

WORKING PAPERS

IN

LINGUISTICS

The notes and articles in this series are progress reports on work being carried on by students and faculty in the Department. Because these papers are not finished products, readers are asked not to cite from them without noting their preliminary nature. The authors welcome any comments and suggestions that readers might offer.

Volume 48 (1)
2017
(February)

DEPARTMENT OF LINGUISTICS
UNIVERSITY OF HAWAI'I AT MĀNOA
HONOLULU 96822

An Equal Opportunity/Affirmative Action Institution

DEPARTMENT OF LINGUISTICS FACULTY
2017

Victoria B. Anderson
Andrea Berez-Kroeker (Graduate Chair)
Derek Bickerton (Emeritus)
Robert A. Blust
Lyle Campbell (Adjunct)
Kenneth W. Cook (Adjunct)
Kamil Deen (Chair)
Patricia J. Donegan (Adjunct)
Katie K. Drager
Emanuel J. Drechsel (Adjunct)
Michael L. Forman (Emeritus)
Gary Holton
Roderick A. Jacobs (Emeritus)
Bradley McDonnell
William O’Grady
Yuko Otsuka (Adjunct)
Ann Marie Peters (Emeritus)
Kenneth L. Rehg (Adjunct)
Lawrence A. Reid (Emeritus)
Amy J. Schafer
Albert J. Schütz, (Emeritus, Editor)
Jacob Terrell
James Woodward Jr. (Adjunct)

REFERENTIAL CHOICE IN KOREAN-SPEAKING CHILDREN WITH AUTISM SPECTRUM DISORDER (ASD)¹

YURI LEE

This study examines the referential choices in narratives by Korean-speaking children with Autism Spectrum Disorder and a well-matched typically developing control group in relation to discourse-pragmatic features. The arguments were coded for the categories of referential forms and accessibility features. The referential forms were coded as three types: (1) nominal forms, (2) pronominal forms, and (3) null forms. The accessibility features were coded as six types: (1) newness, (2) ambiguity, (3) absence, (4) animacy, (5) query, and (6) third person. The results reveal that both groups' referential choices were highly influenced by accessibility features. However, a group difference was found in that the children with ASD showed overspecification and less ability to integrate various factors simultaneously, which implies atypical performance in pragmatics.

1. INTRODUCTION. Using appropriate referential forms when a speaker refers to an entity or a person is important in communication during conversation. Speakers are likely to use high information forms such as nominal forms when a referent is newly introduced in the discourse, i.e., new information, whereas they are likely to use low information forms such as pronouns or null forms when a referent is already presented in the previous discourse, i.e., old information. For example, in (1a), Speaker A uses the nominal form *Jane* for the first mention of the referent in the discourse, when it is newly introduced. In contrast, in (1b), Speaker B uses a low information form, the pronoun *she*, to refer to Jane instead of repeating the nominal form. In this case, Speaker B can assume that the listener, Speaker A, knows who is being referred to because it has become old information. If the nominal form, *Jane*, were chosen in this utterance, the sentence might sound less natural. In discourse-oriented languages such as Korean, Chinese, or Japanese, which allow argument omission, null forms are preferred for the subject in such situations, as in (1c).

- (1) a. A: Jane had an apple after lunch.
b. B: No, she had a pear.
c. B: aniya, pay-lul mek-ess-e.
 no (she) pear-ACC eat-PST-DECL
 'No, she ate a pear.'

The distinction between new and old information is not the only factor that affects the choice of referential form. For example, the existence of potential competitors for a referent can also make the referent ambiguous in discourse. In (2), B uses a nominal form to refer to someone who has already been mentioned in the discourse (i.e., *Jane*). If B instead used a low information form like a pronominal or null form, the listener might have difficulty understanding who the speaker's intended referent is, even though *Jane* is already given information, as such forms could refer to either Jane or Melody in this context. This example shows that referential choice is not determined by only one factor, but is affected by several factors simultaneously.

- (2) A: Jane and Melody are my friends.
B: Really? Jane will marry my brother.

¹ I would like to thank Kamil Deen and my other qualifying paper committee members, Yuko Otsuka and Andrea Berez-Kroeker, for their support and insight, as well as William O'Grady and Suk Hwan Cho for the guidance and advice that initially inspired me to work on this topic. I would also like to express my appreciation to Kyung-Suk Lee, the Severance Hospital of Yonsei University, and the Sewon Infant Child Development Center for providing me with access to the data.

A speaker has to choose a referential form that is not overly specific, but is specific enough for a listener to understand the speaker’s intention. This is in accordance with Grice’s (1975) maxim of quantity, which states that speakers should make their contribution as informative as required, but not more informative than required. Speakers may therefore err in at least two ways: providing more information than required, or providing less information than required. In this paper, the term *underspecification* refers to using less specific forms such as null forms when a referent has not been mentioned in the previous discourse. The opposite, *overspecification*, is using overly specific forms such as nominal forms when a referent has already been mentioned, where a null or pronominal form would be sufficient.

Previous studies have shown that referential choice in adult language is highly influenced by discourse-pragmatic features related to conceptual accessibility (Ariel 1990; Arnold and Griffin 2007; Chafe 1976; Du Bois 1985; Givón 1983; Gundel et al. 1993). According to Bock and Warren’s (1985) definition of the conceptual accessibility of referents, if potential referents can be easily activated in speakers’ mental representations, they are considered accessible; if not, they are considered inaccessible. Less accessible referents are newly introduced, not present in the room in the conversation situation, or ambiguous because of another potential referent in the situation. It has been suggested that referents that are not accessible to interlocutors are more likely to be realized with high information forms like lexical noun phrases than with low information forms like pronouns or null forms, while referents that are highly accessible to interlocutors are more likely to be realized with low information forms (Greenfield and Smith 1976). This difference is shown in example (1), where (1a) indicates the utterance spoken by an interlocutor, (1b) the appropriate English response to (1a), and (1c) the appropriate Korean response to (1a). Studies of children’s referential choice that have adopted a discourse-pragmatic perspective have shown that children’s referential choice is also affected by discourse-pragmatic features (Allen 2000; Clancy 1997; Guerriero et al. 2006). The correlation has been observed in child language cross-linguistically, including in English (Greenfield and Smith 1976), Korean (Clancy 1997), Japanese (Guerriero et al. 2006), Inuktitut (Allen 2000), and Chinese (Huang 2011). In Clancy’s longitudinal study, which is particularly relevant to the current study, two Korean-speaking children’s choice of referential forms was correlated with discourse-pragmatic features. The data were collected over one year in conversational settings, beginning when the children were 1;10 and 1;8. The children produced a higher percentage of nominal forms than null forms for arguments that were less accessible from the previous discourse. The children also produced a higher percentage of null forms than nominal forms for more accessible arguments that is, previously mentioned, present, or unambiguous referents. Clancy’s results clearly showed that Korean-speaking children are already sensitive to pragmatic features before the age of two.

2. REFERENTIAL CHOICE AND AUTISM SPECTRUM DISORDER. Deficits in social interaction and communication are considered one of the central features of Autism Spectrum Disorder (ASD), according to diagnostic criteria (American Psychiatric Association 2000). Related to deficits in communication, the impairment of pragmatic abilities is considered to be a common characteristic of these individuals’ language use (Diehl et al. 2006; Tager-Flusberg 2000). In addition, there are other features that the language of individuals with ASD tends to show, which, although they may not be purely linguistic, can affect their language performance, especially referential choice. The first feature is related to theory of mind (ToM), which refers to the speaker’s consideration of the listener’s state of mind. Children with ASD show poor ToM (Barendse et al. 2013). The second feature is related to working memory, which speakers need to access information from the previous discourse. Some studies have reported that children with ASD have poor working memory, although these studies’ results are not consistent (Kuijper et al. 2015; Tager-Flusberg 2000). The last characteristic is related to joint attention, which is a social-communicative skill in which interlocutors use nonlinguistic cues such as eye gaze or gestures to show their attention to interesting referents. Children with ASD show impaired development of this skill, while typically developing (TD) children develop it between 9 and 18 months of age (Jones and Carr 2004; Skarabela et al. 2013). Considering these features, we can predict that the use of referential forms by children with ASD and TD children might differ.

The difference in referential choice patterns between TD children and children with ASD can be represented in two ways in production data. The first is underspecification. If a referent is realized as a less specific form than needed, listeners may be confused and communication may become difficult, because underspecification can cause a listener's failure to successfully identify the intended referent in discourse. The second is overspecification, which may cause fewer communication problems than underspecification. Overspecification is a violation of Grice's maxim of quantity. If a speaker uses too many overspecified referential forms, his or her speech may sound clumsy, unnatural, or pedantic (Arnold et al. 2009), but no ambiguity will arise. In addition, as Gordon et al. (1993) demonstrated, processing time can be increased when referential forms that are more specific than required are used.

While much research has found either under- or overspecification among populations with ASD, there is no consensus as to whether one or the other is the typical pattern for individuals with ASD. Part of the reason for this lack of consensus might be differences in participant age and methodology among the studies. In terms of underspecification, Colle et al. (2008) found that adults with ASD produced more ambiguous pronominal forms than matched controls did in contexts with competing potential referents in a narrative task. In Novogrodsky's study (2013), children with ASD aged 6 to 11 showed similar results in a story-telling task. In studies that adopted more controlled and structured tasks (Dahlgren and Dahlgren Sandberg 2008; Nadig et al. 2009), children with ASD were less accurate than TD children in describing an entity to interlocutors. For example, in Nadig et al.'s (2009) referential communication task, in which shared information was manipulated, children were asked to describe an entity to an addressee. The children were asked to provide clues containing information about an object hidden from the addressee, such as 'big' when there are two cups. Children with ASD gave less efficient descriptions such as adjectives that described the object, while TD children tended to provide more efficient descriptions. In a study by Marinis et al. (2013), Greek-speaking children with ASD from age 5 to 8 were less accurate than TD children of the same age in choosing appropriate referential forms for ambiguous referents in a subtest of the Diagnostic Evaluation of Language Variation (DELV; Seymour et al. 2005). In Wicklund's (2012) study, six children with ASD aged 5 to 7 also showed a tendency toward underspecification in conversational settings, frequently using pronouns where there were competing potential referents.

Meanwhile, several studies have shown a tendency for children with ASD to produce overly specific forms. In Tager-Flusberg's study with 12-year-olds (1995), more children with ASD than TD children used definite noun phrases for introducing new characters in a narrative task, where indefinite noun phrases are more appropriate. Arnold et al. (2009) found that children with ASD aged 11 produced more nominal forms than TD children of the same age when less specific forms were sufficient to identify the referent. More structured experiments have also observed overspecification by ASD groups. Volden et al. (1997), Colle et al. (2008), and Nadig et al. (2009) showed that individuals with ASD used more specific forms than needed for unambiguous referents compared to control peers. In Wicklund's (2012) study that found under-specification by children with ASD, these children also showed a tendency toward overspecification in conversational settings. However, differences in underspecification or overspecification of referential choice between groups of matched autism and control groups have not always been observed in previous studies. While Arnold et al. (2009), using a narrative task, found overspecification in their younger ASD group (age 11), they did not find differences in overspecification or underspecification between their older ASD and TD groups (age 14–15). Novogrodsky, who compared the production of ambiguous pronouns by ASD and TD groups of children from 6 to 14 (2013), did not find a group difference in a retelling task, but did find a group difference in a story-telling task, which suggests that differences in task demands can cause different results. Kuijper et al. (2015) also found no significant difference between children with ASD and TD children from age 6 to 12 in a reference production study investigating referential choices for distinguishing new and old information and disambiguating ambiguous referents. The conflicting results of these previous studies seem to be partly due to the differences in the age of participants (e.g., Arnold et al. 2009) and task demands (e.g., Novogrodsky 2013); however, a detailed examination of the reasons is beyond the scope of this study. The results of previous studies are summarized in table 1.

TABLE 1. Summary of previous studies

Study	Target language	ASD groups' ages	Control groups' ages	Methods	Findings
Tager-Flusberg 1995	English	12;1	7;9	Narratives (Frog story)	ASD: overspecification & more definite NPs
Volden et al. 1997	English	13–24	13–24	a. Perspective taking b. Referential communication	ASD: overspecification
Colle et al. 2008	English	Adults	Adults	Narratives	ASD: overspecification & underspecification
Dahlgren and Dahlgren Sandberg 2008	Swedish	7–14	7–14	Referential communication task	ASD: underspecification
Nadig et al. 2009	English	9–14	8–14	Referential communication task	ASD: underspecification & overspecification
Arnold et al. 2009	English	Young: 11.1 Old: 15.1	Young: 11.6 Old: 14.6	Narrative	ASD: overspecification (Young group)
Wicklund 2012	English	5–7	5–7	Conversation	ASD: underspecification & overspecification
Marinis et al. 2013	Greek	5–9	5–9	Narrative (subtest of DELV)	ASD: underspecification
Novogrodsky 2013	English	6–14	6–14	a. Retelling b. Story-telling	a. No group difference b. ASD: underspecification
Kuijper et al. 2015	Dutch	6–13	6–13	Reference production task	No difference

3. THE CURRENT STUDY. Though referential choice in individuals with ASD has been investigated in various studies in different ways, no study has explored referential choice with children who speak topic-oriented languages such as Korean, Chinese, or Japanese. In these languages, omitting an argument is determined by discourse-pragmatic features, and thus referential choice might be influenced more by pragmatic features than it is in other languages, such as English. In addition, previous studies of referential choice in the ASD population have examined only one or two factors that affect referential choice. By investigating various factors at the same time, this study will provide a better picture of referential choice in children with ASD.

This study adopted a discourse-pragmatic approach to analyze how differently or similarly Korean-speaking TD children and children with ASD use referential expressions. The narrative data were elicited from 10 Korean-speaking children with ASD and 10 typically developing age and IQ controls. This study is the first to investigate the choice of referential expressions in children with ASD and TD children who speak a topic-oriented language and the first to adopt discourse-pragmatic principles to investigate referential expressions.

The primary goal of the current study is to compare the referential choice of Korean-speaking children with ASD and TD children. To do this, the study investigates whether the referential choices of Korean-speaking children with ASD are sensitive to pragmatic features. As discussed in section 2, the results reported in the literature are somewhat mixed. Therefore, in terms of predictions for the current study, two possibilities arise. The first is based on the hypothesis that children with ASD have deficient pragmatics, as suggested by Tager-Flusberg (2000), among others. If this is the case, then the study predicts that children with ASD will choose too many specific forms (overspecification) or too many null forms (underspecification), or perhaps choose referential forms randomly, regardless of pragmatic features. However, another possibility exists. If children with ASD are sensitive to pragmatic features, as suggested by Kuijper et al. (2015), the study predicts that children with ASD will behave like TD

children. That is, they will be likely to produce more specific forms, such as nominal forms, to refer to inaccessible referents, and less specific forms, such as null forms, to refer to accessible referents. However, even if both groups are sensitive to pragmatic features, we might observe some group differences in overspecification and/or underspecification between TD children and children with ASD, as previous research has found (Arnold et al. 2009).

This study adopted a narrative task, using a Korean version of the MacArthur Story Stem Battery (MSSB; Bretherton et al. 1990). The task had some methodological advantages. First, a narrative task allowed us to examine factors in a more natural setting than a controlled experiment, but it was more structured than spontaneous speech data. Second, a narrative task allowed us to investigate a variety of factors simultaneously, whereas we could investigate only one or a few factors in the typical experimental situation (Allen et al. 2008).

3.1 METHOD.

3.1.1 PARTICIPANTS. There were two groups of participants: 10 children with ASD (ASD, age 5;10–7;05), and 10 typically developing children (TD, age 4;06–7;11) whose verbal and nonverbal IQs matched those of the ASD group (table 1). They were recruited at a hospital and a child-development center in Seoul, South Korea. For the ASD group, the participants’ diagnoses had been evaluated using standardized diagnostic assessments: the Autism Diagnostic Observation Schedule (ADOS), the Autism Diagnostic Interview–Revised (ADI-R), and cognitive tests that have been validated for South Korean children. All of the participants in this group had been diagnosed with Asperger’s disorder by experienced psychiatrists on the basis of DSM-IV (APA 2000). For the TD group, no participant had been diagnosed with ASD or any pervasive developmental disorder. The ADOS, ADI-R, and cognitive tests had been administered by experienced psychiatrists to this group as well. None of the participants in this group scored above the cut-off for ASD. In addition, they had no history of neurological or psychiatric problems, and no language delay.

3.1.2 PROCEDURE. The narrative data were collected using the Korean version of the MacArthur Story Stem Battery (MSSB), in which children hear the initial portion (the “stem”) of a story up to a dramatic point, and are then encouraged to complete the story (Bretherton et al. 1990; Shin et al. 1999). The MSSB story stems used in this study were as follows: “Birthday,” “Spilled Juice,” “Lost Keys,” “Family Reunion/Departure,” “Candy Store,” “Dog Lost/Reunion,” “Hot Pot,” “Climbing the Rock,” “Ball Play” and “Mom’s Headache.” The administration process involved telling a child the scripted stem of a story. For example, in the story titled “Lost Keys,” an investigator describes Mum and Dad in the kitchen. The child is then asked to “show and tell” the investigators “what happens next.” The script goes as follows.

Mum: ‘You’ve lost my keys!’
 Dad: ‘I have not!’
 Mum: ‘Yes you have, you always lose my keys!’

The experiment took approximately 30 minutes. Each child’s completion of each scenario was video-recorded for later analysis and transcription. The transcription was done by research assistants following the CHAT conventions (MacWhinney 2000).

TABLE 2. Participant characteristics

	ASD	TD	<i>t</i> -test	Significance
Number	<i>n</i> = 10 (M = 9; F = 1)	<i>n</i> = 10 (M = 4; F = 6)		
Age	6.35 (<i>SD</i> = 0.66)	5.95 (<i>SD</i> = 1.19)	0.92	0.36
IQ	106.4 (<i>SD</i> = 16.60)	112.70 (<i>SD</i> = 8.97)	-1.05	0.3
Verbal IQ	114.60 (<i>SD</i> = 18.40)	110.70 (<i>SD</i> = 8.10)	0.61	0.54

3.2 ANALYTICAL FRAMEWORK.

Referential forms: While most of the previous studies have adopted binary categorization of referential forms, this study adopts a three-way categorization following Clancy 1997 and Huang 2011: (a) nominal forms, (b) pronominal forms, and (c) null forms. The reason for this categorization is that pronouns can be considered either low or high information forms (Graf et al. 2014), and it is unclear which type Korean pronouns are.

- a. Nominal forms: Proper names (e.g., *Young-Su*), nouns, and noun phrases.
- b. Pronominal forms: Pronouns (e.g., *ne* ‘you’) and demonstratives (e.g., *yay* ‘this person’).
- c. Null forms: Absence of an overt form.

3.3 ACCESSIBILITY FEATURES. The following features were adopted and modified from Allen 2000 and Huang 2011. They are summarized in table 3.

3.3.1 NEWNESS. The feature NEWNESS is the most widely studied among discourse-pragmatic features. It concerns whether a referent has been previously mentioned in the discourse. The criteria for distinguishing new and given referents vary across studies according to the characteristics of their data (Allen et al. 2008). In this study, an argument is considered new if the referent had not been mentioned within the same episode. When a child changed the story topic, even within one stem story, the new story topic was considered another episode (e.g., when a child talked about Cinderella while talking about “Mom’s Headache,” the Cinderella story was counted as a new episode). In addition, first and second person referents were considered as given in this study following Chafe’s (1976) categorization, because the first and second person always refers to a speaker and a listener who participate in the discourse.

3.3.2 AMBIGUITY. The feature AMBIGUITY² characterizes a term that can refer to more than one referent in the discourse. In this study, this term is used with a similar meaning as “contrast” or “differentiation” in other studies. When there is more than one potential referent in a discourse, there is potential confusion in identifying the target referent. In such cases, a speaker might have to explicitly differentiate the target referent from the other potential referents.

3.3.3 ABSENCE. The feature ABSENCE identifies whether a referent in the conversation is present or not in the physical context. A referent that is physically present is more accessible than one that is absent.

3.3.4 ANIMACY. The feature ANIMACY identifies whether a referent is animate or inanimate. Because the number of animate entities is relatively limited compared to the number of inanimate entities in discourse, inanimate referents are inaccessible (Allen 2000).

3.3.5 QUERY. The feature QUERY is the subject of a query or the response to it. The identity of the referent of a question is not accessible to the listener before it is provided by the speaker. Thus a referent that is the subject of or the answer to a query is inaccessible.

3.3.6 THIRD PERSON. The feature THIRD PERSON concerns whether a referent is third person or first/second person. In discourse, the number of third person entities tends to be greater than the number of first or second person entities. Thus, third person is inaccessible.

3.4 CODING. The transcribed narratives were divided into clauses, that is, “any unit that contains a unified predicate,” following Berman and Slobin’s definition (1994). Then the referential form type and accessibility features were coded. The example below shows how coding was done with *enni* ‘older sister’ in the utterance of one child.

² Allen (2000) and Huang (2011) further divide the AMBIGUITY feature into contrast, differentiation in context, and differentiation in discourse. This study does not adopt this three-way system.

TABLE 3. Accessibility features (Adopted and modified from Allen 2000 and Allen et al. 2008)

Pragmatic features	Inaccessible value	Accessible value
NEWNESS	Referent new to discourse	Referent not new to discourse
AMBIGUITY	Two or more potential referents in preceding discourse	Only one potential referent in preceding discourse
ABSENCE	Referent absent from physical context	Referent present in physical context
ANIMACY	Inanimate referent	Animate referent
QUERY	Referent subject of or answer to query	Referent not subject of or answer to query
THIRD PERSON	Third person referent	First or second person referent

(3) 4;0 TD, CLI: Clinician, CHI: Target child

(The clinician started to talk about the beginning part of “Ball Play.”

The older child (Heejin) and her friend are playing with the ball. The younger child (Younghee) asks to join them. The friend replies, “If you let your sister play, I won’t be your friend anymore.” Tell me what happens now!)

*CHI: ca, ca enni patalap. Peng!
 well well sister get
 ‘Well, sister, get (the ball).’

*CHI: kuleko kunyang en, enni-nun kunyang cip-ey kapeli-ko,
 and anything sis sister-TOP nothing home-at go-and
 ‘And then the sister (Heejin) went home and’

*CHI: huycini-lang kathi kongnoli-lul hayssta-y.
 Heejin-with together ball play-ACC did-said
 ‘(the younger child said) (she) played ball with the older sister.’

(4) *enni* ‘older sister’ in the second utterance of CHI

- a. Referential form: Nominal
- b. NEWNESS: Accessible
- c. AMBIGUITY: Inaccessible
- d. ABSENCE: Accessible
- e. QUERY: Accessible
- f. ANIMACY: Accessible
- g. THIRD PERSON: Inaccessible

In (3), *enni* ‘older sister’ had been mentioned before (NEWNESS); she is one of more than two potential referents (Three children were mentioned before) in the previous discourse (AMBIGUITY); there were three toy children in the room (ABSENCE); *enni* is not the subject of or answer to a query (QUERY), she is animate (ANIMACY); and the form is third person (THIRD PERSON). Thus, the referent is coded as accessible for NEWNESS, ABSENCE, QUERY, ANIMACY, and inaccessible for AMBIGUITY, and THIRD PERSON.

The list in (5) presents the guidelines the study used for including and excluding utterances from the analysis. Some parts of this list were adopted from Kim (2000).

(5) Guidelines for clauses

- a. Imitations were excluded. Imitations were defined as utterances that immediately followed and repeated an adult’s utterance without any change. However, repetitions were included as separate utterances.
- b. Subjects of imperative and propositive clauses such as *pap meke* ‘Let’s have a meal’ and *pap mekca* ‘Have a meal’ were excluded.

- c. Clauses with the light verb *-hata* ‘do’ were excluded (e.g., *iyaki-hata* ‘tell a story’ and *kongnoli-hata* ‘play with a ball’) because they are used as fixed expressions and usually produced without case-markers in Korean
- d. Set phrases or fixed expressions were excluded (e.g., *ttey ssuta* ‘throw a tantrum’, *malsseng pwulita* ‘play up’, and *sayngil chwukhahata* ‘celebrate one’s birthday’).
- e. NPs with omitted verbs were included when they were answers to questions.
- f. In multiclausal utterances, the unit of analysis for assessing subject use was the clause.

4. RESULTS. The main questions of this study are whether pragmatic features are a good predictor for referential choice by Korean TD children and children with ASD and if so, whether there are differences between the two groups.

4.1 GENERAL DISTRIBUTION. Table 4 presents general information about the data.

TABLE 4. Data

	TD	ASD
Total number of clauses	1449	2773
Number (token) of transitive verbs	342	435
Number (token) of verbs	866	1208

As seen in the table, children with ASD produced many more clauses (2773) than their TD counterparts (1449). This difference is likely because some children with ASD produced stories unrelated to the given topic, such as a fairy tale or their own story.

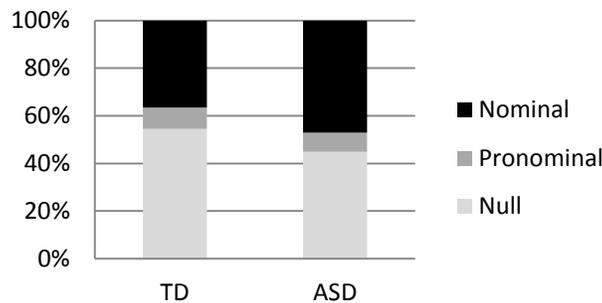
Table 5 shows the numbers and percentages of the three types of referential forms.

TABLE 5. Numbers of referential forms

	Nominal	Pronoun	Null	Total
TD	442 (36.59%)	108 (8.94%)	658 (54.47%)	1208
ASD	735 (47.03%)	127 (8.13%)	701 (44.85%)	1563

The total number of referential forms in the TD group’s data was 1208 arguments, and the total number in the ASD group’s data was 1563. The proportions of pronouns are similar in the data of both groups (TD: 8.94% vs. ASD: 8.13%). However, the proportions of nominal forms and null forms are significantly different by group ($\chi^2(2) = 30.86, p < .001$). That is, the children with ASD produced more nominal forms than the TD children did, which means that the TD children omitted more arguments than the children with ASD did, as illustrated in figure 1.

FIGURE 1. Distribution of referential forms



4.2 ACCESSIBILITY AND REFERENTIAL CHOICE. Further analysis was conducted to investigate the relationship between accessibility and the choice of referential forms by children with ASD and TD children.

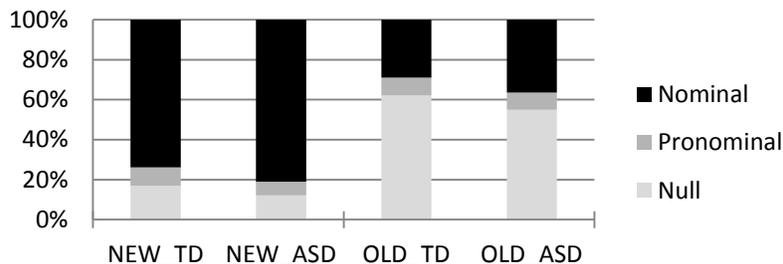
4.2.1 SENSITIVITY TO ACCESSIBILITY. Table 6 shows the distribution of referential forms with respect to NEWNESS. New referents are inaccessible, and so we expect high-information forms, such as nominal forms, to be used more frequently. However, old referents are accessible, and so we expect low-information forms, such as null forms, or perhaps pronominal forms, to be used less frequently when the referents are new. This tendency is clearly shown in figure 2. Both the TD children and the children with ASD showed a higher rate of nominal forms than null forms for inaccessible arguments, as seen in the two bars on the left side in figure 2 (TD: 73.79% > 16.99%; ASD: 81.08% > 12.16%). On the other hand, both groups used higher rates of null forms than nominal forms for accessible arguments as seen in the two bars on the right side in figure 2 (TD: 62.18% > 28.94%; ASD: 54.99% > 36.46%). Chi-square analyses showed a significant difference in the use of referential forms in terms of NEWNESS in the data of both the TD children and the children with ASD. This suggests that both groups of children are sensitive to NEWNESS when they choose referential forms (TD: $\chi^2(2) = 157.98, p < .001$; ASD: $\chi^2(2) = 236.16, p < .001$).

TABLE 6. Distribution of referential forms with respect to NEWNESS

Feature	Type of speaker	Forms	Inaccessible		Accessible		χ^2 (In. vs. Ac.)
			N	%	N	%	
NEWNESS	TD	Null	35	16.99	623	62.18	157.98 *** ³
		Pronominal	19	9.22	89	8.88	
		Nominal	152	73.79	290	28.94	
	ASD	Null	45	12.16	656	54.99	59.98***
		Pronominal	25	6.76	102	8.55	
		Nominal	300	81.08	435	36.46	

The distribution of each type of form was further analyzed to understand the general pattern better. First, null forms were used less frequently for new referents than for old referents by both groups (TD: 16.99% < 62.18%; ASD: 12.16% < 54.99%). Second, nominal forms were used more frequently for new referents than for old referents by both groups (TD: 73.79% > 28.94%; ASD: 81.08% > 36.46%). Third, neither group showed a significant difference in pronominal forms for new referents versus old ones (TD: 9.22% > 8.88%; ASD: 6.76% < 8.55%).

FIGURE 2. Percentages of referential forms with respect to NEWNESS



Similar distribution patterns are observed in the analysis of referential choice in regard to the other five accessibility features, except for some aspects of the QUERY and THIRD PERSON features. A summary of the results appears in table 7. The distribution of all the referential forms with respect to each accessibility feature is provided in the appendix. General patterns include the following: (1) both groups of children showed a higher rate of nominal forms than null forms for inaccessible arguments and a higher rate of null forms than nominal forms for accessible arguments; (2) both groups used null forms

³ *** p < 0.001

less frequently for inaccessible referents than for accessible referents and nominal forms more frequently for inaccessible referents than for accessible referents; (3) neither group used pronominal forms frequently; the distribution pattern of pronominal forms was not significantly different between accessible and inaccessible referents.

TABLE 7. Summary of referential choice with respect to accessibility

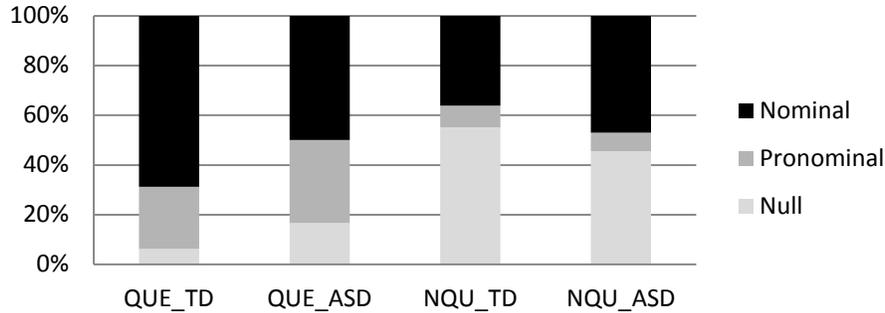
Feature	Type of speaker	Inaccessible	Accessible	Statistical significance
NEWNESS	TD	Nominal forms > Null forms	Nominal forms < Null forms	***
	ASD	Nominal forms > Null forms	Nominal forms < Null forms	***
AMBIGUITY	TD	Nominal forms > Null forms	Nominal forms < Null forms	***
	ASD	Nominal forms > Null forms	Nominal forms < Null forms	***
ABSENCE	TD	Nominal forms > Null forms	Nominal forms < Null forms	***
	ASD	Nominal forms > Null forms	Nominal forms < Null forms	***
ANIMACY	TD	Nominal forms > Null forms	Nominal forms < Null forms	***
	ASD	Nominal forms > Null forms	Nominal forms < Null forms	***
QUERY	TD	Nominal forms > Null forms	Nominal forms < Null forms	***
	ASD	Nominal forms > Null forms	Nominal forms = Null forms	***
THIRD PERSON	TD	Nominal forms < Null forms	Nominal forms < Null forms	***
	ASD	Nominal forms > Null forms	Nominal forms < Null forms	***

However, QUERY and THIRD PERSON showed somewhat different patterns than the other features. For QUERY, the TD children showed a similar pattern in that they used a higher rate of nominal forms than null forms for inaccessible arguments, and a higher rate of null forms than nominal forms for accessible arguments. This pattern is as expected. However, the children with ASD did not show the expected pattern, as seen in the two bars on the right side of figure 3. Specifically, they used a similar rate of null forms and nominal forms for nonquery referents (null: 45.51%, nominal: 46.95%), while the expected pattern is a higher rate of null forms than nominal forms for nonquery referents, as seen in figure 2. This might suggest that the children with ASD were less sensitive to the accessibility of referents for QUERY. Another difference was observed in regard to pronominal forms for QUERY. The use of pronominal forms for inaccessible referents is unexpected because they are low information forms, which are expected to refer to accessible arguments. However, both groups of children used a much higher rate of pronominal forms for inaccessible referents with the QUERY feature, unlike for the other features, as seen in the two bars on the left side of figure 3 (QUERY: TD: 25.00%; ASD: 33.33%. Other features: TD: 2.91–9.22%; ASD: 0.42–8.33%). This finding may be due to a unique property of the QUERY feature. In (6), the child used a pronominal form *ike* ‘this’ to refer to the inaccessible argument. This is a very frequent spoken pattern when the speaker refers to something unknown to him/her.

- (6) 6;2 ASD, CLI: Clinician, CHI: Target child
 (The clinician showed a toy gas range to the child.)
 *CHI: ike-y mwe-ey-yo? (Touching the toy gas range)
 this-NOM what-is-HON
 ‘What is this?’
 *CLI: kasuleyni.

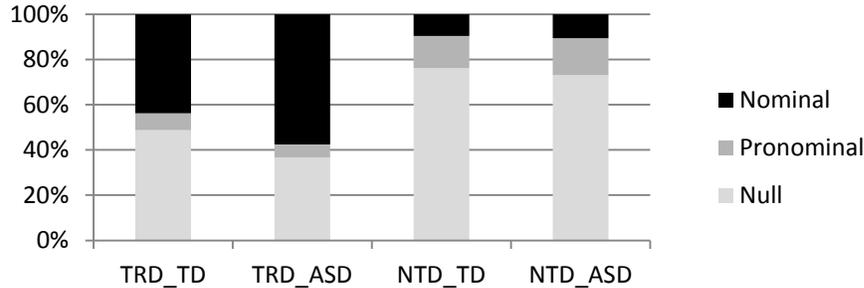
gas range
'Gas range.'

FIGURE 3. Percentages of referential forms with respect to QUERY



In addition, the TD children showed an unexpected pattern for THIRD PERSON, while the children with ASD showed the expected pattern. Both groups showed the expected pattern of a higher rate of null forms than nominal forms for accessible arguments (i.e., non-third person). But, as the bars on the right side of figure 4 show, for inaccessible arguments (i.e., third person), the TD children used a higher rate of null forms than nominal forms (null vs. nominal: 48.74% > 43.72%), while the expected pattern is a higher rate of nominal forms than null forms, which is the pattern shown by the children with ASD (null vs. nominal: 36.69% < 57.54%).

FIGURE 4. Percentages of referential forms with respect to THIRD PERSON



A similar pattern is observed in regard to the ANIMACY feature when direct objects are excluded and only subjects are analyzed, as seen in figure 5. The TD children used a higher rate of null forms than nominal forms for third person referents (null vs. nominal: 48.74% > 28.14%), while the expected pattern is a higher rate of nominal forms than null forms for inaccessible referents, as the children with ASD displayed (null vs. nominal: 28.14% < 60.48%).

When we observe only the features of THIRD PERSON and ANIMACY (of subjects) for inaccessible referents, it seems that the children with ASD were more sensitive to the THIRD PERSON of inaccessible arguments. This matter will be mentioned again in the discussion in section 5.

4.2.2 GROUP DIFFERENCE. We expected to see a group difference between children with ASD and TD children in two ways, underspecification and overspecification. As discussed in section 2, underspecification is the use of fewer informative forms than required, and it is one of the important group differences that we can expect, based on the previous studies on children with ASD. However, underspecification by the children with ASD was not observed in the data. Figure 6 illustrates the two groups' use of more and less informative forms for referents that are inaccessible in terms of each of the six features.

FIGURE 5. Percentages of referential forms with respect to ANIMACY of subjects

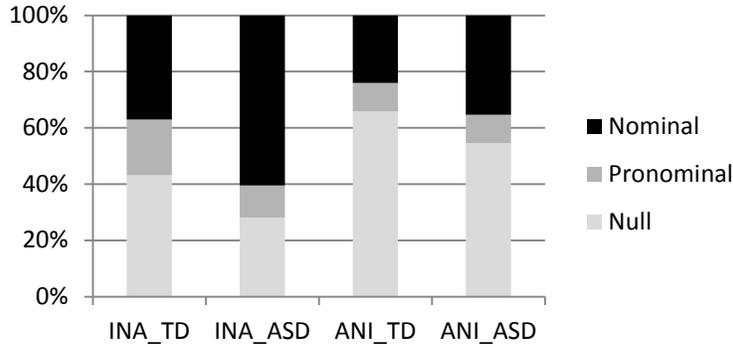
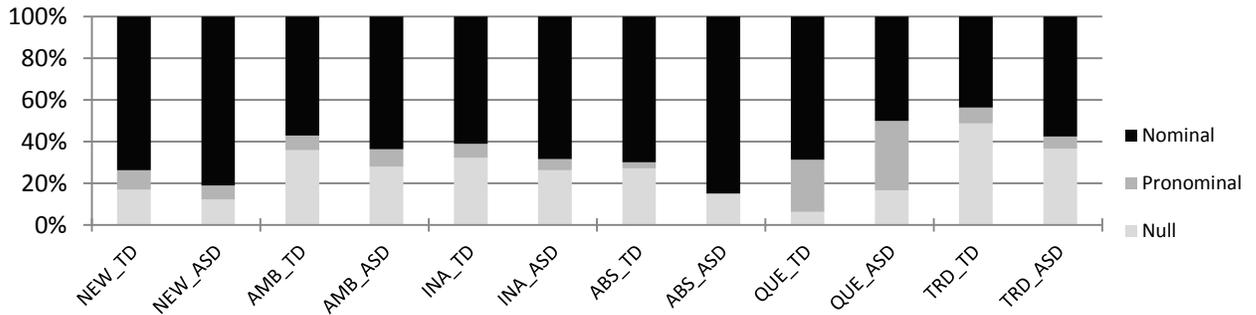


FIGURE 6. Percentages of referential forms with respect to inaccessible referents

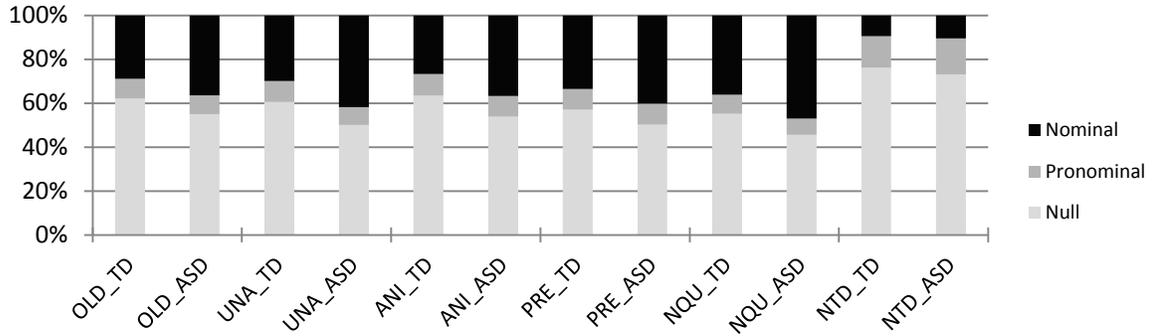


For example, for the feature NEWNESS, new referents are inaccessible, and so we expect high-information forms such as nominal forms to be used more frequently than low information forms. As seen in the two leftmost bars of figure 6, the children with ASD’s rate of nominal forms is higher than that of the TD children. This tendency is also observed in regard to four of the other features: AMBIGUITY, ANIMACY, ABSENCE, and THIRD PERSON. However, it is not observed for the feature of QUERY. The general pattern suggests that children with ASD chose better referential forms than TD children, at least for inaccessible referents. As for the different pattern for the QUERY feature, it can be disregarded because the amount of relevant data is too small: only 16 for TD children and 36 for children with ASD. The general tendency that children with ASD showed better sensitivity to inaccessible referents was confirmed by chi-square analyses (NEWNESS: $\chi^2(2) = 4.17, p = 0.12$; AMBIGUITY: $\chi^2(2) = 4.88, p = 0.09$; ABSENCE: $\chi^2(2) = 11.75, p < .05$; ANIMACY: $\chi^2(2) = 11.75, p < .05$; THIRD PERSON: $\chi^2(2) = 57.97, p < 0.01$). As for QUERY, there was no significant group difference for inaccessible referents ($\chi^2(2) = 1.84, p = 0.40$).

Second, we observed overspecification, the use of more specific forms than required, in the data. Table 7 presents the two groups’ use of more and less informative forms for referents that are accessible in terms of each of the six features.

For example, in terms of NEWNESS, old referents are accessible, and so we expect low information forms such as null forms to be used for them more frequently than high information forms. Although both groups of children show the expected pattern, the children with ASD show a greater tendency toward overspecification, as seen in the two leftmost bars in figure 7. The children with ASD used more nominal forms for old referents than the TD children did. This tendency is also observed in regard to most of the other features, as the figure shows. The children with ASD show higher rates of nominal forms than the TD children for every feature except for THIRD PERSON. The children with ASD used nominal forms

FIGURE 7. Percentages of referential forms with respect to accessible referents



more frequently to refer to unambiguous, animate, present, or nonquery arguments than the TD children did. This group difference was significant, and confirmed by chi-square analyses (NEWNESS: $\chi^2(2) = 14.22, p < .001$; AMBIGUITY: $\chi^2(2) = 31.6, p < .001$; ABSENCE: $\chi^2(2) = 11.68, p < .01$; ANIMACY: $\chi^2(2) = 11.68, p < .01$; QUERY: $\chi^2(2) = 32.08, p < .001$). This tendency had already been observed in the general distribution seen in table 4 and figure 1, and it can be interpreted as overspecification by the ASD group for accessible referents. The results demonstrating the group differences are summarized in table 8.

TABLE 8. Summary of group differences

Feature	Inaccessible	Accessible
NEWNESS	TD < ASD (ASD higher sensitivity)	TD > ASD (ASD overspecification)
AMBIGUITY	TD < ASD (ASD higher sensitivity)	TD > ASD (ASD overspecification)
ABSENCE	TD < ASD (ASD higher sensitivity)	TD > ASD (ASD overspecification)
ANIMACY	TD < ASD (ASD higher sensitivity)	TD > ASD (ASD overspecification)
QUERY	TD = ASD (No group difference)	TD > ASD (ASD overspecification)
THIRD PERSON	TD < ASD (ASD higher sensitivity)	TD = ASD (No group difference)

5. DISCUSSION AND CONCLUSION. The goal of this study is to investigate whether Korean children with ASD can use pragmatic-discourse features to choose an appropriate referential expression, as previous studies have reported to be the case for TD children (e.g., Clancy 1997). The study therefore asks whether there are group differences between children with ASD and TD children in their use of referential expressions. As discussed, the results reported in the previous literature on this topic are somewhat mixed, and so the current study has made two contrasting predictions. The first prediction is based on the view that children with ASD have deficient pragmatics, as suggested by Tager-Flusberg (2000). If this is the case, then children with ASD will choose too many specific forms (overspecification) or too many null forms (underspecification), or they might choose referential forms randomly, regardless of pragmatic features. The second prediction is based on the view that children with ASD are sensitive to pragmatic features, as suggested by Kuijper et al. (2015). If this is the case, then children with ASD will be likely to produce more specific forms like nominal forms to refer to inaccessible referents and less specific forms like null forms to refer to accessible referents, just as TD children have been shown to do in previous studies. Even in this case, however, children with ASD can be expected to show overspecification or underspecification; that is, whether or not children with ASD are sensitive to pragmatic features, they are likely to use overspecification and underspecification at higher rates than TD children, as seen in Arnold et al.’s study (2009).

The results of this study were consistent with the second view, which is that children with ASD are sensitive to inaccessible features, and their referential choices are affected by discourse-pragmatic

principles. Furthermore, the children with ASD were more sensitive to some features than the TD children were, particularly for inaccessible referents (table 8). The findings of the present study are partly consistent with some previous studies in other languages. For example, Arnold et al. (2009) observed that English speaking-children with ASD were sensitive to NEWNESS, and Kuijper et al. (2015) also showed that children with ASD’s use of referential expressions was affected by NEWNESS and AMBIGUITY, similar to TD children’s.

5.1 CHILDREN WITH ASD’S SENSITIVITY TO PRAGMATIC FEATURES. Previous research has shown that two important potential determinants of referential choice are whether a speaker can assess the listener’s state of mind and whether the speaker can access information from the previous discourse (Ariel 1990; Gundel et al. 1993). The latter requires good theory of mind (ToM), and the former is related to good working memory (Kuijper et al. 2015). It is well known that children with ASD have difficulties with ToM (Tager-Flusberg 2000). In addition, it has been reported that they have problems with working memory, although the results are not consistent (Barendse et al. 2013). But if children with ASD have poor ToM and/or poor working memory, why did these children show more sensitivity to inaccessibility than the TD children in this study?

The first potential explanation is related to the findings on the THIRD PERSON feature in this study. As seen in figure 4, the ASD group’s behavior was closer to the prediction that children will show a higher use of nominal forms than null forms for inaccessible arguments, while the TD children used more null forms. However, this does not mean that the ASD group’s general performance in the choice of referential forms was better than the TD group’s. That is, the better performance shown by the children with ASD in this case might be due to their inability to aggregate and calculate conflicting values across features. For example, if NEWNESS conflicts in its accessibility value with, say, THIRD PERSON (one being inaccessible and the other accessible), any speaker of a language would have to calculate how to encode such a situation, in which accessibility values conflict. I suggest that this might be where children with ASD lag behind their TD peers, giving the illusion of relatively better sensitivity to pragmatic features. For example, in (7), the subject of the child’s utterance is a (toy) gas range that the investigator had just mentioned. Therefore, the subject is accessible in NEWNESS whereas it is inaccessible in THIRD PERSON. As Allen et al. (2008) pointed out, the strength of features varies. The effect of some features, like NEWNESS, is stronger than that of others, like THIRD PERSON. Thus, we can say that the subject in this dialogue was more influenced by NEWNESS than by THIRD PERSON. That is, we cannot say that this TD child is not sensitive to pragmatic features just because he chose a null form for THIRD PERSON. The higher sensitivity to weak pragmatic features in children with ASD does not guarantee better performance of overall discourse. When choosing an appropriate referential form, a speaker has to consider multiple pragmatic features at the same time, and a stronger feature might determine which form will be chosen while other features are ignored. Thus, greater sensitivity to one weak feature might mean that children with ASD have difficulty aggregating and calculating conflicting values across features.

(7) TD 5;8

*CLI: ceki kasuleyinci-to cwuseyyo
 there gas range-also give-IMP
 ‘Give (me) the gas range from there as well.’

*CHI: wuwa! cincca-chelem sayngky-ess-ta.
 wow real-like look-PST-DECL
 ‘Wow, it looks like a real thing.’

5.2 OVERSPECIFICATION VERSUS UNDERSPECIFICATION.

5.2.1 OVERSPECIFICATION. The purpose of this study was to investigate group differences between children with ASD and TD children in the use of referential expressions. Possible differences between the two groups were expected to appear in overspecification and underspecification. Interestingly, using the same data as the current study, Lee et al. (2011) already showed that the children with ASD have deficits in organizing utterances coherently compared to the TD controls. This suggests that the children with ASD in the current study have problems in aspects of discourse-pragmatics. However, in this study, we found only overspecification in the group with ASD. The children with ASD used more specific forms in general than the TD children did. This finding is consistent with the findings of some previous studies (Arnold et al. 2009; Baltaxe 1977; Colle et al. 2008; Nadig et al. 2009; Volden et al. 1997). One potential explanation for overspecification is suggested by Kanner's (1943) original description of autism. When he observed reversals of the pronouns "I" and "you" in the language of individuals with autism, he proposed that these individuals might just repeat what they hear. The overuse of high information forms observed in previous studies of referential expressions as used by individuals with ASD, as well as in the present study, might be due to a tendency to repeat what they just heard. However, the current study did not code repetition of forms, and so a finer-grained analysis to address this possibility is left for future study.

Another possible explanation for overspecification might be related to children with ASD's impaired development of joint attention (Jones and Carr 2004; Loveland and Landry 1986). In fact, children with ASD's overspecification can be interpreted as TD children's underspecification. So the reason that TD children drop more arguments than children with ASD do might be because TD children use not only linguistic cues but also nonlinguistic cues such as eye gaze and gestures more frequently and appropriately when identifying a referent. In the example in (6), the two people in the discourse are looking at the same entity together. A linguistic cue is not necessarily needed here, regardless of the accessibility of the referent. Skarabela et al.'s (2013) study confirmed that joint attention affects TD children's referential choice. The impaired joint attention of children with ASD might cause them to rely more heavily on linguistic cues. That is, their impairment of joint attention might cause overuse of more specific forms. Overspecification seems to be a less serious problem than underspecification in that the overuse of more specific referential forms usually does not cause confusion in identifying referents, whereas omitting too many arguments can cause communication problems. However, it is a violation of a pragmatic maxim. Overly used arguments are redundant information, so they make the discourse sound unnatural and can delay the processing of the information (Gordon et al. 1993).

5.2.2 NO UNDERSPECIFICATION. However, why did the children with ASD in this study not show underspecification but only overspecification? The task demands may be one reason. Novogrodsky's (2013) mixed results might provide a good explanation for the results of the present study, in which children with ASD did not show underspecification for inaccessible referents. As mentioned previously, children with ASD in Novogrodsky's study showed conflicting results by the tasks: good performance in retelling and poor performance in story-telling. The contrasting results of the two tasks might be due to the different task demands: Retelling is less demanding than story-telling. The MSSB used in the present study is less demanding than the story-telling task used by Novogrodsky because with the MSSB, the investigators provided the initial part of the stories and the children could stop or close the story whenever they wanted. Kuijper et al. (2015) suggested the same explanation for their results that showed no difference between children with ASD and TD children in referential choice. Their study adopted a very controlled and short reference production task with only two characters in one story. Taken together, the results of these studies suggest that if children with ASD have difficulty keeping track of a discourse, and if this failure might cause difficulty with referential choices, then children with ASD might show more problems like underspecification in more demanding tasks.

In sum, the results of this study imply that children with ASD are sensitive to pragmatic features that affect referential choices. They do not show any difference from TD children in the use of underspecified referential forms. This finding challenges the prediction that children with ASD tend to show underspecification, which can result in a listener's failure to identify the correct referent. However, the children with ASD in this study did show overspecification, which is consistent with some of the previous

studies in other languages (Arnold et al. 2009; Volden et al. 1997). Furthermore, this study’s analysis of several factors shows that children with ASD seem to have problems integrating various factors at the same time. This finding may be a starting point for building better understanding of their impairment in pragmatic aspects. Moreover, these findings in Korean, a language typologically different from the languages investigated in previous studies, may help to develop a language phenotype for autism that could inform clinical treatment.

LIST OF ABBREVIATIONS

ACC	accusative case	AF	affix	DECL	declarative
IMP	imperative	HON	honorific	PST	past tense
QUES	question				

APPENDIX

Distribution of referential forms with respect to accessibility

Feature	Type of speaker	Forms	Inaccessible		Accessible		χ^2 (In. vs. Ac.)	
			N	%	N	%		
NEWNESS	TD	Null	35	16.99	623	62.18	157.98***	
		Pronominal	19	9.22	89	8.88		
		Nominal	152	73.79	290	28.94		
	ASD	Null	45	12.16	656	54.99		59.98***
		Pronominal	25	6.76	102	8.55		
		Nominal	300	81.08	435	36.46		
AMBIGUITY	TD	Null	107	35.91	551	60.55	71.86***	
		Pronominal	21	7.05	87	9.56		
		Nominal	170	57.05	272	29.89		
	ASD	Null	104	27.96	597	50.13		59.99***
		Pronominal	31	8.33	96	8.06		
		Nominal	237	63.71	498	41.81		
ABSENCE	TD	Null	28	27.18	630	57.01	54.12***	
		Pronominal	3	2.91	105	9.5		
		Nominal	72	69.9	370	33.48		
	ASD	Null	35	14.77	666	50.23		161.58***
		Pronominal	1	0.42	126	9.5		
		Nominal	201	84.81	534	40.27		
ANIMACY	TD	Null	112	32.28	546	63.41	126.84***	
		Pronominal	23	6.63	85	9.87		
		Nominal	212	61.1	230	26.71		
	ASD	Null	134	26.33	567	53.8		138.26***
		Pronominal	27	5.3	100	9.49		
		Nominal	348	68.37	387	36.72		
QUERY	TD	Null	1	6.25	657	55.12	16.18***	
		Pronominal	4	25	104	8.72		
		Nominal	11	68.75	431	36.16		
	ASD	Null	6	16.67	695	45.51		35.41***
		Pronominal	12	33.33	115	7.53		
		Nominal	18	50	717	46.95		
THIRD PERSON	TD	Null	466	48.74	192	76.19	101.5***	
		Pronominal	72	7.53	36	14.29		
		Nominal	418	43.72	24	9.52		

ASD	Null	445	36.69	256	73.14	244.9***
	Pronominal	70	5.77	57	16.29	
	Nominal	698	57.54	37	10.57	

REFERENCES

- ALLEN, SHANLEY. 2000. A discourse-pragmatic explanation for argument representation in child Inuktitut. *Linguistics* 38:483–521.
- ALLEN, SHANLEY; BARBORA SKARABELA; and MARY HUGHES. 2008. Using corpora to examine discourse effects in syntax. In *Corpora in language acquisition research: History, methods, perspectives* (Trends in Language Acquisition Research, vol. 6), ed. by Heike Behrens, 99–137. Amsterdam: John Benjamins.
- AMERICAN PSYCHIATRIC ASSOCIATION (APA). 2000. *The diagnostic and statistical manual of mental disorders*, 4th ed. Washington, DC: American Psychiatric Association.
- ARIEL, MIRA. 1990. *Assessing noun-phrase antecedents*. London: Routledge.
- ARNOLD, JENNIFER E., and ZENZI M. GRIFFIN. 2007. The effect of additional characters on choice of referring expression: Everyone counts. *Journal of Memory and Language* 56(4):521–36.
- ARNOLD, JENNIFER E.; LOISA BENNETTO; and JOSHUA J. DIEHL. 2009. Reference production in young speakers with and without autism: Effects of discourse status and processing constraints. *Cognition* 110(2):131–46.
- BALTAXE, CHRISTIANE A. M. 1977. Pragmatic deficits in the language of autistic adolescents. *Journal of Pediatric Psychology* 2:176–80.
- BARENDSE, EVELIEN M.; MARC P. H. HENDRIKS; JACOBUS F. A. JANSEN; WALTER H. BACKES; PAUL A. M. HOFMAN; GEERT THOONEN; ROY P. C. KESSELS; and ALBERT P. ALDENKAMP. 2013. Working memory deficits in high-functioning adolescents with autism spectrum disorders: Neuropsychological and neuroimaging correlates. *Journal of Neurodevelopmental Disorders* 5(1):14.
- BERMAN, RUTH A., and DAN ISAAC SLOBIN. 1994. *Relating events in narrative: A crosslinguistic developmental study*. NY: Psychology Press.
- BOCK, J. KATHRYN, and RICHARD K. WARREN. 1985. Conceptual accessibility and syntactic structure in sentence formulation. *Cognition* 21(1):47–67.
- BRETHERTON, INGE; DAVID OPPENHEIM; DENNIE WOLF; ROBERT N. EMDE; and THE MACARTHUR NARRATIVE GROUP. 1990. *MacArthur story stem battery*. Unpublished manual.
- CHAFE, WALLACE. 1976. Givenness, contrastiveness, definiteness, subjects, topics, and point of view. In *Subject and topic*, ed. by Charles Li, 25–55. London: Academic Press.
- CLANCY, PATRICIA. 1997. Discourse motivations for referential choice in Korean acquisition. In *Japanese/Korean Linguistics*, vol. 6, ed. by Ho-min Sohn and John Haig, 639–57. Stanford, CA: CSLI.
- COLLE, LIVIA; SIMON BARON-COHEN; SALLY WHEELWRIGHT; and HEATHER K. J. VAN DER LELY. 2008. Narrative discourse in adults with high-functioning autism or Asperger syndrome. *Journal of Autism and Developmental Disorders* 38:28–40.
- DAHLGREN, SVENOLOF, and ANNIKA DAHLGREN SANDBERG. 2008. Referential communication in children with autism spectrum disorder. *Autism* 12(4):335–48.
- DIEHL, JOSHUA J.; LOISA BENNETTO; and EDNA CARTER YOUNG. 2006. Story recall and narrative coherence of high-functioning children with autism spectrum disorders. *Journal of Abnormal Child Psychology* 34(1):83–98.
- DU BOIS, JOHN W. 1985. Competing motivations. In *Iconicity in syntax*, ed. by John Haiman, 343–65. Amsterdam: John Benjamins.

- GIVÓN, TALMY. 1983. *Topic continuity in discourse: A quantitative cross-language study* (Typological Studies in Language, vol. 3). Amsterdam: John Benjamins.
- GORDON, PETER C.; BARBARA J. GROSZ; and LAURA A. GILLIOM. 1993. Pronouns, names, and the centering of attention in discourse. *Cognitive Science* 17(3):311–47.
- GRAF, EILEEN; ANNA THEAKSTON; ELENA LIEVEN; and MICHAEL TOMASELLO. 2014. Subject and object omission in children’s early transitive constructions: A discourse-pragmatic approach. *Applied Psycholinguistics* 36(03):701–27.
- GREENFIELD, PATRICIA MARKS, and JOSHUA H. SMITH. 1976. *The structure of communication in early language development*. New York: Academic Press.
- GRICE, HERBERT P. 1975. Logic and conversation. In *Syntax and semantics, vol. 3: Speech acts*, ed. by Peter Cole and Jerry L. Morgan, 41–58. New York: Academic Press.
- GUERRIERO, SONIA; YURIKO OSHIMA-TAKANE; and YOKO KURIYAMA. 2006. The development of referential choice in English and Japanese: A discourse-pragmatic perspective. *Journal of Child Language* 33(4):823–57.
- GUNDEL, JEANETTE K.; NANCY HEDBERG; and RON ZACHARSKI. 1993. Cognitive status and the form of referring expressions in discourse. *Language* 69:274–307.
- HUANG, CHIUNG-CHIH. 2011. Referential choice in Mandarin child language: A discourse-pragmatic perspective. *Journal of Pragmatics* 43:2057–80.
- JONES, EMILY A., and EDWARD G. CARR. 2004. Joint attention in children with autism: Theory and intervention. *Focus on Autism and Other Developmental Disabilities* 19(1):13–26.
- KANNER, LEO. 1943. Autistic disturbances of affective contact. *Nervous Child* 2:217–50.
- KIM, YOUNG-JOO. 2000. Subject/object drop in the acquisition of Korean: A cross-linguistic comparison. *Journal of East Asian Linguistics* 9(4): 325–51.
- KUIJPER, SANNE J.; CATHARINA A. HARTMAN; and PETRA HENDRIKS. 2015. Who is he? Children with ASD and ADHD take the listener into account in their production of ambiguous pronouns. *PLoS ONE* 10(7):e0132408.
- LEE, KYUNG-SOOK; YEE-JIN SHIN; SOOK WHAN CHO; and KUM-JEONG JOO. 2011. An analysis of narratives by children with Asperger’s syndrome. *Discourse and Cognition* 18(3):195–217.
- LOVELAND, KATHERINE A., and SUSAN H. LANDRY. 1986. Joint attention and language in autism and developmental language delay. *Journal of Autism and Developmental Disorders* 16(3):335–49.
- MACWHINNEY, BRIAN. 2000. *The CHILDES project: Tools for analyzing talk*. Mahwah, NJ: Lawrence Erlbaum.
- MARINIS, THEODOROS; ARHONTO TERZI; ANGELIKI KOTSOPOULOU; and KONSTANTINOS FRANCIS. 2013. Pragmatic abilities of high-functioning Greek-speaking children with autism. *Psychology* 20(3):321–37.
- NADIG, APARNA; GIACOMO VIVANTI; and SALLY OZONOFF. 2009. Adaptation of object descriptions to a partner under increasing communicative demands: A comparison of children with and without autism. *Autism Research* 2:334–47.
- NOVOGRODSKY, RAMA. 2013. Subject pronoun use by children with autism spectrum disorders (ASD). *Clinical Linguistics & Phonetics* 27(2):85–93.

- SEYMOUR, HARRY N.; THOMAS W. ROEPER; JILL DEVILLIERS; and PETER A. DEVILLIERS. 2005. *Diagnostic evaluation of language variation (DELVTM) – norm referenced*. San Antonio, TX: Harcourt Assessment.
- SHIN, YEE-JIN; KYUNG-SOOK LEE; and HAE-RAN LEE. 1999. Haklyengcenki atong-uy simcek phyosang: Pwumo-ey tayhan simcek phyosang-kwaury kwankyey-lul cwungsim-ulo [Mental representation of preschool children: Association with parental mental representation]. *Journal of Child and Adolescent Psychiatry* 10:21–33.
- SKARABELA, BARBORA; SHANLEY E. M. ALLEN; and THOMAS C. SCOTT-PHILLIPS. 2013. Joint attention helps explain why children omit new referents. *Journal of Pragmatics* 56:5–14.
- TAGER-FLUSBERG, HELEN. 1995. “Once upon a ribbit”: Stories narrated by autistic children. *British Journal of Developmental Psychology* 13(1):45–59.
- TAGER-FLUSBERG, HELEN. 2000. Language and understanding minds: Connections in autism. In *Understanding other minds: Perspectives from developmental cognitive neuroscience*, ed. by Simon Baron-Cohen, Helen Tager-Flusberg, and Donald Cohen, 124–49. Oxford: Oxford University Press.
- VOLDEN, JOANNE; R. F. MULCAHY; and G. HOLDGRAFER. 1997. Pragmatic language disorder and perspective taking in autistic speakers. *Applied Psycholinguistics* 18(02):181–98.
- WICKLUND, MARK DONALD. 2012. Use of referring expressions by autistic children in spontaneous conversations: Does impaired metarepresentational ability affect reference production? University of Minnesota PhD dissertation.

yurilee@hawaii.edu