

Phonetic Realization of Focus Particles *Always* and *Only* in Korean: Theoretical Implications of Association with Focus*

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1. Introduction

This study addresses the relationship between prosodic features and semantic functions of focus particles (henceforth, FP). Well known as focus-sensitive operators, FPs, such as *only*, are sensitive to the placement of focus as in (1).

- (1) a. Jan only gave Bill [money]_F.
(Everything Jan gave Bill was money.)
b. Jan only gave [Bill]_F money.
(Everyone Jan gave money was Bill.) (Beaver et al., 2007)

In (1), focused elements accompanied by prosodic salience are marked by a subscripted F. We can interpret the sentence differently depending on which element is focused. Thus, (1) indicates that the prosodic marking by focus affects truth-conditional meaning, interacting with the FP *only*. In this sense, FPs associate with focus (cf., Jackendoff, 1972; Rooth, 1985). Beaver and Clark (2003) investigated properties of two FPs, *always* and *only*, in terms of how to associate with focus. Even though *always* and *only* are similar in meaning, Beaver and Clark claim that English *always* and *only* and their equivalents in other languages such as German differ in ways of associating with focus. To account for the different behaviors of the FPs, they proposed the Quasi/Free/Conventional theory, a hybrid theory of semantics and pragmatics. This paper explores properties of Korean FPs *hangsang* ‘always’ and *ocik* ‘only’ to provide additional support to the cross-linguistic observation by Beaver and Clark. Because focus is closely tied to prosodic salience (cf., Selkirk, 1996; Kadmon, 2001), we conducted a production experiment in order to examine the phonetic realizations of *hangsang* and *ocik*. This experiment is requisite to gain a deep understanding of association with focus from a perspective of prosodic

features of FPs and focus. In this paper, we will show that the phonetic realizations of the FPs *hangsang* and *ocik* reflect their different semantic functions, supporting the Beaver and Clark's theory.

2. *Always and Only*

2.1. Background

Beaver and Clark (2003, 2008) examined and compared the two FPs, *always* and *only*, since they are categorized as focus-sensitive operators and normally analyzed as universal quantifiers. The following example illustrates the similarity in their interpretations.

- (2) a. Sandy always feeds [Fido]_F Nutrapup.
b. Sandy only feeds [Fido]_F Nutrapup.
c. $\forall x \text{ feed}(\text{sandy}, x, \text{nutrapup}) \rightarrow x = \text{fido}$
'Everything Sandy feeds Nutrapup to is Fido.' (Beaver and Clark, 2003)

Although they are similar in meaning, they behave differently with respect to association with focus. Beaver and Clark (2003, 2008) conducted several tests to clarify the difference, and the results show that *only* needs a prosodic cue to create an association. *Always*, on the other hand, can make an association without any prosodic cues. This paper replicates their reduced pronoun (or leaner), extraction, and ellipsis tests to investigate Korean FPs *hangsang* 'always' and *ocik* 'only'. In the next section, we will provide the results of the tests and show that the Korean FPs behave in the same way as the English counterparts.

2.2. *Hangsang and ocik*

In this section, we provide examples of *hangsang* and *ocik* with respect to association with focus, using three tests from Beaver and Clark (2003, 2008). The results from the tests for the English *always* and *only* indicate that *always* shows a free association and *only* has a more restricted association. Among their findings, Beaver and Clark show that English *always* can associate with a reduced pronoun, whereas *only* cannot. This evidence indicates that *always* does not need a prosodic cue to create an association; however, *only* does. Since reduced pronouns are not available in Korean, we substituted *pro* to investigate the phenomenon in Korean. In (3) and (4), the given context assigns focus on *hangsang/ocik* in a sentence that includes *pro*.¹ The examples show that *hangsang* can associate with *pro* but *ocik* cannot.

Context: You had many discussions with Sandy, but what I want to know is the

extent to which you talked about Fred. Of all the times you talked with Sandy, how often was Fred the person you talked about?

- (3) *Na-nun [hangsang]_F Sandy-wa pro tholon-ha-yess-ta.*
 I-Top always Sandy-with discuss-do-Pst-Decl
 ‘I always discussed’im with Sandy.’
 (Whenever I discussed someone with Sandy, I discussed Fred.)

- (4) #*Na-nun [ocik]_F Sandy-wa pro tholon-ha-yess-ta.*
 I-Top only Sandy-with discuss-do-Pst-Decl
 Cannot mean: ‘I only discussed Fred (and no one else) with Sandy.’

Given the evidence presented in (3) and (4), we claim that the properties of *hangsang* and *ocik* are the same as their English counterparts in Beaver and Clark (2003, 2008). *Hangsang* does not need a prosodic cue to create an association, in contrast to *ocik*, which does need a prosodic cue.

The second test, extraction, clarifies the difference between *hangsang* and *ocik*. In the context described below, (5) shows that *hangsang* can associate with the extracted element. The interpretation (5a) that is true in the given context is available. Alternatively, *ocik* cannot create such an association, and the interpretation that is true as in (6a) is not available. These results are the same as their English counterparts.

Context: I have two roommates, Kim and Sandy. I always stock their fishtanks. I stock Sandy’s fishtank with goldfish and nothing else. I stock Kim’s fishtank with goldfish and with clownfish.

- (5) *Kimssi-uy ket-un nay-ka hangsang clownfish-lo chaywu-nun*
 Kim-Gen thing-Top I-Nom always clownfish-with stock-Comp
ehang-ita.
 tank-Decl
 a. ‘I said I stock Kim’s and no other tank with clownfish.’ [TRUE]
 b. ‘I said I stock Kim’s tank with clownfish and nothing else.’ [FALSE]

- (6) *Kimssi-uy ket-un nay-ka ocik clownfish-lo chaywu-nun ehang-ita.*
 Kim-Gen thing-Top I-Nom only clownfish-with stock-Comp tank-Decl
 a. *‘I said I stock Kim’s and no other tank with clownfish.’ [TRUE]
 b. ‘I said I stock Kim’s tank with clownfish and nothing else.’ [FALSE]

Using the ellipsis test, Beaver and Clark (2008) have shown that English *always* can associate with the elided element in contrast to *only*. The following examples show that *hangsang* and *ocik* behave the same as English under the same condition.

Context: At the meeting, some people prepare their presentation and others clean up the table. Some do both. What about Yenghuy and Chelswu?

(7) *Yenghuy-ka hangsang palphyo-lul cwunpi-ha-ki*
Yenghuy-Nom always presentation-Acc prepare-do-Nominal
ttaymwuney Chelswu-to hangsang kulehkey hap-ni-ta.
because Chelswu-too always so do-Hon-Dec
'Because Yenghuy always prepares a presentation, Chelswu always does so.'
(Chelswu prepares a presentation at every meeting because Yenghuy prepares a presentation at every meeting.)

(8) #*Yenghuy-ka ocik palphyo-lul cwunpi-ha-ki ttaymwuney*
Yenghuy-Nom only presentation-Acc prepare-do-Nominal because
Chelswu-to ocik kulehkey hap-ni-ta.
Chelswu-too only so do-Hon-Dec
'Lit. Because Yenghuy only prepares a presentation, Chelswu only does so.'
(cannot mean: 'Chelswu prepares a presentation (and does nothing else) because Yenghuy prepares a presentation (and does nothing else).')

Thus, these three tests indicate that the Korean *hangsang* and *ocik* behave the same as the English *always* and *only*. *Hangsang* is able to create an association freely, and *ocik* has a more restricted association. In the next section, we will briefly introduce a theory of focus by Beaver and Clark (2008), which provides an explanation of how *always* and *only* form their associations with focus differently.

2.3. Theory of association with focus

Previous studies have argued that either pragmatics or semantics should explain the way in which focus-sensitive operators associate with focused elements (e.g., Rooth, 1992, 1996a; von Stechow, 1994; Lambrecht, 1994). Beaver and Clark (2008) proposed a hybrid theory of semantics and pragmatics called the Quasi/Free/Conventional (QFC) theory, which is equivalent to an "intermediate theory" of focus discussed by Rooth (1992). They claim that associations of *always* and *only* with focus are formed differently, as we observed with the Korean examples in the previous section. This approach stipulates the different properties of *always* and *only*, dividing FPs into subsets, which contrasts with previous analyses that make no difference in treatment of FPs (e.g., Rooth, 1992, 2010; Büring, 2008). In the QFC theory, the function of *always* is categorized as free association, constructing an association with contextually salient sets of events or situations. *Only*, on the other hand, functions as

conventional association, which constructs an association based on a lexically-encoded dependency on focus. The semantic formulae for the two FPs by Beaver and Clark are given in (9) and (10).²

(9) **Always**: free association

Truth conditions of *NP always VP*: $\forall e \sigma(e) \rightarrow \exists e' \rho(e, e') \wedge q(e')$

(10) **Only**: conventional association

Truth conditions of *NP only VP*: $\forall e p(e) \rightarrow q(e)$

σ = a function which identifies a context

ρ = a function which maps an events to events

p = a meaning of *NP VP* minus content related to any focused parts of the VP

q = an ordinary meaning of a sentence *NP VP*

Beaver and Clark (2003, 2008)

As described in (9), the QFC theory, a mixture of semantics and pragmatics, accounts for the free association of *always* making use of contextual variables σ and ρ bound by a given context. Since *always* associates with an element that is salient in the given context, it does not need an element to be associated to in its domain. In contrast, *only* needs an element to be associated in its domain as stipulated in (10). Their analysis implies that prosodic salience of a focused element is requisite for *only* to create an association. Prosodic salience is not necessary for *always*, in contrast, because *always* takes a contextually salient element to create an association. Our assumption based on this analysis is that the conventional association for *only* and the free association for *always* should be reflected in their phonetic realizations. On the basis of this assumption, we conducted a production experiment, which we will present in the next section.

3. Production Experiment

3.1. Stimuli

Three sets of data served as stimuli. The first set was given without context. The second set was preceded by a prompt question. The third set was provided with a discourse context in order to elicit a focus effect. These three sets consist of 90 target sentences with fillers and contextual sentences. The following are sample data sets for *hangsang*, where the target sentences are in square brackets and the FPs are in angle brackets.

(11) Prompt question + FP (*hangsang*)

Q: *Ocik mwues.ul cohahaseyyo?*

A: [*Nanun <hangsang> mantwulul cohahapnita*].

‘What do you only like?’ ‘I always like dumplings.’

(12) Context + FP (*hangsang*)

Ce nun elyessul ttaypwuthe han kaci cohahanun umsiki isssupnita. Pika okena myengcel naley hokun ceyka aphul ttay celul wihayse nwunimkkeyse sonswu picecwusin mantwuka isssupnita. Kulayse, [nanun <hangsang> 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.’

3.2. Subjects

Three males and three 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. The participants did not exhibit problems with their speech and hearing nor did they show noticeable accents and dialects.

3.3. 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 recording. The recordings were made electronically and saved directly on a computer through Praat (Boersma & Weenik, 2009). The stimuli were presented on a paper sheet in a randomized order. Before the recordings, the material was first presented to the subjects in order for them to become familiar with the material. They were instructed to repeat the token(s) when they made a mispronunciation or mistake.

A Praat script was used to measure the acoustic parameters of the target sentences (Xu, 2005-2011). In order to extract F0, word boundaries are marked by hand. After the process of F0 extraction, all the target sentences were converted to graphs, provided in the next section. A logarithmic algorithm was performed in order to smooth over and/or remove abrupt bumps and sharp edges. Then, time-normalized F0 curves of all the target sentences were computed.

4. Analyses and Results

Figure 1 displays normalized F0 contours for *hangsang* and *ocik* in three different conditions. They are the mean F0 curves of all the sentences produced by six speakers, and each F0 curve is an average of 36 repetitions. The region [FP], where the FPs are located, indicates that *hangsang* has a higher pitch than

ocik. The pitch contours in other regions for *hangsang* and *ocik* overlap in the graphs. Table 1 shows that there are significant differences in all the measurements between *hangsang* and *ocik*. All the values in the region of *hangsang* are significantly higher than those of *ocik* (duration of *hangsang* vs. *ocik*: 357.9 vs. 292.2 ms., intensity: 72.2 vs. 69.1 dB, mean F0: 219.6 vs. 176.7 Hz, maximum F0: 242.4 vs. 205.0 Hz). Table 1 also shows that the phonetic realizations are consistent among the three conditions ([1] without a context, [2] with a prompt question, [3] with a discourse context).

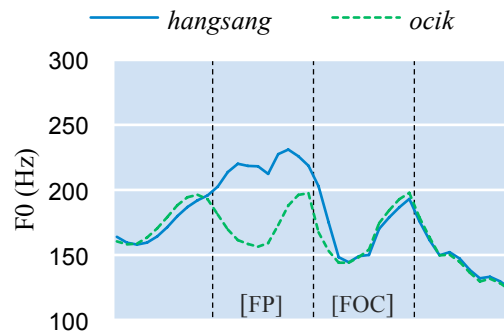


Figure 1: Mean F0 curves of all the stimuli with *hangsang* and *ocik* produced six times by each of six speakers ([FP]=a region for FP, [FOC]=a focused element). The target sentence is *Nanun {hangsang, ocik} mantwulul cohahapnita*.

	(df = 1, 5)	
	FPs	Focused elements
Duration	F=260.9, $p < .0001$	F=1.41, $p=0.24$
Mean Intensity	F=58.97, $p < .0001$	F=1.29, $p=0.28$
Mean F0	F=84.61, $p < .0001$	F=0.55, $p=0.46$
Max F0	F=71.15, $p < .0001$	F=0.44, $p=0.51$

Table 1: Results of a one-way ANOVA for all measurements a) between *hangsang* and *ocik* and b) between focused elements in the three different conditions

In addition, Figure 1 shows that the pitch of *hangsang* is higher than the focused element ([FOC]), but the difference in pitch of *ocik* with the focused element is not that large. Before we conclude that the two FPs have different

relationships with the focused element in terms of pitch, we need to take into account a possible F0 declination effect. To compare the two peaks in a sentence, an F0 declination effect has to be excluded so that the exact intonational functions of the target sentence can be observed. We conducted a linear regression using the formula (13) to neutralize the effect and measure the slope.

$$(13) \hat{\beta} = (X'X)^{-1}X'y = \left(\frac{1}{n} \sum x_i x_i'\right)^{-1} \left(\frac{1}{n} \sum x_i y_i\right)$$

Figure 2 displays F0 residuals, which exclude the F0 declination effect. Just as was shown in Figure 1, Figure 2 also demonstrates that *hangsang* has a higher pitch than *ocik* ($F[1,5]=591.867, p<.0001$). Additionally, the pitch for *hangsang* is higher than the focused element, whereas the pitch of *ocik* is not. However, there is a difference between the pitches of the focused elements with *hangsang* and *ocik* ($F[1,5]=104.89, p<.0001$). This finding contrasts with the data in Figure 1, where the pitch of the focused element with *ocik* is higher than the one with *hangsang*.

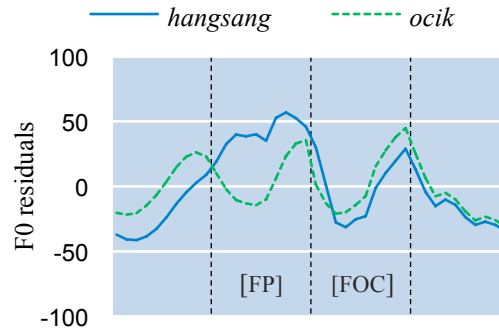


Figure 2: F0 residuals of all the sentences spoken produced six times by each of six speakers. Each F0 curve is an average of 36 repetitions. The target sentence is *Nanun {hangsang, ocik} mantwulul cohahapnita*.

5. Discussion

The results of our experiment show that *hangsang* has a higher pitch than the focused element and also has the most salient prosody in the sentence. In contrast, the pitch of *ocik* is lower than its focused element and the focused element has the most salient prosody in the sentence. This supports the QFC theory by Beaver and Clark (2008), which distinguishes *hangsang/always* and

ocik/only as free association and conventional association. Since *hangsang* associates with an element that is the most salient in a context, it does not need to have prosodic prominence on a focused element to create an association. However, *ocik* needs a prosodic cue to associate with a focused element. Thus, the results imply that the prosodic patterns of *hangsang* and *ocik* reflect a semantic distinction as stipulated in the QFC theory. From the perspective of phonetic realizations of FPs and focus, this experiment clarified the different functions of *hangsang* and *ocik* with respect to association with focus.

However, there remains a question: why does *hangsang* have the most salient prosody? Although the QFC theory predicts that *hangsang/always* does not need a prosodic cue to create an association, it does not require that the highest prosodic prominence should be on *hangsang/always* in the sentence. The most plausible account for the prosodic prominence is that the interpretation of *hangsang* was affected by “association with presupposition” (Rooth, 1996b). Since there is an overlap between a stative predicate *cohapnita* ‘like’ and a temporal meaning of *hangsang* in the stimuli, *hangsang* can be interpreted as an intensifier, which emphasizes the meaning of the sentence and associates with a presupposition, that is, *I like dumplings*. When the participants interpret *hangsang* as intensifier, it seems natural that *hangsang* was realized with stress.³ In contrast, such an interpretation is not available for *ocik*. Thus, we assume that the interpretation of *hangsang* as intensifier correlates with the prosodic salience of *hangsang*, which is different from *ocik*. To exclude the intensifier interpretation of *hangsang* in the experiment, the predicate type needs to be non-stative such as *eat* so that the overlap observed in our stimuli can be avoided. With the non-stative predicate, we are able to compare prosodies of *hangsang* and *ocik* that have the same function in stimuli. For our current purpose, however, the different functions of *hangsang* and *ocik* do not cause a problem, since it does not contradict our prediction based on the QFC theory. Rather, it supports the theory, presenting the unconfined association of *hangsang/always*, in contrast to *ocik/only* that has a more restricted association.

One final point in the results needs to be explained. Figure 2 shows a difference in pitch between the focused elements with *hangsang* and *ocik*. As we explored above, if *hangsang* was interpreted as intensifier, the low pitch of the focused element with *hangsang* is caused by Post-Focus Compression (Chen et al., 2009; Lee & Xu, 2010), which is known to compress the F0 contour after focus. Since *hangsang* associates with presupposition and has the highest pitch, which can be interpreted as focus, the pitch contours following *hangsang* experiences the compression that lowers pitches of the following words. Thus, the focused element with *hangsang* is lower in pitch than the focused element that follows *ocik*.

6. Conclusion

Following Beaver and Clark (2003, 2008), we investigated Korean FPs *hangsang* and *ocik* and found that they behave the same as the English counterparts in terms of their association with focus. Furthermore, the results of our production experiment indicate that the phonetic realizations of *hangsang* and *ocik* reflect their semantic distinction explicated in the QFC theory. Since our stimuli contain the use of *hangsang* as intensifier, it is requisite to investigate a prosodic feature of *hangsang* with a non-stative predicate such as *eat*. In addition to the Korean FPs, further research is needed to ascertain the relationship between semantic functions of FPs and their phonetic realizations in other languages. Moreover, a comprehension or perception study is necessary to elucidate the way in which listeners make use of prosodic information with respect to FPs and association with focus.

Notes

* We would like to thank the audiences at the 2010 Western Conference on Linguistics and the talk at the University of Pennsylvania for their valuable comments and suggestions. Special thanks go to Aviad Eilam for his detailed comments. Any remaining errors are our own.

1. All of the contexts for the Korean examples given in this paper are equivalent to the English one in Beaver and Clark (2003).
2. As for the details of the formula, refer Beaver and Clark (2003, 2008).
3. To support the idea that *hangsang* ‘always’ in our stimuli was realized as an intensifier, we compared two pitch contours with *hangsang* and a genuine intensifier *cengmal* ‘really’ as below. It represents that the pitch contours have the similarity in that *hangsang* and *cengmal* have the most prominent pitch in the sentence.

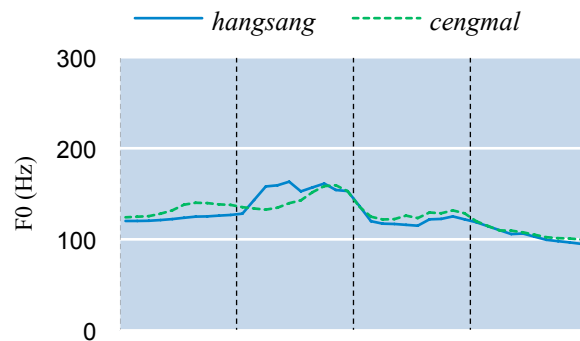


Figure 3: Mean F0 curves of the stimuli with *hangsang* and *cengmal* ‘really’ produced seven times by one speaker. The sentence is *Nanun {hangsang, cengmal} mantwulul cohahapnita*.

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