Processing Null and Overt Pronoun Subject in Ambiguous Sentences in Korean

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Abstract

This study investigates the processing of the null and overt pronouns in intra-sentential coreference in complex sentences that consist of a subordinate clause followed by a main clause in Korean. It tests the Position of Antecedent Hypothesis (PAH), which holds that Ø and overt pronouns have a division of labor and perform different functions. This hypothesis assumes that in Italian intra-sentential anaphora, the null pronoun prefers the subject as antecedent, whereas the overt pronoun prefers the object as antecedent. As Korean is different from Italian in the word order of the main and the subordinate clauses and in the syntactic function of the subject, this study aims to test the PAH to see whether this principle can make a similar prediction for a typologically different language, Korean. Korean university students completed a questionnaire that was designed to test the PAH in sentences that were wholly ambiguous in Korean. The results revealed that Korean speakers preferentially associated Ø with an antecedent in the subject position and the overt pronoun with an antecedent in the object position. This confirms that the PAH makes a correct prediction for Korean as well.

Keywords: Pronoun resolution, Anaphora in Korean

1. Introduction

Anaphora resolution has engaged the significant attention of linguists for last few decades, and most of the research has been done in the interpretations of reflexives, emphatically in English (Finer, 1991; Finer & Broselow, 1986; Hirakawa, 1990, Thomas, 1991; White, 1989) and generally in various languages (Christie & Lantolf, 1998; Katada, 1991; Pica, 1987). The interpretation of pronouns, in contrast, has received less attention than that of reflexives, and most of the research done on pronouns is mainly focused on the processing of pronouns in English, a language that has only overt pronouns.

Many languages of the world, such as Japanese, Korean, Romanian, and Italian, allow pronouns to remain unexpressed; that is, they allow null pronouns. These pro(noun)-drop languages have both null and overt pronouns in their pronominal inventory. In other words, Korean-type languages are called null subject languages, whereas English-type languages are called nonnull subject languages. If a language has two pronominal forms (null and overt pronoun) in its system, it is expected that they will have distinct functions in pronoun coreference.

Recently, Carminati (2002) proposed that in intra-sentential anaphora in Italian, a pro-drop language, the null and overt pronouns have distinct functions that are characterized by distinct biases for antecedents in different syntactic positions. Investigating the processing of the null and the overt pronouns in Italian, Carminati (2002) proposed a processing hypothesis for Italian, Position of Antecedent Hypothesis (henceforth, PAH), which holds that there is a division of labor between Ø and overt pronouns and they have different functions. This hypothesis assumes that in Italian intra-sentential anaphora, the null pronoun prefers a more prominent antecedent that is in the Spec IP position, whereas the overt pronoun prefers other positions lower in the structural tree.

The PAH makes a strong prediction regarding pronoun resolution in Italian, a pro-drop language. This hypothesis can be given stronger explanatory power if other languages that have Ø/overt pronoun alternations apply the same principle in intra-sentential pronoun resolution as does Italian. However, this hypothesis cannot be tested for non-pro-drop languages like English, the most widely studied language in the field. Therefore, this hypothesis needs to be tested in a pro-drop language to examine whether null and overt pronouns have different functions in intra-sentential anaphora.

Korean is different from Italian in word order, particularly in the flexibility of the position of the main and the subordinate clause (Diessel, 2001, 2005; Kweon, 2008); (i.e., Korean allows subordinate-main clause order, but it does not allow main-subordinate clause order, whereas Italian allows both subordinate-main and main-subordinate clause order), and in the existence of dummy elements as the subjects of sentences (e.g., expletives *it, there*, etc.) The present study aims to test the PAH, which was originally proposed for Italian, to account for the processing of the null and overt pronouns in intra-sentential anaphora and to examine whether it can predict similar results for another language, in this study, Korean, which also has Ø/pronoun alternation in its system.

2. Research Background
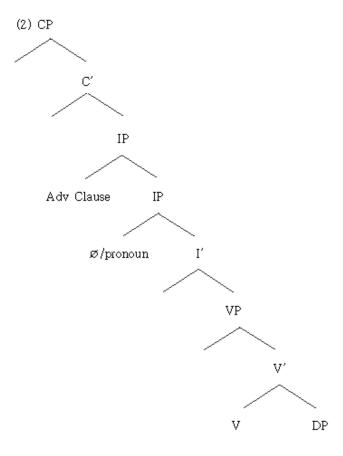
2.1 Pronoun resolution in Italian

Carminati's (2002, p. 57) hypothesis for the null and overt pronoun in Italian in intra-sentential contexts is the following.

> The PAH for the Italian null and overt pronouns in intra-sentential anaphora: the null pronoun prefers an antecedent which is in the Spec IP(Note 1)position, while the overt pronoun prefers an antecedent which is not in the Spec IP position.

This hypothesis predicts that in Italian, the null pronoun prefers the subject antecedent and the overt pronoun the indirect object in (1) below.

(1) a. Quando Mario$_i$ ha telefonato a Giovanni, Ø $_i$ aveva appena finite di mangiare.
   When M$_i$, has telephoned to G, Ø $_i$ had just finished eating.
   b. Quando Mario ha telefonato a Giovanni$_i$, lui$_i$ aveva appena finito di mangiare.
   When M, has telephoned to G$_i$, he$_i$ had just finished eating.

Carminati (2002) showed the structure of the complex sentences in the tree diagram in (2) and assumes that the subordinate clause is attached high in the sentence, being base-generated in an IP-initial position and thus, left adjoined to the IP.

In the diagram proposed above for the sentences in (1), the antecedents appear in the subordinate clause, and the pronouns appear in the Spec IP position of the main clause.

According to Principle B of Binding theory (Chomsky, 1981), coreference between either null or overt pronouns and either of the antecedents, i.e., subject or object, is possible because the pronoun is 'free' in its governing category: It does not have a c-commanding antecedent in the same clause.

Carminati (2002) found the PAH strategy of pronoun antecedent assignment in Italian intra-sentential anaphora throughout various experiments with wide range contexts (e.g., contexts with canonical subjects in Spec IP, and contexts with non-canonical ones, i.e., dative subjects). Her experimental evidence supported the prediction that the null pronoun preferred an antecedent in the Spec IP (subject) position, whereas the overt pronoun preferred an antecedent which is not in the Spec IP position.

2.2 Pronoun resolution in Korean

The PAH (Carminati, 2002) was originally proposed to explain the antecedent bias between the Ø and the overt pronoun that creates a division of labor in pronoun ambiguity resolution in Italian. If the principle can be applied to other pro-drop languages, such as Korean, a language that has the Ø/pronoun alternation like Italian, then the PAH predicts that the null pronoun prefers the subject antecedent and that the overt pronoun prefers the direct object antecedent in Korean. That is, in (3a), the null pronoun will prefer the subject of the subordinate clause, *HyenWu*, and in (3b), the object *SungGi*.

(3) a. HyenWu-ka SungGi-lul parapol ttay Ø coffee-lul masye-yo.
     HyenWu-N SungGi-A see when Ø coffee-Acc drink
     'When HyenWu looks at SungGi, Ø drinks coffee.'
   b. HyenWu-ka SungGi-lul parapol ttay ku-ka coffee-lul masye-yo.
     HyenWu-N SungGi-A see when he-N coffee-Acc drink
     'When HyenWu looks at SungGi, he drinks coffee.'

This account of the null subject parameter is based on the idea that a subject in a pro-drop language can be omitted because its content can be recovered by using verbal inflection, specified by the feature of person, number and gender (Rizzi, 1982; see also Chomsky, 1982; Jaeggli, 1982; Perlumtter, 1971; Taraldsen, 1978). Thus, the 'richness' of the verbal morphology makes the expression of an overt subject redundant.

Korean is a pro-drop language, allowing the null subject as well, but it does not show verbal inflection. This suggests there should be a means to compensate for the absence of the verbal morphology in the Korean language. When the subject in the main clause is omitted, the degree of ambiguity for the interpretation of the null pronoun depends on the kind of preceding adverbial clauses, not on the verbal inflection. Compare the meaning of (4a) to that of (3a). Most Korean native speakers would say that the subject antecedent assignment *HyenWu* is overwhelmingly more probable in (4a) than in (3a). In (4a), -*myense* is the adverbial suffix which always associates the subject with the null pronoun, whereas -*ttay* in (3) is ambiguous. This contrast becomes much clearer when the overt pronoun is the subject. In (4b), although the subject of the main clause is overt, it still refers to the subject of the

subordinate clause *HyenWu*, rather than to the direct object *SungGi*; this association contradicts the PAH (compare (4b) with (3b)).

(4) a. HyenWu-ka SungGi-lul parapo-**myense**   Ø coffee-lul masye-yo.
    HyenWu-N SungGi-A see-at the same time Ø coffee-Acc drink
    While HyenWu looks at SungGi,   Ø   drinks coffee.'

   b. HyenWu-ka SungGi-lul parapo-**myense**   ku-ka coffee-lul masye-yo.
    HyenWu-N SungGi-A see-at the same time he-N coffee-Acc drink
    While looking at SungGi, HyenWu drinks coffee.'

There has been no previous study directly testing the PAH in Korean to the best of my knowledge. Although quite a few studies have been done on the interpretation of anaphors (Principle A) theoretically (Kang, 1998; Kim, 2000; Moon, 1995; Yang, 1983; Yoon, 1989) and empirically (Cho, 1989, 1992; Choi & Kim, 2007; Kim & Montrul, 2004; Kim et al., 2009 a, b; Lee, 1990; Lee & Wexler, 1987; Song et al., 1997) in Korean, research on Principle B has been comparatively sparse (Kim, 2003; Hong, 2002, for the interpretation of zero pronouns in Korean). Note that the PAH is not related to the interpretation of pronouns in the sense of Principle B; rather, it is testing the asymmetrical antecedent preference between the subject and the object position with respect to the ambiguity resolution of ∅/overt pronoun alternation in pro-drop languages.

The goal of the present study is to test the Position of Antecedent Hypothesis for intra-sentential coreference in complex sentences that consist of subordinate clauses followed by main clauses in Korean. If the PAH correctly predicts the relationship between the overt and null pronouns in one pro-drop language, it should work in another pro-drop language. This should hold true even if the languages are typologically different (i.e., Italian vs. Korean). Because complex sentence formation in Korean is distinguished from that in Italian, a few comments should be mentioned. For adverbs in the subordinate clause in Korean, I used a temporal clause marker *-ttay* to best realize the experimental purpose of the whole ambiguity for the test items, in which the pronouns in the main clause should be able to refer to both the subject and the object with the same degree of preference. There are a few other temporal markers in Korean, i.e.*, -myense, -tongan*, each of which has slightly different semantic properties. This is related to the language-specific property of verb morphology in Korean.

The Korean sentences used in the present experiment meet the criterion that the subordinate clause introduces two individuals of the same gender, one in the subject position, the other in an object position. The main clause, starting with a null or an overt pronoun, contains a statement which is ambiguous, referring, in principle, to either antecedent in the preceding subordinate clause.

In order to confirm the universal applicability of the PAH, Carminati (2002) conducted a brief cross-linguistic survey to one or two speakers of some pro-drop languages, including Spanish (2), Russian (1), Polish (1), Hebrew (1), Korean (2), and Japanese (1), believing that if a language has two pronominal forms in its system, they should have distinct functions.

From these crosslinguistic investigations, Carminati found that Ø displayed a special affinity for a subject antecedent across these languages. In contrast, the behavior of the overt pronoun across languages is more variable: it ranges from a situation in which the pronoun prefers to retrieve the direct object to a situation in which it shows no particular preference for a subject or an object antecedent.

The two Korean informants that Carminati consulted reported differently. The first informant reported that Ø is not 'allowed' at all in a sentence like (3a); the second informant, however, accepted Ø and 'preferred it to be construed as referring to the subject.' Interestingly, however, 'both informants prefer the overt pronoun to retrieve the object' (p. 328). Of the two informants, which are too few to draw a conclusion, only one displayed a preference that confirms the PAH. Considering the small number of informants and their disagreement, the applicability of the PAH to Korean could not be confirmed in Carminati (2002). Therefore, to determine whether the PAH can work as a universal principle in pronoun resolution, a study should be conducted in which more informants are employed.

3. Research Hypotheses

The purpose of the present experiment is to test the PAH in Korean, i.e., whether a principle which governs the use of pronouns in Italian, a pro-drop language with two pronominal forms, also applies to another pro-drop language, Korean, which is typologically different from Italian. Based on this objective, the research hypothesis is formulated as follows. According to the PAH, the Ø and overt pronouns have distinct biases for antecedents in different syntactic positions, showing a division of labor in which the null pronoun prefers an antecedent in the Spec IP position and the overt pronoun prefers an antecedent in a lower syntactic position in the phrase structure.

3.1 Hypothesis

If the PAH correctly predicts the intra-sentential coreference of the Ø/overt pronoun in Korean, then Korean speakers will prefer an antecedent which is in the subject position and the overt pronoun will prefer an antecedent which is in the object position.

4. Method

4.1 Subjects

The subjects were 52 native Korean speakers majoring in science and technology at a university in Korea. No student had the linguistics background in the phenomenon under investigation.

4.2 Materials

A questionnaire that consisted of twelve experimental sentences with two conditions was implemented. The sentences were constructed to test the PAH in sentences that were wholly ambiguous in Korean. Each sentence comprised a subordinate clause followed by a main clause. The potential referents of the pronoun could equally well be either the subject or the object of the initial subordinate clause.

Participants were asked to select which interpretation of the main clause they preferred, consequently, whether they thought the main clause was a statement about the subject or the object of the preceding subordinate clause. Therefore, each experimental item was followed by two interpretations of the main clause. In the following are the two experimental conditions and the interpretations of the main clause that participants were asked to indicate(Note 2).

Condition (A): null pronoun

인호가 승기를 칭찬할 때 Ø 미국에 있어요.

When InHo praises SungGi, Ø is in America.'
Condition (B): overt pronoun

인호가 승기를 칭찬할 때 그가 미국에 있어요.

When InHo praises SungGi, he is in America.'

A. 인호가 미국에 있어요.   B. 승기가 미국에 있어요.

InHo is in America.'   'SungGi is in America.'

The two null and overt experimental conditions were counterbalanced and randomized across the two questionnaire sets (null vs. overt). The order of the interpretation statement was also counterbalanced, i.e., for half of the items the subject antecedent interpretation was presented on the left, and for the other half it appeared on the right. Out of the 52 participants, 26 participants were randomly assigned to the questionnaire set of condition (A) and the other 26 to the questionnaire set of condition (B). Therefore, each participant saw only one experimental condition of each item. Twenty-four sentences from another study were used as filler items.

4.3 Procedure

A few preliminary pilot tests were administered to 36 students who did not participate in the present study with two reasons: First, in order to develop the test items which have the equal possibility for the subject and the object to be selected as the antecedent of the Ø and the overt pronouns. Second, in order to guarantee the semantic felicity in that the same subject can function for the verbs both in the subordinate clause and in the main clause at the same time.

The felicity of the test items was determined, first, by asking the likelihood the subject of the subordinate clause was the subject of the matrix verb. Next participants were asked the likelihood the object of the subordinate clause was the subject of the matrix verb. Finally, the felicity for the two verbs in the subordinate clause and in the main clause to be able to occur in a complex sentence with the same subject was tested (i.e., *H is looking at something, while drinking coffee*.) By so doing, the test items should be equally ambiguous between the subject and the object to become the antecedent of the Ø/overt pronouns. That is, pronoun resolution was manipulated to be equally ambiguous for the purpose of the experiment.

For three kinds of sentences, students evaluated the acceptability of each sentence with a Likert scale, ranging from 1 (least likely) to 10 (most likely). The twelve sentences that scored 7 or higher were eventually selected for the main test items. The percentage of frequencies that participants selected the subject and the object antecedent interpretation was calculated for each of the two conditions.

5. Results

Students preferentially selected subject antecedents for the null pronoun and object antecedents for the overt pronoun. Table 1 shows that the subject antecedent was predominantly selected for the null pronoun (81%), and the object antecedent was preferentially selected for the overt pronoun (69%). A one-way ANOVA was conducted to analyze the data for the percentage choices of the antecedent for the two pronouns. The difference (81% vs. 31%) was highly significant ($F(1,51)=78.65$, $p < .001$), which suggests that the percentage of the subject antecedent choice was significantly higher in the null pronoun condition than in the overt pronoun condition. Another one-way ANOVA revealed that the difference between the preferred antecedent choices of the null and overt pronoun (81% vs. 69%) was significant ($F(1,51)=4.99$, $p < .05$). This suggests that there was a preponderance of subject antecedent choices for the null pronoun compared to object antecedent choices for the overt pronoun.

Table 1. Percentage of subject and object antecedent choices for the null and overt pronoun conditions (The percentages for the most frequent choices of antecedents for each pronoun are in bold)

Condition	subject antecedent	object antecedent
null (∅) pronoun	81.1	18.9
overt pronoun	31.4	68.6

6. Discussion and Conclusion

The current study examined the processing of the null and overt pronouns in intra-sentential anaphora in Korean. It tested the PAH originally proposed for Italian, which claims that Ø and overt pronouns have distinct functions that are characterized by distinct biases for antecedents in different syntactic positions. The results have shown that the Korean speakers preferentially associated the Ø pronoun with an antecedent in the Spec IP position (i.e., the subject) and preferentially associated the overt pronoun with an antecedent in a syntactic position lower in the phrase structure (i.e., the object); this result conforms with the prediction of the PAH.

This study was motivated by the incongruent responses of the two Korean informants in Carminati's (2002) pilot study for Korean data on the null/overt pronouns in intra-sentential anaphora, which suggested the need of a larger study to get a clearer picture for Korean and to further examine the possibility of a cross-linguistic application of the PAH. Based on the results of the current study, the PAH was supported in Korean as it is in Italian.

As mentioned above, Carminati (2002) conducted a cross-linguistic pilot study for languages with Ø/overt pronoun alternation, assuming that if a language has two pronominal forms in its system, they should have distinct functions and apply, in principle, universally. The Ø retains its special connection with the prominent antecedent (i.e., subject position), but the behavior across languages is more variable, showing preference for a less prominent antecedent than Ø (i.e., object) or no preference for either the subject or the object. However, even though we accept the 'multi-purpose' uses of the overt pronoun, a division of labor of the antecedent bias between the Ø and overt pronoun was observed. In this division of labor, Ø was most likely to be coreferred to an antecedent in the subject position and the overt pronoun coreferred to various positions more deeply embedded in the sentence for disambiguation. Therefore, Carminati (2002) assured that the special connection of Ø with the subject is a universal feature that can be expected to occur in all languages that have Ø/pronoun alternation. In other words, if a crosslinguistic category of 'subject' can be shown to exist, and such a category is associated with the structural Spec IP position, it is conceivable that a null pronoun in a pro-drop language would prefer an antecedent in the subject position over the object position.

Notice that this assumption partially supports the PAH. That is, the assumption does not assume a true complementary distribution between the Ø and overt pronoun use; rather it makes a relatively stronger exertion of the association between the Ø and the subject for coreference. In contrast, the coreference between the overt pronoun and the object is not as strong as in the case of the null pronoun coreference, because the overt pronoun acts like a 'general purpose' pronominal device (Carminati, 2002, p. 333). In this respect, the results of the present study provide full support for the PAH by showing a significant difference in the preference pattern between the null and overt pronoun in their search of the possible antecedent referent. Thus, further cross-linguistic studies with larger data than in Carminati (2002) should be conducted with languages other than Korean to examine whether the PAH can be universally confirmed across different languages which allow both Ø and overt pronouns.

Two further predictions about the positional antecedent biases of the pronouns that the PAH states should be mentioned. First, however flexible the function of the overt pronoun is, compared to the special affinity for the subject antecedent of the Ø pronoun in these languages, we do not expect to find a language in which an overt pronoun has special association with the subject; that is, in which an overt pronoun is preferred to Ø to retrieve the subject antecedent. Nor do we expect to find the opposite, a language in which Ø would be preferred to the overt pronoun in retrieving the object antecedent.

Second, the antecedent assignment in intra-sentential anaphora stated in the PAH is guided based on the structural factor, i.e., the syntactic status of the antecedent, which implies that non-structural factors such as the pragmatic or semantic information of the antecedent do not significantly affect the preference of the pronoun coreference. Contrary to this view, Sag and Hankamer (1984) proposed the assumption that pronouns are interpreted with reference to a content-based discourse representation, and thus that a syntactic representation need not be consulted for pronoun resolution. However, psycholinguistic research has shown that this

view is too deterministic, especially for intra-sentential anaphora. As Carminati (2002) indicated for the Italian data that overall confirm the PAH, the results of the present study for the Korean data also reinforce the view that structural factors, such as the syntactic position of the antecedent of the pronoun are of primary importance in the process of pronoun resolution in intra-sentential anaphora.

In conclusion, the results of the present study with the Korean data are in clear support of the PAH, a strategy that a processor uses to resolve the antecedent for pronouns in intra-sentential anaphora for languages with Ø and overt pronoun alternation in their systems.

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NOTE

Note 1. Carminati (2002) explains that she intentionally uses the term Spec IP position, not using simply a 'subject' position that the null pronoun is associated with. It is because it predicts that only pre-verbal subjects (in Spec IP) and not post-verbal subjects (not in Spec IP) are predicted to be good antecedents for Italian null pronouns. Italian allows both pre-verbal and post-verbal subjects. Considering that Korean does not allow post-verbal subjects freely, I will use the term 'subject' throughout this paper to refer to the potential constituent that the null pronoun is associated with.

Note 2. One may point out that a third option should be given as possible antecedents in addition to the two options; a) the subject, *Inho*, b) the object, *SungGi*, and c) an extralinguistic antecedent, neither *Inho* nor *SungGi,* for natural selection of the antecedent. I believe that option c) is not necessary, because this study is examining a kind of subject/object asymmetry with respect to antecedent bias between the Ø and overt pronoun resolution in terms of division of labor. It is not examining pronoun resolution in general, in which speakers are asked to choose among all possible antecedents, including extralinguistic antecedents. Therefore, speakers should be forced to choose between the subject and the object as the antecedent of either the null or the overt pronoun in order to see the division of labor between these two distinguished pronouns.

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