Focus-sensitive Operator or Focus Inducer: Always and Only

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Abstract

There is a long-standing debate in the literature about whether focus particles function as focus-sensitive operators or focus inducers. However, it has not yet been established which perspective is correct. The current study investigates the effect of focus particles, using four different conditions. The results show that the focus particles are focus-sensitive operators, since the focused words are not affected by the presence of the focus particles. In addition, prosodic differences can be seen between always and only. The former has more increased mean and maximal F0, duration, and intensity values than the latter. This result suggests that always bears notable prosodic features in and of itself.

Index Terms: focus-particle, focus-sensitive operator, focus inducer, PENTA, intonational function

1. Introduction

Cross-linguistically, focus particles (henceforth, FPs) are believed to be associated with information structure [1]. FPs are generally assumed to assign a focus feature to the following domain. See (1).

(1) a. I always play [basketball]FOC.
b. I only play [basketball]FOC.

In (1), basketball receives a focus by virtue of the FPs, always and only. In this case, the FP is called a focus inducer since it literally induces focus. The same is true for Korean. See (2).


However, according to a different perspective, focus is not determined by FPs. Rather, it is elicited by a discourse context [2]. See (3).

(3) a. Contrastive focus with an FP. [2: 5]
...Unfortunately, Friday’s attendance list went missing. The secretary told the head of department that all three pupils had worked on that day. But she was wrong. On Friday, only Sabine came.

b. Contrastive focus without an FP. [2: 6]
...On Friday, there was a big surprise. Andreas had told us that Franziska would arrive on that day. But he had completely mixed it up. On Friday, Sabine came. Franziska still had to work.

The contrastive foci in both (3a) and (3b) are triggered by the discourse context. In (3), the focused element is underlined and the sentence with the focus is italicized. The difference between the sentences is that (3a) contains an FP, whereas (3b) does not. According to [2], however, there is no phonological and/or phonetic difference between the two conditions. This is because the focus in (3b) is already determined by the discourse context. Thus, it can also be realized with a contrastive focus accent. Accordingly, the occurrence of the FP does not give rise to a prosodic difference.

We have examined the two different perspectives on FPs. The first point of view is that the FPs behave like a focus inducer. Thus, they induce a focus feature in the following domain. Conversely, it has been argued that the FPs are not related to prosody. Rather, a (contrastive) focus can be triggered by the discourse context.

Given the disagreement about the nature of the FPs, the goal of the present study is to investigate which claim is more adequate for Korean FPs. In addition, it is of interest to see whether or not there is a prosodic difference between the FPs. That is, are they prosodically equivalent or different?

2. Methodology

2.1. Stimuli

In the current study, four sets of data served as stimuli. The first three sets had two FPs: always and only. However, they were paired with three different contexts. For example, in the first set, the FPs were given without context. The corresponding items in the second set were preceded by a prompt question. In the third set, the discourse context was given in order to elicit the focus effect. Finally, the last set did not include an FP, and focus was elicited through the discourse context. In total, 216 sentences were used. Among them, 126 sentences served as target sentences. The rest were used either as prompt questions or discourse contexts. See the following sample data set, where the target sentences are in square brackets and the FPs are in angle brackets.

(4) Prompt question + FP (always)
Q: Ḵayin mwues.ul cohaseyyo?
A: [Nanun <hxangsg> mantwulul cohahapnita]. ‘What do you always like? I always like dumplings.’

(5) Context + FP (always)
Ce nun eyessul tayipwute han kaci cohahanun umsiki issupnita. Pika okena myengcel naley hokun ceyka aphul tayy celuy nihanimikyee sonswu piecewusin mantwuka issupnita. Klayse, [nanun <hxangsg> mantwulul cohahapnita]. ‘There is something I have liked since I was young. When it rained, when it was a holiday, or when I was
sick, my elder sister used to make dumplings for me. For this reason, I always like dumplings."

2.2. Subjects
Two males and two females participated in the experiment. All participants were native speakers of Korean. We recruited the subjects at the University of Pennsylvania and paid them for their participation. No problems with their speech or hearing were found, and neither were noticeable accents and/or dialects found.

2.3. Procedure
The stimuli were recorded in a sound-proof booth in the Department of Linguistics at the University of Pennsylvania. A head-mounted microphone was used for this experiment. The recordings were made electronically and saved directly on a computer through Praat [3]. Before the recordings, the materials were first presented to the subjects in order for them to become familiar with the materials. During the session, the subjects were allowed to drink water and take a short break if they felt tired. However, they were asked not to pause while reading. In addition, they were instructed to repeat the token(s) when a mispronunciation or mistake was found. The stimuli were presented on a paper sheet in randomized order.

2.4. F0 extraction
A Praat script was used to measure the acoustic parameters of the target sentences [4]. In order to extract F0, syllable boundaries are marked by hand. A logarithmic algorithm was also performed in order to smooth over and/or remove abrupt bumps and sharp edges. After the process of F0 extraction, all the target sentences were converted to graphs. Then, time-normalized F0 curves of all the target sentences were computed, using all the tokens produced by the four subjects.

In Figure 1, we see that each word is bordered by a vertical line. In general, one or two peaks in each phrase are observed over the course of a sentence. However, noticeable differences can also be seen across the three FP conditions: i) focus preceded by always; ii) focus preceded by only; iii) focus without an FP (henceforth, the three different FP conditions). Notice that the second area is at the location of the FPs. In the No FP condition, however, since it does not include an FP, the F0 contour cannot be seen in this area.

First, a large difference in F0 can be observed between the FPs always and only. That is, the F0 contour of the former sharply rises, beginning with the release of the word. Afterwards, it drops sharply until it moves upward again. Conversely, only does not show a sharp increase. Rather, in the following phrase (i.e., the 3rd area), the F0 curve seems to reach the highest peak. For this reason, it is necessary to regard the FPs as an independent factor in order to see whether the F0 curve with always is higher than that with only, regardless of the different contexts. In

2.5. F0 Measurements
Given the visual representations of the F0 contours in Figure 1, the present study measures duration, intensity, mean F0, and maximal F0 (henceforth, Max F0) across the three different FP conditions. The measurements are extracted from the 1st, 2nd, and 3rd region. In addition,
such measurements were used to examine the difference between *always* and *only*. In the present study, the measurements were obtained directly from the Praat script [4], by using manually-labeled boundaries.

2.6. Analyses and Results

In the present study, the measurements are largely divided into two parts. First, we investigate whether the focused word is influenced by the presence of an FP or whether the focused word is independent of the FP. In this group, we have one independent factor (i.e., three different FP conditions). The dependent variables are then duration, mean intensity, mean F0, and Max F0. Next, as previously mentioned, the current study also examines the difference between *always* and *only*, to see whether they show different prosodic patterns. Thus, the FPs and the three different contexts serve as independent factors. The dependent variables are the same as the first group. One-way ANOVA for the three different FP conditions and 2-way ANOVA for the three different contexts were performed to answer these questions.

In Figure 2, we can see that there are no significant differences for all the measurements (i.e., duration, mean intensity, mean F0, and max F0) across the three FP conditions, even though minor differences are observed.

In Table 2, first, we see that there is no significant effect on duration: 399.8 ms (NFP), 391.9ms (Always), and 394.3 ms (Only). The same is true for mean intensity: 69.1 dB (NFP), 69.1 dB (Always), and 70.5 dB (Only). Second, both mean F0 and Max F0 are also not significantly different across the three conditions: mean F0: (168.4 Hz (NFP), 166.2 Hz (Always), 170.2 Hz (Only)); Max F0 (194.8 Hz (NFP), 194.5 Hz (Always), 198.0 Hz (Only)).

However, significant differences can be found in all the measurements comparing the FPs *always* and *only*, as is shown in Figure 3 and Table 2. That is, all the values in the region of *always* are significantly higher than those with *only*. For example, the duration values for *always* and *only* are 357.9 vs. 292.2 ms. The intensity values are 72.2 vs. 69.1 dB. The mean F0 values are 219.6 vs. 176.7 Hz. The Max F0 values are 242.4 vs. 205.0 Hz. Conversely, significant interactions between the FPs and the three different contexts are not found, as shown in Table 2.

Table 2. Results of one-way ANOVAs for all measurements in the three FP conditions.

<table>
<thead>
<tr>
<th>FPs (Focus Particle)</th>
<th>FP X Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>F = 0.2077, p = 0.815</td>
</tr>
<tr>
<td>Mean Intensity</td>
<td>F = 1.6883, p = 0.192</td>
</tr>
<tr>
<td>Mean F0</td>
<td>F = 0.0282, p = 0.972</td>
</tr>
<tr>
<td>Max F0</td>
<td>F = 0.0179, p = 0.982</td>
</tr>
</tbody>
</table>

In Figure 1, we can see that the F0 curve of the sentence with *always* bears the highest peak in the second region, whereas the F0 contour of the sentence with *only* has its
highest peak in the third region. What is the crucial difference between them? To see the effect, we also measured the mean F0 of the three areas surrounding always and only. Figure 4 shows the transition of the F0 curves from the first to the third area, where we see that the F0 curve with always undergoes a sharp transition (F[1] = 29.494, p < 0.0001) from the first to the second area and then reaches the highest peak. Afterwards, it experiences a large drop (F[1] = 23.488, p < 0.0001). Conversely, the F0 contour with only shows a smooth transition over the three areas. However, there is a slight, albeit significant, F0 decrease (F[1] = 13.795, p < 0.001). Then, the F0 begins to move upward following the second area (F[1] = 15.673, p < 0.0001).

3. Discussion

In Figures 1 and 2, no prosodic differences can be observed between the three different FP conditions, where the focused items have virtually identical duration, intensity, mean F0, and Max F0. This finding seems to support the claim that focus is not determined by the FPs, but rather elicited by the context [2]. If the FPs serve as focus inducers, the focused items without FPs should not have values which are prosodically equivalent to the ones observed with FPs.

In addition, in Figure 1, we can see that there are differences between the FPs always and only. The former is realized with a longer duration, a higher pitch, and a greater intensity than its counterpart. This provides a new perspective on FPs. Given that always shows more dynamic, rising F0 contours than the subsequent focused item, it can be assumed that always receives a focus feature whatever the context is. However, the F0 contour of only does not exhibit prosodically prominent features.

In Figure 4, in the case of only, the F0 decrease can be found between the first and the second region. This does not imply that only is prosodically unmarked. Rather, it is likely to be influenced by F0 declination, which is the tendency to lower the F0 contour at the end of sentences [5, 6]. However, the focused item in the third area receives a focus feature, given that the F0 contour rebounds and begins to move upward, regardless of the F0 declination effect.

Finally, in the case of always, dynamic F0 transitions are observed. An exponential increase in F0 can be seen between the first and the second area. Then, the F0 decreases sharply. Korean is found to exhibit post-focus compression after focus [7]. However, always does not delete the function of the following focused item. Hence, this finding supports the PENTA (The Parallel Encoding and Target Approximation) model [8, 9, 10, 11], which is based on function, not form. The model denotes the mechanisms of multiple intonational functions simultaneously conveyed through speech melody [8, 9, 10, 11]. Thus, it may be the case that two (or more) intonational functions can be simultaneously realized in one sentence.

4. Conclusion

The findings in the present study reveal that focus can be elicited by the context. Accordingly, FPs need to be treated as focus-sensitive operators, rather than focus-inducers. In addition, clear differences between the FPs always and only can be observed. The former has longer duration, higher pitch, and greater intensity values. Thus, the FP always seems to carry a focus feature. Even though it is realized with longer duration, higher pitch, and greater intensity, however, it does not eliminate the function of the subsequent word whose focus is elicited by the context. This demonstrates that speech must be described in function, not in form [9, 11], since it can bear (possibly) two or more intonational functions. Lastly, it would be of interest to examine cross-linguistic typological patterns in order to understand the nature of FPs, e.g. i) whether FPs serve as focus-sensitive operators/focus-inducers or ii) whether there are phonetic differences between FPs.

5. References