recording Procedure

This was a fruit sequence naming task. Participants were shown three pictures showing yam, breadfruit and taro and were instructed to put the pictures in a specific order. The interviewer then pretended to mishear the picture order and asked the precursor question starting with ‘Did you say...?’ followed by the sentence targeting different focus conditions (refer to ‘Precursor question’ in table 1). For all focus conditions, the participants were instructed to respond by providing a complete answer, i.e. *sega/io* ‘yes/no’ plus the target sentence.

2.4 Annotation and measurements

We first chunked the raw sound data into individual utterances, then labelled them by syllable with PRAAT [6]. Vocal pulses were manually checked and rectified. After annotation, we obtained the time-normalised f_0 , intensity, and syllable duration with ProsodyPro [7]. As the mean f_0 of each participant is similar (84.27 - 98.65Hz), normalisation into semitones was not performed.

3. RESULTS

3.1 F0

We fitted linear mixed effects models to the f_0 data using *lmerTest()* [8]. Post-hoc comparisons were done using *emmeans()* [9]. Intensity (§3.2) and duration (§3.3) data were analysed using the same approach. The main effect of focus on f_0 was significant, $X^2(3) = 508.57, p < .001$. Post-hoc test shows that initial, medial and final focus had significantly higher f_0 than neutral focus ($p < .0001$). It means that, regardless of focus locations, a general elevation of f_0 is observed for all narrow focus conditions. The SS ANOVA [10] plot (Figure 1) shows that this difference was significant, and the difference lied in the last word *dalo* ‘taro’ (the red line indicates word boundaries).

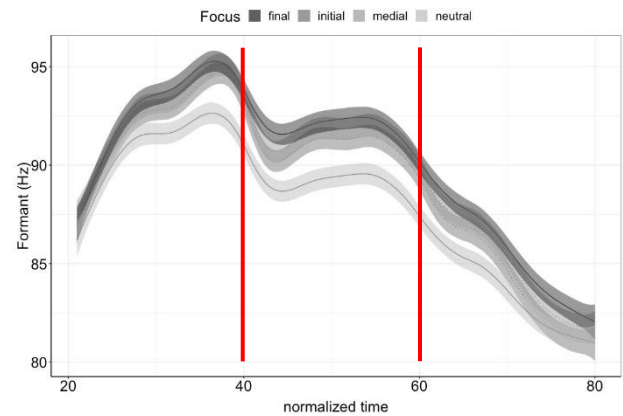


Figure 1: SS ANOVA comparing f_0 (Hz) of different focus conditions

3.2 Intensity

The main effect of focus on intensity was significant, $X^2(3) = 69.829, p < .001$ too. The Post-hoc test indicates that intensity of narrow focus (final and medial) is generally greater than neutral focus ($p < .0001$, see Figure 2). The SS ANOVA plot (Figure 2) shows the difference was significant, and the difference lied in the last word *dalo* ‘taro’.

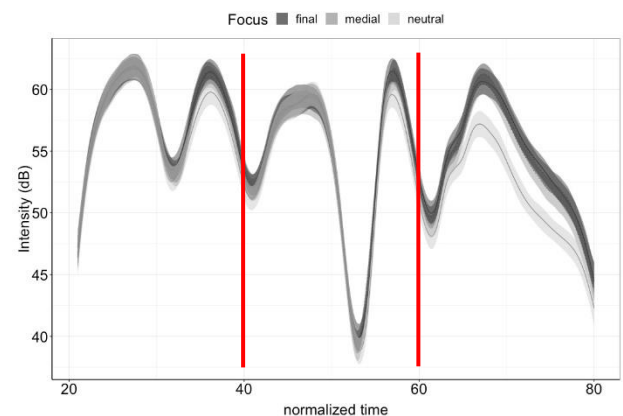


Figure 2: SS ANOVA comparing intensity (dB) of final, medial and neutral focus

3.3 Duration

While there are significant differences between f_0 and intensity of neutral focus and other narrow focuses, the difference in duration is not significant, $X^2(3) = 5.6281, p = 0.1312$.

In general, mean syllable duration is longer in narrow focus conditions, except for initial focus, in which syllable duration is shorter than in neutral focus (see Figure 3).

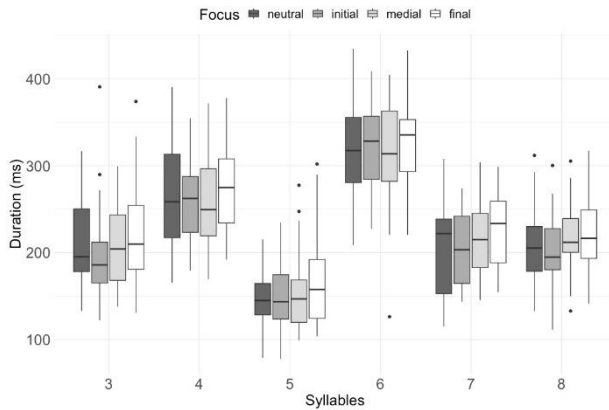


Figure 3: Syllable duration of different focus conditions

4. DISCUSSION

This study set out to identify prosodic focus marking strategies in Fijian. We compared narrow focus with neutral focus at different locations of a sentence, namely in - (i) initial, (ii) medial and (iii) final position. It appears that in situ prosodic focus in Fijian is mainly marked by a general elevation of f_0 , as significant f_0 raising was found for all narrow focus conditions, compared to neutral focus. Significant increase in intensity was also observed in the narrow vs. neutral focus, though localised to the final word.

We found that focus conditions significantly affected prosodic focus markers, however, it is likely that Fijian speakers use different ways to mark focus in natural speech. In addition, as the strategies available to speakers are multiple, cross-speaker variability is nearly inevitable.

As a first systematic production study of Fijian focus prosody, this pilot study reports on the correlates of focus of scripted sentences, making comparisons between each condition possible. To gain a better understanding of Fijian focus prosody, further studies are needed, taking account of the various strategies available to speakers, ideally based on natural language samples from daily conversations.

5. CONCLUSION

To conclude, Fijian language seems not to mark prosodic focus making use of the cue of duration. The

¹ Phone numbers in Fiji are usually given in English and not in Fijian.

phonetic cues used to mark focus include a raised f_0 regardless of focus locations, and a raised intensity when the focus element is in the medial or final position.

6. REFERENCES

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7. ACKNOWLEDGEMENTS

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