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4pSCb28. Prosodic characteristics of two focus types in emphatic context in Thai
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This study presents an acoustic analysis of narrow focus (early focus) and broad focus, each in emphatic context (tune) in Thai, with the goal of providing a basic characterization of their prosody. To investigate prosodic realizations, target words from each of the 5 lexical tones in Thai were placed in subject and object positions of sentences with SVO structure. Each target word was placed in a sentence in which each syllable contained the same lexical tone as that of the target word. Results show that F0 measures, especially F0 maximum, minimum, and range, differed between focus types. In particular, narrow focused words were distinguished from non-narrow focused by higher F0 maximum, minimum, and range, while post-focal words contained lower F0 measures. Syllable duration also played a role in signaling narrow focus: focal words in narrow focus sentences were significantly longer than their non-focal counterparts in broad focus sentences. Interestingly, a pitch reset seemed to occur post-focally. Results suggest that while in board focus sentences, sentence stress is aligned to the final syllables, in narrow focus sentences, the stress is divided into two parts: strong and weak; the former is aligned to early focused words while the latter to final syllables.

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1. Introduction

This paper uses “broad focus sentence” to refer to a sentence in which the point of prominence in meaning is on the whole sentence, whereas “narrow or early focus sentence” is used to refer to a sentence in which the point of prominence is on a specific item or word that is not located in the final position of a sentence. The main goal of study is to provide an acoustic analysis of these two focus types in Thai. In particular, the main question that this study asks is: Which acoustic cues characterize broad and narrow focus in Thai?

Thai is a stress final language [1, 2]. Thus, there is an ambiguity between a sentence in which the point of prominence is on the final syllable and a broad focus sentence in which the default point of prominence is on the final syllable. In Thai, broad focus sentences are marked by the lengthening of the final syllables of the phonological phrases which contain at most 5-8 syllables, whereas narrow focus sentences, though are marked by phrase-final lengthening, are accompanied by a pause [2]. For instance, in the sentence /laa32 kin32 plaa32/ “donkey eats fish”, if /laa32/ “donkey” is the narrow focused item, it will be lengthened and there will be a pause between /laa32/ “donkey” and /kin32/ “eat”.

The fact that both focus types require lengthening creates further questions: Are the lengthening the same between the two focus types? If there are no significant differences, can one hypothesize that a narrow focus sentence is merely just a sentence made up of two broad focus sentences? What other acoustic cues signal each focus type? In particular, are the f0 values of the lengthened items the same across both focus types?

In order to answer these questions, this paper will examine sentences with SVO structure. In narrow focus sentences, the S will be placed under the point of prominence, while in broad focus sentences, the default point of prominence will be placed on the O.

Given the fact that in Thai emphatic context (or emphatic tune), the final syllables of phonological phrases are more lengthened than they do in neutral context [1, 2, 3], it is suggestive that under this tune, the distinction between narrow and broad focus sentences will be easy to detect. Thus, the emphatic context will be used in this study.

1.1. Hypotheses

In order to answer these questions, I propose the following hypotheses:

i. Since S in narrow focus is under the point of prominence, its acoustic measures should be higher than those in S in broad focus.

ii. Since O in narrow focus and O in broad focus occur phrase finally, both should have the same acoustic measures.

iii. Since S in narrow focus is under the point of prominence, whereas O in narrow focus is not, the former should have higher acoustic measures even if the latter occurs phrase finally.

iv. Since O in broad focus is under the default point of prominence, while S in narrow focus is under the point of prominence, both should have the same acoustic measures.

In order to evaluate these hypotheses, four comparisons will be made. Specifically, this paper will look at the differences between: S in narrow focus and S in broad focus (i), O in broad focus and O narrow focus (ii), S in narrow focus and O in narrow focus (iii), and O in broad focus and S in narrow focus (iv).
2. Method

Target words from each of the 5 lexical tones in Thai were placed in subject and object positions of SVO sentences containing five syllables. Each word in S and O positions is a bisyllabic word containing phonemic long vowels. Each target word was placed in a sentence in which each syllable contained the same lexical tone as that of the target word. Thus, all five syllables of each sentence have the same tone.

The sentences were produced by four native Thai speakers (F) from the central region of Thailand, ages from 45-50, who are living in Los Angeles.

Sentences were elicited via an interaction between the participants and an elicitor who is a native Thai speaker. To produce broad focus sentences, participants were told to respond to the question “Huh?! What was that?!?” which was produced loudly by the elicitor, and to produce narrow focus sentences, participants were told to respond to the question “Huh?! Who did it?” with “did it” being the same verb and object respectively as those in the sentence which the participants were told to utter. For instance, when the elicitor says “Huh?! Who sold pig legs?”, the participants answered “MY NIECE sold pig legs.”

3. Results

For each of the measures below, the forty tokens for each item were averaged together to get an item mean.

Target words in subject positions in narrow focus sentences were found to be significantly more prominent than their counterparts in broad focus sentences. Specifically, the f0 minimums of the target words in subject positions in narrow focus sentences are significantly lower than the f0 minimums of the target words in subject positions in broad focus sentences (p < 0.001), which makes the f0 ranges of the target words in subject positions in narrow focus sentences significantly larger than the f0 ranges of the target words in subject positions in broad focus sentences (p < 0.001). In addition, the durations of the target words in subject positions in narrow focus sentences are significantly longer than the durations of the target words in subject positions in broad focus sentences (p < 0.001). Figure 1 shows the mean f0 values of target words in subject positions, separated according to focus type, and Figure 2 shows the mean duration of target words in subject positions, separated according to focus type.

Figure 1. Mean f0 for target words in subject positions across broad and narrow focus sentences.
Target words in object positions in narrow focus sentences were found to be significantly less prominent than their counterparts in broad focus sentences. Specifically, the f0 maximums of the target words in object positions in narrow focus sentences are significantly lower than the f0 maximums of the target words in object positions in broad focus sentences (p < 0.001), making the f0 ranges of the target words in object positions in narrow focus sentences significantly smaller than the f0 ranges of the target words in object positions in broad focus sentences (p < 0.001). In addition, the durations of the target words in object positions in narrow focus sentences are significantly longer than the durations of the target words in object positions in broad focus sentences (p < 0.001). Figure 3 shows the mean f0 values of target words in object positions, separated according to focus type, and Figure 4 shows the mean duration of target words in object positions, separated according to focus type.
Target words in subject positions in narrow focus sentences were found to be significantly more prominent than the target words in object positions in sentences of the same focus type. Specifically, the f0 maxima of the target words in subject positions in narrow focus sentences are significantly higher than the f0 maxima of the target words in object positions in narrow focus sentences (p < 0.001), the f0 minima of the target words in subject positions in narrow focus sentences are significantly higher than the f0 maxima of the target words in object positions in narrow focus sentences (p < 0.001), making the f0 ranges of the target words in subject positions in narrow focus sentences significantly larger than the f0 ranges of the target words in object positions in narrow focus sentences (p < 0.001). In addition, the durations of the target words in subject positions in narrow focus sentences are significantly longer than the durations of the target words in object positions in narrow focus sentences (p < 0.001).

Figure 5 shows the mean f0 values of target words in narrow focus sentences, separated according to subject or object position, and Figure 6 shows the mean duration of target words in narrow focus sentences, separated according to subject or object position.

**Figure 4.** Mean duration for target words in object positions across broad and narrow focus sentences.

**Figure 5.** Mean f0 for target words in subject and object positions in narrow focus sentences.
Target words in object positions in broad focus sentences were found to be significantly more prominent than the target words in subject positions in narrow focus sentences. Specifically, the f0 maximums of the target words in object positions in broad focus sentences are significantly higher than the f0 maximums of the target words in subject positions in narrow focus sentences (p < 0.001), making the f0 ranges of the target words in object positions in broad focus sentences significantly larger than the f0 ranges of the target words in subject positions in narrow focus sentences (p < 0.001). Figure 7 and Figure 8 respectively show the mean f0 values and the mean duration of target words between object positions in broad focus sentences and in subject positions in narrow focus sentences.

Figure 7. Mean f0 values of target words across object positions in broad focus sentences and subject positions in narrow focus sentences.
4. Discussion

(1) shows a summary of the results:

<table>
<thead>
<tr>
<th>Focus type</th>
<th>Subject</th>
<th>Object</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>broad focus</td>
<td>S₁</td>
<td>O₁</td>
<td>“Donkey eats fish.”</td>
</tr>
<tr>
<td>narrow focus</td>
<td>S₂</td>
<td>O₂</td>
<td>“DONKEY eats fish”</td>
</tr>
</tbody>
</table>

Comparison among target words in subject and object positions across focus types.

As can be seen in (1), S₂ is more prominent than S₁ and O₂, but it is less prominent than O₁. O₂ is less prominent than O₁.

Results suggest that most proposed hypotheses must be rejected. Because the acoustic measures of S in narrow focus were found to be higher than those of S in broad focus, hypothesis (i) must not be rejected. Since the acoustic measures of O in narrow focus were not found to be the same as those in O in broad focus, hypothesis (ii) must be rejected. Because the acoustic measures in S in narrow focus were found to be higher than those in O in narrow focus, hypothesis (iii) must not be rejected. This finding suggests that the acoustic measures in S causes the acoustic measures in O in be lowered. Thus, it is possible that there might a pitch reset occurring after S. In addition, given the fact that the acoustic measures in S and O are different, the finding also suggests that narrow focus sentences are not made up of two broad focus sentences, perhaps instead there are two intermediate phrases. And finally, since the acoustic measures in O in broad focus were found to be higher than those in S in narrow focus, hypothesis (iv) must be rejected.

Results suggest that lengthening is not the only cue that distinguishes broad and narrow focus from each other; f₀ also plays a role in signal each focus type. In addition, results also suggest that the sentence stress is distributed differently in each focus type. Specifically, in board focus, the stress is only realized on the final syllables, whereas in narrow focus, the stress is divided into two parts: strong and weak; the former is aligned to narrow focused words while the latter to the final syllables, e.g. if the sentence /laa₃₂ ᵃ₃₂ plaa₃₂/ “donkey eats fish” is put in narrow focus context, the stronger part of the stress will be realized on /laa₃₂/ “donkey”, while the weaker part will be on /plaa₃₂/ “fish”.
5. Conclusions

The results of this study suggest that more research must be done on stress final tone languages such as Thai in order to better understand broad and narrow focus.

6. References

