

On the Reference of Zero Forms in Korean

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Joh, Yoon-kyoung. (2013). On the Reference of Zero Forms in Korean. *The Linguistic Association of Korea Journal*, 21(2), 69-88. This paper claims that zero forms must be treated as topics when we understand the notion of topic in a precise and broad manner. Previously, Huang (1984) has suggested that zero forms are the outcomes of Topic NP deletion. However, Kim (2003) has refuted his claim with examples that construe topics in a narrow sense. This paper embraces the notion of topic proposed by Kuppevelt (1995) and argues that, under his program, we can legitimately claim that zero forms are indeed topics. Characterizing the nature of zero forms as topics, this paper corrects Kim (2003)'s optimality-theoretic analysis on zero pronouns. First, this paper newly proposes the Topic Establishment Constraint that replaces Kim's (2003) Center Continue Constraint that encounters a number of counter-examples and then ranks it as the highest constraint, adequately capturing the very nature of zero pronouns.

Key Words: zero pronoun, topic, centering, question, optimality

1. Introduction

Zero pronouns have intensively been studied in the area of pragmatics. However, their exact nature is still not understood well. This paper would like to make a small contribution to the studies on zero pronouns by supporting the view proposed by Huang (1984) in light of a new characterization of topichood and by proposing a new constraint that revises Kim's (2003) optimality-based analysis.

Huang (1984) has claimed that zero forms are topics in nature. However, Kim (2003) has opposed this view by presenting the examples from (1) to (3). In

the (b) sentences in the following examples, zero pronouns are employed. However, Kim (2003) claims that the zero pronouns are not the instances of topics in the discourse. In (1a), the topic seems to be *emma* 'mother' but the zero pronoun in (1b) refers to *sakwa* 'apple.' In (2a), we can easily come to the hasty conclusion that the topic is *apeci* 'father.' However, in (2b), the zero subject refers to *kangaci* 'puppy.' In the same way, in (3a), the topic is claimed to be *Yengswu* since it is suffixed with the so-called topic marker *nun*. However, in (3b), not *Yengswu* but *Yenghuy* is realized by the zero form.

- (1) a. Emma-nun way maynnal sakwa-man saci?
 Mom-Top why every day apple-only buy-Int?
 'Why does mom always buy apples?'
 b. Mom-ey coh-ko ceychelianha.
 body-to good-and in-season-dec.
 'good to body and in season.'
- (2) a. Ecey apeci-nun kangaci han mali-lul sa o-sy-ess-ta.
 yesterday father-Top puppy one Classifier-Acc buy
 come-Hon-Pst-Dec
 'Yesterday father came home buying a puppy.'
 b. Thel-i hayah-ko manh-ass-ta.
 fur-Nom white-conj a lot-Pst-Dec.
 'Fur was white and a lot.'
- (3) a. Yengswu-nun ecey tungkyoskil-ey yenghuy-lul mann-ass-ta.
 Yengswu-Top yesterday on the way to school Yenghuy-Acc
 meet-Pst-Dec.
 'Yesterday Yengswu met Yenghuy on the way to school.'
 b. Yecenhi yeyppessta.
 still be pretty-Pst-Dec
 '(She) was still pretty.'

With the examples above, Kim (2003) refutes Huang's (1984) claim that zero pronouns are topics. However, I would like to contend that the examples above are not necessarily counter-examples to Huang's (1984) claim if we understand the notion of topic in a way suggested by Kuppevelt (1995) who allows more

than one topic to be present in a sentence. Approaching topics in a broad sense by relying on the program that provides the definition of topic by means of explicit or implicit questions, I would like to support Huang's (1984) claim and revise the optimality-theoretic analysis of Kim (2003).

This paper is organized as follows. First, section 2 will briefly look at Huang's (1984) original claim on zero forms. Then, in section 3, I will briefly introduce previous studies on zero pronouns which are on the basis of the centering framework and discuss problems of such analyses. Section 4 will discuss a new way of understanding topics in terms of Kuppevelt (1995) and propose a new constraint concerning the topichood of zero forms and re-rank the constraints involved with resolving the reference of zero pronouns in Korean.

2. Huang (1984)

Huang (1984) extends the hot-cool division of the media proposed by McLuhan (1964) to the language. McLuhan (1964) has originally claimed that a medium can be divided either into a hot source or into a cool source: a medium is hot if the communication procedure requires little or no audience participation but a medium is classified into being cool if active audience participation necessarily involves in the process of the medium. For example, a movie is hot since most of what is presented in a movie is provided to the audience without necessitating much effort of the viewers. However, a telephone is classified as a cool medium since the communication through the telephone relies on intense participation of the audience.

Huang (1984) suggests that the same division can be made in the linguistic field on the basis of the explicitness with which certain anaphoric elements are expressed. For example, English may be identified as a hot language in that pronouns cannot generally be deleted and the information that is required to construe an utterance is, most of the time, obtainable from the overt forms of the utterance. However, Chinese has the opposite characteristics. Chinese can be classified as a cool language since pronouns are usually omitted from the grammatical sentences in which they occur and understanding the pronouns

involves much effort from the communication participants. The two languages are at the two ends of a continuum and other languages are claimed to have a status in between.

One of the primary features of such cool languages as Chinese, Japanese, and Korean is the massive use of zero forms. In fact, Huang (1984) makes a stronger claim that the very determining factor between cool languages and hot languages is the distribution of zero forms. That is, cool languages employ many occurrences of zero pronouns whereas hot languages cannot find many uses of zero forms. In explaining the distribution of zero anaphora in various languages, Huang (1978) borrows another distinction proposed by Tsao (1977). According to Tsao (1977), there is a clear distinction between discourse-oriented languages and sentence-oriented languages. Huang (1984) further insists that cool languages that heavily depend on zero forms are characteristically discourse-oriented.

Discourse-oriented languages are languages which are topic-prominent while sentence-oriented languages are essentially characterized as being subject-prominent. Sentence-oriented languages require the presence of the subject in a sentence and thus they make many uses of pleonastic elements. On the other hand, in discourse-oriented cool languages, the topic-comment structure is well established in each utterance. Huang (1984) further argues that the high instances of zero forms are possible in discourse-oriented cool languages in the first place since the languages have a prominent topic-comment structure and zero forms are made available by the Topic NP Deletion. In sum, Huang (1984) claims that cool languages are characterized by zero forms which are topics in nature. Huang's (1984) claim that zero forms are results of topic deletion in the utterance is well-formulated and captures the fundamental nature of zero forms. However, his study seems limited in that he couldn't define the notion of topic in a specific and concrete manner. Thus, what I would like to develop in this paper is to seek for the characterization of the topic notion that can make us maintain his insightful claim.

3. Centering Theoretic Analyses

Korean zero forms have been studied under the centering theory the most. This section will briefly overview the centering theory and examine how previous studies have analyzed Korean zero forms in terms of the centering theory.

The centering theory primarily concerns discourse centers. Thus, the most important notions of the centering theory is the three kinds of centers: forward-looking centers (Cfs), preferred centers (Cps), and backward-looking centers (Cbs). Forward-looking centers (Cfs) represent discourse entities realized in an independent utterance within a discourse segment. The preferred center (Cp) is, by definition, the highest-ranked discourse entity in a given utterance. The backward-looking center (Cb) is a special discourse entity in the Cf list, which stands for the discourse object that the utterance primarily talks about. With regard to the three types of centers, Walker, Joshi, and Prince (1998) present three constraints described in (4).

- (4) Constraints: For each utterance U_i in a discourse segment D consisting of utterances U_1, \dots, U_m :
1. There is precisely one backward-looking center $C_b(U_i, D)$.
 2. Every element of the forward centers list, $C_f(U_i, D)$, must be realized in U .
 3. The center, $C_b(U_i, D)$, is the highest-ranked element of $C_f(U_{i-1}, D)$ that is realized in U_i .

The first constraint is about the backward-looking centers stating that there is only one central discourse center that the utterance concerns about. In the centering theory, there is only one C_b in an utterance so that its implied restriction is that there is only one topic in a single utterance. There are many ways to construe the second constraint relying on how we define the relation *realize*. Grosz, Joshi, and Weinstein (1986) explains the *realize* relation as in (5).

- (5) An utterance U realizes a center C if C is an element of the situation described by U , or C is the semantic interpretation of some subpart of U .

According to this definition, both pronouns and zero pronouns can be included in the forward-looking center list. To put it differently, not only explicitly realized centers but also implicitly realized centers can be part of the Cf list in theory. Therefore, the forward-looking centers in the centering theory can be viewed as a very flexible set of discourse objects.

The third constraint in (4) provides the definition of the backward-looking center and this definition makes the relative ranking of the forward-looking centers of the previous utterance significant in determining the backward-looking center of the current utterance. If a preferred center (Cp) is realized in the next utterance, it is defined to be the backward-looking center (Cb) of that utterance in an automatic way. The centering theory is also equipped with two rules in (6). The first rule concerns pronouns. The rule regulates that Cb is a strong candidate to be realized as a pronoun. If there is any other discourse entity in the utterance that is realized as a pronoun, then the Cb must take the form of the pronoun.

- (6) Rules: For each U in a discourse segment D consisting of utterances U, ..., U:
1. If some element of Cf (U, D) is realized as a pronoun in U, then so is Cb (U,D).
 2. Transition states are ordered. The CONTINUE transition is preferred to the RETAIN transition, which is preferred to the SMOOTH-SHIFT transition, which is preferred to the ROUGH-SHIFT transition.

The second rule in (6) proposes four transition types, each of which can be characterized as in (7). The four transition types -- CONTINUE, RETAIN, SMOOTH-SHIFT, and ROUGH-SHIFT -- can help us to measure the coherence of the discourse segment in which a set of utterances occurs and provides us a criterion to make a segment boundary.

(7) Centering Transition States

	$Cb(U_i) = Cb(U_{i-1})$ or $Cb(U_{i-1}) = [?]$	$Cb(U_i) \neq Cb(U_{i-1})$
$Cb(U_i) = C_p(U_i)$	CONTINUE	SMOOTH-SHIFT
$Cb(U_i) \neq C_p(U_i)$	RETAIN	ROUGH-SHIFT

Now, with the examples presented by Walker, Joshi, and Prince (1998), let me further illustrate the discourse algorithm of the centering theory. In the context described in (8a) and (8b) where *Cb* is established as *Jeff*, the utterance in (8c) is in a CONTINUE transition with respect to the previous discourse with the *Cb* still being *Jeff*. However, under the same context described in (8a) and (8b), the utterance in (8d) shifts the primary focus of the discourse into *Dick* so that the transition type of the utterance in (8d) is defined as SMOOTH-SHIFT and the *Cb* is defined as *Dick*. Of course, in each utterance, the discourse entities are realized as the members of the *Cf* list.

(8) a. Jeff helped Dick wash the car.

<p><i>Cb</i>: [?] <i>Cf</i>: [JEFF, DICK, CAR] Centering Transition: No CB</p>
--

b. He washed the windows as Dick waxed the car.

<p><i>Cb</i>: [JEFF] <i>Cf</i>: [JEFF, WINDOWS, DICK, CAR] Centering Transition: CONTINUE</p>

c. He soaped a pane.

<p><i>Cb</i>: [JEFF] <i>Cf</i>: [JEFF, PANE] Centering Transition: CONTINUE</p>

d. He buffed the hood.

Cb: [DICK]
 Cf: [DICK, HOOD]
 Centering Transition: SMOOTH-SHIFT

Within the framework of the centering theory briefly introduced above, Kim (2003) claims that zero forms in Korean are filtered by the constraint in (9). In terms of it, the zero form of the current utterance refers to the C_p of the previous utterance.

(9) Center Continue Constraint: the $C_p(U_{n-1})$ is realized to $C_b(n)$ in the rule of center-establishment of Centering.

However, this constraint encounters not a few counter-examples as Kim (2003) herself notifies. First, since the centering theory allows only one topic in an utterance, the centering-based analysis on zero forms cannot predict the utterances that have more than one occurrence of zero form in a single utterance. Second, in actual uses of the zero forms like the examples illustrated in (1) - (3) in the introduction, we can observe that many zero forms do not refer to the C_p of the previous utterance. These potential counter-examples, in fact, force her to rank the Center-Continue Constraint as the lowest constraint whose violation has the least strong impact in the optimality-based analysis of zero forms.

Another study conducted by Kim, M. K. (2003)¹⁾ finds that zero subjects are hard to be characterized by the types of centers themselves. Rather, she claims that their distribution can be explained when we look at the transition types of the utterances where the zero forms occur. Her finding is that zero forms were preferred to overt noun phrases in SMOOTH-SHIFT transitions as well as in CONTINUE transitions, providing the statistics of each type of transition types

1) To distinguish two studies conducted by two different authors whose last name is Kim, I use Kim (2003) to refer to *the Optimality Approach to the Referential Interpretation of Zero Anaphora in Korean* while using Kim, M. K. (2003) to refer to *A Centering Dynamics Approach to Zero Pronouns in Korean*.

as in the table given in (10).

(10) Distribution of Centering Transitions and Zeros in Korean Texts

	CONTINUE		RETAIN		SMOOTH-SHIFT		ROUGH-SHIFT		Total
	N	%	N	%	N	%	N	%	
Zero NPs	53	94.6	1	4.8	31	59.6	17	14.2	102
Overt NPs	3	5.4	20	95.2	21	40.4	103	85.8	147
Total	56	100	21	100	52	100	120	100	249

However, the generalization about the zero forms on the basis of transition types cannot completely and strictly show us the intrinsic property of zero forms since it is not the case that they cannot occur in transition types other than SMOOTH-SHIFT and CONTINUE. In fact, as the table above reveals, zero forms can appear in utterances whose transition statuses are RETAIN and ROUGH-SHIFT even though the rate of the occurrence is low.

4. Proposal

In the previous section, I have reviewed previous studies on zero forms that are based on the centering theory. However, these analyses cannot properly capture the very basic property of zero forms which Huang (1984) characterizes as topics since the notion of topic in the centering theory is too narrowly defined. This section will introduce a new program that defines the topic notion in a broad sense and claim that, under the program, zero pronouns are most well understood as topics. Under the notion of topic which will be reviewed in this section, I will also revise the Center Continue Constraint that Kim (2003) discusses since it is faced with not a few counter-examples. Instead, I will put forth a new constraint that does not encounter counter-examples. This newly proposed constraint, different from the Center Continue Constraint, which is ranked lowest by Kim (2003), will be ranked as the highest constraint, which adequately reflects the very nature of zero pronouns as topics.

Kuppevelt (1995) provides the formal characterization of his topic notion as in (11). However, as he admits, the formal characterization of the topic-comment structure described in (11) does not suffice to identify a topic notion in a principled manner.

- (11) A discourse unit **U** has the property of being directed at a selected set of discourse entities. This selected set of entities in focus attention is what **U** is about and is called the topic of **U**. The complementary notion of comment is characterized as that which is newly asserted of the topic **U**.

Therefore, Kuppevelt (1995) further presents a selectional criterion for topic entities which can be distinguished from other entities in the discourse in a principled manner. To be specific, for the operational characterization of the topic structure, Kuppevelt (1995) provides the basic assumption stated in (12). The premise presents a selectional criterion for topic entities that are distinguished from the comment structure of the discourse. In other words, of all the entities introduced by a discourse unit *U*, only the subsets of discourse entities that are able to be adjusted to be the subject of explicit as well as implicit questioning are argued to have the topic function.

- (12) Every contextually induced explicit or implicit questions Q_p that is answered in discourse constitutes a topic T_p . T_p is that which is being questioned. Comment C_p is provided by the answer and names or specifies the entity asked for.

For example, in (13), a topic structure is introduced as the result of the dynamic evocation of the question Q_1 . Under this context, the comment structure replying to the topic structure is provided by answer A_1 , which replaces the *wh*-constituent, specifying the information asked for.

- (13) A: Late yesterday evening, I got a lot of telephone calls.
 Q_1 B: Who called you up?
 A_1 A: John, Peter, and Harry called me up.

In addition to sentence topics, Kuppevelt (1995) also discusses another type of topics, namely sub-topics. Kuppevelt (1995) specifies that questions that have no autonomous status of their own in discourse are sub-questions and that the contextual elicitation of sub-questions is the consequence of unsatisfactory answers to preceding questions as indicated in (14). The explicit or implicit sub-questions defined in (14) constitute sub-topics in the program put forth by Kuppevelt (1995).

(14) Sub-questions

An explicit or implicit question Q_p is a sub-topic-constituting subquestion if it is asked as the result of an unsatisfactory answer A_{p-n} to a preceding question Q_{p-n} with the purpose of completing A_{p-n} to a satisfactory answer to Q_{p-n} .

In sum, in Kuppevelt's program, topics are constituted by explicit or implicit questions. This allows us to have more than one topic in a single utterance, different from the centering theory that restricts only one topic in an utterance.

Let us look at more examples of zero forms and see which theory works better. The (b) sentences in the following examples contain zero forms. The sentence in (15b) is the most typical case of the zero form. In some cases such as (16) and (17) which are also common uses of zero forms, there are more than one occurrence of the zero form in a sentence. The centering-based analysis cannot address the latter kind of examples since, as mentioned above, there is only one C_p or C_b in an utterance.

(15) a. Apeci-ka ettesyessnuntey?

Father-Nom what about

'What about father?'

b. Ciho-eykey yongton-ul cwu-sy-ess-e.

Ciho-Dat pocket money-Acc give-Hon-Pst-Dec.

'(He) gave pocket money to Ciho.'

(16) a. Apeci-ka ciho-eykey mwel cwu-sy-ess-ni?

Father-Nom Ciho-Data what give-Hon-Pst-Int?

'What did father give to Ciho?'

- b. Yongton-ul cwusyesse.
'(He) gave (Ciho) pocket money.'
- (17) a. Ciho-eykey yongton-ul nwu-ka cwusy-ess-ni?
Ciho-Dat pocket money-Acc who-Nom give-Hon-Pst-Int?
'Who gave Ciho pocket money?'
- b. Apeci-ka cwu-sy-ess-e.
father-Nom give-Hon-Pst-Dec
'Father gave (Ciho) (pocket money).'

However, under the Kuppevelt's program, we can easily account for multiple occurrences of zero forms. In the following examples, there are explicit questions that formulate the topics of the discourse. In these examples discussed by Kim (2003), we can observe that the entities which are part of the question in the previous discourse can naturally occur as zero forms. In (15), the zero subject refers to *apeci* 'father' which was mentioned in the explicit question. In (16), both the zero subject referring to *apeci* 'father' and the zero indirect object referring to *Ciho* were established as topics by the question in the previous discourse. In (17) as well, the entities referred to by the zero indirect object and the zero direct object in the (b) sentence were constituted as topics in the previous discourse in (a) by the topic-forming question.

Under the notion of topic suggested by Kuppevelt (1995), we can make a generalization that only the topic structure can be realized by zero forms but the comment structure must be realized by overt forms. We can extend this generalization to the utterances that do not employ explicit questions since, even in such utterances that do not employ explicit topic-formulating questions, we can easily provide implicit questions that might have formed topics in the previous discourse. This is the major contribution of Kuppevelt (1995) who defines topics not only on the basis of explicit questions but also by means of implicit questions.

Furthermore, with this broad notion of topic, we can explain the potential counter-examples discussed by Kim (2003), the examples mentioned in the introduction. In a narrow sense, only *emma* 'mom' is the topic in (18a). However, under Kuppevelt's program, *sakwa* 'apple' is also a topic in (18) since it is part of the question in the previous discourse. This enables us to explain the zero

realization of *sakwa* 'apple' in (18). In (19a), if we suppose that the topic-forming question which was implicitly provided in the discourse was 'how was the puppy?' then we can explain the zero form of *kangaci* 'puppy' in (19b). The same goes for the discourse in (20). Under the narrow view on topics, the zero form in (20) seems to be the counter-example to the claim that zero forms are topics but, under the broad definition, the zero subject in (20b) can be construed as a topic since an implicit question such as 'How was Yenghuy' could be elicited in the previous discourse. Under the implicit question, *Yenghuy* could be established as a topic in the discourse presented in (20). Thus, under the program that establishes topics by means of implicit questions, we can address the zero instances that Kim (2003) views as counter-examples to Huang's claim.

- (18) a. Emma-nun way maynnal sakwa-man saci?
 Mom-Top why every day apple-only buy-Int?
 'Why does mom always buy apples?'
- b. Mom-ey coh-ko ceychelicanha.
 body-to good-and in-season-dec.
 'good to body and in season.'
- (19) a. Ecey apeci-nun kangaci han mali-lul sa o-sy-ess-ta.
 yesterday father-Top puppy one Classifier-Acc buy
 come-Hon-Pst-Dec
 'Yesterday father came home buying a puppy.'
- b. Thel-i hayah-ko manh-ass-ta.
 fur-Nom white-conj a lot-Pst-Dec.
 'Fur was white and a lot.'
- (20) a. Yengswu-nun ecey tungkyoskil-ey yenghuy-lul mann-ass-ta.
 Yengswu-Top yesterday on the way to school Yenghuy-Acc
 meet-Pst-Dec.
 'Yesterday Yengswu met Yenghuy on the way to school.'
- b. Yecenhi yeypessta.
 still be pretty-Pst-Dec
 '(She) was still pretty.'

With this broad notion of topichood, let us reexamine the optimality-theoretic

analysis of Kim (2003). Kim (2003) has proposed 7 constraints and defined them as in (21). They are ranked in the order in (21) with BR being the highest and CC being the lowest. However, even though the fact that the zero form is the topic of the utterance is the most intrinsic property we should capture, Kim (2003) has to rank the constraint regarding this feature as the least prominent constraint since there are too many counter-examples to the CC constraint. That is, many occurrences of the zero form violate the CC constraint so that, in her analysis, the constraint is not regarded as the determining factor that lets us choose the optimal candidate. However, this seems problematic since the most intrinsic condition of using the zero form is that it must be the topic of the utterance.

- (21) a. Relevance Principle (BR): Be relevant.
 b. Theta-role Match (TM): The argument must match with semantic selectional restriction required by its predicate.
 c. Morphological Match (MM): The argument must match with a specific morpheme which plays the role of the AGREE feature.
 d. Disjoint Interpretation (DI): The arguments subcategorized by the same predicate must not be coreferential to each other.
 e. Recency Preference Construal (RPC): the entities realized in an immediate preceding utterance are the most prominent.
 f. Functional Parallelism (FP): the parallelism must be kept in the grammatical, thematic and functional roles.
 g. Center-Continue (CC): the $C_p(U_{n-1})$ is realized to $C_b(n)$ in the rule of center-establishment of Centering.

Thus, I would like to propose a new constraint which designates that the zero form must be the topic of the discourse and this constraint must function as the most important rule which determines the reference of the zero form. In my new constraint, I use the topic notion proposed by Kuppevelt (1995). Any discourse entities can be regarded as topics if they are established by topic-forming questions in the previous discourse and these questions can be not only explicit but also implicit.

- (22) a. Topic Establishment (TE): The zero form is the topic of the discourse which is established by either an explicit or an implicit question.

With the topic notion in the broad sense in (22), the TE constraint can be ranked as the highest constraint among the constraints that provide us the optimal reference of the zero form, as shown in (23). The primary reason why and how this constraint can be ranked the highest is that it faces few counter-examples. Ranking it as the highest constraint seems to be desirable since being a topic is the most basic condition of being realized as a zero form. Thus, any entity that is not construed as a topic in the discourse is, first and foremost, filtered out by the top-ranked constraint of Topic Establishment. In Kim (2003), the Center Continue Constraint which corresponds to the Topic Establishment Constraint that I propose was ranked the lowest just because it encounters too many counter-examples. However, the constraint that regulates that the zero form is the topic of the discourse is obviously the most important constraint that the zero form must satisfy to begin with. If any discourse entity is not a topic, then it should not be realized as a zero form. The top-ranked constraint that I propose adequately regulates this generalization.

- (23) Topic Establishment (TE) > Relevance Principle (BR) > Theta-role Match (TM) > Morphological Match (MM) > Disjoint Interpretation (DI) > Recency Preference Construal (RPC) > Functional Parallelism (FP)

Let me show you how this system that I propose works with an example. In the example below, the indirect object is realized by the zero pronoun. To find the reference of the zero pronoun, we can resort to the Topic Establishment Constraint. In the previous discourse presented in (24a), both *Ciho* and *yongton* 'pocket money' are established as topics but not the person who gave the pocket money to *Ciho*, namely *apeci* 'father.' In this circumstance, *apeci* 'father' can never be the reference of the zero pronoun since it is not the topic in the discourse. Thus, the non-topic reference is primarily filtered out by the Topic Establishment Constraint. The noun phrase *yongton* 'pocket money' cannot be the reference of

the zero pronoun in (24b) since it violates the Theta-role Match Constraint. Thus, the optimal reference of the zero pronoun in (24b) is *Ciho*.

- (24) a. *Ciho-eykey yongton-ul nwu-ka cwu-sy-ess-ni?*
Ciho-Dat pocket money-Acc who-Nom give-Hon-Pst-Int?
 'Who gave *Ciho* pocket money?'
 b. *Apeci-ka yongton-ul cwu-sy-ess-e.*
father-Nom pocket money-Acc give-Hon-Pst-Dec
 'Father gave (*Ciho*) pocket money.'

The table for selecting the optimal candidate can be illustrated as in (25). As the table clearly shows us, 'father' and 'pocket money' are opted out since they violate the constraints that operate for the resolution of zero forms.

(25) Optimalitic Table for (24b)

	TE	BR	TM	MM	DI	RPC	FP
father	*!						
⇨ <i>Ciho</i>							
pocket money			*!				

Other than ranking the TE Constraint as the highest restriction to sort out non-topic discourse entities, other constraints work in the same way as in the analysis proposed by Kim (2003). For example, in the discourse presented in (26), the zero subject in (26c) is resolved to be *Minswu*. To yield the optimal outcome, the Recency Preference Construal Constraint operates prominently. The possible candidates to be the reference of the zero subject in (26c) are *Chelswu*, *Minswu*, and *pan* 'class.' First, *pan* 'class' violates the Theta-role Match Constraint so that it is opted out. Now, we have two candidates to compare: *Chelswu* and *Minswu*. Out of the two candidates, *Chelswu* is dispreferred in terms of the Recency Preference Constraint. Through these opting-out processes, the candidate *Minswu* becomes the final outcome.

- (26) a. Chelswu-nun pan-eyse minswu-ka ceyil coh-ass-ta.
 Chelswu-Top class-in Minswu-Nom the most like-Pst-Dec
 'Chelswu liked Minswu the most in class.'
- b. Minswu-nun chakhay-ss-ta.
 Minswu-Top be good-Pst-Dec
 'Minswu was good.'
- c. Congi cepki-to cal hay-ss-ta.
 paper work-even very well do-Pst-Dec
 '(He) was good even at paper work.'

The table in (27) sums up the process described above. It seems that the Topic Establishment Constraint that I propose does not affect the optimal outcome of the zero pronoun in (26c). However, still the top-most position of the constraint in the table below implicitly and adequately incorporates the most fundamental principle involved with zero pronouns: zero pronouns must be topics in the discourse; otherwise, zero forms are impossible. That is, zero pronouns which are not topics must be filtered out and this should be the strongest constraint on all occurrences of zero forms, whatever constraints might operate to determine the final outcome of their reference.

(27) Optimalitic Table for (26c)

	TE	BR	TM	MM	DI	RPC	FP
Chelswu						*!	
☞Mi nswu							
class			*!				

5. Conclusion

This paper has claimed that zero forms are instances of topics in the discourse, supporting the view presented by Huang (1984). Huang (1984) originally proposed the generalization that zero forms are the outcomes of Topic NP deletion. However, he could not provide an explicit algorithm to define the

topic notion. Furthermore, by construing the topic in a narrow sense, his claim has been refuted with not a few counter-examples. This paper has introduced the notion of topic characterized by Kuppevelt (1995) and claimed that, under his program for topics, we can legitimately claim that zero forms are generalized to be topics. Given that, I have proposed a new optimality-theoretic account of zero forms by presenting the Topic Establishment Constraint instead of the Center Continue Constraint and by re-ranking the Topic Establishment Constraint as the most prominent constraint among 7 constraints involved with the resolution of zero forms. In Kuppevelt's (1995) program, more than one topic is permitted in a single utterance. This can directly explain more than one occurrence of zero form in an utterance. Even though the centering theory has been employed to analyze zero forms in many studies, the most critical drawback of the centering theory was that it could not address more than one occurrence of zero form in an utterance. Overcoming this limitation, by employing Kuppevelt's (1995) notion of topic, this paper could explain not only zero subjects but also zero objects, not to mention the cases where both the zero subject and the zero object occur in the same sentence. Furthermore, Kuppevelt (1995) allows not only explicit questions but also implicit questions to formulate topics. Thus, under his notion of topic, the constraint that I propose in this paper could deal with zero forms without encountering counter-examples. Also, in my analysis, the Topic Establishment Constraint is ranked as the highest constraint in contrast to the previous analysis provided by Kim (2003) who ranked the Center Continue Constraint as the lowest. Considering the fact that the topic notion is the most integral part of zero forms and the necessary condition to be zero forms, I believe that ranking the constraint regarding the topic the highest is on the right track, since it must be the most crucial factor when we actually use the zero form. Any zero form that violates this constraint should not occur in natural languages. In other words, it must be the case that, only when the most fundamental principle of the zero form is satisfied, we can take other constraints into account.

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