

## Focus Prosody in Fijian: a Pilot Study

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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]), and focus is often marked by word order [4]. Currently, there is no published production study of Fijian focus prosody (except one pilot study [5]).

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 varied in 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 accent 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 elicit prosodic focus markers in situ with fronting suppressed, one possible strategy is by avoiding natural sentences. Alternatively, one could use strings such as phone numbers or, in the present study, items. With such a paradigm, one could answer research questions such as: (i) Are narrow focus different from neutral focus? (ii) Is narrow focus marked differently across different locations? (iii) What acoustic cues (e.g.  $f_0$ , intensity, duration) are used to mark focus? We designed a production task using item strings to answer these questions.

Ten native speakers of Fijian from the University of South Pacific were recruited. They have no (history of) hearing or language impairment. Participants completed a sequence naming task. The sentences are composed of three adjacent noun phrases (NPs), i.e. *uvi, uto, dalo* ‘yam, fruit, taro’. Each sentence has four focus conditions based on the NP positions, namely initial focus, medial focus, final focus (i.e. narrow focus), and neutral focus (i.e. broad focus) (Table 1). The focuses were elicited by the presentation of pictures of yam, fruit and taro, followed by a precursor question asked by the interviewer. Altogether, we recorded 120 utterances (1 sentence \* 4 focus conditions \* 3 repetitions \* 10 speakers).

Figure 1 displays the  $f_0$  of all focus conditions with SS ANOVA [6]. The neutral focus condition has significantly lower  $f_0$  than the narrow focus conditions starting in the final word. We also fitted linear mixed effects models to the  $f_0$  data using *lmerTest()* [7]. Model construction followed a bottom-up approach. Post-hoc comparisons were done using *emmeans()* [8]. The best fitting model contained the fixed factor of the focus condition (initial, medial, final, neutral), and by-subject random intercept. Intensity and duration 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.

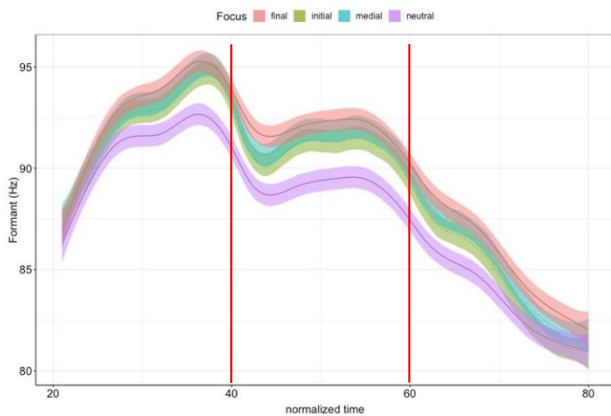
Figure 2 shows that the intensity of the focus conditions of medial, final (narrow focus) and neutral focus. The main effect of focus on intensity was significant,  $X^2(3) = 69.829, p < .001$  too. Post-hoc test indicates that intensity of final and medial focus is significantly greater than neutral focus ( $p < .0001$ ), but the intensity of initial and neutral focus is not significantly different ( $p = 0.9440$ ).

It is likely that in situ prosodic focus in Fijian is mainly marked by elevation of  $f_0$  and intensity in narrow focuses, the difference in duration is not significant,  $X^2(3) = 5.6281$ ,  $p = 0.1312$ . Generally speaking, mean syllable duration is longer for narrow focus conditions, but that for initial focus is the only exception, meaning that syllable duration is shorter for than neutral.

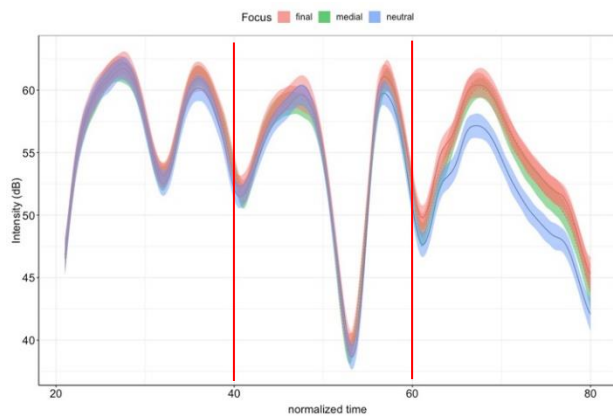
Our findings suggest that in situ prosodic focus in Fijian is mainly marked by a general elevation of  $f_0$  in narrow focus conditions and increase in intensity (in medial and final focus conditions), and not by syllable duration. Although we have found that focus locations significantly affected prosodic focus markers in scripted sentences, there are different ways to mark focus in natural speech, in addition to, cross-speaker variability. To gain a better understanding of Fijian focus prosody, further systematic production studies of focus marking strategies are needed.

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>	broad (neutral)

**Table 1:** Summary of stimuli used



**Figure 1:** SS ANOVA comparing  $f_0$  (Hz) of different focuses (word boundaries in red)



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

## References

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