

The Effects of Discourse-Pragmatic Principles on Young Turkish Toddlers' and Their Regular
Caregivers' Referential Expressions

by

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A Thesis Submitted to the

Graduate School of Social Sciences and Humanities

In Partial Fulfillment of the Requirements for

The Degree of

Master of Arts

In

Psychology

Koç University

September 2010

Koç University

Graduate School of Social Sciences and Humanities

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STATEMENT OF AUTHORSHIP

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ABSTRACT

The goal of the present study is to investigate the relative contribution of three discourse-pragmatic principles (joint attention, physical presence, and prior mention) to young Turkish toddlers' and their regular caregivers' referential communicative devices, i.e., verbal referential forms and referential gestures. We examine four Turkish children's (2 males, 2 females) daily interactions with their regular caregivers at three different time points, when the children were at 12, 17, and 21 months of age. The results indicated that the children and their regular caregivers basically used their referential forms based on the similar discourse-pragmatic principles. First, the children's and their caregivers' referential forms changed depending on the physical status of a referent. Both the children and the caregivers were less likely to use overt linguistic forms as opposed to ellipsis of noun phrases for physically present referents. Second, both groups were more likely to express physically present referents that are mentioned in the immediately preceding discourse through overt arguments. The children and their regular caregivers' use of discourse-pragmatic principles in choosing their referential forms differed from each in some respects. First, unlike the children, the caregivers were less likely to use overt arguments for previously mentioned referents. Second, as opposed to the children, the caregivers were more likely to use overt arguments for physically present referents that were mentioned within the last five utterances in prior discourse.

The analyses of the referential gesture use revealed that the caregivers', but not the children's, use of gestures varied depending on the physical status of a referent. The caregivers were more likely to employ gestures for physically present referents than for physically absent referents. However, they decreased their rate of use of gestures when physically present referents were previously mentioned in prior talk. The children's and the caregivers' referential choices did not change depending on whether they jointly attended to a referent or not.

This study explored how referential communication about external entities unfold verbally and gesturally in caregiver-child discourse with children younger than two and learning Turkish, where nouns as subjects and objects are grammatically allowed to be left out from overt verbal expressions. Although the children and their caregivers largely benefit from similar discourse-pragmatic principles, discrepancies appear owing to the asymmetry between children as new learners of language and caregivers as main organizers of discourse.

Keywords: Discourse-pragmatic principles, joint attention, physical presence, prior mention, referential expressions, referential gestures, child-caregiver discourse

ÖZET

Bu araştırmanın amacı, etkileşimlerin kodlanmasıyla elde edilecek üç pragmatik faktörün (ortak dikkat, nesnenin fiziksel varlığı, önceki konuşmalarda bahis) Türkçe öğrenen çocukların ve bu çocukların düzenli bakıcılarının nesnelere referans verme becerileri (dilbilgisel referans formları ve mimikler/jestler) üzerindeki olan göreceli etkisini incelemektir. Bu çalışmada, dört çocuğun (2 kız, 2 erkek) bakıcılarıyla gün içindeki iletişimleri, çocuklar 12, 17 ve 21 aylıkken incelemektedir. Çalışmanın sonuçları, çalışmada belirtilen üç pragmatik faktörün çocukların ve bakıcıların referans formları üzerinde benzer bir etkisinin olduğunu göstermektedir. Örneğin, çocukların ve bakıcıların nesnelere hakkındaki konuşmaları, referans nesnesinin fiziksel statüsüne bağlı olarak değişmektedir. Referans nesnelere konuşma ortamında fiziksel olarak bulunması, hem çocukların hem de çocukların bakıcılarının bu referans nesnelere isim ve zamir gibi gramatik formlar kullanarak ifade etme eğilimini azalmaktadır. Diğer yandan, hem çocuklar hem de bakıcılar konuşmada bir önceki cümlede bahsi geçen ve fiziksel olarak konuşma ortamında bulunan referans nesnelere açık gramatik formlar (isim, zamir, vb.) kullanarak ifade etme eğilimindedirler. Bu benzerliklerin yanı sıra, belirtilen pragmatik faktörlerin çocukların ve bakıcıların referans formlarını farklı şekilde etkilediği durumlar da bulunmaktadır. Örneğin, çocuklardan farklı olarak bakıcılar, konuşma sırasında bahsi geçen referans nesnelere için daha az açık gramatik formlar kullanma eğilimindedir. Ayrıca, bakıcılar fiziksel olarak konuşma ortamında bulunan ve konuşma sırasında beş önceki cümlede bahsi geçen referans nesnelere açık gramatik formlar kullanarak ifade etme eğilimi göstermektedir.

Yapılan analizler, sadece bakıcıların mimik/jest kullanımının referans nesnelere konuşma ortamındaki fiziksel varlığına bağlı olarak değiştiğini göstermiştir. Bakıcılar, konuşma ortamında fiziksel olarak bulunan referans nesnelere için daha çok mimik/jest kullanma eğiliminde olmuştur. Fakat, konuşma ortamında fiziksel olarak bulunan referans

nesnelerinin konuşmada daha önce bahsinin geçmesinin, bakıcıların mimik/jest kullanma eğilimlerini azalttığı gözlemlenmiştir.Çocukların ve bakıcıların referans verme becerilerinin ortak dikkate bağlı olarak değişmediği çalışmanın bulguları arasındadır.

Bu çalışma, özne ve nesnenin cümleden düşürülmesine izin veren Türkçe gibi bir dilde, Türkçe'yi öğrenen küçük çocukların bakıcılarıyla geçen konuşmalarını, dolayısıyla bu çocukların ve bakıcılarının dış varlıklarla/nesnelerle ilgili sözsel ve mimiksel referansal iletişimlerini incelemiştir. Çocukların ve bakıcılarının referansal iletişimleri sırasında benzer konuşma prensiplerinden faydalandığı, fakat çocukların ve bakıcılarının bu prensipleri kullanımı sırasında farklılıklar gösterdiği görülmüştür. Bu farklılıkların dili edinme sürecinde olan çocuklar ile dile göreceli hakim olan bakıcıların referans verme becerileri arasındaki asimetriyi gösterdiği düşünülmektedir.

Anahtar Kelimeler: Konuşmadaki pragmatik prensipler, ortak dikkat, fiziksel varlık, önceki bahis, referans verme becerileri, referans formları, referanssal mimikler/jestler, çocuk-bakıcı iletişimi

ACKNOWLEDGMENTS

It is an honor for me to thank those people whose contribution made this thesis possible. I owe my deepest gratitude to Assoc. Prof. Aylin Küntay who was very generous in making the time and offering very valuable insight and guidance to help me finish this thesis. She always believed in me and provided the greatest motivation during even in my most difficult times.

I would like to thank to the committee members Prof. Sami Gülgöz and Prof. Aslı Özyürek for their valuable comments and contributions to this thesis. I am also deeply thankful to Özlem Ece Demir, Reyhan Furman, and Dr. Victoria Hyrka Taylor for their contributions to the development of this thesis, to the children and their caregivers who provided me with such rich data, to Aslı Özden, Ayça Bilmez, Elif Söylemez, and Ozan Kuru for their precious help in the coding process.

I am grateful to the faculty for broadening my academic perspective and contributing to my personal development throughout my years at Koç University. My special thanks is to my cohort members (Ceren Sönmez, İrem Güröğlü Utku, Pınar Arslan Ceran, Senay Cebioğlu, and Sevda Binici) for their sincerity, support and understanding. We definitely shared much more than the time in class through the two years.

My heartiest thanks to my family (Huriye Ateş, Azmi Ateş, Hatice Melek Ateş Taşcı, and Osman Talha Taşcı). They appreciated my efforts and always provided me with the greatest support. I specially thank to my closest friend, my husband Mehmet Sinan Şen, for his continuous patience, understanding and support. I feel lucky to have such a thoughtful and sharing family and spouse.

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Chapter 1

INTRODUCTION

There are various theoretical approaches that focus on the importance of pragmatics in understanding the relationship between grammatical properties of language and the extra-linguistic context where these properties occur (Gundel, Hedberg, & Zacharski, 1993; Van Hoek, 1995, etc.). According to some approaches to language and communicative development, learning the association between syntactic and pragmatic aspects of language may pave the way for becoming a competent speaker (Serratrice, 2005). Examining referential expressions in different situations can be a good method to understand the interaction of syntactic aspects of language with discourse-pragmatic features (Serratrice, 2005; Rozendaal, & Baker, 2008).

The same referent can be denoted by various expressions. For example, a person can refer to the same referent, for example, an apple by saying "Give *the apple* to me" or "Give *it (the apple)* to me", i.e., with noun phrases or pronouns. Alternatively, in some languages, speakers can omit the referential term and merely utter verbs "give". A speaker's task in a situation of referential communication is to choose an appropriate referential form which uniquely identifies a referent among several alternatives for the sake of comprehension by the listener. In order to achieve this task, the speaker employs a range of cues which occur in the extra-linguistic context, such as shared knowledge, information in prior and current discourse, perceptual availability of the referent, and the attentional status of the addressee. Such cues serve to contribute to the establishment of a common ground between the speaker and the listener, which makes the listener truly understand the referent addressed by the speaker (Serratrice, 2008). Therefore, speakers are faced with a double task in the acquisition of referential abilities. First, they need to consider various discourse-pragmatic conditions in order to provide a referent identificational context for the listener. Second, they need to use a

relevant morphosyntactic form considering the relevant discourse-pragmatic cues to talk about a referent (Rozendaal, & Baker, 2010). Examining referential choices in different conversational situations allows us to understand the relationship of syntactic characteristics of speech with the extra-linguistic context where the speech occurs.

The specified task seems complicated especially for children since choosing appropriate referential forms with sensitivity to discourse-pragmatic cues requires social-cognitive skills (Kail, & Hickmann, 1992; Matthews, Lieven, Theakston, & Tomasello, 2006). Before the ages of 4 or 5, children are poor at understanding knowledge states of others. For example, they perform relatively poor in the tasks which require social-cognitive skills such as perceptual perspective-taking, conceptual perspective-taking and theory of mind (Flavell, Green, & Flavell, 1990). Therefore, they might be expected to have some difficulties in choosing appropriate referential forms in accordance with communicative demands of the situation.

The difficulties that children have using appropriate referential forms can be attributed to their limited grammatical knowledge or processing abilities (Guerriero, Oshima-Takane, & Kuriyama, 2006; Gürcanlı, Nakipoğlu, & Özyürek, 2007). Therefore, some researchers (e.g., Demir, & So, 2007; So, Demir, & Goldin-Meadow, 2010) turned to examining another modality other than speech in order to understand whether young children benefit from gestural devices in making their own referential choices and learning to comprehend their caregivers' referential communication attempts.

Children begin to display communicative gestures around the age of 10 months before the appearance of their first words (Acredolo, & Goodwyn, 1988; Iverson, Capirci, Volterra, & Goldin-Meadow, 2008). The total number of gestures they exhibit increases around the age of 1;2 and exceeds their number of words. By the age of 1;6, they produce a higher number of words than gestures. During this period, although they prefer words as the modality to talk

about a referent, they continue to display gestures together with speech (Acredolo, & Goodwyn, 1988; Goodwyn, & Acredolo, 1993; Özçalışkan, & Goldin-Meadow, 2005). One possibility for children's use of speech in combination with gestures is that children may not develop complex phonological and articulation mechanisms in order to produce comprehensible words. Therefore, the use of gestures is the other important modality besides speech that allows young children to express the ideas which cannot be stated since they do not yet have a comprehensive verbal repertoire (Demir, & So, 2007; Iverson, et al., 2008; Namy, & Nolan, 2004; Özçalışkan, & Goldin-Meadow, 2005; So, et al., 2010).

However, another factor which probably helps children with the comprehension and emergence of referential language is facilitative caregiver interactions. That is, how caregivers sensitively modify their speech and actions for their young children is important for the development of children's early referential skills (Zukow-Goldring, 1996). How competent caregivers are in taking into account various discourse-pragmatic cues and how they adjust their speech and actions in order to help their children identify ambient referents would plausibly affect children's early referential skills.

Common questions about the development of children's referential abilities are how children benefit from discourse-pragmatic features in their early referential choices, whether children use non-verbal means such as gestures to compensate for their relative lack of skills in the use of verbal referring expressions, and whether there are similarities in the way of children's and adults' use of discourse-pragmatic cues. Previous studies focus on different aspects of such questions.

In this MA thesis, the main goal is to analyze the contribution of several discourse-pragmatic principles (i.e., joint attention, physical presence of the referent and prior mention in discourse) to verbal and non-verbal referential devices (i.e., referential forms and deictic gestures) of young Turkish-learners and their regular caregivers. As a secondary goal, the

present thesis examines how verbal and non-verbal repertoires of very young children and their caregivers change developmentally in the second year of the child's life, depending on the three discourse-pragmatic features specified above. In addition to these main purposes, the current thesis aims to qualitatively describe daily referential interactions of very young children and their caregivers.

The first part of this thesis concentrates on the theoretical background examining and explaining the use of referring expressions in caregiver-child conversational interactions. The second section brings in relevant empirical findings in accordance with the questions addressed in the thesis. In the third section, the method is explained. The fourth part presents the results, and the last section discusses the findings, and provides a list of limitations and suggestions for further studies.

Chapter 2

THEORETICAL BACKGROUND

The same entity can be referred to by both verbal and non-verbal ways in human communication. In other words, the same referent can be addressed through different forms such as nouns or pronouns, and through eye-gaze or different gestures such as pointing, showing, or reaching. Alternatively, different entities can be referred to by using the exact same verbal means such as pronouns (e.g., *it*) or non-verbal ways such as index finger pointing. Yet, people still manage to understand what they mean while they converse, at least most of the time. According to Gundel, et al.(1993), this is one of the most interesting and powerful characteristics of human language. Faced with such an ambiguity, an important aspect of building successful communication is choosing an appropriate referential form. In recent years, there have been many studies examining how children understand which object or occasion a person talks about among multiple referents and how they begin to use truly specific labels across numerous linguistic alternatives (Allen, 2007; Campbell, Brooks, & Tomasello, 2000; Guerriero, et al., 2006; Gundel, et al., 1993) as well as studies focusing on the referential abilities of adults (Du Bois, 1987; Gundel, et al., 1993).

From a developmental point of view, young children confront challenges in their acquisition of the required referential skills. For example, they deal with the challenge of learning about a referent's accessibility or inaccessibility for the listener based on either a perceptual or discourse context. In fact, young children sometimes fail to appropriately identify referents that are not available perceptually or through discourse (Matthews, et al., 2006; Salomo, Graf, Lieven, & Tomasello, in press). Also, children's early speech samples often lack either the subject or the object argument¹ or both types of arguments unlike adult

¹An argument refers to a noun phrase that has a syntactic relationship with the verb in a clause by answering questions such as who did what to whom in the clause.

speech samples (Grinstead, 2000; Guerriero, Oshima-Takane, & Kuriyama, 2006; Serratrice, 2005; Valian, & Eisenberg, 1996). However, overall, argument omissions of children gradually decline over time and reach adult levels at some early in development (Allen, 2000; Guerriero, et al., 2006; Grinstead, 2000; Serratrice, 2005; Valian, & Eisenberg, 1996). Similarly, the use of overt arguments gradually increases over time and replaces argument omissions (Guerriero, et al., 2006; Serratrice, 2005; Valian, & Eisenberg, 1996). In scrutiny of such a universal pattern, past research indicated that argument omission rates of children change depending on the characteristics of their target language (whether the target language is an overt argument² or a null argument language³) and also depending on the syntactic functions of arguments (whether the argument serves as a grammatical subject or object of an utterance) (Gürcanlı, et al., 2007). Although such factors affect argument omission of children, one of the important findings in the literature, based on various studies which examine children's referential expressions in different languages such as Brazilian Portuguese, Inuktitut, and Hebrew (Allen, 2000; Uziel-Karl, S., & Berman, R. A., 2000; Valian, & Eisenberg, 1996), is that children display higher argument omissions rates than adults irrespective of their target language. However, which factors play a role in early argument omissions of children across different languages remains an unanswered question.

There are different hypotheses in the literature to account for children's acquisition of linguistic reference. The hypotheses that explain early argument omissions of children can be gathered under the two fundamentally different theoretical approaches: *the non-pragmatic approach* and *the pragmatic approach*.

² Overt argument language refers to a language whose grammar does not allow omitting an explicit argument in a clause. English is an example of an overt argument language.

³ Null argument language refers to a language whose grammar allows omitting an explicit argument in a clause. Omitted arguments in null argument languages can be called "null arguments". Chinese, Mandarin, and Turkish, can be given as examples of null argument languages.

One of the non-pragmatic approaches, namely, the *competence-based account* suggests that children display higher frequencies of argument omission than adults since their grammar is immature and they are still incompetent in the syntactic aspects of language. For example, a crucial grammatical node, namely, the *complementizer phrase (CP)*, which licenses subject use, does not operate in young children's language systems so that children cannot achieve overt use of subjects. As children's grammar matures (based on the parental input they are exposed to), the difference between the rate of adults' argument omissions and the rate of children's argument omission decreases over time. However, the argument of the competence-based approach fails to explain the mechanisms leading to a gradual rather than an abrupt shift from argument omission to use of overt arguments (Allen, 2000; Guerriero, et al., 2006; Gürcanlı, et al., 2007).

Differently, the *performance-based approach*, which is another non-pragmatic approach, claims that children have grammatical competency from very early ages. In spite of this competency, they omit arguments since their processing capacities are immature or restricted. For example, they leave out arguments more often in longer sentences than in shorter ones. As their processing abilities become mature in time, their argument omissions gradually decline and reach adult levels. Although the performance-based approach explains the initial argument omission of children and a gradual shift from argument omission to the use of overt arguments, it fails to clarify any cross linguistic differences which appear later on between null argument and overt argument languages. Therefore, how children learn under which conditions they need to provide full arguments remains vague (Guerriero, et al., 2006; Gürcanlı, et al., 2007).

Unlike the non-pragmatic approaches, the *discourse-pragmatic approach* accounts for children's early argument omissions based on a universal sensitivity to discourse-pragmatic features (information status, the saliency of the referred element in the utterance) rather than grammatical or processing restrictions. That is, like adults, children omit arguments in a

systematic way depending on the pragmatic status of arguments in discourse (Allen, 2000; Guerriero, et al., 2006; Matthews, et al., 2006; Serratrice, 2005; Skarabela, & Allen, 2010). For example, referents previously mentioned in a discourse (given referents) are more prone to be omitted rather than referents not previously mentioned in the discourse (new referents) since the former are more salient and accessible for the listener (Allen, 2000; Rozendaal, & Baker, 2008, Skarabela, & Allen, 2010). Similarly, referents that are physically present during a conversation are omitted more than the referents physically absent throughout the conversation (Matthews, et al., 2006; Salomo, et al., in press). These features point to two different hypotheses under the discourse-pragmatic approach: the *perceptual availability* and the *discourse availability hypotheses*. The two hypotheses present a controversy about whether young children adapt their use of referring expressions to discourse context prior to perceptual context or vice versa (Matthews, et al., 2006; Salomo, et al., in press). The discourse-pragmatic account appears to compensate for most of the lacking aspects of both the grammatical and the performance-based approaches by integrating grammar with discourse-pragmatic principles (Guerriero, et al., 2006) in explaining children's gradual shift from argument omissions to the use of over arguments and early cross-linguistic differences in argument omission rates of children who speak either null argument or overt argument languages (Allen, 2000; Guerriero, et al., 2006; Gürcanlı, et al., 2007).

Though research in this area is sparse and new, the recent empirical findings reviewed in the literature as part of this thesis indicate that a third approach, interfacing the discourse-pragmatic approach with parental input, is needed in order to compensate the lacking sides of both the non-pragmatic and pragmatic approaches. Therefore, the present thesis examines the integrated effects of discourse-pragmatic features, namely joint attention, physical presence and prior mention on the choice of caregivers' and their children's referential forms.

Chapter 3

LITERATURE REVIEW

This chapter first summarizes developmental studies, which emphasize the importance of discourse-pragmatic features such as joint attention, perceptual availability, and discourse availability in the acquisition of referential language. Second, the chapter discusses studies that focus on how children integrate deictic gestures with their early referential forms in order to be a competent native speaker. Third, the chapter presents research that emphasizes the role of both verbal input (i.e., child-directed speech) and non-verbal input (i.e., deictic gestures) on children's referential abilities. Fourth, the chapter summarizes cross linguistic studies about the children's acquisition of appropriate reference forms and the new perspective launched by these cross linguistic studies regarding the development of children's early referential choices. The last part of this chapter presents the main questions of the present study.

3.1 Developmental studies of referential language examining the effect of discourse-pragmatic features on referential choices of children

A first set of studies focuses on the effect of attention status as one of the discourse-pragmatic factors playing a role in children's early referential choices. Küntay and Özyürek (2006) compared four- and six-year-old preschool children's use of the three-way demonstrative pronoun system in Turkish (i.e., *bu*, *şu*, *o*) with adults' use in a block construction task. Their results demonstrated that Turkish-speaking children have an adult-like competency in their use of the demonstratives *bu* and *o*. In other words, they produce the demonstratives *bu* and *o* as frequently as adults, and by taking the distance of the referent from the speaker into account. Yet, both four-year-olds and six-year-olds do not display an adult level competency in their use of the attention-directing demonstrative *şu*. That is, Turkish children's ability to take into account a recipient's attentional status in choosing the

appropriate demonstrative in fast-flowing conversations appears to develop beyond the age of 6.

Gürcanlı et al. (2007) investigate the effect of different information structural contexts on argument omissions of 46 Turkish native speakers. Twenty four of the participants were college-aged adults and the remaining 22 were children in the age range of 3;0 to 4;1. Unlike previous studies that examine spontaneous data, this research investigated argument omissions in a controlled setting, where the researchers could manipulate the extent of information shared between the speaker and the addressee. In such a setting, two experimenters and the participant watched some vignettes in one of two conditions. In the first condition, namely, the *Shared Information Condition (SIC)*, the vignette was in the visual sight of both experimenters (experimenter 1 and experimenter 2) and the participant. In the second condition, namely, the *Unshared Information Condition (USC)*, the video was in the visual field of only one of the experimenters (experimenter 1) and the participant. Therefore, the other experimenter (experimenter 2) could not see the vignette in the unshared information condition. In either case, the participants were asked to tell the event in the vignette to experimenter 2. The results pointed out that children more frequently omitted arguments than adults in both a shared and an unshared information context. Moreover, the rate of children's argument omissions in the shared information context was higher compared to that in the unshared information context. However, adults' rate of argument omissions did not change as a function of the information structural context. Thus, children seemed to be aware of varying requirements of the addressee depending on the discourse-pragmatic context. In other words, children did not make random choices between overt and null arguments, but they systematically chose either overt or omitted arguments depending on the requirements of the discourse context. However, the children's higher omission rates than adults in the unshared context was interpreted by Gürcanlı et al.(2007) that 3- to 4-year-old

children are aware of a listener's needs and can take a listener's perspective, but their full control over relevant linguistic tools develop as they get older.

An earlier study similar to that of Gürcanlı, et al. (Kail, & Hickmann, 1992) also investigated how young French-speaking children in three different age groups (6-, 9- and 11-year-olds) introduce various referents in their narratives. There were two situations where children produced their narratives: *Mutual Knowledge* (MK) and *Non-Mutual Knowledge* (NMK) situations. In the first condition, the Mutual Knowledge Condition, both the children and their interlocutors could see the picture they were talking about. However, in the second condition, Non-Mutual Knowledge, only the children could see the picture, so that there was no common knowledge for the children and their interlocutors about the referent. The results of the study indicated that the number of indefinite determiners in the second condition (NMK) was higher for all groups of children than the number of indefinite determiners in the first condition (MK). Therefore, children seemed to show sensitivity to the changing requirements of the situation in choosing either indefinite or definite linguistic forms.

A recent study focuses on similar questions to this thesis (Skarabela, & Allen, 2010) by exploring the role of two discourse-pragmatic features on argument realization of four monolingual Inuktitut-speaking children between the ages of 2 to 3. These features were newness (i.e., prior mention) and joint attention. The purpose of the study was to determine to which degree these two features independently estimate overt vs. omitted arguments in spontaneous speech of these children. The first feature, newness, was identified as "a binary discourse-pragmatic feature" in the study. That is, if the referent was mentioned in the previous twenty utterances, it was coded as "given". Otherwise, it was coded as "new". Borrowing from Tomasello (1999), Skarabela and Allen (2010) defined the second feature as a triadic social activity wherein both the speaker and the listener attended to the same referent while they were aware of each other's attention. For example, an argument produced in the presence of joint attention was coded as "accessible". In contrast, an argument produced in the

absence of joint attention was coded as "inaccessible". As another example, an argument which introduced a given (i.e., previously mentioned) or a physically present referent was coded as "accessible". On the other hand, an argument which introduced a new (i.e., previously not mentioned) or physically absent referent was coded as "inaccessible". The results indicated that both newness and joint attention significantly predicted the children's argument realization. There was also an interactional effect of two features on children's choices for overt vs. omitted arguments. Children were more likely to omit arguments if the referent was given and produced in the presence of joint attention. Consistent with this finding, children were less likely to omit arguments if the referent was new and produced in the absence of joint attention. In other words, children's omission rates increased when an argument was accessible for two discourse-pragmatic features while children's omission rates decreased when an argument was inaccessible for the discourse-pragmatic features. Furthermore, the study revealed that newness and joint attention contributed to children's argument realization in different degrees. Compared to newness, joint attention had the stronger effect on children's argument realization. That is, joint attention increased children's use of overt arguments for new referents making these referents accessible. However, it did not have as much as effect on given referents which were already accessible.

The second group of studies examines the role of either perceptual or discourse context on referential language abilities of children. Although the discussion of these different studies seems to be gathered under two separate titles based on whether they focus on the effect of perceptual or discourse context on children's referring expressions, the two lines of investigation are integrated in reviewing the literature relevant to this thesis. In other words, as stated by Allen (2007), the effects of discourse-pragmatic features should not be studied in isolation from each other. The features might show their impact cumulatively as a result of multiple integrating factors on the development of language.

Campbell, et al. (2000) found that English-speaking children ranging from the age of 2;3 to the age of 3;10 preferred to use more null referring expressions in response to a specified question (*What did X do?*) whereas they preferred to use more nouns or pronouns in response a generic question (*What happened?*). Therefore, they chose referential forms on the basis of the discourse context, which was provided by the interlocutor's question.

Serratrice (2005) questioned whether informative features in discourse play a role on the argument realization of six Italian-speaking children during their spontaneous interactions with various adults such as mothers, father, grandmothers and investigators. The longitudinal data from the children were classified into 4 stages of linguistic complexity, which ranged from the lowest to the highest MLU-w (i.e., mean length of utterance, in words) between 1.50 and 4.00/above. The stages included MLU-ws between 1.5 to 2.0, 2.0 to 3.0, 3.0 to 4.0, and lastly above 4.0 respectively. The results indicated that children omit subjects in a systematic and pragmatically appropriate way as early as when MLU-w reaches 2.0. Moreover, their sensitivity to discourse-pragmatic features gradually improved as their MLU-w increased, and exhibited a developmental shift especially during the transition from MLU stage 1 to stage 2. For example, children preferred to use overt subjects more often than null subjects over time in order to refer to a third person subjects, which were more likely to be realized overtly than first and second person arguments. Serratrice's study (2005) concluded that children learn to take the discourse context into consideration in their use of referring expressions depending on their MLU level or their general linguistic sophistication.

Some studies question whether previous discourse mention or physical context has a more prominent effect on young children's use of referring expressions (Matthews, et al., 2006; Salomo, at al., in press). Matthews et al. (2006) examined which context has priority relative to the other by conducting two subsequent studies on the same sample with children at the ages of 2, 3, and 4. Children watched videos in which different characters performed simple actions (e.g., eating, jumping). In the first study, perceptual availability was

manipulated based on two conditions. In one condition, both the child and the addressee could see the referent; in the other condition, only the child could see the referent. Then, the children were asked to talk about the event happening in the video when the video was still playing or after the video had been stopped. The results pointed out that 2-year-olds were not sensitive to the distinction between an addressee who can or cannot see the referent while they choose the appropriate form of referring expressions. As opposed to 2-year-olds, 3- and 4-year-olds had some sensitivity to such a distinction. More specifically, both 3- and 4-year-old children were more likely to describe the event in the video by using noun-verb combinations (e.g., "The clown is jumping.") as long as the referent was outside of the addressee's visual attention. However, when the referent was inside the addressee's visual field, 4-year-olds used more pronoun-verb combinations (e.g., "He's jumping.") to describe the event whereas 3-year-olds produced either pronoun-verb or verb-alone (e.g., "Jumping.") responses under such a condition. Therefore, it seems that children can choose an appropriate form of referent based on the visual accessibility status of the referent beginning from the age of 3, and improve this ability as they get older.

In their second study, Mathews, et al. (2006) examined the effect of prior mention in discourse on children's forms of referents. They used the same question ("*What happened?*") that referred to the same scene in either the condition of 'no-noun' ("*That sounds like fun! What happened?*") or the condition of 'noun-given' ("*Was that the clown? Oh! What happened?*"). The difference between these two conditions was whether the experimenter mentioned the referent prior to the question of "*What happened?*" or not. In comparison to perceptual availability, children's sensitivity to prior discourse appeared earlier. In other words, 2-year-olds as well as 3- and 4-year-olds tended to give more noun-alone responses if the speaker did not refer to the character with a full noun before the question. Therefore, it seems that sensitivity to discourse context develops earlier than sensitivity to perceptual context, given the experimental paradigm Mathews et al. were using.

On the other hand, there is other research indicating that the physical presence of a referent has a developmentally prior effect on children's choices of referential forms relative to previous discourse mention of the referent. For example, in their study, Salomo, et al. (in press) worked on both noun phrases and verbs of 3- and 4-year-old children as responses to a predicate focus question such as "What is the monkey doing now?" They also tried to represent real life situations through the simultaneous presentation of perceptual and discourse availability of the referent to the listener in a systematically manipulated manner. In order to achieve such an aim, the children were shown three short video clips where an agent consecutively performed three different actions on the same patient (*monkey kissing lion; monkey pulling lion; monkey stroking lion*). The actions of the agent in the first two scenes were verbally described to the child by one of the two experimenters whereas the action of the agent in the last scene was asked the child ("What is the monkey doing now?"). The discourse context was manipulated based on two conditions in which either the addressee was present or was not present during the verbal descriptions of the actions in the scenes to the child. The perceptual availability was manipulated through two conditions in which either the addressee could see or could not see the video while asking the question to the child. The results indicated that both 3- and 4-year-old children's choices of referring expressions were affected from perceptual availability whereas only 4-year-old children's choices of referring expressions were affected from the discourse context. More specifically, both 3- and 4-year-olds used more lexical nouns to refer to the patient under the condition where the video was not available to the experimenter than when the video was available to the experimenter. In contrast, only 4-year-olds used more lexical nouns when the experimenter was absent during verbal descriptions of the scenes than when the experiment was present. Thus, the results indicated that although children were sensitive to both perceptual and discourse availability, the development of children's sensitivity to perceptual context preceded the development of

their sensitivity to discourse, presenting conflicting conclusions to those in the Matthews et al.'s study (2006).

In sum, previous literature offers evidence that discourse-pragmatic principles such as joint attention, prior mention and physical presence have an effect on children's choices of referring expressions. Yet why children fail to identify referents at times, and why they show sensitivity to discourse versus perceptual context at other times remain as ongoing questions. Referential communication has been studied in languages other than English (such as Inuktitut by Allen [2000]) but more cross linguistic work is definitely in order.

3.2 *Importance of gestures in early child language*

Speech is only one of the modalities children employ when talking about referents. The other important modality commonly used by children in order to refer to entities is gesture. It is interesting that even young children manage to use their gestures simultaneously with their speech in a consistent way. In fact, they create an incorporated speech-gesture system to address various events at early stages of their development (Özçalışkan, & Goldin-Meadow, 2005). Therefore, how children use gestures can also give some idea about children's early referential skills. Such an investigation will help to answer open questions in the literature regarding acquisition of referential forms.

Based on recent studies that emphasize children's use of gestures in more spontaneous contexts, the present literature suggests that even very young children use gestures in accordance with discourse-pragmatic principles, and compensate for their inappropriately underspecified referents through the use of gestures.

So et al. (2010) explored referential forms and gestures of six 3,7- to 5,2-year-old English-speaking and six 2,10- to 4,11-year-old Chinese-speaking children through the sessions consisting of the children's interaction with either the caregiver or the experimenter during free play activities and spontaneous conversations. The researchers investigated whether English- and Chinese-speaking children's referential forms and gestures changed depending on their sensitivity to two discourse-pragmatic features. These features included person (1st/2nd person vs. 3rd person) and information status (given vs. new information). However, the researchers' main question was whether English- and Chinese-speaking children's gestures are constrained by the referents' status in the discourse. More specifically, the researchers asked whether the rate of children's use of gesture is higher for the ambiguous referents which need to be specified by overt arguments (3rd person and new referents) than that for the referents which can be underspecified using pronouns or null arguments (1st or 2nd person and given referents). In order to answer this question, the relation between children's display of gestures and the referents' status in the discourse (fully specified by overt arguments vs. underspecified by pronouns or null arguments) was examined. The results indicated that both English- and Chinese-speaking children made their referential choices in accordance with the requirements of two specified discourse-pragmatic features. For example, both groups of children were more likely to use nouns for 3rd person and new referents. Moreover, both groups of children used either pronouns or null arguments for 1st or 2nd person and given referents. However, English-speaking children preferred to use pronouns while Chinese-speaking children preferred to use null arguments for the referents which did not need to be overtly specified. Moreover, both groups of children were more likely to display gestures for 1st or 2nd person and given referents, especially when the referents were specified by pronouns and null arguments. Therefore, according to the authors, gestures are useful mechanisms for young children to compensate for the underspecified status of their early verbal referential forms.

In one study that investigated the relation between gesture and earlier speech of children, Özçalışkan and Goldin-Meadow (2005) found that the increase in children's gestures was consistent with the increase in their words during the period in which children began to produce one- to two-word utterances. Moreover, the number of supplementary combinations of gesture+ speech⁴ (the combinations that convey apparently conflicting information in speech) increased during this period.

Such changes in children's use of gestures probably did not result from the changes in their caregivers' use of gestures because gestures accounted for a much bigger proportion of children's communication (50%) than the caregivers' communication (10%). Based on these results, Özçalışkan and Meadow (2005) suggested that gesture+word combinations probably helped children convey information that they could not pass on through speech. In that sense, gesture seems to be an early device used to refer to objects and events and to precede use of words in communicative development to comment on the relation between the objects and events.

A study by Iverson, et al. (2008) that compared gesture and speech productions of Italian and American children indicated that the gesture repertoires of American and Italian children were different from each other. That is, American children basically produced deictic gestures and somewhat fewer representational gestures⁵ whereas the Italian children produced as many representational as deictic gestures. Therefore, the repertoire of the Italian children for representational gestures was larger compared to the American children. Despite such a difference, both groups of children exhibited a sharp increase in their vocabulary size just before the onset of two-word speech. On the other hand, probably compensating for the

⁴ There are three kinds of speech+gesture combinations, namely, supplementary, disambiguating, and reinforcing. Özçalışkan and Goldin-Meadow (2005) defined these combinations in their study as, "gesture adds semantic information to the message conveyed in speech", "gesture clarifies a perform in speech", and "gesture conveys the same information with speech" respectively (pp. 488) .

⁵ Representational gestures refer to a referent such as an object, a location, or an event depending on the referent's meaning rather than the context where the referent takes place (Iverson, Capirci, Volterra, & Goldin-Meadow, 2008).

differences in their gestural repertoires, the Italian children's size of spoken vocabularies was relatively smaller than the American children's size of spoken vocabularies. Only if both spoken words and representational gestures were included in the calculation, there was no difference in the vocabulary size of the two groups of children (Demir and So, 2007; Iverson, et al., 2008). In sum, it seems that children use gestures in order to provide information that cannot be expressed or cannot be clarified through speech. In fact, children can employ gestures as the tools in order to support (e.g. point to door + say "open"), disambiguate (e.g. point to toy + say "this") or reinforce (e.g. point to bottle of milk + say "milk") the information transmitted through speech. However, whether children's use of argument expressions and the accompanying use of gestures during communication vary cross linguistically need to be studied further.

3.3 The effect of verbal input (child-directed speech) and non-verbal input on children's referential abilities

As suggested by Brooks and Meltzoff (2008), infants use gestures to fulfill communicative functions by inviting adults to label objects. Caregivers seem to exhibit a complementary function by providing necessary information both verbally and non-verbally to their children in order to make the infants disambiguate the target referent from other alternatives and in order to make them pick up necessary information for full inspection of the target referent and for full processing of the linguistic input. Using such an assumption, Campbell et al. (2000) considered the input children receive early on as a responsible factor for children's referential failures. Although various studies focus on caregivers' referring expressions as the linguistic input for children, there has not been sufficient studies about parents' use of gestures serving as or accompanying referring expressions. Therefore, whether verbal input (i.e., referential forms of caregivers) and non-verbal input (i.e., deictic gestures of caregivers) play a role on both children's verbal and non-verbal referential choices are questions that need to be examined further.

In their very recent study, Rozendaal and Baker (2010) analyzed the speech and examined the input provided to three English-learning children every 3 months beginning from the ages of 2 to 3. The main aim of the study was to investigate whether the children's use of morphosyntactic forms changed depending on two discourse-pragmatic factors. The morphological forms included definite determiners ("*that* chair", "the *man*"), indefinite determiners (e.g., "wheels of *a* car"), pronouns which include numerals without a noun (e.g., "I have *two*") and nouns (e.g., "my *chair*", "two *chairs*"). The first discourse-pragmatic feature was whether a referent was given (i.e., previously mentioned) or new (i.e., previously not mentioned) in the surrounding discourse. The second discourse-pragmatic feature was whether the speaker considered the listener's perspective when a referent was new; in other words, whether there was mutual knowledge, such as previously shared knowledge, general word knowledge or common inference based on contextual evidence, between the speaker and the listener about a new referent. Another purpose of the study was to determine whether the variation in referential choices of children depending on these discourse-pragmatic features was consistent with input. In the present thesis, only the results relevant to the first discourse-pragmatic feature (new/given distinction) are discussed, since one of the questions of the present thesis is whether new/given distinction (prior mention) has an effect on children's and their regular caregivers' referential choices.

Rozendaal and Baker's study (2010) indicated that English children between the ages of 2;0 and 2;6 developed adult-level sensitivity to new/given distinction in their determiner choices. That is, they used fewer indefinite determiners for given referents than for new referents. Consistently, they preferred to use definite determiners for given referents rather than for new referents. Children's restriction of indefinite determiners to new referents reached an adult-level around the age of 2;9. Furthermore, the children showed input-level sensitivity to new/given distinction in their pronoun vs. noun choices between the ages of 2;0 and 2;6. For example, they preferred nouns to talk about new referents. However, their

pronoun/noun choices for new/given distinction reached an adult-level between the ages of 2;9 and 3;3. Based on the reported results, the researchers concluded that children's sensitivity to the new/given distinction developed earlier in their determiner use (around the age of 2;9) than in their pronoun use (between the ages of 2;9 and 3;3). The difference between the determiner and the pronoun use was attributed to the fact that pronouns were more rarely associated with new/given function than determiners in the input provided to the children.

Estigarribia and Clark (2007) examined how parents introduce new referents in an experimental context to their young children ranging in age from 1;4 to 3;2. Parents were asked to perform some actions with six unfamiliar objects to their children. The target behaviors in mother-child interactions were attention-getters (i.e., parental behaviors before children's first look at the object), attention-maintainers (i.e., parental behaviors after children's first look at the object), attention-getting intervals (i.e., the interval between the presentation of the new object and the children's first look at the object), attention-maintaining intervals (i.e., the interval between children's first look at the object and the displacement of the object). The results showed that in the first few seconds of the experimental task, mothers were most likely to introduce new referents through verbal attention-getters (e.g., anticipations, deictics, interjections, and names) compared to gestures (pointing, displaying). Moreover, mothers used more deictic terms (e.g., *here, this, look*) and interjections (e.g., *hey, wow*) with younger children around the age of 1;5 while they used more anticipatory comments (e.g., *ready for the next one?*) with older children around the age of 3;0. Based on these results, mothers' ways of introducing a referent seems to vary depending on developmentally changing demands of their children over time and over a session.

Clancy (in press) investigated two Korean children's interactions at the ages of 1;8 and 1;10 with a communicative partner during various everyday activities (e.g., reading books, eating snacks, and playing with toys) within one month intervals, in her one year long study. Overt S (i.e., the sole argument of an intransitive verb), A (i.e., the agent-like argument

of a transitive verb), and O (i.e., the more patient-like argument of a transitive verb) arguments in both children's and mothers' speech samples were analyzed to understand the role of priming in the acquisition of Korean case-marking morphology (i.e., the accusative). According to Bock and Griffin (2000), priming can be defined as the "...tendency to repeat the general syntactic patterns of an utterance" (as cited in Clancy, in press). The results of the study showed that marked arguments (overt arguments) of children were preceded by marked primes (overt arguments of mothers); unmarked arguments (bare/null arguments) of children were preceded by consistently unmarked primes (bare/null arguments of mothers). Moreover, children's marked arguments were negatively correlated with unmarked primes in the preceding utterance; similarly, their unmarked arguments were negatively correlated with marked primes in the preceding utterance. More interestingly, children's argument markers were the same with the marker that was immediately primed. This study shows input provides "linguistic priming" for children before they learn to provide necessary marking on their own.

Some researchers have claimed that non-verbal input plays a more important role than verbal input in children's language development. For instance, Zukow-Goldring (1996) proposed that caregivers provide an extra perceptual structure to their children when children exhibited communicative breakdowns in their pre-linguistic and one-word periods. The non-verbal cues given by caregivers helped the children to reach a common understanding regarding the referent. Yet, caregivers' modifications in their verbal messages did not contribute to the children's understanding of the referent.

Various studies have pointed out that gesture and speech are employed in collaboration to accomplish referential function in interactions with children. For instance, Shimpi and Huttenlocher (2007) tried to understand the joint role of labeling and gestures on children's early word learning by investigating follow-in and lead-in labeling along with gestural cues offered by mothers to their children in mother-child interaction. Tomasello and Todd (1983) proposed that lead-in labeling lead children to play an active role in coordinating

their own attentional status with their addressee whereas follow-in labeling does not force children to play such an active role. Therefore, follow-in labeling simplifies children's early word learning (as cited in Shimpi, & Huttenlocher, 2007). Opposing the evidence in Tomasello and Todd's (1983) study, Shimpi and Huttenlocher (2007) suggested that the developmental outcomes of the use of lead-in labels are positive. As long as labeling managed to redirect the children's attention to the referred object, it was beneficial for vocabulary development of children. Gestures were also found to be powerful tools increasing the success of redirection of children's attention to the referred object.

Both verbal and non-verbal characteristics of parental input are dynamic and adapt to the changing communicative demands of children across different times and places. As a case in point, Namy and Nolan (2004) depicted how the use of gestural and verbal labels in parental input varied over the development of children. They observed parent-child dyads in a free-play condition at three developmentally important time points: when children begin to produce their first verbal and gestural labels (around the age of 1;0), when children exhibit a spurt in their rate of word acquisition (around the age of 1;6), and when children begin to build two- to three-word utterances (around the age of 2;0). The frequency of verbal and gestural labels in parental speech and the vocabulary size of children were calculated at each of these time points. According to the group patterns of parental speech, parents produced more verbal than gestural labels at each time point. Parental use of verbal labeling followed an unchanged pattern over time. On the other hand, parental use of gestures did show a developmental change across time. More specifically, the rate of parental use of gestures went down after a certain developmental time point across the second year of age whereas the parental use of verbal labeling remained constant.

The same study also indicated that the individual patterns of parental use of both gestural and verbal labeling were not consistent with the group patterns of parental use of both gestural and verbal labeling. More interestingly, when group patterns of parental speech

were examined, there was not a significant correlation between the rates of gestural and verbal labeling of parents. On the other hand, when individual patterns of parental speech were investigated, there was a significant association between the two types of labeling around the age of 1;6. In other words, all parents regardless of their individual parental communication styles, adopted a communication style that correspond to the changing communicative demands of children around the age of 1;6, which is an important transitional stage for children's productive language development .

The studies by Masur, Flynn, and Eichorst (2005) and by Flynn, and Masur (2007) also verified that children benefit from gestural and verbal input differently depending on their changing language competency over time. According to one of these studies (Masur, et al., 2005), during the time children produce their first verbs (from 0;10 to 1;1 year olds), mothers' behavioral but not verbal measures positively affected the lexical development of children. During the time children experienced a vocabulary spurt (the period from 1;1 to 1;5), mothers' verbal interactions became important in the lexical development of children. Specifically, mothers' verbal imitation and their follow-in directives were positively associated with the lexical growth of children whereas their production of lead-in directives was negatively related to the lexical growth of children. When children were in the most lexically advanced period (from 1;5 to 1;9), both verbal and behavioral measures of maternal responsiveness and directiveness predicted the lexical development of children. Specifically, mothers providing more utterances which describe the aspects of an environment depending on the interest of children and the ones with more supportive behavioral directives had children with larger lexicons. These studies suggest that the frequency and value of certain devices in child-directed speech might vary in relation to the developing skills and needs of children.

Both verbal and non-verbal input provided to children has recently been analyzed in the literature to affect how children develop early referential abilities. Thus far, only a handful

studies have examined the changing characteristics of both verbal and non-verbal parental input and children's developing verbal and non-verbal referential skills across time. The literature does not answer some questions: How do discourse-pragmatic factors influence parents' referential choices in the input they provide to their children?, How does parental input change over time?, How do discourse-pragmatic factors affect children's early referential abilities?, How do children's verbal and non-verbal referential choices change over time? Therefore, the present study will address these questions using videotaped data from Turkish child-caregiver interactions. As presented in the next section, cross linguistic studies about the development of referential communication skills of children are not that many.

3.4 *Cross-linguistic studies about referential abilities of children*

The question of whether children omit arguments with the same motivation at earlier ages and at older ages regardless of the linguistic structure of their native language is another issue about referential abilities of children (Guerriero, et al., 2006). Whether children's use of argument expressions and use of gestures during communication vary cross linguistically needs to be studied.

Guerriero, et al. (2006) addressed whether children's choice of referential forms is affected by their native language structure through their study of both English and Japanese mother-child dyads' interactions. English and Japanese were specifically chosen as target languages since they have different grammatical structures: the former is *an overt argument language* whereas the latter is *a null argument language*. They found that both English and Japanese children did not exhibit argument realization consistent with discourse-pragmatic principles early on. English-speaking children displayed both *language-universal* and *language-specific* principles of discourse-pragmatic skills between the ages of 2;0 and 2;7. Unlike English-speaking children, Japanese-speaking children did not display *language-universal* principles of discourse-pragmatic skills. That is, English-speaking children begin to

lexicalize new information and non-lexicalize given information at some point in their development. In contrast, Japanese-speaking children used more non-lexical arguments in reference to given information while they used both non-lexical and lexical-arguments in reference to new information. More interestingly, these patterns for English and Japanese children did not change when both linguistic (given/new referential status) and non-linguistic (pointing, reaching, eye gaze) pragmatic behaviors of mothers were taken into account. The researchers also found that there was a close similarity between the children's and their mothers both linguistic and non-linguistic referential patterns. For example, English-speaking mothers consistently displayed both language-universal and language-specific patterns of discourse-pragmatic skills beginning from their children's early ages. However, Japanese-speaking mothers exhibited inconsistent patterns of discourse-pragmatic skills for especially new referents. Both English- and Japanese-speaking children reproduced the patterns provided by their mothers later on. Therefore, the study by Guerriero et al. (2006) seems to refute children's sensitivity to merely discourse-pragmatic factors by focusing on children's reproduction of either consistent or inconsistent discourse-pragmatic principles just imitating the patterns provided through parental input.

Another cross linguistic study explored whether parental input has a role on the Dutch, English and French children's acquisition of the determiner system in their own language (the choice of indefinite vs. definite determiners). Rozendaal and Baker (2008) examined various discourse-pragmatic features such as specificity of reference, discourse status and information status. The specificity of reference involved whether the speaker has a particular entity in his/her mind about the referent. If a speaker had a specific entity of the referent in his/her mind, it was called a "specific referent", otherwise it was called a "non-specific referent". The discourse status referred to the new/given status of the referent. In other words, if a referent was mentioned in previous utterances in the discourse, it was coded as "discourse-given"; if not, it was coded as "discourse-new". The information status referred to the mutual/no mutual

knowledge between interlocutors. That is, if the referent was mutually known by both parties in the communication, it was coded as "mutually known"; otherwise it was coded as "mutually unknown". The results of the study showed that children exhibited sensitivity to the new/given distinction and the non-specific/specific reference at adult levels, which was reflected in their use of indefinite, definite articles and pronouns in discourse. However, their sensitivity to the distinction between mutual/non-mutual knowledge occurred relatively later. More importantly, these patterns showed strong similarities with the adult input. In other words, earlier development of sensitivity to the new/given and the non-specific/specific distinction probably resulted from the cue frequency and consistency in the input whereas later acquisition of the sensitivity to the mutual/non-mutual knowledge distinction could be attributed to scarce reference to non-mutual knowledge in caregiver-child interactions. Furthermore, French children demonstrated the quickest acquisition of the association between pragmatic functions and determiner development relative to English and Dutch children. Such a difference in the rate of determiner acquisition of children from three different languages was attributed to the distinct frequencies of determiners in the input provided to these children. In other words, scarce use of bare nouns in French relative to English and Dutch input gave French children an advantage in the acquisition of determiners.

The rate of children's argument use seems to differ from language to language. Demir and So (2007) examined 4- to 5-year-old English and Turkish children's gestures in communication to understand whether children's use of gestures varies depending on their language. They found that although both groups of children did not differ from each other with regard to the frequency of gesturing, they did differ concerning the way of gesturing. More specifically, unlike English-speaking children, Turkish-speaking children's gestures functioned more frequently as supplementing the argument omissions and disambiguating the pronouns in their speech. In other words, English-speaking children exhibited more arguments in their speech whereas Turkish-speaking children tried to compensate for the

rarity of argument use in their speech through their gestures. In fact, Turkish-speaking children used gestures to expand the tools of their spoken language.

Longitudinal investigations of argument omission across different developmental periods and across different languages seem to offer a new perspective by suggesting that children's use of referents is affected by the interplay of discourse-pragmatic strategies with parental input. Based on such a new perspective, the present thesis addresses some potential factors in maternal speech which might play a role on children's argument realization. Departing from the previous literature that has basically focused on older children's use of referring expressions at a certain time point, the current thesis explores how younger children's use of referring expressions develops across time. In that sense, this longitudinal study examines early referential abilities of children in a null-argument language in a developmental manner.

3.5 *Main questions of the present study*

The present study investigates the effects of three discourse-pragmatic factors, namely joint attention, physical presence and prior mention, on referential forms and deictic gestures of the children and their regular caregivers. Moreover, the study addresses how referential forms and deictic gestures of the children and the caregivers developmentally change across time. Consequently, the main questions of the thesis are:

1. How do joint attention, physical presence, and prior mention affect children's forms of referring expressions?
2. How do joint attention, physical presence, and prior mention influence regular caregivers' forms of referring expressions?
3. How do joint attention, physical presence, and prior mention influence children's use of deictic gestures?

4. How do joint attention, physical presence, and prior mention influence regular caregivers' use of deictic gestures?
5. Do children's forms of referring expressions show developmental changes across time?
6. Do regular caregivers' forms of referring expressions show changes across developmental time of their children?
7. Does children's use of gestures show developmental changes across time?
8. Does regular caregivers' use of gestures vary across developmental time of the children?

Chapter 4

METHOD

There are six sections in this chapter. The first section presents the participants and the data. The second section describes the development of the transcription procedure. The third section explains the data reduction process. The fourth and fifth sections define the coding system and coding categories. The last section presents the methods of data analysis.

4.1 Participants and the data

The previously recorded interactions of four children (2 girls and 2 boys) out of a total of eight children (6 girls and 2 boys) and their caregivers were employed from the database at Koç University (*Koç University Longitudinal Language Development Database-KULLDD*). These four children were chosen in order to balance the sample in terms of characteristics such as gender and socio-demographic status. Among four girls, we picked two girls whose families had similar socio-demographic characteristics with the families of the two boys. All child participants in the database were monolingual, typically developing Turkish learners and were single children of their families during the course of the data collection period. The mothers of the four children selected for this thesis ranged in age from 21 to 34 ($M= 26, 3$) whereas the fathers of the children ranged in age from 26 to 35 ($M= 29, 3$). The education level of the children's mothers and fathers varied from regular school to university. The average year of education that mothers and fathers completed was the same (10 years). Table 1 provides the demographic information about the parents of the participating children.

Table 1: The demographics for the families of the children

Child	Mother education	Father education	Mother occupation	Father occupation	Mother age	Father Age
C (boy)	University	University	Financial consultant	Financial consultant	34	35
O (boy)	Primary	Primary	Housewife	Worker	21	27
S (girl)	University	University	Architect	Business expert	Missing	Missing
T (girl)	Primary	Primary	Housewife	Driver	24	26

To establish the dataset, daily interactions between regular caregivers (i.e., mothers, fathers, grandparents and baby sitters) and children were videotaped at the children's home during various everyday activities such as free-play, meal time, book-reading. The 62-minute video recordings for each visit were taken twice monthly beginning when the infants were around the age of 8 months and continued until the infants were around the age of 36 months. The focus of these video recordings was children's language production and the input provided to them (i.e., child-directed speech). No attempt was made to guide the interactions in any given way by the researchers.

In the present thesis, the video recordings chosen represented three different developmental points for each of the four children. The first developmental point was 12 months of age, when first words or word-like utterances are expected to appear. The second developmental point was 17 months of age when longer utterances might show up. The last developmental point was 21 months of age when sentence-like utterances become noticeable.

One video session for each child was chosen from the specified months of age in order to represent each developmental point. In sum, three video sessions (12 months, 17 months, and 21 months) for each child were coded and analyzed, amounting to 12 sessions in aggregate (See Tables 2, 3 and 4 below).

Table 2: The characteristics of the participants on the first developmental point (12-13 months of age)

Child initials	Date of birth	Date of recording	Age (year/month/day)	Age (days)
C (male)	August 18, 2000	September 8, 2001	01;00;21	386 days
O (male)	February 4, 2001	February 28, 2002	01;00;24	389 days
S (female)	November 23, 2001	December 3, 2002	01;00;10	375 days
T (female)	May 12, 2001	March 29, 2002	00;10;17	321 days

Table 3: The characteristics of the participants on the second developmental point (17-18 months of age)

Child initials	Date of birth	Date of recording	Age (year/month/day)	Age (days)
C (male)	August 18, 2000	January 29, 2002	01;05;11	529 days
O (male)	February 4, 2001	July 26, 2002	01;05;22	537 days
S (female)	November 23, 2001	April 29, 2003	01;05;06	522 days
T (female)	May 12, 2001	October 23, 2002	01;05;11	529 days

Table 4: The characteristics of the participants on the third developmental point (21-22 months of age)

Child initials	Date of birth	Date of recording	Age (year/month/day)	Age (days)
C (male)	August 18, 2000	May 27, 2002	01;09;09	647 days
O (male)	February 4, 2001	November 9, 2002	01;09;05	643 days
S (female)	November 23, 2001	August 18, 2003	01;08;26	633 days
T (female)	May 12, 2001	March 15, 2003	01;10;03	672 days

4.2 *Transcription of the data*

Trained research assistants transcribed the three specified sessions for each child from the videotapes. The trained research assistants were native speakers of Turkish who knew English as their second language. All speech produced by children and their caretakers during the entire recorded sessions were transcribed using the CHAT transcription format (MacWhinney, 2000). In order to ensure the reliability of the transcriptions, a second set of trained research assistants and the researcher checked the accuracy of the transcribed data watching the video-taped data after importing the transcription to a coding program called the ELAN annotation tool (Hellwig, 2008). This program allowed the assistants and the researcher to watch the video and see the contents of the transcription simultaneously. Any inconsistency in the transcription which had been completed by the original and the second

transcribers were verified by the researcher based on the principles in the CHAT transcription manual.

4.3 *Restricting the data*

In this section, the steps followed for the data reduction process are described in detail.

The referential talk of child-caregiver dyads in the videos was analyzed for *referential sets*. The idea of referential sets originated from the concept of "variation sets". Küntay and Slobin (2002) defined *variation sets* as "a sequence of utterances with a constant intention but a varying form". Similar to this approach, *referential sets* were defined as a sequence of utterances which include a referent addressing a third person or a third person object across three successive utterances of either the child or the caregiver. In other words, a referent that was repeated at least across three successive utterances of the caregiver and the child was counted as a referential set.

Although it was accepted that the referent must be repeated at least three times to form a referential set, there was an exception: If the child initiated the interaction by a gesture, an action or by a verbal turn, two mentions of the referent were accepted as sufficient in order to form a referential set. The reason for sufficiency of just two mentions is that the children in the present study were very young and just began to produce language, so the cases where the children joined into referential communication episodes and carried on these episodes were not very common. To exemplify the concept of reference sets, two conversational segments are presented below.

In the first example, the interaction was initiated by the caregiver. While the child was sitting on the floor, the mother brought the child's walker and tried to persuade the child to get on the walker. In this interaction, the repeated referent is *the walker* and this referent is repeated across three successive utterances in the dialog.

(1) Example 1 (the child's initial *T*, age: 0;10, 5th referential set)

(1) MOT: *oturtaca bin.*

get on the walker.

(2) MOT: *bin kızım.*

get on, my daughter.

(3) MOT: *otursana evladım!*

sit down, my child!

In the second example, the child initiated the interaction by reaching for the picture of her father in her mother's hand. Although the referent (the father's picture) was repeated more than three times throughout the interaction, two repetitions of the referent was enough to accept this interaction as a reference set, because the interaction was initiated by the child.

(2) Example 2 (the child's initial *T*, age: 1;10, 27th referential set)

(1) CHI-MOT: *ah !*

(the child reaches towards the picture in her mother's hand)

(2) MOT-CHI: *kim o?*

who is he?

(3) MOT-CHI: *baba mı?*

is he the father?

(4) CHI-MOT: *baba.*

the father.

The referents in the identified referential sets were coded as long as they were referred to by a child or her/his regular caregivers such as the mother, the father, the grandparents, or

the baby-sitter. Any referent which was talked about by other partners in the video rather than a regular caregiver (such as the recorder) were not coded further even if it was located within the referential set.

First and second person referents (I, you, we) were not included in the present study because of several reasons. First, coding of first and second person arguments in terms of joint attention is not as clear as for third person arguments. In other words, first and second person arguments lead to an assumed presence of joint attention rather than a codeable presence or absence of joint attention. Second, first and second person referents are more likely to be referred by null arguments whereas third person referents are more likely to be denoted by overt arguments. Serratrice (2005) suggests that the activation level of third person referents in the listener's memory (identifiability and accessibility of the referent for the listener) is different from the activation level of the other two person referents. In other words, both first and second person referents are active by default; however, there is no such thing as a default level of activation for third person referents. In fact, the activation status of third person referents decays over time, therefore overt subjects are needed to clarify these inactive referents (Serratrice, 2005). In sum, 1st and 2nd person referents were excluded from the analyses in order not to confound joint attention with the "person" status of the referent. Consequently, only third person referents were included in the analyses.

However, some third person referents were excluded from the coded data. First, the sentences where the child herself/himself was the third person referent as an actor, a patient or a recipient were not coded since coding joint attention on these referents were problematic. Similar to coding joint attention on first and second person referents, it was not clear whether the child attended to herself/himself when her/his name functioned as a referent in the utterance. Second, third person referents functioning as recipients and referring to a vague location such as "buraya" (here), "oraya" (there) were also not included in the coded data,

because coding the exact identity of these referents was problematic. However, when such referents were thought to represent an exact location, they were coded.

In the example below, the child was trying to ride his bike and her father was teaching the child how to turn the pedals. In this interaction, the repeated referent was "the pedals". In the third utterance of the reference set, the referent (*oraya* 'there') was coded even if it was a location word, since it clearly referred to the pedals of the bicycle.

(3) Example 3 (the child's initial C, age: 1;09, 63th referential set)

(1) FAT: *bas.*

step on.

(2) FAT: *hadi bas tekerlere oğlum.*

come on, step on the pedals.

(3) FAT: *oraya basacaksın.*

you will step on there.

(4) FAT: *ayakla basacaksın oğlum.*

you will step on (the pedals) with the feet.

(5) FAT: *bas.*

step on.

(6) FAT: *bas.*

step on.

(7) FAT: *bas.*

step on.

(8) FAT: *bassana*.

step on.

Generics were also not coded because they did not address a specific reference within the referential set. The example below shows an interaction between a father and a child about the owner of the shop across the street while they were looking outside the window in their house. The referent repeated throughout the referential set was "the man" and the first utterance in the referential set (What are they doing here?) addressed this referent (the man) by a generic (they). Based on the coding principles in the present study, the referent in the generic form in the first utterance (they) was not coded.

(4) Example 4 (the child's initial C, age: 1;09, 31st referential set)

(1) FAT: *burada ne yapıyorlar?*

what are they doing here?

(2) FAT: *amca ne yapıyor?*

what is the man doing?

(3) FAT: *amca ne satıyor?*

what is the man selling?

After the data reduction, approximately 5,095 utterances out of about 12,696 utterances in the 12 videos of four children were coded. The number of referents mentioned as arguments within 5,095 utterances was 5,609. Table 5 indicates the number of utterances and the number of arguments in each session of each child.

Table 5: The number of utterances and arguments in the videos of each child at three time points (12, 17 and 21 months of ages)

	Time point	Child initials			
		C	O	S	T
Number of utterances	t1	415	1230	830	546
	t2	846	894	1413	995
	t3	1443	1239	1441	1404
	total #	2704	3363	3684	2945
Number of coded utterances (after data reduction)	t1	158	344	322	120
	t2	212	382	768	500
	t3	498	619	647	525
	total #	868	1345	1737	1145
Number of arguments/referents	t1	166	360	420	121
	t2	212	410	958	509
	t3	501	659	723	570
	total #	879	1429	2101	1200

4.4 Coding Procedure

The selected utterances of both caregivers and children in the transcriptions were coded by the researcher based on the coding system developed by Hughes and Allen (2008) and modified for our purposes. Specifically, forms of the referents (zero, pronoun, noun, question form, adjective, and combinations of these forms), the status of joint attention on a referent, perceptual availability (physical presence/absence) and prior mention in discourse (newness/giveness) were coded in *the speech-alone* (null, pronominal, demonstrative, lexical), *the gesture-alone* (deictic, iconic) and *the speech+gesture* (null, null with gesture,

pronominal, pronominal with gesture, demonstrative, demonstrative with gesture, lexical, lexical with gesture) conditions. The ELAN annotation tool (Hellwig, 2008) was used to apply this coding system to the videotaped data. This tool gave the opportunity of creating, editing, visualizing and searching annotations for the videotaped data. Using ELAN was advantageous for the present study since it was particularly designed for analyses of spoken language and gesture.

The referents were coded under one of the categories representing the arguments in three different semantic roles in an utterance, namely actor, patient and recipient. An actor argument in an utterance addressed the entities who are the doers of an action. A patient argument in an utterance was defined as a state, condition or an entity which undergoes a change of location or possession. Patient arguments usually take place with verbs such as kill, wash, destroy. A recipient argument referred to the end point of a locational or possessional change (Van Valin, 2001). In the present study, the referents which could not be classified under one of the three categories were coded under the category of "other".

Consistent with the main questions of the present study, all argument types of both children and adults that satisfy the specified coding criteria in the corpus were categorically coded for morphological form and gesture types. The use of each argument was also coded in terms of the relevant discourse-pragmatic information based on three features, namely *joint attention*, *perceptual availability*, and *prior mention*. Although these discourse-pragmatic features can have scalar characteristics in reality, as stated by Huges and Allen (2008), categorical values were assigned to these features in the current study.

In order to ensure that all the coders consistently and reliably applied the coding procedure, the researcher organized several training sessions. In these sessions, the researcher checked whether the coders followed the coding principles in a reliable way, whether they made the correct choices for each coding category, whether there are any inconsistencies

among the decisions of the coders. The researcher corrected the coders' mistakes and eliminated the inconsistencies among the coders by organizing these training sessions with regular intervals and by checking the coding of the whole data by herself.

4.5 *Coding Categories*

This section presents the five main coding categories, their sub-categories and the numeric values assigned to these categories, and an explanation of some coding principles used to pick those values.

4.5.1 *Referential Form*

Referential form consisted of six main categories, namely null reference (0), pronoun (1) and lexical noun (2), proper lexical noun (3), question (4), and adjective (5). There were also several categories that were generated from the combination of the main categories (pronoun+pronoun (11), pronoun+noun (12), noun+noun (22)). However, coding of the form of children's referential talk required some additional categories. Unlike adults, young children use vocalizations, acts or gestures with referential purposes in addition to one-word and two-word sentences. Therefore, two main categories and one combinational category made up from these two main categories were added to the coding system to handle the children's turns. These categories were vocalization (6), gesture/action (7) and vocalization+gesture (67). In total, referential form included fifteen sub-categories with eight main and seven combinational sub-categories. A detailed description of these sub-categories and the coding values assigned to these categories is presented in Table 6.

Table 6: The table for the sub-categories of morphological forms, their coding values, and operational definitions

Sub-categories of referential form	Coding value	Operational definition	Example
Null (Zero)	0	No nominal or pronominal forms used for the argument	Göster ona (the books). Show (the books) to her.
Pronoun	1	Pronominal form such as her, him, it, this	Vermezler sana onu . They don't give <i>it</i> (the microphone) to you.
Noun	2	Nominal form such as the name of an object	Gördün mü bisküviyi ? Did you see the biscuit ?
Proper noun	3	Proper name such as the unique name of a person or a city	Hani Elif ? Where is Elif ?
Question form	4	Question form such as whom, where, which	Kim geldi? Who came?
Adjective	5	An adjectival form (can be used by itself)	yeşil . green .

Vocalization	6	Vocalization, such as uh, ih used as a referential form	hav hav The speaker imitates a dog.
Gesture/act	7	Gestures or actions such as point, open-hand beg.	The speaker points to a ball.
Pronoun+pronoun	11	Combination of two pronouns	Senin şeyini ver. Give (me) your stuff.
Pronoun+noun	12	Combination of a pronoun with a noun	Bu parmağına tak. Put it on this finger.
Noun+noun	22	Combination of two nouns	Makyaj çantamı beline takalım. Let's put your make- up bag on your waist.
Proper noun+noun	32	Combination of a proper noun with a noun	Şimdi Senem'in tırnaklarına sürelim. Now, let's coats it (nail polish) on Senem's nails.

Adjective+pronoun	51	Combination of an adjective with a pronoun	Neydi o giden ? What was it which was going ?
Adjective+noun	52	Combination of an adjective with a noun	Bana kırmızı kalemi getir misin? Can you bring the red pencil to me?
Vocalization+gesture	67	Vocalization combined with a gesture or an action	ih! The speaker points to the butterfly on the book while vocalizing.
Non-codable	98	The referents which the coder cannot decide on which category the referent belongs to	

4.5.2 Referential Gesture

Deictic and iconic gestures of both caregivers and children performed by using their hand(s), face (head and eyes) and body when the utterance occurred were coded under one of the fourteen categories. A detailed description of each gestural category can be found in Table 7. In addition to the thirteen categories, there were two general categories, which were "not-applicable" and "non-codable". If the coder could not see either the speaker's face or one/both of his/her hands in the video and there were not any visible gestures at the time the utterance

was produced, the gesture was coded as "not applicable". If the coder could not decide on whether there is a gesture addressing the referent or which category a gesture belonged to, the gesture was coded as "non-codable".

Table 7: The table for the categories of gesture, their coding values, and operational definitions

Gesture	Coding value	Operational definition
No	0	There was no relevant gesture related to the referent at the time the utterance was produced.
Point	1	The speaker pointed to the referent object by her/his index finger or hand in order to show the referent to the listener.
Beg	2	The speaker tried to take or wanted the object she/he was talking about from the recipient by extending her/his hand.
Demonstrate-action	3	The speaker demonstrated an action which refers to the referent object.
Demonstrate-object	4	The speaker demonstrated the function of the referent object.
Give	5	The speaker gave or tried to give the referent object to the listener.
Head/eye	6	The speaker signed the referent object by exhibiting some head or facial movements or by looking at the referent object while turning her/his head towards it (eye-gaze).
Iconic-action	7	A complementary gesture accompanied an action word which was related to the referent in the utterance. In other words, the speaker represented or

		tried to symbolize an action that addressed a referent by some body or hand movements.
Iconic-object	8	A complementary gesture accompanied the name of a referent in the utterance. In other words, the speaker represented or tried to characterize the referent object by some body or hand movements.
Physical manipulation/holding	9	The speaker held the referent object while he/she was talking about it without the aim of showing the object to the listener.
Place	10	The speaker located the referent object on a surface for the listener.
Reach/move towards	11	The speaker reached to or approached to the referent object by any part of his/her body. Taking the referent object from the recipient was also coded under this category.
Show/hold-up	12	The speaker held the referent object in order to show it to the listener.
Multiple gestures	13	The speaker simultaneously or consecutively performed two or more gestures addressing the referent object.
Non-codable (NC)	98	The coder could not decide on whether there is a gesture addressing the referent or under which category the gesture belongs to.

Not-applicable (NA)	99	The coder could not see either the hand(s) or the head (actually face) of the speaker.
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4.5.3 *Discourse-pragmatic Features*

The present study focuses on three discourse-pragmatic features, namely joint attention, physical presence and prior mention. The first feature, joint attention, was defined based on Tomasello's previous work (1999) as a social activity that the speaker and her/his addressee(s) are jointly attended to the same action, event, object or person while each partner in the communication is aware of each other's attention. Moreover, the definition of joint attention included "the use of communicative acts such as eye contact, affective expression, eye-gaze and gestures in order to draw and direct a social communicative partner's attention" (cited in Tasker, & Schmidt, 2008, pp. 264) to an action, an event, an object or a person with an intent to communicate (cited in Tasker, & Schmidt, 2008). The second feature, physical presence, was described as a visual or auditory presence of a referent in the place where the current conversation took place. The third feature, prior mention, was defined as whether a referent was previously mentioned in the noun form within the prior five utterances in the current discourse. Table 8 presents the sub-categories coded for each features and the coding values attributed to these categories.

Table 8: The table for the discourse-pragmatic features of the referent and their coding values

Pragmatic feature	Sub-categories	Coding value
Joint attention	Absent	0
	Initiating	1
	Global	2
	Follow	3
	Maintain	4
Physical presence	Physically absent	0
	Physically present	1
Prior mention	New	0
	Very immediate	1
	Immediate	2

For the first discourse-pragmatic feature, joint attention, the argument was coded under one of the five categories: absent (0), initiating (1), global (2), follow (3), and maintain (4). When either the speaker and or the hearer did not attend to the same physically present referent during the conversation, the joint attention on the referent was accepted as "absent" and a value of 0 was assigned to this referent. If the attention on the referent was initiated by the speaker's endeavor (through gestures, sound, attention getters such as *hey*, *wow*, name of the child, words, phrases or utterances), joint attention on the referent was coded as "initiating" and the referent took the value of 1. When the attention on a physically present referent was triggered by one of the two parties, but it was not known which party initiated the attention, joint attention on the referent was coded as "global" and a value of 2 was assigned to this referent. If the initiated attention by a previous speaker on a physically

present referent was taken up by the listener who became the subsequent speaker, joint attention on the referent was accepted as "follow" and a value of 3 was attributed to this referent. When the speaker kept referring to the same entity he/she introduced and continued to sustain the attention of the listener on this entity, joint attention on the referent was coded as "maintain" and received the value of 4. Moreover, the cases where the caregiver followed the children's attention on an entity (the cases that the child initiated the attention of the caregiver through some gestures and acts) and continued to sustain the child's attention on this entity, joint attention on this entity was also coded as "maintain". Table 9 describes the sub-categories of joint attention.

Table 9: The table for the categories of joint attention, their coding values, and operational definitions

Type of joint attention	Coding value	Operational definition
Absent	0	The referent object was not physically present, alternatively, either the speaker or the listener did not attend to the same physically present referent during the conversation.
Initiating	1	The speaker initiated the attention of the listener to a physically present referent through any gestures, sound, attention getters (<i>hey, wow, name of the child</i>), words, phrases or utterances.
Global	2	It was not known that the attention on a physically present referent was initiated by which partner of the communication.
Follow	3	The initiated attention by the speaker on a physically present referent was followed by the recipient.
Maintain	4	The speaker kept referring to the same entity he/she introduced and continued to sustain the attention of the listener on this entity.
Non-codable	98	The coder could not decide on the type of joint attention or the referent was a body part of either the speaker or the listener and it was not clear whether the person actively attend to his/her body part.

In the example below, the father and the child were reading a book that had different animal pictures. The father initiated the attention of the child to the horse picture in one of the pages of the book by asking some questions, which was accepted as initiating joint attention and took the coding value of 1. The child attended to the horse picture by turning his head towards the picture, which was accepted as followed joint attention and took the value of 3. Both the father and the child were looking at the picture while the father continued asking questions about the horse picture, which was accepted as maintained joint attention and took the value of 4.

(5) Example 5 (the child's initial *C*, age: 1;09, 21st referential set)

(1) FAT: *at neredē at?*

where is the horse, horse?

(2) FAT: *hani at?*

so, where is the horse?

(3) CHI: *at.*

horse.

(child turns his head towards the horse picture on the book page)

(4) FAT: *at hangisi?*

which one is the horse?

There were some special cases in the coding of joint attention. First, sometimes, the interaction took place between three people such as a father, a mother and a child. In such an interaction, one of the speakers (such as the mother) made the listener (the child) attend to the referent. After the child attended to the referent, the second speaker (such as the father)

attended to the same referent by joining in this interaction between the mother and the child. In such a case, joint attention on the referent was coded as "initiating" for the mother, "follow" for the child and "follow" for the father. Second, if the speaker talked about a body part of the listener and there was not a clear sign that the listener attended to his/her own body part, joint attention on this body part was coded as "non-codable".

The transcription below exemplifies the former special case. In the example, there was a bracelet in the child's hand. First, the mother attended to the bracelet in the child's hand by asking the child to give it to the recorder. The mother persisted in asking the child lend the bracelet to the recorder while the bracelet was in the child's hand (maintained joint attention). Later, the baby-sitter joined in the dialogue by asking the child to give the bracelet to the recorder (the baby-sitter followed joint attention between the mother and the child).

(6) Example 6 (the child's initial *S*, age: 1;08, 37th referential set)

(1) MOT: *ver.*

give.

(2) MOT: *taksın .*

I want her put it on.

(3) MOT: *Özlem de taksın.*

I want Özlem put it on.

(4) BAB: *haydi ver!*

come on, give!

(5) BAB: *ver Özlem ablaya.*

give it to Özlem.

(6) MOT: *ay çok güzel oldu.*

ooo! it is very nice.

For the second feature, physical presence, the argument was coded as either *physically present* (1) or *physically absent* (0). If the referent was visually or audibly (such as sound of a person, sound of a phone) present in the physical context where the conversation took place, it was accepted as “physically present” and assigned a value of 1; otherwise it was accepted as “physically absent” and given a value of 0. Table 10 presents the sub-categories and their coding values for physical presence.

Table 10: The table for the categories of physical presence, their coding values and operational definitions

Physical presence	Coding value	Operational definition
Absent	0	The referent was physically absent in the context where the conversation took place. For example, a referent in another room (a ball in the bed room) rather than the room where the conversation took place (the living room) was accepted as physically absent.
Present	1	The referent was physically present in the context where the conversation took place.
Non-codable	98	The coder could not decide on whether the referent was physically present or absent in the context that the conversation took place, because of insufficient evidence in the video segment.

As an example, while the recorder and the child were talking about the child's ball, the child held the ball in his hands and asked his mother: *Anne, nerden almış bunu babam?* 'Where did my father get this?'. Since the referent (the ball) was present during the conversation, it was coded as "physically present" and took the value of 1 in the analysis.

However, there was one exceptional case coding physical presence. When the child and the caregiver talked about a referent outside the house by looking at the referent through the window and the scene outside was not seen in the video, the referent was assumed as "physically present" throughout the referent set as long as there was a visual or auditory cue about the presence of the referent.

In the transcription sample below while the father and the child were looking through the window of their house, a bus passed across the street. Because some part of the bus could be seen in the video recording, the bus was accepted as physically present throughout the referential set and the value of 1 was attributed to this referent.

(7) Example 7 (the child's initial *C*, age: 1;09, 25th referential set)

(1) CHI: 0 [=! looks at the bus] .

(2) FAT: *o otobüs* .

it is a bus.

(3) FAT: *o otobüs*.

it is a bus.

(4) CHI: *a ah!*

uh!

(child is surprised)

(5) FAT: *belediye otobüsü o*.

it is a city bus.

(6) CHI: *a ah!*

uh!

child is surprised

(7) FAT: *halk otobüsü*.

it is a public bus.

(8) FAT: *vatandaşlar otobüse biniyor.*

the citizens are getting on the bus.

For the third feature, prior mention (the newness/giveness), the argument was coded as one of the following three alternatives: *very immediately previously mentioned* (1), *immediately previously mentioned* (2) or *new* (0). Any referent that was mentioned in noun form in the previous utterance was coded as “very immediately previously mentioned” and was assigned a value of 1. If the referent was mentioned in the noun form in one of the previous five utterances (not in the previous utterance), it was coded as “immediately previously mentioned” and received a value of 2. Any referent that had not been included within the previous 5 utterances was coded as “new” and received the value of 0. In other words, if a referent took place 6 or more utterances before or if the referent was referred to through other morphological forms rather than noun (such as null, pronoun, question form), it was accepted that the referent was not previously mentioned in the discourse. Table 11 presents the sub-categories and their coding values.

Table 11: The table for the categories of prior mention, their coding values, and operational definitions

Prior mention	Coding value	Operational definition
New	0	The referent was not mentioned as a noun within the previous five utterances.
Very immediate	1	The referent was mentioned as a noun in the previous utterance.
Immediate	2	The referent was mentioned as a noun in one of the previous five utterances (not in the previous utterance).
Non-codable	98	The coder could not decide on the category of prior mention. Furthermore, the first five utterances of the video were coded as "non-codable" as long as the referent did not take place within the first five utterances of the video-recording.

In the example below, the mother directed the child's attention to the cat pictures on the child's t-shirt and shorts by talking about and pointing to the cat picture(s) with her index finger. Prior mention for the referent (the cat) in the utterance 2 (Where is your cat?) was coded as "very immediately previously mentioned" since the previous utterance (utterance 1) included the referent (the cat) in the noun form. Similarly, prior mention of the referent in the third utterance (Look at the cat!) and in the fourth utterance (Look! there is here, too.) of the

referential set were also coded as "very immediately previously mentioned". Therefore, both referents in the utterances 2 and 3 took the value of 1 in the analysis. However, prior mention of the referent in the fifth utterance (There is here, too) was coded as "immediately previously mentioned". The reason was that the referent was used in null form (Look, there is here, too) in the previous utterance (utterance 4) although it showed up as a noun (cat) in one of the previous five utterances during the conversation. Therefore, the referent was coded as "immediately previously mentioned" and assigned a value of 2 in the analysis.

(8) Example 8 (the child's initial *O*, age: 1;05, 15th referential set)

(1) MOT: *hani kedin senin?*

where is your cat?

(2) MOT: *hani kedin?*

where is your cat?

(3) MOT: *kekiye bak!*

look at the cat!

(4) MOT: *bak burada da var.*

look! there is here, too.

(5) MOT: *burada da var.*

there is here, too.

(6) MOT: *hani kediler?*

where are the cats?

(7) MOT: *hani kedin O...?*

where is your cat, O..(initial of the name of the child)?

(8) MOT: *kediler nerede?*

where are the cats?

(9) MOT: *hani?*

where?

(10) MOT: *kedine bak.*

look at your cat.

(11) MOT: *şurada da kedi var.*

there is a cat there, too.

Coding of prior mention for the first five utterances in the video needed a different treatment. If there was a mention of the referent in one of the utterances within the first four, prior mention for the referent in the fifth utterance was coded as either “immediate” or “very immediate” depending on the number of many utterances that transpired after the referent was mentioned. Otherwise, it was coded as “non-codable”, not as "new". The reason for such a coding was that it was not known whether the referent was mentioned before the video recording began. Moreover, in the rare situations where the video recording was damaged or disrupted, prior mention for the first sentence following the disrupted/broken part in the video was coded as non-codable.

4.6 *Methods of Data Analyses*

This section provides information about the descriptive analyses and the statistical method applied to the dataset in order to examine the expected relationships between the variables in this thesis.

4.6.1 *Descriptive Analyses*

Since the questions of the present thesis were mostly qualitative in nature, the descriptive analyses and their interpretations carry out an important role to describe the data-set. Crosstabs analyses and subsequent chi-square statistics were conducted to describe the data-set qualitatively. Further analyses were conducted on the basis of such initial qualitative work.

4.6.1.1 *Data Reduction for Descriptive Analyses*

In order to conduct descriptive analyses, the coding categories of the variables were reorganized. As described in the section about Coding Categories (See Section 4.5.1), referential form had fifteen sub-categories of coding which included eight main categories such as noun, pronoun, adjective and seven combinational categories such as pronoun+noun (this pencil, that book). The combinational categories were generated from the combination of the main categories. For example, the category pronoun+noun (this pencil, that book) was generated from the main categories of "pronoun" and "noun". In order to obtain a clear description of the data set, the combinational sub-categories and the main category of "proper noun" were joined into six main sub-categories: zero, pronominal, nominal, adjective, question, and vocal/gestural. The researcher decided on which main category a combinational category belongs to based on the second component in the combinational category. For instance, a combinational category of pronoun+noun belongs to the noun category.

Moreover, joint attention initially had five sub-categories (See Section 4.5.3), namely absent, global, initiating, follow, and maintain. The subcategories of global and initiating were combined under the name of "initiating". The reason for this rearrangement was that the categories of global and initiating represented the similar status of joint attention. The difference between the two categories is that whether the speaker initiated his/her recipient's attention. How the addressee's attention naturally began is not clear in the "global" sub-

category whereas the speaker clearly initiates the addressee's attention in the "initiating" sub-category. After this rearrangement, there were four sub-categories for joint attention: absent, initiating, follow, and maintain. The "non-codable" category for all the variables were accepted as missing data. Table 12 below displays the sub-categories and the recoded coding values assigned to them for each of the sub-categories.

Table 12: The encoding values of the variables

Variable	Sub-categories	Encoding value
Joint attention	Absent	0
	Initiating	1
	Follow	2
	Maintain	3
Physical presence	Absent	0
	Present	1
Prior mention	New	0
	Very immediate	1
	Immediate	2
Deictic gestures	No	0
	Point	1
	Beg	2
	Demonstrate-action	3
	Demonstrate-object	4
	Give	5
	Head/eye	6
	Iconic-action	7
	Iconic-object	8
	Physical manipulation	9
	Place	10
	Reach/move towards	11
	Show/hold-up	12
Multiple	13	

Referential form	Zero	0
	Pronoun	1
	Noun	2
	Adjective	3
	Question	4
	Vocal/gestural	5

*The "non-codable" category was coded as 99 for all variables.

4.6.2 *Binary Logistic Regression*

Binary Logistic Regression was used as a statistical procedure in assessing the relative contribution of each discourse-pragmatic feature to referential choices in the dataset. The method of logistic regression was chosen in this thesis for several reasons:

First, the logistic model enables researchers to work on various social phenomena which are "discrete or qualitative rather than continuous or quantitative in nature" (Pampel, 2000). Since the present study involved coding qualitative processes into categorical variables, logistic regression was chosen as an appropriate statistical method for the analyses. Second, the logistic regression estimates the relative contribution of one or more predictor variables to the variation of a dependent variable. For the dataset used for this study, the regression estimated the relative contribution of three discourse-pragmatic features, namely joint attention, physical presence and prior mention to either the form of the referential expression or the presence of referential gestures. Third, the logistic procedure gives the probability of the occurrence of a dependent variable in accordance with each predictor variable. Therefore, the method of binary logistic regression allows us to evaluate whether each feature correctly predicts the form of an argument and the presence of gesture in the referential talk of children and adults.

In the present study, we preferred to use binary logistic regression rather than multiple logistic regression in order to analyze our data, because the study is the first study with Turkish-speaking families on the effect of multiple discourse-pragmatic principles (joint attention, physical presence, and prior mention) on both verbal and non-verbal referential choices of young children and their regular caregivers. As an initial step, we examined the data to answer the questions such as: Are there any effects of the three discourse-pragmatic principles on both young children's and their regular caregivers' referential choices? Do the discourse-pragmatic principles affect either verbal (use of referential expressions) or non-verbal (use of referential gestures) referential choices of young children and their caregivers or affect their both types of referential choices? Do the discourse-pragmatic features have a role on children's and caregivers' referential choices individually or interacting with each other? Are there any differences among the extent of the three discourse-pragmatic features' contribution to children and regular caregivers' use of referential expressions and use of referential gestures?

In the logistic regression analyses presented below, the predictors were three discourse-pragmatic features: joint attention, physical presence and prior mention. The referential form (omitted vs. overt arguments) and use of gesture (gesture-absent vs. gesture-present) were used as dependent variables. The unit of analysis was one argument in either a child' or a caregiver' utterance. Both sets of analyses include 5609 cases which equals the total number of arguments in the dataset.

4.6.2.1 Data Reduction for Logistic Regression

In order to apply the binary logistic regression analyses, dependent variables (referential form and gesture) in the present study were reorganized as dichotomous variables. Referential form had fifteen sub-categories with eight main and seven combinational sub-categories (See Section 4.5.1) indicating the exact linguistic status of the referring expression.

In order to adapt this variable to a binary logistic regression, the fifteen categories were reduced to two categories, namely "omitted" and "overt". The category of "null/zero" was coded under the new category of "omitted" and all the remained main and combinational sub-categories were coded under the new category of "overt". As an example, the referent '**the books**' in the utterance of "show (**the books**) to her" (*göster ona*) initially was coded under the sub-category of "zero/null". After the reorganization of the variables, the same referent was placed under the new category of "omitted". As another example, the referents (**the microphone and the biscuit**) in the utterances of "they don't give *it* (**the microphone**) to you" (*vermezler sana onu*) and "did you see **the biscuit**?" (*gördün mü bisküviyi?*) initially were under the sub-categories of "pronoun" and "noun" respectively. After the reorganization of the variables, both referents were subsumed under the new category of "overt". There are three additional categories (gesture/act, vocalization and act+vocalization) for the coding of children's referential talk, because, unlike adults, young children often used vocalizations, acts or gestures with referential purposes unlike adults. Therefore, there were fifteen sub-categories of referential form for the children's utterances. These fifteen sub-categories in the children's contributions were reclassified as "linguistic" and "gestural/vocal" for a binary logistic regression analysis.

Gesture as a dependent variable initially consisted of fourteen sub-categories. For the analysis, the fourteen categories were reduced to two categories, namely "gesture-present" and "gesture-absent". Moreover, the variables determined as discourse-pragmatic features were also reorganized for the analyses. Joint attention as one of these features initially had five sub-categories, namely "absent", "initiating", "global", "follow" and "maintain". For the analyses, these five sub-categories were gathered under two sub-categories as "absent" and "present". The sub-category "absent" remained the same whereas other sub-categories (initiating, global, follow and maintain) were replaced under the new category of "present". For the second discourse-pragmatic feature, physical presence, there was no need for

reorganization since this predictor already consisted of two sub-categories as "absent" and "present". The third discourse-pragmatic feature, prior mention, also kept its original three sub-categories: "new", "very immediate" and "immediate". There was a common category for all variables which was "non-codable". The cases coded under this category were accepted as missing data in the analyses. Table 13 below indicates the encoding values of the variables for the analyses.

Table 13: The encoding values of the variables for Binary Logistic Regression Analyses

Variable	Sub-categories	Encoding value
Joint attention	Absent	0
	Present	1
Physical presence	Absent	0
	Present	1
Prior mention	New	0
	Very immediate	1
	Immediate	2
Deictic gesture	Absent	0
	Present	1
Referential form	Omitted	0
	Overt	1

Chapter 5

RESULTS

The first section in this chapter describes the data set qualitatively in the current study. The second section presents the results of binary logistic regression analysis to address the study's main questions.

5.1 *Descriptive Analyses*

This section reports the proportions obtained from the crosstabs procedure and the results of chi-square statistics. Firstly, the proportions and chi-square statistics for the effects of the three discourse-pragmatic principles on the children's and primary caregivers' referential forms are presented. Secondly, the proportions and chi-square statistics for the role of the same three discourse-pragmatic principles on the children's and their caregivers' referential gestures are provided.

5.1.1 *Descriptive Analyses for the Effects of the Three Discourse-pragmatic Principles on the Children's and the Regular Caregivers' Referential Forms*

Chi-square tests conducted after the reorganization of the variable "referential form" into a variable with six sub-categories indicated that all of the three discourse-pragmatic principles were significantly associated with both the children's and the regular caregivers' referential forms ($ps < .001$). In other words, the discourse-pragmatic principles created significant differences for both the children's and the caregivers' choices among six sub-categories of referential form. Table 14 below demonstrates chi-square test statistics for the specified associations.

Table 14: Pearson chi-square statistics for the association between the three discourse-pragmatic principles and the children's and the regular caregivers' choices among six sub-categories of referential forms

Speaker	Predictors	Pearson chi-square	df	P
Children	Joint attention	258.1	15	.0001
	Physical presence	69.92	5	.0001
	Prior mention	342.49	10	.0001
Speaker	Predictors	Pearson chi-square	df	P
Regular caregivers	Joint attention	549.31	15	.0001
	Physical presence	291.97	5	.0001
	Prior mention	630.95	10	.0001

Moreover, we conducted some chi-square tests using the variable "referential form" as a binary variable in order to understand whether the data requires a further analysis, namely a binary logistic regression analysis. As Table 15 shows, the chi-square tests conducted after the reorganization of the variable "referential form" as a variable with two sub-categories (omitted vs. overt) indicated that the three discourse-pragmatic principles also significantly affected both the children's and the caregivers' choices between omitted and overt referential forms. Therefore, we decided on conducting a binary logistic regression analysis to understand the relative contribution of each discourse-pragmatic principle to the children's and their caregivers' use of referential forms.

Table 15: Pearson chi-square statistics for the association between the three discourse-pragmatic principles and the children's and the regular caregivers' choices between omitted and overt referential forms

Speaker	Predictors	Pearson chi-square	df	P
Children	Joint attention	111.04	3	.0001
	Physical presence	46.22	1	.0001
	Prior mention	275.84	2	.0001
Speaker	Predictors	Pearson chi-square	df	P
Regular caregivers	Joint attention	368.76	3	.0001
	Physical presence	105.02	1	.0001
	Prior mention	239.04	2	.0001

We also conducted some cross-tabs in order to describe the significant relationships between the three discourse-pragmatic principles and the children's and their caregivers' choices among six sub-categories of referential forms. The three sub-sections below present the percentages of the children's and the caregivers' choices among six sub-categories of referential form for the three discourse-pragmatic principles.

5.1.1.1 Joint Attention

As Figure 1, Figure 2 and Table 16, Table 17 indicate, overall, there are some cases that the discourse-pragmatic principles seem to affect the children's and the caregivers' use of referential forms in a similar way. For instance, in the absence of joint attention, both the children and their caregivers predominantly preferred to use nouns in order to talk about a referent. In fact, the children and the caregivers used nominal forms 69% of the time and 57% of the time respectively to refer to a referent in the absence of joint attention. Moreover, the

children and the caregivers mostly used nouns (70% and 38% of the time respectively) to follow their communicative partner's attention.

There are also the cases that the children and the caregivers chose different referential forms in spite of the same discourse-pragmatic cues: The children initiated their caregivers' attention using vocalizations and/or gestures 51% of the time whereas the caregivers initiated the children's attention using nouns 47% of the time. Moreover, unlike the children, the caregivers omitted the arguments (31%) besides using nominal forms in order to refer to a referent which the children had already attended to. When there is an established joint attention on the same entity or activity, the children nearly equally preferred to use nouns (40%) or to omit arguments (38%), however their caregivers mostly omitted arguments in such situations (61%). Furthermore, the caregivers used more pronominal forms than their children in all statuses of joint attention. The caregivers' use of pronominal forms reached to the peak (27%) when they followed the children's attention on a referent.

Figure 1: The proportions of the children's referential forms in different statuses of joint attention

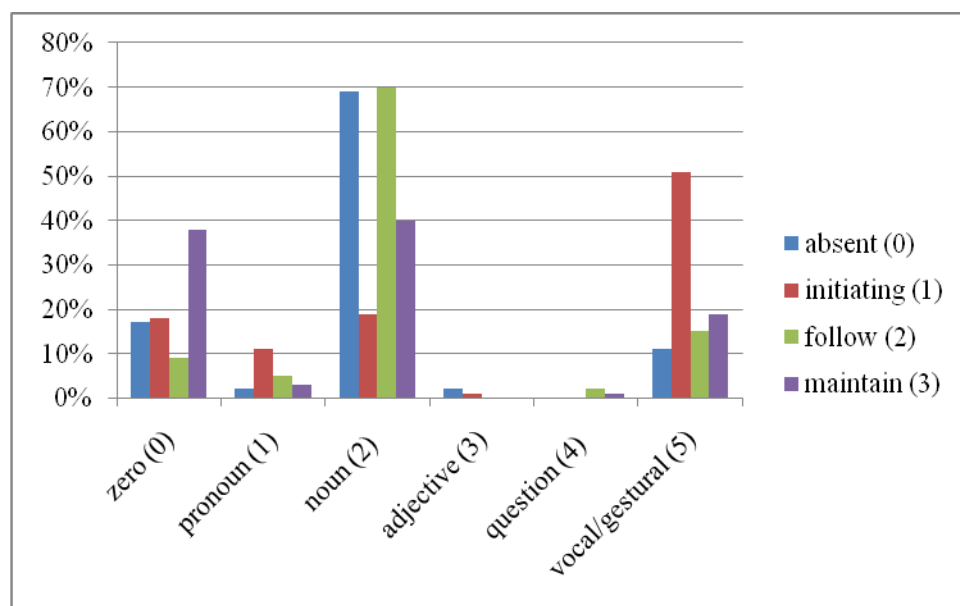


Figure 2: The proportions of the regular caregiver's referential forms in different statuses of joint attention

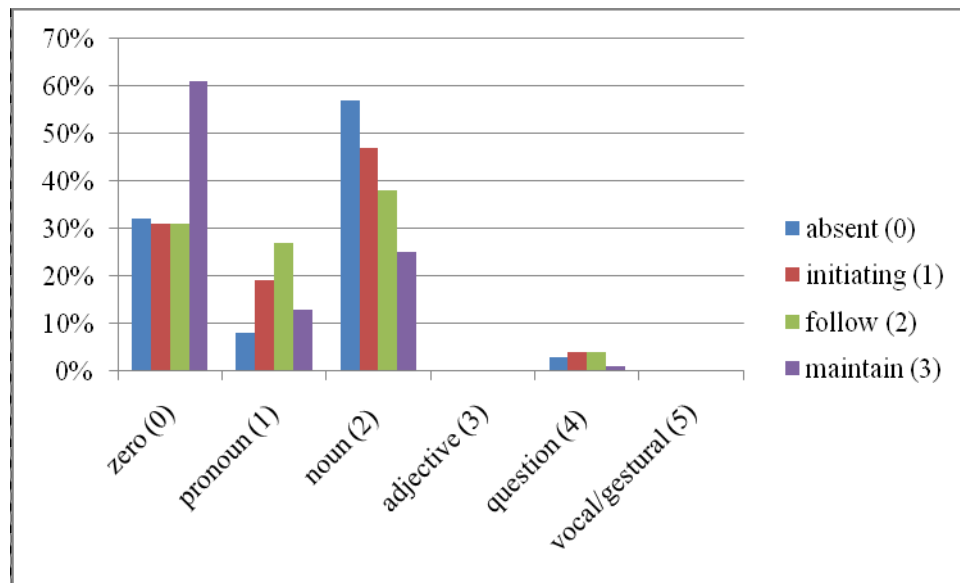


Table 16: The proportions of the children's referential forms in different statuses of joint attention

Joint attention		Zero	Pronoun	Noun	Adjective	Question	Vocal/gestural
		(0)	(1)	(2)	(3)	(4)	(5)
Absent (0)	Count	42	4	173	4	0	27
	percentage	17%	2%	69%	2%	0%	11%
Initiating (1)	Count	45	26	47	3	1	125
	percentage	18%	11%	19%	1%	0%	51%
Follow (2)	Count	6	3	47	0	1	10
	percentage	9%	5%	70%	0%	2%	15%
Maintain (3)	Count	161	11	172	1	2	82
	percentage	38%	3%	40%	0%	1%	19%

Table 17: The proportions of the regular caregiver's referential forms in different statuses of joint attention

Joint attention		Zero (0)	Pronoun (1)	Noun (2)	Adjective (3)	Question (4)	Vocal/gestural (5)
Absent (0)	Count	389	98	702	3	32	2
	percentage	32%	8%	57%	0%	3%	0%
Initiating (1)	Count	135	82	206	0	17	1
	percentage	31%	19%	47%	0%	4%	0%
Follow (2)	Count	96	86	120	0	13	0
	percentage	31%	27%	38%	0%	4%	0%
Maintain (3)	Count	1401	305	581	4	17	3
	percentage	61%	13%	25%	0%	1%	0%

Table 18 shows the children's referential forms at different age points depending on different status of joint attention. In the absence of joint attention, the children used nouns 92% of the time at 12 months, 68% of the time at 17 months, and 64% of the time at 21 months. They also employed vocalizations and/or gestures at all age points. The proportions of children's vocalizations and/or gestures in the absence of joint attention were 8%, 19%, and 7% at 12, 17, and 21 months respectively. Moreover, children began to omit arguments by 17 months. The children's omission rates were 13% at 17 months and 24% at 21 months. In sum, in the absence of joint attention, the children's nominal uses decreased whereas their argument omissions increased in talking a referent as they got older.

The children initiated their addressee's attention using vocalizations and/or gestures at all age points, although the tendency decreased as they got older. The proportions of the children's vocalizations and /gestures were 83% at 12 months, 69% at 17 months, and 31% at 21 months. The children also omitted arguments when they get attention of their caregivers. The children's

omission rates were 3%, 21%, and 21% at the ages of 12, 17, and 21 months respectively. Thus, the children's argument omission rates increased at 17 months, and remained constant at 21 months. Around the age of 21 months, they also started to draw their caregivers' attention using adjectives (2%) and questions (1%), but not yet with high frequency. Furthermore, their choices for nouns and pronouns increased to 27% and 19% respectively at 21 months.

When the children followed their caregiver' attention on a referent, they omitted arguments 40% of the time at 12 months, 13% of the time at 17 months, and 6% of the time at 21 months. They also used nouns and vocalizations and/or gestures to follow the caregivers' attention. The proportions of their nominal forms were 40%, 38%, and 78% when they were 12, 17 and, 21 months of age respectively. They used vocalizations and/or gestures 20% of the time at 12 months, 50% of the time at 17 months, and 9% of the time at 21 months. The children's omission rates decreased at 17 months and their nominal uses expanded at 21 months. Therefore, as children got older, they omitted arguments less and produced more nouns talking about the referents to which their caregivers already attended. Moreover, under the same situation, it seems that after the children's nominal use reaches a certain level (78%) at 21 months, they began to use less vocalizations and/or gestures (9%).

If the children and their caregivers talked about a referent which they jointly sustained their attention on it for a while: The children used vocalizations and/or gestures 63%, 26% and 9% of the time whereas used nouns 8%, 24%, and 54% of the time at 12, 17, and 21 months respectively. Therefore, the children's vocalizations and/or gestures decreased while their nominal uses increased as they got older. It appears that the children seem to use more nouns instead of just vocalizations/gestures as they develop across the second year. Under such a situation, the children also made argument omissions. Their omission rates were 29%, 46%, and 34% around the ages of 12, 17, and 21 months respectively.

Table 18: The proportions of the children's referential forms at 12, 17, and 21 months in different statuses of joint attention

Joint attention		Zero (0)			Pronoun (1)			Noun (2)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	0	10	32	0	0	4	33	53	87
	percentage	0%	13%	24%	0%	0%	3%	92%	68%	64%
Initiating (1)	Count	1	17	27	1	0	25	4	8	35
	percentage	3%	21%	21%	3%	0%	19%	11%	10%	27%
Follow (2)	Count	2	1	3	0	0	3	2	3	42
	percentage	40%	13%	6%	0%	0%	6%	40%	38%	78%
Maintain (3)	Count	11	63	87	0	3	8	3	33	136
	percentage	29%	46%	34%	0%	2%	3%	8%	24%	54%

Joint attention		Adjective (3)			Question (4)			Vocal/gestural (5)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	0	0	4	0	0	0	3	15	9
	percentage	0%	0%	3%	0%	0%	0%	8%	19%	7%
Initiating (1)	Count	0	0	3	0	0	1	30	55	40
	percentage	0%	0%	2%	0%	0%	1%	83%	69%	31%
Follow (2)	Count	0	0	0	0	0	1	1	4	5
	percentage	0%	0%	0%	0%	0%	2%	20%	50%	9%
Maintain (3)	Count	0	0	1	0	2	0	24	36	22
	percentage	0%	0%	0%	0%	2%	0%	63%	26%	9%

Overall, based on the percentages presented in Table 19 below, the children's omitted forms increased whereas their overt forms decreased in time if the children and their caregivers did not jointly attend to the same referent: The percentages of the children's omitted forms in the absence of joint attention were 8% , 32%, and 30% , in contrast, the percentages of their overt forms were 92%, 68%, and 70% when they were 12, 17, and 21 months of age respectively. On the other hand, the children's omitted forms decreased while their overt forms increased over time if the children and their caregivers jointly attended to the same referent: The children used omitted forms 87%, 78%, and 42% of the time while they used overt forms 13%, 22%, and 58% of the time in the presence of joint attention at the ages of 12, 17, and 21 months respectively.

Table 19: The proportions of the children's omitted and overt referential forms at 12, 17, and 21 months in the absence and in the presence of joint attention

Joint attention		Omitted forms (0)			Overt forms (1)		
		Age of child (months)					
		12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	3	25	41	33	53	95
	percentage	8%	32%	30%	92%	68%	70%
Present (1)	Count	69	176	184	10	49	255
	percentage	87%	78%	42%	13%	22%	58%

As Table 20 indicates, the caregivers' referential forms also showed some variations depending on the children's age. For example, the caregivers predominantly used nominal forms at all age points talking about the referents which they and their children did not jointly attend to. In other words, in the absence of joint attention, the proportions of the caregivers' nominal forms were 52%, 64%, and 54% when the children were 12, 17, and 21 months respectively.

There was a clear increase in the caregivers' nominal uses attracting the children's attention to a referent when the children were at 17 months. That is, the caregiver's nominal forms reached to 56% at this age point from 33% at 12 months. The omission rates of the caregivers decreased as the children got older. In fact, the caregivers omitted 51%, 36%, and 18% of the arguments while attracting the children's attention to a referent when the children were at 12, 17 and 21 months respectively. Moreover, the caregivers' pronominal uses in initiating the children's attention nearly tripled and reached to 29% when the children were at 21 months compared to the caregivers' pronominal uses (7%) when the children were at 17 months

Based on Table 20, there was not an important developmental pattern of the caregivers' choices for referential forms in some statuses of joint attention, which are "follow" and "maintain".

Table 20: The proportions of the regular caregivers' referential forms in different statuses of joint attention when the children were at 12, 17, and 21 months

Joint attention		Age of child (months)								
		Zero (0)			Pronoun (1)			Noun (2)		
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	102	126	161	30	23	45	148	280	274
	percentage	36%	29%	32%	11%	5%	9%	52%	64%	54%
Initiating (1)	Count	49	49	37	11	10	61	32	77	97
	percentage	51%	36%	18%	12%	7%	29%	33%	56%	47%
Follow (2)	Count	14	37	45	17	31	38	20	49	51
	percentage	26%	31%	32%	32%	26%	27%	37%	41%	36%
Maintain (3)	Count	279	635	487	64	88	153	90	223	268
	percentage	64%	67%	53%	15%	9%	17%	21%	24%	29%

Joint attention		Age of child (months)								
		Adjective (3)			Question (4)			Vocal/gestural (5)		
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	0	0	3	4	8	20	0	0	2
	percentage	0%	0%	1%	1%	2%	4%	0%	0%	0%
Initiating (1)	Count	0	0	0	4	1	12	0	0	1
	percentage	0%	0%	0%	4%	1%	6%	0%	0%	1%
Follow (2)	Count	0	0	0	3	4	6	0	0	0
	percentage	0%	0%	0%	6%	3%	4%	0%	0%	0%
Maintain (3)	Count	0	0	4	4	0	13	0	0	3
	percentage	0%	0%	0%	1%	0%	1%	0%	0%	0%

5.1.1.2 Physical Presence

As Figure 3, Figure 4 and Table 21, Table 22 show, both children and the caregivers primarily used nouns for physically absent referents during conversation. That is, the children, 79% of the time, and their caregivers, 67% of the time, verbalized these referents in nominal forms. The children's and their caregiver's preference for nouns decreased to 41% and 34% respectively when the referents were physically present during conversation. Moreover, both the children's and the caregivers' omission rates increased from 14% to 26% and from 26% to 50% respectively, when they talked about physically present referents as opposed to physically absent ones. Besides these similarities, there were some differences in the children's and the caregivers' uses of referential forms: The caregivers used more zero forms (50%) referring to physically present referents than the children used (26%). The caregivers chose clearly more zero forms (50%) than nominal forms (34%), however the children still chose more nominal forms (41%) than zero forms (26%) for physically present referents. Moreover, unlike the caregivers, the children talked about both physically absent and physically present referents by vocalizations and/or gestures. They used more vocalizations and/or gestures for physically present referents (26%) than physically absent referents (7%). As opposed to the children, the caregivers, although infrequently, did talk about physically absent referents also using question forms (5%).

Figure 3: The proportions of the children's referential forms in the absence and in the presence of a referent

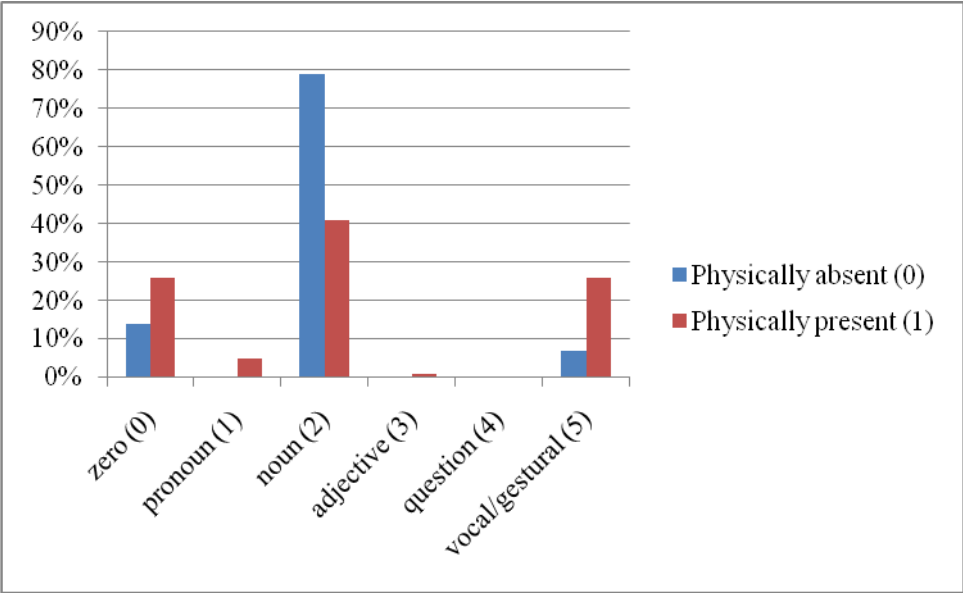


Figure 4: The proportions of the regular caregivers' referential forms in the absence and in the presence of a referent

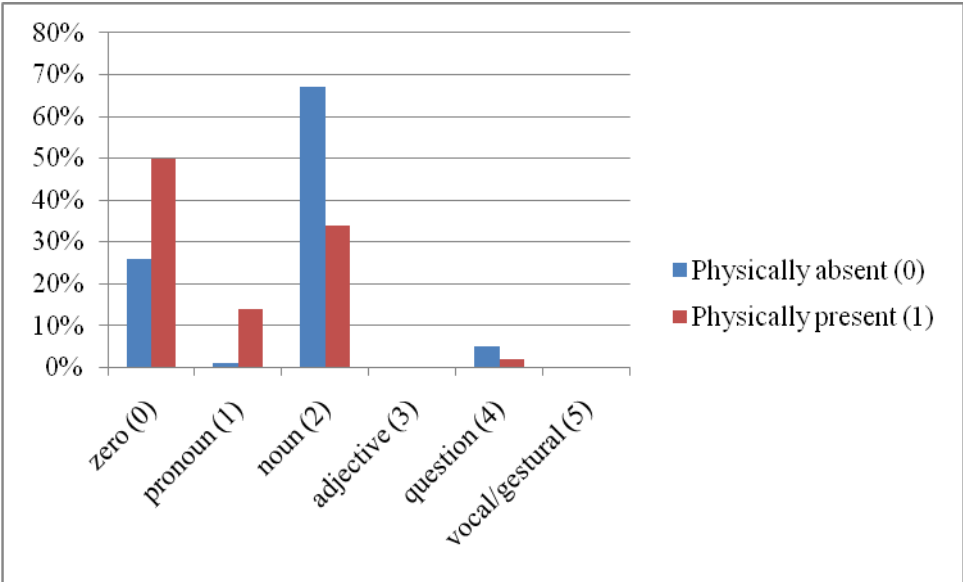


Table 21: The proportions of the children's referential forms in the absence and in the presence of a referent

Physical presence		Zero (0)	Pronoun (1)	Noun (2)	Adjective (3)	Question (4)	Vocal/gestural (5)
Physically abs. (0)	count	19	0	104	0	0	9
	percentage	14%	0%	79%	0%	0%	7%
Physically pre. (1)	count	239	45	369	8	4	239
	percentage	26%	5%	41%	1%	0%	26%

Table 22: The proportions of the regular caregivers' referential forms in the absence and in the presence of a referent

Physical presence		Zero (0)	Pronoun (1)	Noun (2)	Adjective (3)	Question (4)	Vocal/gestural (5)
Physically abs. (0)	count	142	7	364	0	28	0
	percentage	26%	1%	67%	0%	5%	0%
Physically pre. (1)	count	1951	568	1343	7	58	6
	percentage	50%	14%	34%	0%	2%	0%

As Table 23 displayed, the children's referential forms for physically absent and physically present referents varied depending on their ages. If the referent was physically absent, the children used only nominal forms (100%) when they were at 12 months. Their nominal uses for physically absent referents showed an abrupt decrease (approximately 30%) around the age of 17 months, and increased back again (75%) when they reached to 21 months; thus no systematic developmental differences can be gleaned from the data. At the ages of 17 and 21 months, the children began to use alternative forms to nouns talking about

physically absent referents. In other words, they began to use zero forms and vocalizations and/or gestures. For example, they omitted 11% of the arguments at 17 months and omitted 22% of the arguments at 21 months. They also referred to these referents by vocalizations and/or gestures 16 % and 3% of the time at 17 and 21 months respectively.

If the referent was physically present, the children primarily used vocalizations and/or gestures (56%) when they were 12 months. However, they benefitted from vocalizations and/or gestures to refer to physically available referents less as they got older. In fact, the proportions of the vocalizations and/ or gestures dropped to 38% and 15% from 56% when they reached to 17 and 21 months of age respectively. Their omission rates approximately doubled (31%) by the age of 17 months compared to when the age of 12 months and remained nearly the same (26%) by the age of 21 months when they were talking about physically present referents. At 21 months, they used more nominal forms for physically present referents. In fact, their nominal uses showed nearly 20% increase at this age.

Table 23: The proportions of the children's referential forms at 12, 17, and 21 months in the absence and in the presence of a referent

Physical presence		Zero (0)			Pronoun (1)			Noun (2)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Physically absent (0)										
Count		0	5	14	0	0	0	24	32	48
percentage		0%	11%	22%	0%	0%	0%	100%	73%	75%
Physically present (1)										
Count		17	86	136	1	3	41	28	82	259
percentage		16%	31%	26%	1%	1%	8%	27%	30%	50%
Physical presence		Adjective (3)			Question (4)			Vocal/gestural (5)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Physically absent (0)										
Count		0	0	0	0	0	0	0	7	2
percentage		0%	0%	0%	0%	0%	0%	0%	16%	3%
Physically present (1)										
Count		0	0	8	0	2	2	58	105	76
percentage		0%	0%	2%	0%	1%	0%	56%	38%	15%

Overall, based on Table 24 below, the children began to use omitted forms for physically absent referents at the age of 17 months (27%) and they continued to use omitted forms by the age of 21 months (25%). In contrast, they expressed such referents using only overt forms at the age of 12 months (100%). Later on, their overt forms decreased to 73% and

75% by the ages of 17 and 21 months. The proportions of the children's omitted forms were 72%, 69%, and 41% whereas the proportions of their overt forms were 28%, 31%, and 59% for physically present referents at the ages of 12, 17, and 21 months respectively. It seems that children referred to physically absent referents using more omitted and less overt forms whereas they referred to physically present referents using less omitted and more overt forms as they got older.

Table 24: The proportions of the children's omitted and overt referential forms at 12, 17, and 21 months in the absence and in the presence of a referent

Physical presence		Omitted forms (0)			Overt forms (1)		
		Age of child (months)					
		12 m	17 m	21 m	12 m	17 m	21 m
Physically absent (0)	Count	0	12	16	24	32	48
	percentage	0%	27%	25%	100%	73%	75%
Physically present (1)	Count	75	191	212	29	87	310
	percentage	72%	69%	41%	28%	31%	59%

As Table 25 indicates, the caregivers' referential choices for physically absent or physically present referents changed depending on their children's age. For instance, the caregivers made less nominal choices for physically absent referents as the children got older. In fact, 82%, 77%, and 58% of the caregivers' referential forms were nouns when the children were at 12, 17, and 21 months respectively. Moreover, the omission rates of the caregivers for physically absent referents nearly doubled and reached to 34% when the children reached to 21 months of age compared to the caregivers' omission rates when the children were either 12 months (17%) or 17 months (17%).

The caregivers' pronominal choices for physically present referents increased to 19% when the children were 21 months compared to their pronominal choices for physically present referents when the children were 12 months (15%) and 17 months (10%).

Table 25: The proportions of the regular caregivers' referential forms in the absence and in the presence of a referent when the children were at 12, 17, and 21 months

Physical presence		Zero (0)			Pronoun (1)			Noun (2)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Physically absent (0)										
Count		12	30	100	0	3	4	59	135	170
percentage		17%	17%	34%	0%	2%	1%	82%	77%	58%
Physically present (1)										
Count		448	866	637	122	152	294	256	533	554
percentage		53%	56%	42%	15%	10%	19%	30%	34%	36%
Physical presence		Adjective (3)			Question (4)			Vocal/gestural (5)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Physically absent (0)										
Count		0	0	0	1	7	20	0	0	0
percentage		0%	0%	0%	1%	4%	7%	0%	0%	0%
Physically present (1)										
Count		0	0	7	17	6	35	0	0	6
percentage		0%	0%	1%	2%	0%	2%	0%	0%	0%

5.1.1.3 *Prior Mention*

As Figure 5, Figure 6 and Table 26, Table 27 indicate below, children talked about brand new referents by vocalization and/or gestures (33%) or nouns (21%). However, more frequently, they omitted the arguments (38%) talking about new referents. Similar to the children and even more strongly, the regular caregivers predominantly omitted arguments while talking about new referents (56%). They used nouns and pronouns for new referents 23% and 18% of the time, respectively.

Unlike for new referents, both the children and their caregivers most of the time preferred to use nominal forms for previously mentioned referents. In fact, the proportions of the children's and the caregivers' nouns were 81% and 64% for very immediately mentioned referents. Interestingly, the children's nominal choices dropped to 48% whereas the caregivers' nominal choices decreased to 43% for immediately mentioned referents. It seems that the repeated mention of a referent decreased both the children's and the caregiver's choices for nouns. Besides using nouns, both groups continued to omit arguments for very immediately and immediately mentioned referents. The children's omission rates were 6% and 24% for very immediately and immediately referents respectively. The caregivers' omission rates were higher (29% and 46%) than the children's omission rates (6% and 24%) for both very immediately and immediately mentioned referents respectively. It seems that compared to the children, the caregivers more competently employed discourse context as one of the discourse-pragmatic cues in deciding on their referential forms.

Figure 5: The proportions of the children's referential forms at different levels of prior mention

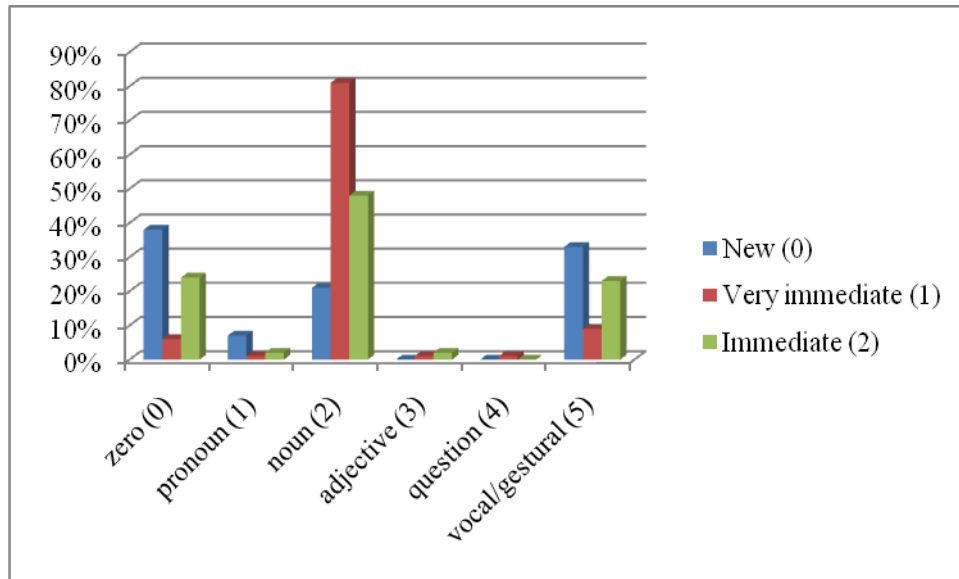


Figure 6: The proportions of the regular caregiver's referential forms at different levels of prior mention

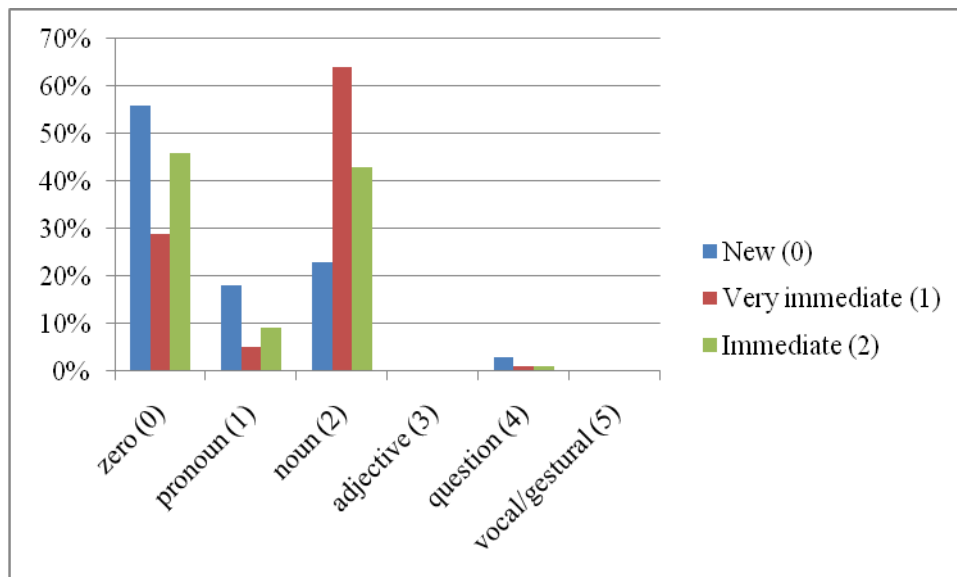


Table 26: The proportions of the children's referential forms at different levels of prior mention

Prior mention		Zero (0)	Pronoun (1)	Noun (2)	Adjective (3)	Question (4)	Vocal/gestural (5)
New (0)	count	204	37	115	1	1	179
	percentage	38%	7%	21%	0%	0%	33%
Very immed. (1)	count	24	5	307	4	3	35
	percentage	6%	1%	81%	1%	1%	9%
Immediate (2)	count	33	3	65	3	0	31
	percentage	24%	2%	48%	2%	0%	23%

Table 27: The proportions of the regular caregiver's referential forms at different levels of prior mention

Prior mention		Zero (0)	Pronoun (1)	Noun (2)	Adjective (3)	Question (4)	Vocal/gestural (5)
New (0)	count	1357	432	566	1	74	1
	percentage	56%	18%	23%	0%	3%	0%
Very immed. (1)	count	343	65	774	3	14	2
	percentage	29%	5%	64%	0%	1%	0%
Immediate (2)	count	417	85	392	3	7	3
	percentage	46%	9%	43%	0%	1%	0%

As Table 28 shows, the children's referential forms for different levels of prior mention also varied depending on their ages. The children used less vocalizations and/or gestures for new referents as they grew older. They referred to a new referent through vocalizations and/or gestures 65% of the time at 12 months, 42% of the time at 17 months,

and 20% of the time at 21 months. Moreover, their preferences for zero forms in talking about new referents reached to 45% by the age of 17 months and their choices for pronouns increased to 12% by the age of 21 months.

In talking about very immediately mentioned referents, the children predominantly used nouns at all ages. The proportions of the children's nominal forms were 92%, 74%, and 82% at the ages of 12, 17, and 21 months respectively. The children rarely omitted arguments talking about such referents that are mentioned in the immediately preceding utterances at all age points. Moreover, in 20% of the time, they referred to these referents by vocalizations and/or gestures at the age of 17 months, but this percentage dropped to 5% at the age of 21 months.

The children's use of vocalizations and/or gestures for immediately mentioned referents (i.e., within the last 5 utterances) decreased as they got older. In other words, the proportions of the children's vocalizations and/or gestures for these referents were 57%, 39%, and 11% at the ages of 12, 17, and 21 months respectively. The number of nouns used by the children in bringing up immediately mentioned referents increased in time. In fact, they chose nominal forms for 14%, 41%, and 55% of the time when they were 12, 17, and 21 months of age respectively. However, the proportions of their choices for zero forms nearly remained constant across the studied age points (29%, 17%, and 28% at the ages of 12, 17, and 21 months respectively).

Besides the specified referential forms, the children began to use adjectives for very immediately mentioned (2%), and immediately mentioned (4%) referents by the age of 21 months. Moreover, they began to use question forms (2%) at 17 months for very immediately mentioned referents. But of course, these numbers are not the many and the use of adjectival and question forms is meager at these ages.

Table 28: The proportions of the children's referential forms at 12, 17, and 21 months at different levels of prior mention

Prior mention		Zero (0)			Pronoun (1)			Noun (2)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	Count	15	79	110	1	1	35	11	22	82
	percentage	20%	45%	39%	1%	1%	12%	14%	13%	29%
Very imme. (1)	Count	0	4	20	0	1	4	45	75	187
	percentage	0%	4%	9%	0%	1%	2%	92%	74%	82%
Immediate (2)	Count	2	8	23	0	1	2	1	19	45
	percentage	29%	17%	28%	0%	2%	2%	14%	41%	55%

Prior mention		Adjective (3)			Question (4)			Vocal/gestural (5)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	Count	0	0	1	0	0	1	50	73	56
	percentage	0%	0%	0%	0%	0%	0%	65%	42%	20%
Very imme. (1)	Count	0	0	4	0	2	1	4	20	11
	percentage	0%	0%	2%	0%	2%	0%	8%	20%	5%
Immediate (2)	Count	0	0	3	0	0	0	4	18	9
	percentage	0%	0%	4%	0%	0%	0%	57%	39%	11%

In general, based on Table 29, the children's omitted forms decreased whereas their overt forms increased for new referents as they got older: The children used omitted forms 84%, 87%, and 58% of the time, in contrast, they used overt forms 16%, 13%, and 42% of the time at the ages of 12, 17, and 21 months respectively. The children's use of omitted and overt

forms for immediately mentioned referents showed a similar patterns with their use of omitted and overt referents for new referents. In other words, similar to their referential choices for new referents, the children used less omitted and more overt forms for immediately mentioned referents in time: The percentages of the children's omitted forms were 86%, 57%, and 39% and the percentages of the children's overt forms were 14%, 44%, and 61% for immediately mentioned referents at the ages of 12, 17, and 21 months respectively. On the other hand, the children's omitted forms increased from 8% to 24% whereas their overt forms decreased from 92% to 77% for very immediately mentioned referents at the age of 17 months.

Table 29: The proportions of the children's omitted and overt referential forms at 12, 17, and 21 months at different levels of prior mention

Prior mention		Omitted forms (0)			Overt forms (1)		
		Age of child (months)					
		12 m	17 m	21 m	12 m	17 m	21 m
New (0)	Count	65	152	166	12	23	119
	Percentage	84%	87%	58%	16%	13%	42%
Very immediate (1)	Count	4	24	31	45	78	196
	Percentage	8%	24%	14%	92%	77%	86%
Immediate (2)	Count	6	26	32	1	20	50
	Percentage	86%	57%	39%	14%	44%	61%

Table 30 below indicates the changes in the caregivers' uses of referential forms for new or previously mentioned referents depending on the children's age. For instance, the caregivers used less zero forms (45%) for new referents when the children were 21 months compared to their zero forms when the children were 12 months (60%) and 17 months (64%).

In contrast, the caregivers used slightly more nominal forms for new referents when the children were 21 months (25%) compared to their nominal forms when the children were 12 months (20%) and 17 months (23%). Therefore, it seems that the caregivers employed discourse context more competently in choosing their referential forms as their children got older.

For very immediately mentioned referents, the caregivers used more pronouns and used less nouns as the children got older. The proportions of the caregivers' pronominal forms were 3%, 5%, and 7% and the proportions of their nominal forms were 70%, 66%, and 61% when the children were at 12, 17, and 21 months. The proportions of the caregiver's omission rates did not change very much across children's increasing ages. Therefore, the caregivers predominantly used nominal forms in talked about very immediately mentioned referents at all the age points.

For immediately mentioned referents, the caregivers used less zero forms and more nominal forms as the children got older. The proportions of the caregivers' zero forms were 50%, 47%, and 44% whereas the proportions of their nominal forms were 38%, 46%, and 43%. Therefore, the caregivers more frequently used zero forms rather than nominal forms when the children were 12 and 17 months. However, their choices for zero vs. nominal forms became nearly equal when the children reached to 21 months of age. Besides the specified forms, the caregivers began to use adjectives for previously mentioned referents when the children were 21 months.

Table 30: The proportions of the regular caregivers' referential forms at different levels of prior mention when the children were at 12, 17, and 21 months

Prior mention		Age of child (months)								
		Zero (0)			Pronoun (1)			Noun (2)		
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	count	335	600	422	98	109	225	113	217	236
	percentage	60%	64%	45%	18%	12%	24%	20%	23%	25%
Very imme.										
(1)	count	51	130	162	7	22	36	148	297	334
	percentage	24%	29%	30%	3%	5%	7%	70%	66%	61%
Immediate										
(2)	Count	83	171	163	17	28	40	63	167	162
	percentage	50%	47%	44%	10%	8%	11%	38%	46%	43%
Prior mention		Age of child (months)								
		Adjective (3)			Question (4)			Vocal/gestural (5)		
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	Count	0	0	1	11	15	48	0	0	1
	percentage	0%	0%	0%	2%	2%	5%	0%	0%	0%
Very imme.										
(1)	Count	0	0	3	5	0	9	0	0	2
	percentage	0%	0%	1%	2%	0%	2%	0%	0%	0%
Immediate										
(2)	Count	0	0	3	2	1	4	0	0	3
	percentage	0%	0%	1%	1%	0%	1%	0%	0%	1%

5.1.2 Descriptive Analyses for the effects of the Three Discourse-pragmatic Principles on Children's and Regular Caregivers' Gestures

Chi-square tests conducted for the effects of three discourse-pragmatic principles on the variable "referential gesture" with fourteen sub-categories indicated that there were significant relationships between the three discourse-pragmatic principles and the children's and the regular caregivers' use of gesture ($ps < .001$). Table 31 demonstrates the chi-square statistics for the effect of each discourse-pragmatic principle on the children's and the caregiver's use of referential gestures.

Table 31: Pearson chi-square statistics for the association between the three discourse-pragmatic principles and the children's and the regular caregivers' choices among fourteen sub-categories of referential gestures

Speaker	Predictors	Pearson chi-square	df	p
Children	Joint attention	266.79	36	.0001
	Physical presence	89.46	12	.0001
	Prior mention	141.30	24	.0001
Speaker	Predictors	Pearson chi-square	df	p
Regular caregivers	Joint attention	349.70	36	.0001
	Physical presence	187.29	12	.0001
	Prior mention	116.09	24	.0001

Similar to the variable "referential form", we conducted some chi-square tests using the variable "referential gesture" as a binary variable in order to understand whether the data requires a further analysis, namely a binary logistic regression analysis. As Table 32 shows, the chi-square tests conducted after the reorganization of the variable "referential gesture" as a variable with two sub-categories (absent vs. present) indicated that the three discourse-

pragmatic principles significantly affected both the children's and the caregivers' choice between absence and presence of referential gestures. Based on these statistics, we decided on conducting a binary logistic regression analysis to understand the relative contribution of each discourse-pragmatic principle to the children's and their caregivers' use of referential gestures.

Table 32: Pearson chi-square statistics for the association between the three discourse-pragmatic principles and the children's and the regular caregivers' choices between absence and presence of referential gestures

Speaker	Predictors	Pearson chi-square	df	P
Children	Joint attention	187.60	3	.0001
	Physical presence	83.50	1	.0001
	Prior mention	93	2	.0001
Speaker	Predictors	Pearson chi-square	df	p
Regular caregivers	Joint attention	82.21	3	.0001
	Physical presence	165.92	1	.0001
	Prior mention	79.08	2	.0001

We also conducted some cross-tabs in order to describe the significant associations between the three discourse-pragmatic principles and the children's and their caregivers' choices among fourteen sub-categories of referential gestures. In the three sub-sections below, there are the percentages that present the children's and the caregivers' use of different referential gestures under the effect of three discourse-pragmatic principles.

5.1.2.1 *Joint Attention*

As Figure 7, Figure 8 show and Table 33, Table 34 in the absence of joint attention, the children and the caregivers did not display any gestures 69% and 48% of the time respectively. These proportions dropped from 69% to 11% for children and from 48% to 21 %

for caregivers when they attracted their addressee's attention towards a referent. The children primarily initiated the caregivers' attention to a referent by pointing to (36%), and secondarily reaching to the referent (19%) or giving the referent to their caregivers (10%). Similarly, the regular caregivers initiated the children's attention to a referent by mainly pointing to (29%) and secondarily reaching to the referent (13%) or giving the referent to the children (10%).

The children did not use any gestures (42%), or alternatively, pointed to (17%), reached to (15%) the referent or pointed to the referent by their head and/or eye(s) (12%) when they began to attend to the referents in which their caregivers had already turned to. The caregivers did not display any gestures (33%), or alternatively, they reached to the referent (25%), exhibited head and/or eye movement(s) (15%) or pointed to the referent (9%) when they followed the children's attention on a referent. Therefore, the children and their caregivers displayed similar gestures when they attended to a referent in which their addressee had already shown an interest.

The children and the regular caregivers did not use gestures very similar proportion of the time (31% and 34% respectively) when they keep attending to the same referent for a while. Alternatively, the children and their caregivers pointed to (19% and 8% respectively), reached to (16% and 13% respectively) or physically manipulated (12% and 15% respectively) the referent under such a situation.

Figure 7: The proportions of the children's referential gestures in different statuses of joint attention

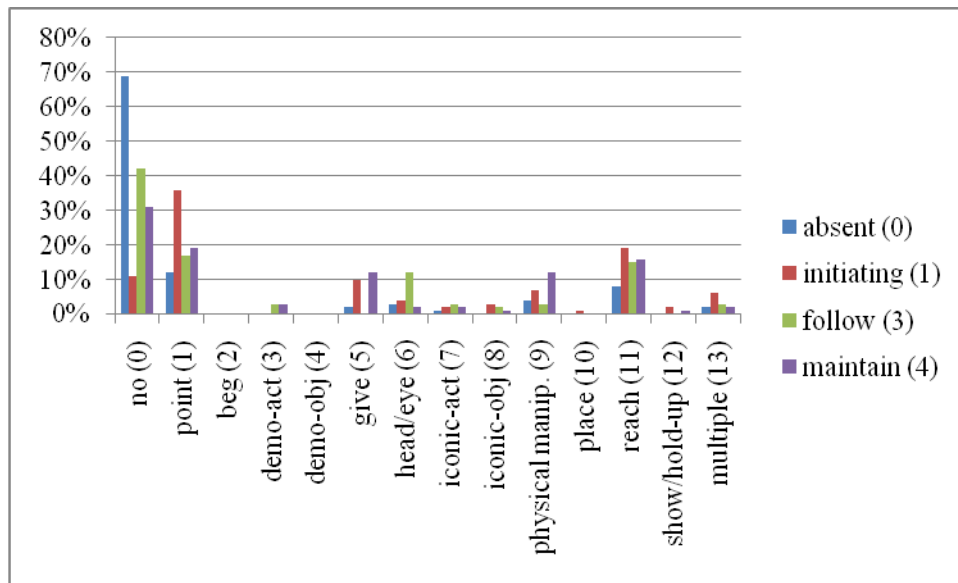


Figure 8: The proportions of the regular caregivers' referential gestures in different statuses of joint attention

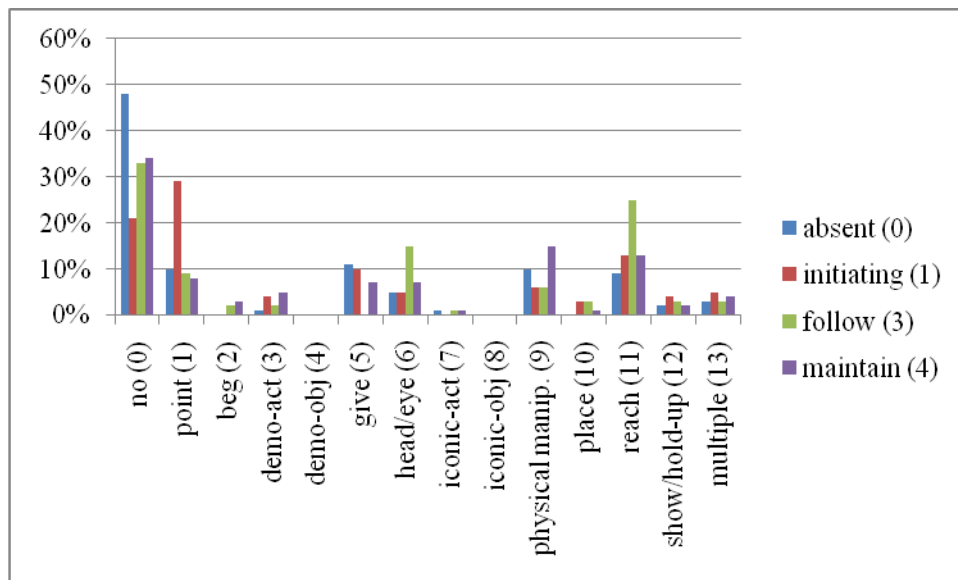


Table 33: The proportions of the children's gestures in different statuses of joint attention

Joint attention		No (0)	Point (1)	Beg (2)	Demo-act (3)	Demo-obj (4)	Give (5)	Head/eye (6)
Absent								
(0)	Count	165	28	0	0	0	4	8
	percentage	69%	12%	0%	0%	0%	2%	3%
Initiating								
(1)	Count	26	86	0	1	0	24	9
	percentage	11%	36%	0%	0%	0%	10%	4%
Follow								
(2)	Count	27	11	0	2	0	0	8
	percentage	42%	17%	0%	3%	0%	0%	12%
Maintain								
(3)	Count	125	76	1	12	0	47	9
	percentage	31%	19%	0%	3%	0%	12%	2%
Joint attention		Iconic-act (7)	Iconic-obj (8)	Physical manip. (9)	Place (10)	Reach (11)	Show/hold-up (12)	Multiple (13)
Absent								
(0)	Count	2	0	10	0	18	0	4
	percentage	1%	0%	4%	0%	8%	0%	2%
Initiating								
(1)	Count	5	6	16	3	46	5	15
	percentage	2%	3%	7%	1%	19%	2%	6%
Follow								
(2)	Count	2	1	2	0	10	0	2
	percentage	3%	2%	3%	0%	15%	0%	3%

Maintain

(3)	Count	9	3	48	1	65	3	10
	percentage	2%	1%	12%	0%	16%	1%	2%

Table 34: The proportions of the regular caregivers' gestures in different statuses of joint attention

Joint attention		No (0)	Point (1)	Beg (2)	Demo-act (3)	Demo-obj (4)	Give (5)	Head/eye (6)
Absent								
(0)	Count	369	76	0	10	0	84	42
	percentage	48%	10%	0%	1%	0%	11%	5%
Initiating								
(1)	Count	69	97	1	14	0	33	18
	percentage	21%	29%	0%	4%	0%	10%	5%
Follow								
(2)	Count	67	18	4	3	0	0	31
	percentage	33%	9%	2%	2%	0%	0%	15%
Maintain								
(3)	Count	529	127	41	78	0	106	100
	percentage	34%	8%	3%	5%	0%	7%	7%
Joint attention		Iconic-act (7)	Iconic-obj (8)	Physical manip. (9)	Place (10)	Reach (11)	Show/hold-up (12)	Multiple (13)
Absent								
(0)	Count	9	1	78	3	66	17	20
	percentage	1%	0%	10%	0%	9%	2%	3%
Initiating								
(1)	Count	1	1	21	9	43	12	18
	percentage	0%	0%	6%	3%	13%	4%	5%
Follow								
(2)	Count	1	0	12	5	50	6	7

	percentage	1%	0%	6%	3%	25%	3%	3%
Maintain								
(3)	Count	18	2	229	21	196	34	58
	percentage	1%	0%	15%	1%	13%	2%	4%

As Table 35 shows, the children's referential gestures varied at the four levels of joint attention depending on their ages. For example, in the absence of joint attention, they did not predominantly display any gestures (83%) at 12 months. At 17 and 21 months, the cases that the children did not use any gestures decreased to 61% and 70% respectively. At 17 months, they began to use pointing (25%) for the referents they and their caregivers were not jointly attending to. Around the age of 21 months, the proportions of their reaching gestures for such referents increased to 12% from 8% at 12 months and 0% at 17 months.

Children drew their partner's attention to a referent mainly by reaching to the referent (39%), giving the referent to their addressee (25%), pointing to the referent (17%), and physically manipulated the referent (11%) when they were 12 months of age. With the same purpose, they mostly used pointing (39%), and reaching (19%) gestures at 17 months. The children continued to use pointing (39%), and reaching (14%) most of the time when they reached 21 months. The proportion of the cases that the children did not display any gestures in initiating their caregivers' attention to a referent were 8%, 5%, and 15% at the ages of 12, 17, and 21 months respectively. Furthermore, the children began to use more than one gesture (11%) in attracting the caregiver's attention to a referent at the age of 17 months.

The children also exhibited distinct gestures at different ages when they followed their partner's attention. They did not display any gestures 40%, 14% and 45% of the time at the ages of 12, 17, and 21 months respectively. Based on the specified proportions, especially at 17 months, the children's number of gestures increased as they followed their partner's

attentional focus. When they used a gesture, they mainly chose reach (40%) at 12 months, point (29%), demonstrate-action (14%), iconic-action (14%), physical manipulation (14%), and reach (14%) at 17 months, point (17%), head/eye (15%) and reach (13%) at 21 months. Interestingly, the children mostly needed to use more than one gesture (20%) at 12 months while they were involved in the activities that their caregivers were already interested in.

Lastly, when the children and their caregivers kept attending to the same referent for a while, the children primarily gave the referent to their conversational partners (58%) and reached to the referent (16%) at 12 months. Under the same situation, the children mostly pointed to (28%), physically manipulated (19%), and reached to (18%) the referent at 17 months and they did not commonly display any gestures (44%) or mostly reached to the referent (15%) when they used a gesture at 21 months.

Table 35: The proportions of the children's referential gestures at 12, 17, and 21 months in different statuses of joint attention

Joint attention		No (0)			Point (1)			Beg (2)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	30	46	89	0	19	9	0	0	0
	percentage	83%	61%	70%	0%	25%	7%	0%	0%	0%
Initiating (1)	Count	3	4	19	6	31	49	0	0	0
	percentage	8%	5%	15%	17%	39%	39%	0%	0%	0%
Follow (2)	Count	2	1	24	0	2	9	0	0	0
	percentage	40%	14%	45%	0%	29%	17%	0%	0%	0%
Maintain (3)	count	2	18	105	1	36	39	1	0	0
	percentage	5%	14%	44%	3%	28%	16%	3%	0%	0%
Joint attention		Demonstrate-action (3)			Demonstrate-object (4)			Give (5)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	0	0	0	0	0	0	1	2	1
	percentage	0%	0%	0%	0%	0%	0%	3%	3%	1%
Initiating (1)	Count	0	0	1	0	0	0	9	7	8
	percentage	0%	0%	1%	0%	0%	0%	25%	9%	6%
Follow (2)	Count	0	1	1	0	0	0	0	0	0
	percentage	0%	14%	2%	0%	0%	0%	0%	0%	0%
Maintain (3)	Count	0	7	5	0	0	0	22	9	16
	percentage	0%	5%	2%	0%	0%	0%	58%	7%	7%

Joint attention		Head/eye (6)			Iconic-action (7)			Iconic-object (8)		
Age of child (months)										
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	0	3	5	0	1	1	0	0	0
	percentage	0%	4%	4%	0%	1%	1%	0%	0%	0%
Initiating (1)	Count	0	5	4	0	1	4	0	5	1
	percentage	0%	6%	3%	0%	1%	3%	0%	6%	1%
Follow (2)	Count	0	0	8	0	1	1	0	0	1
	percentage	0%	0%	15%	0%	14%	2%	0%	0%	2%
Maintain (3)	Count	1	2	6	1	4	4	0	1	2
	percentage	3%	2%	3%	3%	3%	2%	0%	1%	1%
Joint attention		Physical manipulation (9)			Place (10)			Reach (11)		
Age of child (months)										
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	0	2	8	0	0	0	3	0	15
	percentage	0%	3%	6%	0%	0%	0%	8%	0%	12%
Initiating (1)	Count	4	1	11	0	0	3	14	15	17
	percentage	11%	1%	9%	0%	0%	2%	39%	19%	14%
Follow (2)	Count	0	1	1	0	0	0	2	1	7
	percentage	0%	14%	2%	0%	0%	0%	40%	14%	13%
Maintain (3)	Count	1	25	22	0	1	0	6	24	35
	percentage	3%	19%	9%	0%	1%	0%	16%	18%	15%
Joint attention		Show/hold-up (12)			Multiple (13)					
Age of child (months)										

		12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	0	0	0	2	2	0
	percentage	0%	0%	0%	6%	3%	0%
Initiating (1)	Count	0	2	3	0	9	6
	percentage	0%	3%	2%	0%	11%	5%
Follow (2)	Count	0	0	0	1	0	1
	percentage	0%	0%	0%	20%	0%	2%
Maintain (3)	Count	0	0	3	3	4	3
	percentage	0%	0%	1%	8%	3%	1%

Overall, based on Table 36, the percentages of the cases that the children did not use any gestures decreased from 83% to 70% in the absence of joint attention and increased from 9% to 35% in the presence of joint attention by the age of 21 months. In other words, the percentages of the cases that the children used at least one gesture increased from 17% to 31% in the absence of joint attention and decreased from 91% to 65% in the presence of joint attention by the age of 21 months. Therefore, it seems that the children were acquiring to use more gestures in the absence of joint attention and less gestures in the presence of joint attention as they got older.

Table 36: The proportions of gesture-absent and gesture-present conditions for the children at 12, 17, and 21 months in different statuses of joint attention

Joint attention		Gesture-absent (0)			Gesture-present (1)		
		Age of child (months)					
		12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	30	46	89	6	29	39
	percentage	83%	61%	70%	17%	39%	31%
Present (1)	Count	7	23	148	72	195	274
	percentage	9%	11%	35%	91%	89%	65%

As Table 37 indicates, the regular caregivers' gestures also varied at different levels of joint attention depending on the children's age. In the absence of joint attention, the caregivers did not exhibit any gestures 49% of the time when their children were 12 months. They mostly displayed pointing (10%) and reaching (10%) in order to talk about a referent that the children and their caregivers did not jointly attend to. The cases that they did not exhibit any gestures dropped to 34% when the children reached to 17 months of age. At this age point, the mostly displayed gestures of the caregivers were give (21%) and physical manipulation (17%). When the children were 21 months, the cases that the caregivers did not display any gestures increased to 57%. The caregivers mostly pointed to the referent (12%) in the absence of joint attention when the children at 21 months.

When the caregivers attracted the children's attention to a referent, they did not exhibit any gestures 21% of the time when the children were 12 months of age. The caregivers' most common gestures at this time were give (18%), point (13%), and reach (11%). The cases that the caregivers did not display any gestures reduced to 15% when the children were 17 months. The caregivers mostly used reach (22%), give (15%), and physical manipulation

(14%) at this age point. When the children reached to the age of 21 months, the number of cases the caregivers did not exhibit any gestures was 23%. At the same age point, the caregivers' pointing increased to 48% from 13% in attracting their children's attention to the referent.

In order to follow the children's interest on a referent, the caregivers commonly signaled the referent with their head and/or eye(s) (26%) and reached to the referent (19%) when their children at 12 months. The cases where the caregivers did not use any gestures were 29% when the children were 12 months. The caregivers commonly reached to (31%) and pointed to (11%) the referent on which their children was focusing on. The cases where caregivers did not display any gestures dropped to 26% when the children at 17 months. The caregivers mostly reached to the referent (23%) and signaled the referent by their head and/or eye(s) (14 %) when the children were at 21 months. At the same age point, the cases where the caregivers did not display any gestures reached to 39%.

At the times the children and the caregivers focused on the same referent, the caregivers signaled the referent by the gestures of give (12%), reach (13%), and physical manipulation (12%) when the children were at 12 months. Under a similar situation, the caregivers physically manipulated (21%) and reached to the referent (14%) when the children at 17 months. The most commonly used gestures of the caregivers were physical manipulation (12%), reach (12%), point (11%) when the children were at 21 months. The cases that the caregivers did not use any gestures were the highest at the time when the children were 21 months of age (40%).

Table 37: The proportions of the regular caregivers' referential gestures in different statuses of joint attention when the children were at 12, 17, and 21 months

Joint attention		No (0)			Point (1)			Beg (2)		
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	113	79	177	23	15	38	0	0	0
	percentage	49%	34%	57%	10%	6%	12%	0%	0%	0%
Initiating (1)	Count	18	13	38	11	7	79	1	0	0
	percentage	21%	15%	23%	13%	8%	48%	1%	0%	0%
Follow (2)	Count	12	17	38	2	7	9	2	2	0
	percentage	29%	26%	39%	5%	11%	9%	5%	3%	0%
Maintain (3)	count	134	142	253	22	33	72	14	19	8
	percentage	36%	26%	40%	6%	6%	11%	4%	4%	1%
Joint attention		Demonstrate-action (3)			Demonstrate-object (4)			Give (5)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
Absent	Count	3	6	1	0	0	0	19	49	16
	Percent	1%	3%	0%	0%	0%	0%	8%	21%	5%
Initiating (1)	Count	4	8	2	0	0	0	16	13	4
	percentage	5%	9%	1%	0%	0%	0%	18%	15%	2%
Follow (2)	Count	0	1	2	0	0	0	0	0	0
	percentage	0%	2%	2%	0%	0%	0%	0%	0%	0%
Maintain (3)	Count	8	46	24	0	0	0	46	39	21

		percentage	2%	9%	4%	0%	0%	0%	12%	7%	3%
Joint attention		Head/eye (6)			Iconic-action (7)			Iconic-object (8)			
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Absent (0)	Count	20	5	17	0	5	4	0	0	1	
	percentage	9%	2%	6%	0%	2%	1%	0%	0%	0%	
Initiating (1)	Count	4	1	13	0	0	1	0	1	0	
	percentage	5%	1%	8%	0%	0%	1%	0%	1%	0%	
Follow (2)	Count	11	6	14	0	1	0	0	0	0	
	percentage	26%	9%	14%	0%	2%	0%	0%	0%	0%	
Maintain (3)	Count	24	29	47	3	10	5	0	0	2	
	percentage	7%	5%	7%	1%	2%	1%	0%	0%	0%	
Joint attention		Physical manipulation (9)			Place (10)			Reach (11)			
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Absent (0)	Count	11	39	28	0	2	1	24	19	23	
	Percent	5%	17%	9%	0%	1%	0%	10%	8%	7%	
Initiating (1)	Count	6	12	3	6	0	3	10	19	14	
	percentage	7%	14%	2%	7%	0%	2%	11%	22%	9%	
Follow (2)	Count	1	5	6	3	1	1	8	20	22	
	percentage	2%	8%	6%	7%	2%	1%	19%	31%	23%	
Maintain (3)	Count	43	111	75	5	6	10	48	73	75	
	percentage	12%	21%	12%	1%	1%	2%	13%	14%	12%	
Joint attention		Show/hold-up (12)			Multiple (13)						

		Age of child (months)					
		12 m	17 m	21 m	12 m	17 m	21 m
Absent (0)	Count	8	7	2	9	8	3
	percentage	4%	3%	1%	4%	3%	1%
Initiating (1)	Count	7	3	2	5	8	5
	percentage	8%	4%	1%	6%	9%	3%
Follow (2)	Count	0	3	3	3	2	2
	percentage	0%	5%	3%	7%	3%	2%
Maintain (3)	Count	10	10	14	13	19	26
	percentage	3%	2%	2%	4%	4%	4%

5.1.2.2 Physical Presence

As Figure 9, Figure 10 and Table 38, Table 39 indicate, the children and the regular caregivers did not predominantly use any gestures for the physically absent referents. The children, 73% of the time, and their caregivers, 70% of the time, did not display any gestures while referring to physically absent referents. For physically absent referents which were in another room of the house, the children moved towards the direction where the referent could be (11%).

The proportions of the cases that the children and the caregivers did not use any gestures dropped to 31% and 33% respectively when a referent was physically present. For such referents, the children mostly pointed to (22%), reached to (15%), physically manipulated (10%) the referent or gave the referent to their addressee (9%). Similar to the children, the caregivers reached to (13%), physically manipulated (13%), pointed to the referent (12%) or gave the referent to their addressee (8%). Based on these proportions, it

seems that the children and their caregivers used similar gestures for both physically absent and physically present referents.

Figure 9: The proportions of the children's referential gestures in the absence and the presence of a referent

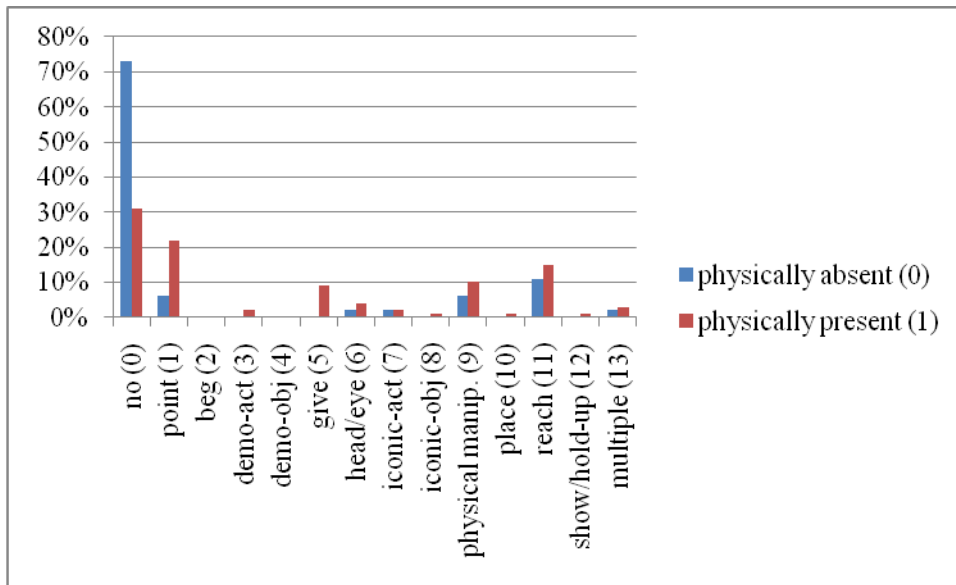


Figure 10: The proportions of the regular caregivers' referential gestures in the absence and the presence of a referent

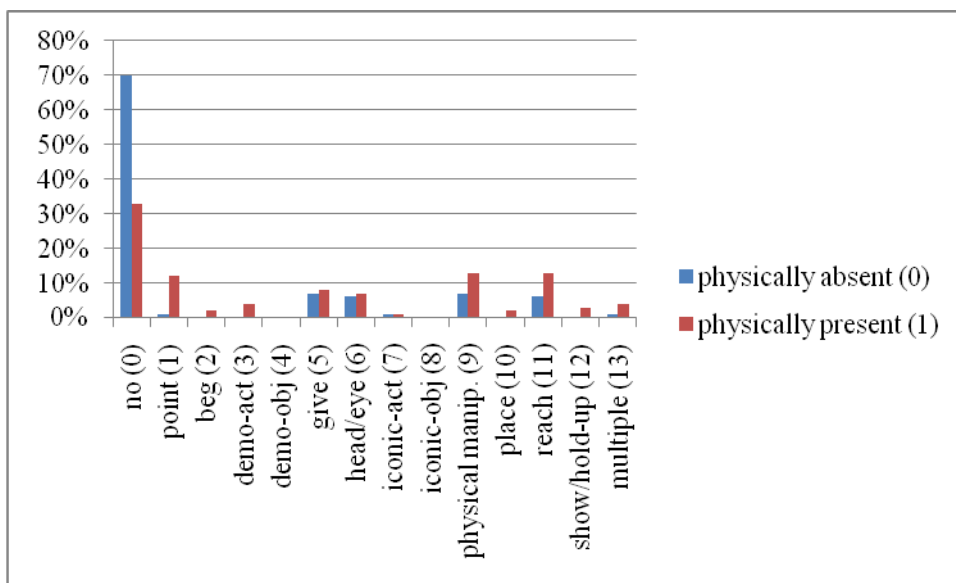


Table 38: The proportions of the children's gestures in the absence and in the presence of a referent

Physical status		No (0)	Point (1)	Beg (2)	Demo-act (3)	Demo-obj (4)	Give (5)	Head/eye (6)
Physical								
absence (0)	Count	90	7	0	0	0	0	3
	percentage	73%	6%	0%	0%	0%	0%	2%
Physical								
presence (1)	Count	266	194	1	15	0	75	33
	percentage	31%	22%	0%	2%	0%	9%	4%
Physical status		Iconic-act (7)	Iconic-obj (8)	Physical manip.(9)	Place (10)	Reach (11)	Show/hold-up (12)	Multiple (13)
Physical								
absence (0)	Count	2	0	7	0	13	0	2
	percentage	2%	0%	6%	0%	11%	0%	2%
Physical								
presence (1)	Count	16	10	87	4	129	8	29
	percentage	2%	1%	10%	1%	15%	1%	3%

Table 39: The proportions of the regular caregivers' gestures in the absence and in the presence of a referent

Physical status		No (0)	Point (1)	Beg (2)	Demo-act (3)	Demo-obj (4)	Give (5)	Head/eye (6)
Physical								
absence (0)	Count	213	3	0	1	0	21	17
	percentage	70%	1%	0%	0%	0%	7%	6%
Physical								
presence (1)	Count	865	322	46	109	0	206	184
	percentage	33%	12%	2%	4%	0%	8%	7%
Physical status		Iconic-act (7)	Iconic-obj (8)	Physical manip (9)	Place (10)	Reach (11)	Show/hold-up (12)	Multiple (13)
Physical								
absence (0)	Count	3	0	22	1	18	0	4
	percentage	1%	0%	7%	0%	6%	0%	1%
Physical								
presence (1)	Count	30	4	332	39	354	69	99
	percentage	1%	0%	13%	2%	13%	3%	4%

As Table 40 shows, for physically absent referents, the children predominantly did not display any gestures (88%) at 12 months. The only gesture they exhibited to refer to physically absent referents at this age was reach (13%). When they reached to 17 and 21 months, the number of their gestures for physically absent referents increased. In other words, the proportion of the cases that the children did not use any gestures were 76% and 64% respectively at these ages. The gestures displayed by the children at 17 months were point

(10%), head/eye (5%), iconic-action (2%), and reach (2%). The children commonly used reaching (15%) to refer to physically absent referents at the age of 21 months.

The children displayed more gestures at all ages for physically present referents. In other words, the cases they did not exhibit any gestures at the ages 12, 17, and 21 months were 21%, 16%, and 40% respectively. For physically present referents, the children mostly used give (31%), reach (21%), and physical manipulation (12%) at 12 months, point (32%), reach (16%), and physical manipulation (12%) at 17 months, point (21%) and reach (13%) at 21 months.

Table 40: The proportions of the children's referential gestures at 12, 17, and 21 months in the absence and in the presence of a referent

Physical status		No (0)			Point (1)			Beg (2)			
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Physically absent (0)		Count	21	31	38	0	4	3	0	0	0
		percentage	88%	76%	64%	0%	10%	5%	0%	0%	0%
Physically present (1)		Count	22	43	201	7	84	103	1	0	0
		percentage	21%	16%	40%	7%	32%	21%	1%	0%	0%
Physical status		Demonstrate-action (3)			Demonstrate-object (4)			Give (5)			
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Physically absent (0)		Count	0	0	0	0	0	0	0	0	0
		percentage	0%	0%	0%	0%	0%	0%	0%	0%	0%
Physically present (1)		Count	0	8	7	0	0	0	32	18	25
		percentage	0%	3%	1%	0%	0%	0%	31%	7%	5%
Physical status		Head/eye (6)			Iconic-action (7)			Iconic-object (8)			
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Physically count		0	2	1	0	1	1	0	0	0	

absent (0)		percentage	0%	5%	2%	0%	2%	2%	0%	0%	0%
Physically											
present (1)	Count		1	10	22	1	6	9	0	6	4
	percentage		1%	4%	4%	1%	2%	2%	0%	2%	1%
Physical status		Physical manipulation (9)			Place (10)			Reach (11)			
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Physically											
absent (0)	Count	0	0	7	0	0	0	3	1	9	
	percentage	0%	0%	12%	0%	0%	0%	13%	2%	15%	
Physically											
present (1)	Count	12	32	43	0	1	3	22	41	66	
	percentage	12%	12%	9%	0%	0%	1%	21%	16%	13%	
Physical status		Show/hold-up (12)			Multiple (13)						
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m				
Physically											
absent (0)	Count	0	0	0	0	2	0				
	percentage	0%	0%	0%	0%	5%	0%				
Physically											
present (1)	Count	0	2	6	6	13	10				
	percentage	0%	1%	1%	6%	5%	2%				

In general, as Table 41 indicates, the percentages of the cases that the children did not use any gestures decreased from 88% to 64% for physically absent referents and increased from 21% to 40% for physically present referents by the age of 21 months. In other words, the percentages of the cases that the children used at least one gesture increased from 13% to 36% for physically absent referents and decreased from 79% to 60% for physically present referents by the age of 21 months.

Table 41: The proportions of gesture-absent and gesture-present conditions for children at 12, 17, and 21 months in the absence and in the presence of a referent

Physical presence		Gesture-absent (0)			Gesture-present (1)		
		Age of Child (months)					
		12 m	17 m	21 m	12 m	17 m	21 m
Physically absent (0)	Count	21	31	38	3	10	21
	Percentage	88%	76%	64%	13%	24%	36%
Physically present (1)	Count	22	43	201	82	222	301
	Percentage	21%	16%	40%	79%	84%	60%

As Table 42 displays, the caregivers did not use any gestures 72% of the time for physically absent referents when their children were 12 months of ages. At this age point, the caregivers mostly referred to the referents by their head and/or eye(s) (15%). When the children were 17 months of age, the proportion of the cases that the caregivers did not refer to physically absent referents by gestures reached to 82%. The caregivers' most common gesture for such referents at this age of the children was reach (7%). When the children were at 21 months, the cases that the caregivers did not display any gestures for physically absent referents dropped to 65%. The caregivers' most common gestures at this age of children were reach (6%) and head/eye (5%).

When a referent was physically present, the proportion of the cases that the caregivers did not use any gestures dropped from 72% to 37% when the children were at 12 months. The most common gestures of the caregivers to talk about such referents at this age were reach (13%) and give (11%). When the children were at 17 months, the cases that the caregivers did not exhibit any gestures for physically present referents were reduced to 23%. Physical manipulation (20%), reach (15%), and give (11%) were commonly displayed gestures of the caregivers for physically present referents at 17 months. When the children reached 21 months of age, the caregivers continued not to exhibit any gestures for some physically present referents (38%). Alternatively, they referred to such referents mostly by the gestures of point (19%) and reach (12%).

Table 42: The proportions of the regular caregivers' referential gestures in the absence and in the presence of a referent when the children were at 12, 17, and 21 months

Physical status		No (0)			Point (1)			Beg (2)			
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Physically absent (0)		Count	34	56	123	0	0	3	0	0	0
		percentage	72%	82%	65%	0%	0%	2%	0%	0%	0%
Physically present (1)		Count	264	203	398	59	67	196	17	21	8
		percentage	37%	23%	38%	8%	8%	19%	2%	2%	1%
Physical status		Demonstrate-action (3)			Demonstrate-object (4)			Give (5)			
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Physically absent (0)		Count	0	0	1	0	0	0	2	6	13
		percentage	0%	0%	1%	0%	0%	0%	4%	9%	7%
Physically present (1)		Count	17	64	28	0	0	0	80	96	30
		percentage	2%	7%	3%	0%	0%	0%	11%	11%	3%
Physical status		Head/eye (6)			Iconic-action (7)			Iconic-object (8)			
		Age of child (months)									
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Physically count		7	0	10	0	1	2	0	0	0	

absent (0)		percentage	15%	0%	5%	0%	2%	1%	0%	0%	0%
Physically											
present (1)	Count	56	43	85	3	16	11	0	1	3	
	percentage	8%	5%	8%	0%	2%	1%	0%	0%	0%	
Physical status		Physical manipulation (9)			Place (10)			Reach (11)			
Age of child (months)											
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	
Physically		-----			-----			-----			
absent (0)	Count	1	0	21	0	0	1	1	5	12	
	percentage	2%	0%	11%	0%	0%	1%	2%	7%	6%	
Physically											
present (1)	Count	66	175	91	16	9	14	91	137	126	
	percentage	9%	20%	9%	2%	1%	1%	13%	15%	12%	
Physical status		Show/hold-up (12)			Multiple (13)						
Age of child (months)											
		12 m	17 m	21 m	12 m	17 m	21 m				
Physically		-----			-----						
absent (0)	Count	0	0	0	2	0	2				
	percentage	0%	0%	0%	4%	0%	1%				
Physically											
present (1)	Count	25	23	21	28	37	34				
	percentage	4%	3%	2%	4%	4%	3%				

5.1.2.3 *Prior Mention*

As Figure 11, Figure 12 and Table 43, Table 44 show, if a referent was new, the children did not display any gestures (23%), alternatively, pointed to (21%), reached to the referent (18%), gave the referent to their addressee (12%) or physically manipulated the referent (10%). Similarly, the regular caregivers did not use any gestures (31%), reached to (15%), physically manipulated (13%) or pointed to (11%) the referent when the referent was new.

If a referent was very immediately mentioned in conversation, both the children and their caregivers did not use any gestures most of the time (56% and 49% respectively). However, the children also pointed to (18%), reached to (11%), physically manipulated (7%) a very immediately mentioned referent. Their caregivers also pointed to (10%), physically manipulated (10%), reached to (9%) a very immediately mentioned referent or signaled the referent by their head and/or eye(s) (8%).

Compared to very immediately mentioned referents, immediately mentioned referents dropped the proportion that the children and their caregivers did not display any gestures, from 56% to 35% and from 49% to 41% respectively. The children commonly pointed to (25%), physically manipulated (13%) or reached to (10%) the referents which were immediately mentioned in conversation. The caregivers most frequently physically manipulated (13%), reached to (11%) or pointed to (10%) the immediately mentioned referents.

Figure 11: The proportions of the children's referential gestures at different levels of prior mention

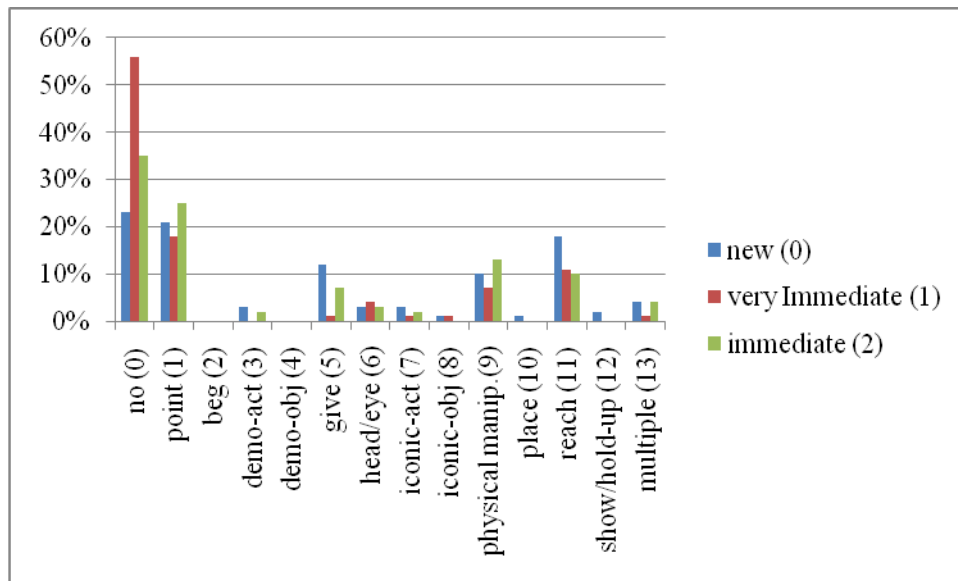


Figure 12: The proportions of the regular caregivers' referential gestures at different levels of prior mention

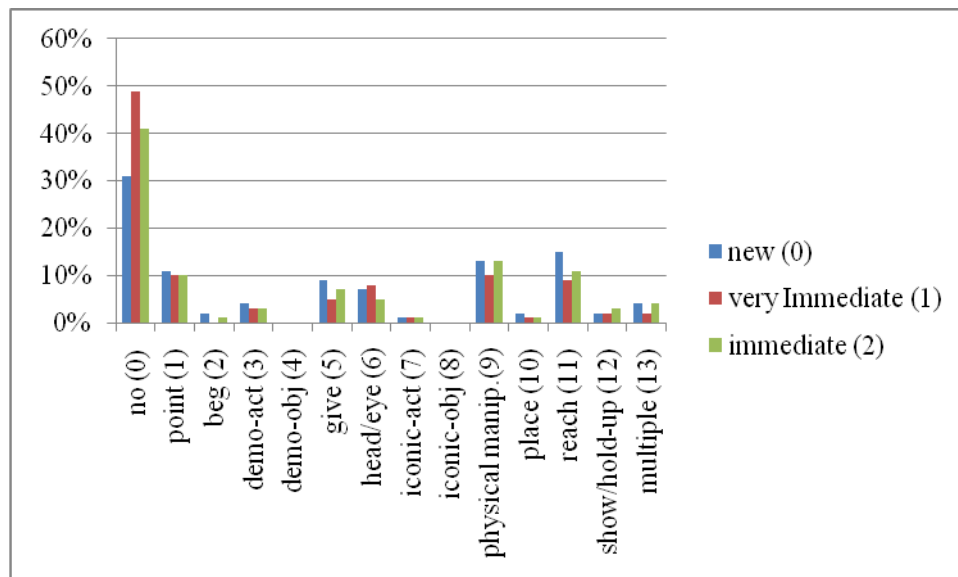


Table 43: The proportions of the children's referential gestures at different levels of prior mention

Prior mention		No (0)	Point (1)	Beg (2)	Demo-act (3)	Demo-obj (4)	Give (5)	Head/eye (6)
New (0)	Count	121	108	1	13	0	62	17
	percentage	23%	21%	0%	3%	0%	12%	3%
Very								
imme. (1)	Count	196	62	0	0	0	5	15
	percentage	56%	18%	0%	0%	0%	1%	4%
Immediate								
(2)	Count	42	30	0	2	0	8	4
	percentage	35%	25%	0%	2%	0%	7%	3%
Prior mention		Iconic-act (7)	Iconic-obj (8)	Physical manip.(9)	Place (10)	Reach (11)	Show/hold-up (12)	Multiple (13)
New (0)	Count	13	7	50	4	94	8	22
	percentage	3%	1%	10%	1%	18%	2%	4%
Very								
Imme. (1)	count	3	3	26	0	37	0	4
	percentage	1%	1%	7%	0%	11%	0%	1%
Immediate								
(2)	Count	2	0	16	0	12	0	5
	percentage	2%	0%	13%	0%	10%	0%	4%

Table 44: The proportions of the regular caregivers' referential gestures at different levels of prior mention

Prior mention		No (0)	Point (1)	Beg (2)	Demo-act (3)	Demo-obj (4)	Give (5)	Head/eye (6)
New (0)	Count	510	188	40	66	0	144	113
	Percentage	31%	11%	2%	4%	0%	9%	7%
Very								
imme. (1)	Count	371	79	2	25	0	41	68
	Percentage	49%	10%	0%	3%	0%	5%	8%
Immediate								
(2)	Count	235	59	4	19	0	42	31
	Percentage	41%	10%	1%	3%	0%	7%	5%
Prior mention		Iconic-act (7)	Iconic-obj (8)	Physical manip.(9)	Place (10)	Reach (11)	Show/hold-up (12)	Multiple (13)
New (0)	Count	20	2	212	25	248	38	66
	Percentage	1%	0%	13%	2%	15%	2%	4%
Very								
imme. (1)	count	6	1	73	8	65	12	15
	Percentage	1%	0%	10%	1%	9%	2%	2%
Immediate								
(2)	count	7	1	73	6	61	19	22
	Percentage	1%	0%	13%	1%	11%	3%	4%

As Table 45 indicates, if a referent was new, the children at 12 months primarily gave the referent to their addressee (33%) or reached to the referent (29%). By 17 months, they commonly displayed the gestures of point (25%), reach (22%), and

physical manipulation (12%) to refer to a new referent. Around the age of 21 months, the most common gestures for such a referent were point (22%) and reach (13%). The proportions of the cases that the children did not signal a newly mentioned referent by any gestures were 15% at 12 months, 12% at 17 months, and 33% at 21 months.

In talking about very immediately mentioned referents, the children predominantly used physical manipulation (13%) when they were at 12 months, point (30%) when they were 17 months, point (16%) and reach (15%) when they were at 21 months. The children did not exhibit any gestures for these referents 71% of the time at 12 months, 51% of the time at 17 months, and 55% of the time at 21 months.

If a referent was immediately mentioned, the children predominantly used give (57%), point (29%), and reach (14%) at 12 months. They referred to such referents mainly by point (40%) at 17 months, by physical manipulation (17%), and point (16%) at 21 months. The children used referential gestures for every immediately mentioned referent when they were 12 months of age. The proportions of the cases that the children did not signal such a referent by a gesture were 23% and 45% when the children were 17 and 21 months of age respectively.

Table 45: The proportions of the children's referential gestures at 12,17, and 21 months at different levels of prior mention

Prior mention		No (0)			Point (1)			Beg (2)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	Count	11	20	90	4	43	61	1	0	0
	percentage	15%	12%	33%	5%	25%	22%	1%	0%	0%
Very										
imme. (1)	Count	32	46	118	1	27	34	0	0	0
	percentage	71%	51%	55%	2%	30%	16%	0%	0%	0%
Immediate										
(2)	Count	0	10	32	2	17	11	0	0	0
	percentage	0%	23%	45%	29%	40%	16%	0%	0%	0%
Prior mention		Demonstrate-act. (3)			Demonstrate-obj.(4)			Give (5)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	Count	0	7	6	0	0	0	25	16	21
	percentage	0%	4%	2%	0%	0%	0%	33%	9%	8%
Very										
imme. (1)	Count	0	0	0	0	0	0	3	0	2
	percentage	0%	0%	0%	0%	0%	0%	7%	0%	1%
Immediate										
(2)	Count	0	1	1	0	0	0	4	2	2
	percentage	0%	2%	1%	0%	0%	0%	57%	5%	3%

Prior mention		Head/eye (6)			Iconic-action (7)			Iconic-object (8)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	Count	0	6	11	1	4	8	0	5	2
	percentage	0%	4%	4%	1%	2%	3%	0%	3%	1%
Very										
imme. (1)	Count	1	3	11	0	2	1	0	1	2
	percentage	2%	3%	5%	0%	2%	1%	0%	1%	1%
Immediate										
(2)	Count	0	3	1	0	1	1	0	0	0
	percentage	0%	7%	1%	0%	2%	1%	0%	0%	0%
Prior mention		Physical manip. (9)			Place (10)			Reach (11)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	Count	6	20	24	0	1	3	22	37	35
	percentage	8%	12%	9%	0%	1%	1%	29%	22%	13%
Very										
imme. (1)	Count	6	8	12	0	0	0	2	2	33
	percentage	13%	9%	6%	0%	0%	0%	4%	2%	15%
Immediate										
(2)	Count	0	4	12	0	0	0	1	3	8
	percentage	0%	9%	17%	0%	0%	0%	14%	7%	11%
Prior mention		Show/hold-up (12)			Multiple (13)					
		Age of child (months)								

		12 m	17 m	21 m	12 m	17 m	21 m
New (0)	Count	0	2	6	6	11	5
	percentage	0%	1%	2%	8%	6%	2%
Very							
imme. (1)	Count	0	0	0	0	2	2
	percentage	0%	0%	0%	0%	2%	1%
Immediate							
(2)	Count	0	0	0	0	2	3
	percentage	0%	0%	0%	0%	5%	4%

In general, based on Table 46, the proportion of the cases that the children did not display any gestures increased from 14% to 33% for new referents, decreased from 65% to 54% for very immediately referents and increased 0% to 43% for immediately mentioned referents by the age of 21 months. In other words, the proportion of the cases that the children used at least one gesture decreased from 86% to 67% for new referents, increased from 35% to 46% for very immediately referents and decreased from 100% to 56% for immediately mentioned referents by the age of 21 months. Although the children did not have an overall control on their use of discourse-pragmatic principle "prior mention" in deciding on whether they use referential gestures or not, it seems that the children were learning that very immediately mentioned referents are more accessible for the listener than new referents.

Table 46: The proportions of gesture-absent and gesture-present conditions for children at 12, 17, and 21 months at different levels of prior mention

Prior mention		Gesture-absent (0)						Gesture-present (1)					
		Age of child (months)											
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	count	11	20	90	66	153	186						
	percentage	14%	12%	33%	86%	88%	67%						
Very immediate (1)	count	32	46	118	17	45	101						
	percentage	65%	51%	54%	35%	50%	46%						
Immediate (2)	count	0	10	32	7	33	41						
	percentage	0%	23%	43%	100%	77%	56%						

As Table 47 displays, the caregivers' gestures also varied at different levels of prior mention depending on the children's age. Talking about new referents, the regular caregivers most of the time reached to the referent (14%) and gave the referent to the children (13%) when the children were at 12 months. The most common gestures of the caregivers for new referents were physical manipulation (20%), reach (17%), and give (11%) when the children were at 17 months. The caregivers commonly pointed to (19%) and reached to (14%) the referents when the children were at 21 months. The caregivers did not display any gestures in talking about new referents 31%, 24%, and 35% of the time when the children were 12, 17, and 21 months of age respectively.

If a referent was very immediately mentioned, the most common gestures displayed by the caregivers were head and/or eye (12%) when the children were at 12 months, physical manipulation (17%) and reach (12%) when the children were at 17 months, and point (15%)

when the children were at 21 months. The proportion of the cases that the caregivers did not signal the referents by any gestures were 59%, 35%, and 54% at these months respectively.

For the referents that were immediately mentioned, the most common gestures were point (11%) and reach (10%) when the children were at 12 months, physical manipulation (16%), point (12%), give (10%), and reach (11%) when they were at 17 months, physical manipulation (12%) and reach (11%) when they were at 21 months. The caregivers did not exhibit any gestures for immediately mentioned referents 43%, 30%, and 48% of the time when the children were at 12, 17, and 21 months respectively.

Table 47: The proportions of the regular caregivers' referential gestures at different levels of prior mention when the children were at 12, 17, and 21 months

Prior mention		No (0)			Point (1)			Beg (2)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	count	148	131	231	36	26	126	12	20	8
	percentage	31%	24%	35%	8%	5%	19%	3%	4%	1%
Very										
imme. (1)	count	95	85	191	7	18	54	1	1	0
	percentage	59%	35%	54%	4%	7%	15%	1%	0%	0%
Immediate										
(2)	count	63	59	113	16	23	20	4	0	0
	percentage	43%	30%	48%	11%	12%	9%	3%	0%	0%
Prior mention		Demo-act. (3)			Demo-obj. (4)			Give (5)		
		Age of child (months)								
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	count	10	33	23	0	0	0	63	61	20
	percentage	2%	6%	4%	0%	0%	0%	13%	11%	3%
Very										
imme. (1)	count	3	18	4	0	0	0	9	21	11
	percentage	2%	7%	1%	0%	0%	0%	6%	9%	3%
Immediate										
(2)	count	4	13	2	0	0	0	10	20	12
	percentage	3%	7%	1%	0%	0%	0%	7%	10%	5%

Prior mention		Head/eye (6)			Iconic-action (7)			Iconic-object (8)		
Age of child (months)										
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	count	37	28	48	3	9	8	0	1	1
	percentage	8%	5%	7%	1%	2%	1%	0%	0%	0%
Very										
imme. (1)	count	19	10	31	0	3	3	0	0	1
	percentage	12%	4%	9%	0%	1%	1%	0%	0%	0%
Immediate										
(2)	count	8	6	17	0	5	2	0	0	1
	percentage	6%	3%	7%	0%	3%	1%	0%	0%	0%
Prior mention		Physical manipulation (9)			Place (10)			Reach (11)		
Age of child (months)										
		12 m	17 m	21 m	12 m	17 m	21 m	12 m	17 m	21 m
New (0)	count	48	107	57	13	1	11	67	92	89
	percentage	10%	20%	9%	3%	0%	2%	14%	17%	14%
Very										
imme. (1)	count	6	40	27	1	5	2	12	29	24
	percentage	4%	17%	8%	1%	2%	1%	8%	12%	7%
Immediate										
(2)	count	13	32	28	2	3	1	15	21	25
	percentage	9%	16%	12%	1%	2%	0%	10%	11%	11%
Prior mention		Show/hold-up (12)			Multiple (13)					
Age of child (months)										

		12 m	17 m	21 m	12 m	17 m	21 m
New (0)	count	20	11	7	17	21	28
	percentage	4%	2%	1%	4%	4%	4%
Very							
imme. (1)	count	1	6	5	6	6	3
	percentage	1%	3%	1%	4%	3%	1%
Immediate							
(2)	count	4	6	9	7	10	5
	percentage	3%	3%	4%	5%	5%	2%

5.2 *Binary Regression Logistic Analyses*

This section presents the results of the analyses obtained from Binary Logistic Regression. First, the analyses assessing the effects of the three discourse-pragmatic factors on the referential forms of the children and their regular caregivers are provided. Second, the analyses examining the role of the same three discourse-pragmatic features on the children's and their caregivers' gestures are exhibited.

5.2.1 *The Role of Joint Attention, Physical Presence and Prior Mention on Referential Forms of Turkish Toddlers and Their Caregivers*

Two models are presented to estimate the role of the coded discourse-pragmatic features on the first dependent variable, referential form with two levels (omitted vs. overt). The first model including only the main effects of the predictors reached its final version by testing the three predictors one at a time (See Model 1g). If the likelihood ratio test for inclusion of a predictor was significant, this predictor was kept in the model presented here. Table 48 and Table 49 indicate the likelihood ratio test statistics after the inclusion of each predictor variable to Model 1g, for the children and the caregivers, respectively.

Table 48: The likelihood test statistics of alternative models and Model 1g for the children's referential forms

Alternative models	-2 Log likelihood	Cox & Snell R square	Nagelkerke R square
Model 1a (joint attention)	1306.713	.068	.091
Model 1b (physical presence)	1386.640	.046	.062
Model 1c (prior mention)	1157.811	.246	.328
Model 1d (2 factor-model/joint attention and physical presence)	1300.694	.074	.098
Model 1e (2 factor-model/joint attention and prior mention)	1083.681	.255	.340
Model 1f (2 factor-model/physical presence and prior mention)	1125.579	.256	.342
Model 1g (3 factor-model in the present thesis)	1080.899	.257	.342

Table 49: The likelihood test statistics of alternative models and Model 1g for the caregivers' referential forms

Alternative models	-2 Log likelihood	Cox & Snell R square	Nagelkerke R square
Model 1a (joint attention)	5780.754	.037	.050
Model 1b (physical presence)	6081.914	.024	.032
Model 1c (prior mention)	6034.516	.053	.070
Model 1d (2 factor-model/joint attention and physical presence)	5764.551	.040	.054
Model 1e (2 factor-model/joint attention and prior mention)	5599.734	.074	.099
Model 1f (2 factor-model/physical presence and prior mention)	5876.016	.065	.087
Model 1g (3 factor-model in the present thesis)	5593.463	.075	.100

Model 2 reached its final version by testing interaction effects of each predictor variable with each other one by one (see Model 2d). As in the first model, each interaction was kept in the model as long as the likelihood ratio test for inclusion of the interaction was significant. Table 50 and Table 51 show the likelihood ratio test statistics after the inclusion of each interaction effect to Model 2, for the children and the caregivers, respectively.

Table 50: The likelihood test statistics of alternative interaction models and Model 2d for the children's referential forms

Alternative models	-2 Log likelihood	Cox & Snell R square	Nagelkerke R square
Model 2a (joint attention by physical presence)	1079.967	.257	.343
Model 2b (joint attention by prior mention)	1064.518	.269	.359
Model 2c (physical presence by prior mention)	1061.958	.271	.361
Model 2d (3 way-interaction/the model in the present thesis)	1056.461	.275	.366

Table 51: The likelihood test statistics of alternative interaction models and Model 2d for the caregivers' referential forms

Alternative models	-2 Log likelihood	Cox & Snell R square	Nagelkerke R square
Model 2a (joint attention by physical presence)	5591.887	.075	.101
Model 2b (joint attention by prior mention)	5568.884	.080	.107
Model 2c (physical presence by prior mention)	5563.129	.082	.109
Model 2d (3 way-interaction/the model in the present thesis)	5554.395	.083	.111

The first model (Model 1d) reliably predicted both the children's choices between omitted and overt referential forms ($X^2(4) = 294.30, p < .01$) and the caregivers' choices

between omitted and overt referential forms ($X^2(4) = 334.52, p < .01$). Between 26% and 34% of the variance in the children's referential forms (Cox and Snell $R^2 = .26$; Nagelkerke $R^2 = .34$) and between 8% and 10% of the variance in the caregivers' referential forms (Cox and Snell $R^2 = .08$; Nagelkerke $R^2 = .10$) were accounted for by Model 1d. In Model 1d with the three predictors, 74% of the children's referential forms and 63% of the caregivers' referential forms were accurately predicted. On the other hand, in a model without the effects of predictors (a constant-only model), 50% of the referential forms of children and 53% of the referential forms of their caregivers were accurately predicted. Thus, the three-predictor model estimated a higher percent of cases accurately both in the children's and their caregivers' referential forms. In this model, the effects of all three predictors on the referential forms were significant both for the children's and their caregivers' arguments ($p < .01$).

For the referential forms of children, *Wald statistics* for joint attention, physical presence and prior mention were respectively 3.29, 2.76, and 181.36. For the referential forms of caregivers, *Wald statistics* for joint attention, physical presence and prior mention were respectively 49.39, 5.30, and 152.08. Therefore, the effect of prior mention was the strongest factor on the referential forms of both children and the caregivers.

As Table 52 presents, the first model (Model 1d) indicated that children were more likely to use overt arguments such as nouns, pronouns, and question forms when the referents were very immediately or immediately mentioned in a discourse than when the referents were newly introduced. The odds of using overt forms were 11.15 times higher for very immediately mentioned referents and 2.46 times higher for immediately mentioned referents than the odds of using overt forms for new referents.

Table 52: Binary logistic regression test results for assessing the effects of the predictor variables on the children's referential forms

Predictors	B	SE	Wald	df	Sig	Exp (B)
Joint attention (1)	-.427	.235	3.288	1	.070	.653
Physical presence (1)	-.527	.317	2.756	1	.097	.590
Prior mention (very immediate) (1)	2.411	.179	181.283	1	.0001	11.146
Prior mention (immediate) (2)	.899	.208	18.754	1	.0001	2.458

Table 53 indicates the estimated coefficients of predictors on the referential forms of caregivers for Model 1d. The caregivers were less likely to use overt arguments when the referents were physically present than when the referents were physically absent. Similarly, they were less likely to use overt arguments in the presence of joint attention than in the absence of joint attention. Furthermore, they were more likely to use overt arguments for the referents which were very immediately or immediately mentioned than for the referents which were newly introduced to the discourse. The odds of overt arguments were .75 times lower for physically present referents than for physically absent referents. The odds of overt arguments were .54 times lower when both the caregivers and the children jointly attended to the referents than when they did not jointly attend to the referents. In other words, the caregivers were respectively 25% and 46% less likely to choose overt arguments for the referents which were physically present and jointly attended to, respectively. The odds of employing overt arguments by the caregivers were 2.69 times higher for the referents which were very immediately mentioned and 1.36 times higher for the referents which were immediately mentioned than the referents which were new.

Table 53: Binary logistic regression test results for assessing the effects of the predictor variables on the caregivers' referential forms

Predictors	B	SE	Wald	df	Sig	Exp (B)
Joint attention (1)	-.620	.088	49.389	1	.0001	.538
Physical presence (1)	-.294	.128	5.295	1	.021	.746
Prior mention (very immediate) (1)	.988	.080	152.045	1	.0001	2.687
Prior mention (immediate) (2)	.305	.082	13.917	1	.0001	1.357

The second model (Model 2d) which included the interaction effects was statistically significant for the referential forms of both children ($X^2(9) = 318.74, p < .01$) and adults ($X^2(11) = 373.59, p < .01$). The model accounted for the variance in the children's referential forms by 28% to 37% (Cox and Snell $R^2 = .28$; Nagelkerke $R^2 = .37$) and accounted for the variance in the caregivers' referential forms by 8% to 11% (Cox and Snell $R^2 = .08$; Nagelkerke $R^2 = .11$). Compared to the first model, both Cox and Snell R^2 and Nagelkerke R^2 respectively increased from .26 to .28 and from .34 to .37 in the analyses with the children's arguments. There was an increase for only the Nagelkerke R^2 (from .10 to .11) in the analyses with the caregivers' arguments. Moreover, -2-log-likelihood test statistics respectively were decreased from 1080.90 to 1056.46 and from 5593.46 to 5554.40 for the children's and their caregivers' referential forms. Therefore, the second model seemed more adequately to fit the data set in explaining the use of explicit vs. zero referential forms in the current study. Similar to Model 1d, 76% of the overall children's referential forms and 63% of the caregivers' referential forms were accurately predicted in Model 2d.

As Table 54 displays, Model 2d showed that children were less likely to use overt arguments in the presence of the referent. A physically present referent decreased the children's choices for overt arguments by 85% ($e^B = .15, p < .005$). However, the association

between the children's use of overt arguments and the physical status of the referents varied depending on prior mention of a referent. In other words, children were more likely to choose an overt argument when a physically present referent was very immediately addressed during the talk. The odds of overt arguments were 7.52 times higher when a physically present referent was very immediately mentioned in discourse compared to the odds of omitted arguments. However, the association between the physical status of the referent and the referential choices of children did not depend on joint attention on the referent by the children and their caregivers.

Table 54: Binary logistic regression test for the effect of the interaction of the three discourse-pragmatic factors on the children's referential forms

Predictors	B	S.E.	Wald	df	Sig.	Exp(B)
Joint attention (1)	-22.761	40192.587	.000	1	1	.000
Physical presence (1)	-1.915	.651	8.646	1	.003	.147
Prior mention (very immediate) (1)	-.032	.620	.003	1	.959	.968
Prior mention (immediate) (2)	-.865	.700	1.527	1	.217	.421
Joint attention(1) by Physical presence (1)	21.930	40192.587	.000	1	1	3E+009
Joint attention (1) by Prior mention (very immediate) (1)	.824	.538	2.342	1	.126	2.279
Joint attention (1) by Prior mention (immediate) (2)	.759	.590	1.653	1	.199	2.136
Physical presence (1) by Prior mention (very immediate) (1)	2.018	.790	6.518	1	.011	7.523
Physical presence (1) by Prior mention (immediate) (2)	1.222	.882	1.918	1	.166	3.393

Table 55 shows the estimated coefficients for the interaction of the predictors on the caregivers' referential forms. According to the interaction model (Model 2d), the caregivers were less likely to use overt arguments when a referent was physically present and immediately mentioned. Physical presence and immediate mention of a referent reduced the caregivers' choices for overt arguments by 62% ($e^B = .38, p < .001$) and 55% ($e^B = .45, p < .005$) respectively. The association between the caregivers' use of overt arguments and the physical presence of the referents depended on whether the referent was very immediately or

immediately addressed in the discourse. A very immediate mention of a physically present referent increased the odds of caregivers' choices for overt arguments by 2.81 times and an immediate mention of a physically present referent raised the odds of caregivers' use of overt arguments by 2.34 times. Joint attention on a referent did not significantly affect the caregivers' use of overt arguments.

Table 55: Binary logistic regression test for the effect of the interaction of the three discourse-pragmatic factors on the caregivers' referential forms

Predictors	B	SE	Wald	df	Sign	Exp (B)
Joint attention (1)	-.914	.935	.956	1	.328	.401
Physical presence (1)	-.973	.233	17.467	1	.0001	.378
Prior mention (very immediate) (1)	-.211	.247	.729	1	.393	.810
Prior mention (immediate) (2)	-.804	.279	8.288	1	.004	.447
Joint attention (1) by Physical presence (1)	.094	.943	.010	1	.920	1.099
Joint attention (1) by Prior mention (very immediate) (1)	21.008	28420.451	.000	1	.999	1E+009
Joint attention (1) by Prior mention (immediate) (2)	21.602	40192.587	.000	1	1	2E+009
Physical presence (1) by Prior mention (very immediate) (1)	1.033	.321	10.375	1	.001	2.810
Physical presence (1) by Prior mention (immediate) (2)	.850	.336	6.388	1	.011	2.340
Joint attention (1) by Physical presence (1) by Prior mention (very immediate) (1)	-20.639	28420.451	.000	1	.999	.000
Joint attention (1) by Physical presence (1) by Prior mention (immediate) (2)	-21.167	40192.587	.000	1	1	.000

5.2.2 *The Role of Joint Attention, Physical Presence and Prior Mention on Use of Gestures by Turkish Toddlers and Their Caregivers*

As Tables 56, 57, 58, and 59 indicate, various models were tested for the second dependent variable, i.e., use of referential gesture), as in the analyses of the first dependent variable (referential form). The two models (Model 3g and Model 4d) which had the best predictive ability in testing the contribution of the three discourse-pragmatic predictors of the children's and their caregivers' use of gestures are presented here.

Table 56: The likelihood test statistics of alternative models and Model 3g for the children's use of gesture

Alternative models	-2 Log likelihood	Cox & Snell R square	Nagelkerke R square
Model 3a (joint attention)	1100.556	.144	.198
Model 3b (physical presence)	1217.641	.077	.106
Model 3c (prior mention)	1219.941	.088	.121
Model 3d (2 factor-model/joint attention and physical presence)	1098.750	.146	.200
Model 3e (2 factor-model/joint attention and prior mention)	1054.953	.183	.252
Model 3f (2 factor-model/physical presence and prior mention)	1151.674	.135	.185
Model 3g (3 factor-model in the present thesis)	1054.263	.184	.252

Table 57: The likelihood test statistics of alternative models and Model 3g for the caregivers' use of gesture

Alternative models	-2 Log likelihood	Cox & Snell R square	Nagelkerke R square
Model 3a (joint attention)	3690.018	.020	.027
Model 3b (physical presence)	3735.957	.052	.071
Model 3c (prior mention)	3901.032	.026	.035
Model 3d (2 factor-model/joint attention and physical presence)	3581.488	.055	.076
Model 3e (2 factor-model/joint attention and prior mention)	3636.730	.037	.050
Model 3f (2 factor-model/physical presence and prior mention)	3692.566	.065	.089
Model 3g (3 factor-model in the present thesis)	3544.606	.066	.091

Table 58: The likelihood test statistics of alternative interaction models and Model 4d for the children's use of gesture

Alternative models	-2 Log likelihood	Cox & Snell R square	Nagelkerke R square
Model 4a (joint attention by physical presence)	1053.742	.184	.253
Model 4b (joint attention by prior mention)	1052.359	.186	.255
Model 4c (physical presence by prior mention)	1051.714	.186	.255
Model 4d (3 way-interaction/the model in the present thesis)	1050.597	.187	.257

Table 59: The likelihood test statistics of alternative interaction models and Model 4d for the caregivers' use of gesture

Alternative models	-2 Log likelihood	Cox & Snell R square	Nagelkerke R square
Model 4a (joint attention by physical presence)	3542.773	.067	.091
Model 4b (joint attention by prior mention)	3538.867	.068	.093
Model 4c (physical presence by prior mention)	3528.123	.071	.098
Model 4d (3 way-interaction/the model in the present thesis)	3518.857	.074	.102

The first model (Model 3g) testing the role of the three predictors on the dependent variable (use of gesture) was significant for both children ($X^2(4) = 194.62, p < .01$) and their

caregivers ($X^2(4) = 195.45, p < .01$). The model accounted for the variance in the children's use of gesture by 18% to 25% (Cox and Snell $R^2 = .18$; Nagelkerke $R^2 = .25$) and the variance in the caregivers' use of gesture by 7% to 9% (Cox and Snell $R^2 = .07$; Nagelkerke $R^2 = .09$). The model with the three predictors reliably estimated 74% of the children's and 68% of their caregivers' use of gesture. A model without the effects of any predictors (a constant-only model) accurately estimated 64% of all the cases (use of gesture) for both the children and their caregivers. Therefore, both the children's and their caregivers' use of gesture were predicted more reliably by the three-predictor model as opposed to a constant-only model.

Wald statistics of joint attention, physical presence and prior mention were 48.82, .69, and 44.18 respectively for the children's use of gesture and were .001, 83.67 and 33.32, respectively for the caregivers' use of gesture. Based on Wald statistics, joint attention had the strongest effect on the children's use of gesture whereas physical presence showed the strongest effect on the caregivers' display of gesture during referential language.

Table 60 shows the predicted coefficients of the three predictors on the children's use of gesture for Model 3g. According to Model 3g, children were more likely to use gestures as long as the children and their caregivers jointly attended to a referent. The odds of children's use of gesture were 4.69 times higher in the presence of joint attention than in the absence of joint attention. As opposed to joint attention, prior mention of a referent decreased the likelihood of the children's display of gesture. If the referent was very immediately addressed in a referential set, the odds of children's use of gesture diminished by 65% ($eB = .35, p < .001$).

Table 60: Binary logistic regression test results for assessing the effects of the predictor variables on the children's use of gesture

Predictors	B	SE	Wald	df	Sig	Exp (B)
Joint attention (1)	1.545	.221	48.819	1	.0001	4.686
Physical presence (1)	.238	.287	.689	1	.407	1.269
Prior mention (very immediate) (1)	-1.062	.165	41.212	1	.0001	.346
Prior mention (immediate) (2)	-.138	.241	.329	1	.566	.871

As Table 61 presents, Model 3g also indicated that the caregivers were more likely to display gestures when the referents were physically present than when the referents were physically absent. On the other hand, they were less likely to use gestures for the referents which were very immediately or immediately mentioned than for the referents which were new. Physical presence of a referent increased the odds of the caregivers' use of gesture by 4.3 times. Very immediate and immediate mention of a referent in previous discourse predicted a reduction in the odds of the caregivers' display of gesture by 42 % ($e^B = .58, p < .001$) and by 28% ($e^B = .72, p < .005$) respectively.

Table 61: Binary logistic regression test results for assessing the effects of the predictor variables on the caregivers' use of gesture

Predictors	B	SE	Wald	df	Sig	Exp (B)
Joint attention (1)	.003	.109	.001	1	.982	1.003
Physical presence (1)	1.459	.159	83.673	1	.0001	4.300
Prior mention (very immediate) (1)	-.546	.097	31.429	1	.0001	.579
Prior mention (immediate) (2)	-.326	.107	9.373	1	.002	.722

The second model (Model 4d) which included interaction effects was statistically significant for both the children's ($X^2(9) = 198.29, p < .01$) and the caregivers' display of gesture ($X^2(11) = 221.20, p < .01$). The model accounted for between 19% and 26% of the variance in the children's use of gesture (Cox and Snell $R^2 = .19$; Nagelkerke $R^2 = .26$) and between 7% and 10% of the variance in the caregivers' use of gesture (Cox and Snell $R^2 = .07$; Nagelkerke $R^2 = .10$). Both Cox and Snell R^2 and Nagelkerke R^2 were higher in this model compared to R squares in the model which did not include interaction effects. Furthermore, -2-log-likelihood test statistics were reduced from 1054.26 to 1050.60 and from 3544.61 to 3518.86 respectively for the children's and their caregivers' display of gesture. Similar to Model 3g, 74% of the children's and 68% of the caregivers' uses of gesture were accurately predicted in Model 4d.

Table 62 and Table 63 indicate the estimated coefficients for Model 4d. Based on Model 4d, there were no any significant associations between the predictors and the children's use of gesture. However, based on the same model, there were significant relationships between some of the predictors and the caregivers' use of gesture. For example, the

probability that the caregivers exhibit gestures was higher when the referent was physically present as opposed to when it was physically absent. In other words, the physical presence of a referent increased the odds of caregivers' display of gesture by 10.03 times.

The physical presence of a referent affected the likelihood of the caregivers' use of gesture depending on whether a referent was mentioned in the previous conversation. The caregivers were less likely to exhibit a gesture when a physically present referent was very immediately or immediately mentioned. Very immediate prior mention of a physically present referent reduced the odds of caregivers' use of gesture by 68% ($e^B = .32, p < .005$). Immediate mention of a physically present referent lessened the odds of caregivers' display of gesture by 64% ($e^B = .36, p < .05$).

Table 62: Binary logistic regression test for the effect of the interaction of the three discourse-pragmatic factors on the children's use of gesture

Predictors	B	S.E.	Wald	df	Sig.	Exp(B)
Joint attention (1)	22.184	40193.049	.000	1	1	4E+009
Physical presence (1)	.863	.589	2.145	1	.143	2.370
Prior mention (very immediate) (1)	-.202	.546	.137	1	.712	0.817
Prior mention (immediate) (2)	.575	.661	.757	1	.384	1.778
Joint attention(1) by Physical presence (1)	-20.555	40193.049	.000	1	1	.000
Joint attention (1) by Prior mention (very immediate) (1)	-.229	.494	.214	1	.644	.796
Joint attention (1) by Prior mention (immediate) (2)	-.045	.624	.005	1	.943	.956
Physical presence (1) by Prior mention (very immediate) (1)	-.756	.711	1.132	1	.287	.469
Physical presence (1) by Prior mention (immediate) (2)	-.720	.856	.708	1	.400	.487

Table 63: Binary logistic regression test for the effect of the interaction of the three discourse-pragmatic factors on the caregivers' use of gesture

Predictors	B	SE	Wald	df	Sign	Exp (B)
Joint attention (1)	-19.934	28421.10	.000	1	.999	.000
Physical presence (1)	2.305	.306	56.898	1	.0001	10.026
Prior mention (very immediate) (1)	.555	.320	3.011	1	.083	1.741
Prior mention (immediate) (2)	.463	.374	1.530	1	.216	1.589
Joint attention (1) by Physical presence (1)	19.874	28421.10	.000	1	.999	4,00E+08
Joint attention (1) by Prior mention (very immediate) (1)	41.851	40193.16	.000	1	.999	1,00E+18
Joint attention (1) by Prior mention (immediate) (2)	41.943	49226.42	.000	1	.999	2,00E+18
Physical presence (1) by Prior mention (very immediate) (1)	-1.151	.399	8.312	1	.004	.316
Physical presence (1) by Prior mention (immediate) (2)	-1.035	.442	5.475	1	.019	.355
Joint attention (1) by Physical presence by Prior mention (very immediate) (1)	-41.961	40193.16	.000	1	.999	.000
Joint attention (1) by Physical presence (1) by Prior mention (immediate) (2)	-41.692	49226.42	.000	1	.999	.000

Chapter 6

DISCUSSION

The first section in this chapter reintroduces the purpose and then presents the main findings of the present thesis. The remained sections discuss the contributions and the limitations of the study, and present some suggestions for future directions.

6.1 Purpose and the Main Findings of the Present Study

The main purpose of this naturalistic video corpus study was to assess the relative contribution of three discourse-pragmatic principles, namely, joint attention, physical presence, and prior mention to young Turkish toddlers' and their regular caregivers' both verbal and gestural referential choices. The referential choices included referential form (omitted vs. overt) and referential gestures (gesture-absent vs. gesture-present). The secondary aim of the study was to describe qualitatively a dataset obtained from 12-hour video recordings of four Turkish children with their caregivers during their daily communications. In order to describe this corpus, spontaneous interactions of four Turkish children (2 males, 2 females; 1 from each sex with lower parental education levels) with their regular caregivers such as mother, father, grandparents, and babysitters were coded from videotapes at three different time points, when the children were 12, 17, and 21 months of age.

The first part of this section presents the main findings about the contribution of the three discourse-pragmatic principles to young Turkish toddlers' and their regular caregivers' referential forms. The second part of this section summarizes the main results showing the effects of the three discourse-pragmatic principles on young Turkish toddlers' and the regular caregivers' use of gesture.

6.1.1 The Effects of Joint Attention, Physical Presence, and Prior Mention on Young Turkish Toddlers' and their Regular Caregivers' Referential Forms

The results of the present study indicate that the children's referential forms changed depending on the physical status of a referent. In fact, the children were less likely to use overt arguments when the referent was physically present. This tendency in our data is consistent with the studies in the literature that emphasize the importance of discourse-pragmatic principles in children's early argument omissions (Gürcanlı, et al., 2007; Kail, & Hickmann, 1992; Matthews et al., 2006; Salomo, et al., in press). For example, Gürcanlı, et al. (2007) found that three- to four-year-old Turkish children made more argument omissions when their addressee could see the referent than when their addressee could not see the referent. The study by Kail and Hickmann (1992) also revealed that six- to eleven-year-old French children produced more indefinite determiners when their interlocutor could not see the referent they talked about.

The findings of the present study are also in line with the results of the study by Matthews et al. (2006) showing that 3- to 4-year-old children have some sensitivity to the distinction between an addressee who can or cannot see the referent as they pick referential forms. More specifically, both 3- and 4-year-old children used noun-verb combinations for the referents outside of their addressee's visual attention. Moreover, 4-year-olds used more pronoun-verb combinations whereas 3-year-olds used either pronoun-verb combinations or verbs alone for the referents inside their addressee's visual field. The same study also found that as opposed to 3- and 4-year-olds, 2-year-olds did not show any sensitivity to the distinction between an addressee who can or cannot see the referent when they choose referential forms. Based on these results, Matthews et al. (2006) proposed that children's sensitivity to perceptual context develops as children get older. In contrast, the current study indicates that Turkish children between 12 to 21 months chose appropriate referential forms in accordance with perceptual availability of the referent in the physical context.

The present study contributes to the literature by working with children younger than 2 year olds and by revealing that children develop sensitivity to discourse-pragmatic principles at younger ages than the ages studied in the literature. There can be two reasons for a discrepancy from the previous studies: First, unlike the three studies (Gürcanlı, et al., 2007; Kail, & Hickmann, 1992; Matthews et al., 2006; Salomo, et al., in press) that investigated the children's referential talk in experimental settings, the present study examined the children's referential talk in its natural environment. Second, the current study emphasized the interaction of children with their regular caregivers rather than with strangers such as an experimenter. Natural environments and familiar people probably enabled children to exhibit their peak performance.

Skarabela and Allen's study (2010) focused on the interactive effects of newness and joint attention on 2- to 3-year-old children's referential forms in spontaneous speech. They found that both newness and joint attention significantly predicted the children's argument realization. These two features interactively affected children's choices for overt vs. omitted arguments. That is, children were more likely to omit arguments for given referents produced in the presence of joint attention. Consistently, they were less likely to omit arguments for new referents produced in the absence of joint attention.

Similar to Skarabela and Allen's study (2010), the current study showed that the discourse-pragmatic principles affect the children's referential skills by interacting with each other. Specifically, this study revealed that the association between a referent's physical status and the children's referential forms varied depending on whether the referent was previously mentioned in discourse or not. In other words, the children were more likely to choose an overt argument when a physically present referent was very immediately addressed during the talk. One of the explanations for such a result can be that children acquire more nouns as they get older and they begin to use these new nouns they learn whenever they have an opportunity. Alternatively, caregivers usually introduce new referents using explicit nouns

and children do not know that they can keep on talking about these previously mentioned referents by zero forms. For example, in one of the dialogues (the child's initial S, age: 1;08, 35th referential set), one caregiver referred to a kangaroo picture on a book by asking the child the name of this animal (*what was this?*). Since the child did not answer her question, the caregiver said the name of the animal (*it is a kangaroo*) to the child. The child immediately imitated the caregiver by repeating the name of the animal (*kangaroo*). In another dialogue between another child and his caregiver (the child's initial C, age: 1;09, 69th referential set), the caregiver asked the child whether he wants some food or not (*will you eat some food?*) and the child answered this question saying "food". As these examples indicate, very young children often use exact repetitions of the forms used by their caregivers rather than expanding the conversation and maintaining reference to these forms by reduced forms such as zeros.

Another interesting finding is that the children in the present study primarily used vocalizations and/or gestures (56%) when they were 12 months. As they got older, the proportions of their vocalizations and/or gestures decreased; in contrast, the proportions of their nouns increased. For instance, the children used vocalizations and/or gestures 56%, 38% and 15% of the time whereas they employed nouns 27%, 30%, and 50% of the time when they were 12, 17 and 21 months respectively. The shifts in proportions shows that children reduce communicating about referents through vocalizations and/or gestures only as they become more competent in spoken language and they use their newly established vocabulary whenever they have an opportunity. This result is consistent with Capirci, et al. (2008)'s study indicating that children's total number of communicative gestures increases and exceeds their number of words at a certain age point. However, later on, the number of gestures by children decreases as they learn more and more words although they continue to display gestures together with speech (Acredolo, & Goodwyn, 1988; Goodwyn, & Acredolo, 1993;

Özçalışkan, & Goldin-Meadow, 2005). Very immediate mention of a referent may provide children with the opportunity of repeating and rehearsing the words they recently acquired. One possibility for children's use of speech in combination with gestures is that children may not yet have complex phonological and articulation mechanisms in order to produce comprehensible words.

According to the binary logistic regression analyses, the children's choices for referential forms did not change depending on whether the children and their caregivers jointly attended to the referent or not. In addition, the same analyses indicated that the children's referential forms for physically absent and physically present referents did not depend on joint attention. These results are not consistent with those of previous studies indicating that the children choose their referential forms showing sensitivity to their interlocutor's attention on a referent (Skarabela, & Allen, 2010). However, the children in the present study are younger than the children in Skarabela and Allen's study (2010). Considering this fact, one possible reason for the inconsistent results can be that children develop their absolute control on discourse-pragmatic principles at older ages (Gürcanlı, et al., 2007) although they begin to benefit from these principles at very young ages. Another reason for insignificant results obtained from logistic regression can be somewhat smaller sample size in coding joint attention. There are some cases that the coders could not code the type of joint attention since they could not see the speaker in the video recordings.

Supporting the second explanation, the descriptive analyses revealed that joint attention was significantly associated with the children's use of referring expressions. There are some specific cases in the data supporting this finding. For example, the children chose nominal forms 69% of the time and zero forms 17% of the time for the referents to which the children and their caregivers did not jointly attend. Moreover, when there was an established joint attention on the same entity or activity, their nominal forms dropped to 40% whereas

their zero forms increased to 38%. Based on these proportions, children seem to be partially sensitive to joint attention in choosing their referential forms.

Overall, these findings suppose that very young children are aware of varying requirements of their addressee in various discourse-pragmatic contexts. In other words, the children did not randomly choose between overt and omitted arguments, rather they systematically decide on either overt or omitted arguments depending on the requirements of the discourse-pragmatic context. However, children seem to need more time than 21 months to develop an absolute control on some of the discourse-pragmatic principles such as joint attention.

The results of this study also pointed out that the children exhibited similar discourse-pragmatic patterns with their regular caregivers, which support other studies pointing out the importance of parental input in children's early argument omissions (Clancy, *in press*; Guerriero, et al., 2006; Rozendaal, & Baker, 2008; Rozendaal, & Baker, 2010).

The similarities between the children's and their regular caregivers' discourse-pragmatic patterns are: First, the caregivers' choices for referential forms varied depending on the physical presence or absence status of a referent. That is, similar to the children, the caregivers were less likely to use overt arguments when a referent was physically present. Second, the association between the physical status of a referent and the caregivers' referential forms depended on whether a referent was previously mentioned, or not. In other words, like the children, the caregivers were more likely to choose overt arguments when a physically present referent was very immediately mentioned in discourse. Furthermore, immediate mention of a physically present referent, in addition to very immediate mention of such a referent, affected the caregivers' choices of referential forms. In fact, very immediate mention of a physically present referent increased the likelihood for the caregivers' use of an overt argument slightly more than immediate mention of the same referent. It is interesting that although Turkish is supposed to be a pro-drop language, both the children and their regular

caregivers used explicit nouns for already mentioned referents instead of omitting these referents. Allen (2000) found similar findings in one of her study: Inuktitut children ranging from the age of 2 to 3;6 did not use overt forms for given arguments and did not use zero forms for all new arguments. More specifically, they stated 45% of new arguments by zero forms while stated 9% of given arguments by overt arguments. Allen explained children's use of overt forms for given referents suggesting that when a speaker makes a mistake in her/his first utterance with an argument in zero form, he/she corrected this mistake using a nominal form in her/his subsequent utterance. In addition, the caregivers may contribute to the children's expanding vocabulary by confirming the verbal label of a previously mentioned referent through explicit nouns rather than zero forms. For instance, in one of the dialogues (the child's initial *S*, age: 1;08, 57th referential set), the child introduced a referent to her caregiver using a nominal form (*this is a monkey*) and the caregiver confirmed the child repeating this nominal form (*yes, it is a monkey*) in spite of the previous mention of the referent. As a result of such interactions, young children acquire new words introduced by their caregivers via self-repetition and imitation (Allen, 2000). In one conversation (the child's initial *O*, age: 1;09, 16th referential set), the caregiver asked the child to show the doll in the room (*lets show the doll!*) and the child repeated only the nominal form (*the doll*) without exhibiting any action. Alternatively, besides the three discourse-pragmatic principles in the present study, there can be some other discourse-pragmatic features affecting both children's and caregivers' referential expressions such as "contrast" (being alternative referents in discourse or physical context for a specified referent) (Allen, 2000). According to Allen (2000), the cases where speakers want to prevent their addressee from doing something he/she is doing and the cases where speakers want their addressee to do something exemplify contrast. As an example from our data, in one of the dialogues (the child's initial *S*, age: 1;05, 48th referential set), the caregiver tried to prevent the child from playing with the toy nail

polish (*do not put on your nail polish*) by suggesting the child to play with the toy lip stick (*put on your lip stick*).

Third, although descriptive analyses reported a significant relationship between the caregivers' referential forms and joint attention, the logistic regression analyses revealed that joint attention did not have a significant effect, by itself or depending on another factor, on the caregivers' referential forms. However, similar to the children, there is data to support the idea that caregivers are sensitive to joint attention in deciding on their referential forms. As an example, the caregivers employed nouns 57% of the time, and used zero forms 32% of the time in the absence of joint attention. In contrast, they mostly preferred zero forms (61%) and rarely used nominal forms (25%) in the presence of an established joint attention on a referent.

There are some differences between the children's and their caregivers' discourse-pragmatic patterns, in addition to the similarities stated above. Unlike the children's referential forms, the caregivers' referential forms changed depending on previous mention of a referent. In other words, an immediate mention of a referent in discourse relatively reduced the caregivers' rate of overt arguments' usage.

Taken as a whole, in spite of the differences in the children's and the caregivers' discourse-pragmatic strategies, the children and their caregivers basically decided on their referential forms based on similar discourse-pragmatic principles. Therefore, the children seem to benefit from the input provided by their regular caregivers in learning or confirming their self-discovered discourse-pragmatic principles and linking these principles to their referential choices.

There are some interesting results of the present study that detail the children's and their regular caregivers' referentially communicative experiences. First, the children mostly use nouns for all levels of joint attention. Only exception is that the children initiated their

caregivers' attention using vocal/gestural tools without any verbal means. Second, children use nouns (40%) and zero forms (38%) nearly equally to maintain an established attention on a referent. Third, they very scarcely use pronouns for all levels of joint attention especially compared to their caregivers' more frequent use of pronouns.

Turning to caregivers, they predominantly use nouns (57%) although they benefit from zero forms (32%) in the absence of joint attention. Second, they benefit from both nouns (47%) and zero forms (31%) when they direct the children's attention to a referent. Third, they employ nouns (27%), zero forms (31%) and pronouns (38%) nearly equal percent of the time when they follow the children's attention on a referent. Fourth, they choose nouns (25%) and zero forms (61%) when there is an established joint attention on a referent.

6.1.2 The Effects of Joint Attention, Physical Presence, and Prior Mention on Young Turkish Toddlers' and their Regular Caregivers' Use of Referential Gestures

Iverson, et al. (2008) suggested that gestures usually accompany children's early speech with two basic facilitating roles on children's language learning. First, children's gesture-word combinations enable parents to understand changing needs of their children at different developmental stages and to reconstruct verbal and non-verbal parental input according to the needs of the children. Second, gesture-word combinations offer opportunities for children to learn how to deal with multiple pieces of information in a communicative message (Iverson, et al., 2008). In fact, gesture is a way for young children to express meanings they are not (yet) able to convey in words (Demir, & So, 2007; Iverson, et al., 2008; So, et al., 2010).

To contribute to this emerging literature on the integration of gesture into speech in early child-caregiver discourse, the current study examined the effects of three discourse-pragmatic principles on the children's and the caregiver's use of gestures during referential language. The results of logistic regression analyses showed that the three discourse-

pragmatic principles did not significantly affect the children's use of gesture. However, according to the descriptive analyses, there were significant relationships between the same principles and the children's and the regular caregivers' use of gesture ($ps < .001$).

Based on these descriptive analyses, there are some cases in the data which indicated that the children benefitted from gesture as an alternative modality to speech to address a referent. For example, the children did not use any gestures 71% of the time at 12 months, 51% of the time at 17 months, and 55% of the time at 21 months when they talked about a very immediately mentioned referent. However, these proportions corresponded to 15% of the time at 12 months, 12 % of the time at 17 months, and 33 % of the time at 21 months when they referred to a new referent. Therefore, the number of cases that the children needed to use gestures was higher at each age point for new referents. So, et al. (2010) examined English-speaking (between 3;7 to 5;2 years of age) and Chinese-speaking (between 2;10 to 4;11 years of age) children's referential gestures and they found that both English-speaking and Chinese-speaking children decide on using or not using referential gestures in accordance with the requirements of two features, namely person (1st/2nd person vs. 3rd person) and information status (given vs. new information). Both groups of children were more likely to display gestures for 1st or 2nd person and given referents, where the referents mostly specified by pronouns and zero forms. Unlike these findings, the present study demonstrated that children exhibited more referential gestures for new referents rather than given referents. The reason for such a difference between the findings of the two studies can be that the children in the current study are younger than the children in So, et al.'s study. Very young children may benefit from gestural devices in addition or in substitution of verbal means in talking about new referents since they may not yet have sufficient control over linguistic tools in presenting new referents into discourse.

Some previous studies suggest that children began to use communicative gestures as early as 10 months before the appearance of their first words (Acredolo, & Goodwyn, 1988;

Iverson, & Goldin-Meadow, 2005), and they create an integrated speech-gesture system around the age of 18 months (Acredolo, & Goodwyn, 1988; Demir, & So, 2007; Goodwyn, & Acredolo, 1993; Özçalışkan, & Goldin-Meadow, 2005). Based on these studies and its own findings, the present study confirms that children begin using gestures at very young ages to provide information that is not expressed or cannot be clarified through speech, however, they need some time to competently create an integrated speech-gesture system.

The results of the present study also revealed that the regular caregivers' use of gestures varied depending on the physical status of a referent. That is, the caregivers were more likely to use gestures when the referent was physically present as opposed to when it was physically absent. Moreover, the present study found that the association of a referent's physical status with the caregivers' use of gesture varied depending on whether the referent was previously mentioned in discourse or not. That is, the caregivers were less likely to use gestures when a physically present referent was very immediately or immediately mentioned in a referential talk. Very immediate prior mention of a physically present referent reduced the probability that the caregivers use a gesture slightly more than immediate prior mention of a physically present referent did. The discourse-pragmatic principles seem to affect the caregivers' gestures in just the opposite way they affected the caregivers' referential forms. In other words, caregivers more frequently employed gestures accompanying zero forms rather than overt forms. It seems that caregivers benefit from gestures as a device to complement their speech in disambiguating underspecified aspects and in clarifying potentially ambiguous aspects of their speech. In such a way, caregivers' gestures appear to ease children's job in understanding the intended referent among various alternatives and appear to facilitate children's acquisition of discourse-pragmatic skills. Although there were not any significant results for the association between the discourse-pragmatic principles and children's use of gestures, children's gestures also seem to show a similar tendency as their caregivers' gestures depending on the discourse-pragmatic features in some cases. For

instance, they did not use any gestures most of the time (73%) for physically absent referents, which were mentioned 79% of the time by nominal forms. In contrast, they used gestures most of the time (70%) for physically present referents, which were mentioned 26% of the time by zero forms.

The findings of the current study is not in line with the results of So, Kita, and Goldin-Meadow's study (2009). In the study, the researchers wanted English-speaking adults to retell two stories in the vignettes they watched to an experimenter. The results indicated that English-speaking adults mostly employed gestures for the referents which were already identified in their prior speech. In other words, English-speaking adults seem not to use gestures to disambiguate underspecified aspects of their speech or to clarify some ambiguity in their speech.

In contrast to the previous studies regarding how different discourse-pragmatic principles affect children's use of gestures, (Iverson, et al., 2008; So, et al., 2010), the current study examined how various discourse-pragmatic principles play a role on both children and their regular caregivers' use of gestures. The existing literature does not answer how caregivers benefit from different discourse-pragmatic cues in deciding to use or not to use gestures and how they integrate speech and gesture using these cues while talking about various referents. This study contributes to the literature by focusing on the change in the caregivers' use of gestures depending on various discourse-pragmatic cues.

6.1.3 Conclusion

The main findings of the current thesis can be summarized as:

First, the findings of the present study supported the Discourse-pragmatic Account (Allen, 2000; Guerriero, et al., 2006; Gürcanlı, et al., 2007) suggesting that children's early argument omission is based on a universal sensitivity to discourse-pragmatic cues rather than just grammatical or processing restrictions. That is, similar to adults, even young toddlers

omit arguments in a systematic way depending on the pragmatic status of arguments in discourse (Guerriero, et al., 2006; Gürcanlı, et al., 2007). However, the present study is also in line with the studies suggesting that the development of children's consistent control over relevant linguistic tools takes more time beyond 21 months of age, the latest age point in this study.

Second, the current findings indicating similar discourse-pragmatic patterns in the children's and the regular caregivers' referential talk support the idea that one of the ways for children to acquire referential skills can be benefitting from parental input. Alternatively, these findings suggest that children and adults are aware of the similar cognitive and discourse-pragmatic principles.

Third, the caregivers used more gestures for the referents underspecified by zero forms than the referents explicitly stated by nominal forms. In other words, the caregivers disambiguate underspecified referents using non-verbal means rather than verbal means. This result supports the recent view that gestures are useful mechanisms for caregivers to compensate the information not expressed through speech (Iverson, et al., 2008; So, et al., 2010).

6.2 *Contributions*

This section summarizes the main contributions of the present study:

First, the present study examines children's spontaneous interactions with their regular caregivers at very young ages. Unlike the previous studies that investigate referential abilities of children at two years old and over, this study focuses on referential abilities of young toddlers before the age of 2. The results of the present study specifically contribute to the literature by indicating that the children develop sensitivity to discourse-pragmatic principles before the age of 2. Additionally, the current study evaluates the children's referential choices at three time points when they were 12, 17, and 21 months. This allows us to describe how the

children's and their regular caregivers' referential choices change depending on various discourse-pragmatic cues in time.

Second, unlike the studies that investigate children's and adults' referential abilities in an experimental setting, the video recordings of spontaneous interactions between children and their caregivers enable us to examine the children's and the caregiver's referential skills in more than one context such as book reading, meal time, and play time. In other words, examining spontaneous interactions is a way to figure out how referential talk between children and their caregivers proceeds in their natural environments.

Third, this study focuses on daily communications of four child-caregiver dyads speaking Turkish, a language where subjects and objects can be dropped in appropriate conditions. Whether children's and caregivers' use of referential gestures besides their use of referring expressions change depending on the characteristics of their native language is a new and sparse area. The present study contributes by exploring children's and caregivers' use of referential gestures as well as their use of referential expressions in a null argument-language with complex morphology, i.e., Turkish.

Fourth, the previous studies focus on the effects of various discourse-pragmatic principles on children's use of gestures (Iverson, et al., 2008; So, et al., 2010). Unlike these studies, the present study investigates the effects of different discourse-pragmatic principles on the regular caregivers' use of gestures besides young children's use of gestures. In that sense, this study contributes to the literature by emphasizing unanswered questions such as how various discourse-pragmatic strategies affect the caregivers' use of gestures.

Fifth, the current study examines individual and interactional effects of different discourse-pragmatic features on children's and regular caregivers' use of referring expressions and referential gestures, which enables us to predict the degree to which individual discourse-

pragmatic features predict overt vs. omitted arguments and to understand both children's and regular caregivers sensitivity to subtle interactions of multiple discourse-pragmatic cues.

6.3 *Limitations and Suggestions for Future Research*

Although the present thesis examines the children's and the caregivers' referential skills at three different time points, it does not evaluate how the effects of the three discourse-pragmatic principles on children's and caregivers' referential skills change over time. Instead, this study considers an overall role of the three discourse-pragmatic principles on the children's and caregivers' use of referring expressions and use of referential gestures. Future research can developmentally evaluate how each discourse-pragmatic feature and the interplay of the three discourse-pragmatic features affect children's and regular caregivers' verbal and non-verbal referential choices.

Moreover, the sample size for joint attention in the current study is not large enough. In other words, there are some cases which the coders could not decide on whether there was joint attention or not since they could not see either the speaker or the listener in the video segment coded. One reason for insignificant results for the effect of joint attention on either the children's or the regular caregivers' verbal and non-verbal referential choices can be inadequate number of cases coded for joint attention. Further studies can combine the datasets obtained from experimental and natural settings to understand how joint attention affects referential communication.

Furthermore, the current study found that the discourse-pragmatic features did not have a significant role on the children's gestures. The reason for such a result can be a relative small sample of the number arguments from children. In other words, the children in this study were very young and just began to produce language, so the cases the children joined into referential communication episodes are not that many. A future study should also include

the samples from children older ages in anticipation of a more robust use of gestural communication.

In the current study, we coded the category of joint attention as absent for all the referents which were coded as physically absent. This application prevented two predictor variables, joint attention and physical presence, from becoming independent from each other and might create a multicollinearity problem. The multicollinearity problem in the data might be the reason for insignificant results for the effect of joint attention on both children's and caregivers' use of referential expressions and referential gestures.

Although we coded three different semantic roles (i.e., actor, patient, and recipient) for the children's and the caregivers' arguments, the present study did not evaluate whether the effects of the three discourse-pragmatic principles on the children's and the caregivers' referential choices change depending on these semantic roles of the arguments in their respective utterances. Therefore, a future study can investigate the variation in the effects of discourse-pragmatic principles on children's and regular caregivers' referential choices among the different semantic roles.

6.4 *Highlights of the Present Study*

- The children developed sensitivity to discourse-pragmatic principles at younger ages than the ages studied in the literature.
- Discourse-pragmatic principles affected the children's and regular caregivers' referential skills by interacting with each other as well as showing their separated/individual effects on both groups' referential skills. The children and their caregivers basically chose their referential forms based on similar discourse-pragmatic principles.
- The caregivers used more gestures for the referents specified by zero forms than the referents explicitly stated by nominal forms.

- The caregivers appear to disambiguate underspecified referents using non-verbal means (gestures) rather than verbal means (speech).
- Gestures seem to be useful mechanisms for the caregivers to compensate the information not expressed through speech.

APPENDIX

Coding Manual for the Discourse-pragmatic Principles and the Referential Choices

A. CODING CATEGORIES IN THE ELAN ANNOTATION TOOL

- ❖ **Only third person arguments are coded, first and second person arguments (I, YOU, WE) are not coded**

A.1. MAIN TIERS: Regular caregivers' and children's utterances with a referent that takes place within a referential set are accepted as the main tiers. The names of the main tiers for the caregivers' utterances are MOT-CHI, FAT-CHI, GRA-CHI. The name of the main tier for the children's utterances is CHI.

A.2. DEPENDENT TIERS: Each argument are placed under one of the three dependent tiers, namely ACTOR, PATIENT, RECIPIENT depending on the syntactic function of the argument in the utterance.

A.3. SUB-DEPENDENT TIERS: GESTURE, JOINT ATTENTION, PHYSICAL PRESENCE, PRIOR MENTION, FORM.

The organization of the main, dependent, and sub-dependent tiers in the Elan is represented below:

A.1. AN UTTERANCE:

A.2.a. ACTOR: An actor argument in an utterance refers to the person/animal/object who is doing the action in the utterance.

A.3.a. Gesture

A.3.b. Joint Attention

A.3.c. Physical presence

A.3.d. Prior mention

A.3.e. Form

A.2.b. PATIENT: A patient argument in an utterance is defined as a state, a condition or an entity which undergoes a change of location or possession. Patient arguments usually take place with verbs such as kill, wash, destroy.

A.3.a. Gesture

A.3.b. Joint Attention

A.3.c. Physical presence

A.3.d. Prior mention

A.3.e. Form

A.2.c. RECIPIENT: A recipient argument refers to the end point of a locational or possessional change.

A.3.a. Gesture

A.3.b. Joint Attention

A.3.c. Physical presence

A.3.d. Prior mention

A.3.e. Form

B. OPERATIONAL DEFINITIONS OF CODING CATEGORIES

B.1. GESTURE: Deictic and iconic gestures of both children and their regular caregivers performed by using their hand(s), face (head and eyes) and body are coded under one of the sixteen sub-categories. A detailed description of each gestural category can be found in the table below.

	Gesture	Operational Definition
1	No	There is no relevant gesture related to the referent at the time the utterance is produced.
2	Point	The speaker points to the referent object by her/his index finger or hand in order to show the referent to the listener.
3	Beg	The speaker tries to take or wants the object she/he is talking about from the recipient by extending her/his hand.
4	Demonstrate-action	The speaker demonstrates an action which refers to the referent object for the listener.
5	Demonstrate-object	The speaker demonstrates the function of the referent object to the listener.
6	Give	The speaker gives or tries to give the referent object to the recipient.
7	Head/Eye	The speaker signs the referent object by exhibiting some head or facial movements or by looking at the referent object while turning

		her/his head towards it (eye-gaze).
8	Iconic-action	A complementary gesture accompanies an action word which is related to the referent in the utterance. In other words, the speaker represents or tries to symbolize an action that addresses a referent by some body or hand movements.
9	Iconic-object	A complementary gesture accompanies the name of a referent in the utterance. In other words, the speaker represents or tries to characterize the referent object by some body or hand movements.
10	Physical manipulation/holding	The speaker holds the referent object while he/she is talking about it without the aim of showing the object to the listener.
11	Place	The speaker locates the referent object on a surface for the listener.
12	Reach/Move towards	The speaker reaches or approaches to the referent object by any part of his/her body. Taking the referent object from the recipient is also accepted under this category.
13	Show/hold-up	The speaker holds the referent object in order to show it to the listener.

14	Multiple gestures	The speaker simultaneously or consecutively performs two or more gestures addressing the referent object.
15	Non-codable (NC)	The coder cannot decide on whether there is a gesture addressing the referent or under which category the gesture belongs to.
16	Not-applicable (NA)	The coder cannot see either the hand(s) or the head (actually face) of the speaker.

B.2. FORM: The form of an argument can be coded under one of the sixteen sub-categories below:

	Form	Operational Definition	Example
1	Null (Zero)	No nominal or pronominal form is used referring to the argument.	Göster ona (the books). (Show (the books) to her.)
2	Pronoun	Pronominal form such as her, him, it, this	Vermezler sana onu . (They don't give <i>it</i> (the microphone) to you.)
3	Noun	Nominal form such as the name of an object	Gördün mü bisküviyi?

			(Did you see the biscuit ?)
4	Proper Noun	Proper name such as the unique name of a person or a city	Hani Elif ? (Where is Elif ?)
5	Question Form	Question form such as whom, where, which	Kim geldi? (Who came?)
6	Adjective	An adjectival form (can be used by itself)	yeşil . (green)
7	Vocalization	Vocalization, such as uh, ih used as a referential form	hav hav (the speaker imitates a dog)
8	Gesture/Act	Gestures or actions such as point, open-hand beg.	The speaker points a ball .
9	Pronoun+Pronoun	Combination of two pronouns	Senin şeyini ver. (give (me) your stuff .)
10	Pronoun+Noun	Combination of a pronoun with a noun	Bu parmağına tak. (Put it on this finger .)
11	Noun+Noun	Combination of two nouns	Makyaj çantanı beline takalım. (Let's put your make-up bag on

			your waist.)
12	Proper Noun+Noun	Combination of a proper noun with a noun	Şimdi Senem'in tırnaklarına sürelim. (Now, let's coats it (nail polish) on Senem's nails.)
13	Adjective+Pronoun	Combination of an adjective with a pronoun	Neydi o giden? (What was it which was going?)
14	Adjective+Noun	Combination of an adjective with a noun	Bana kırmızı kalemi getir misin? (Can you bring the red pencil to me?)
15	Vocalization+Gesture	Vocalization combined with a gesture or an action	ih! (The speaker points the butterfly on the book while vocalizing.)
16	Non-codable	The referents which the coder cannot decide on which category the referent belongs to.	

B.3. JOINT ATTENTION: Joint attention refers to a situation where a speaker and her/his addressee(s) are jointly attended to the same action, event, object or person while each partner in the communication is aware of each other's attention (Tomasello, 1999). Moreover, the definition of joint attention includes "the use of communicative acts such as eye contact, affective expression, eye-gaze and gestures in order to draw and to direct a social communicative partner's attention" to an action, an event, an object or a person with an intent to communicate (cited in Tasker, & Schmidt, 2008, pp. 264). Joint attention can be coded under one of the six sub-categories below.

	Joint Attention	Operational Definition
1	Absent	The referent object is not physically present or either the speaker or the listener does not attend to the same physically present referent during the conversation.
2	Initiating/lead	The speaker initiates the attention of the listener to the physically present referent through any gestures, sounds, attention getters (<i>hey, wow, name of the child</i>), words, phrases or utterances.
3	Global	It is not known that the attention on the physically present referent is initiated by which partner of the communication.
4	Follow	The initiated attention by the speaker on a physically present referent is followed by the recipient.

5	Maintain	The speaker keeps referring to the same entity he/she introduces and continues to sustain the attention of the listener on this entity.
6	NC	The coder cannot decide on attention type in some cases, for example, the referent is a body part of either the speaker or the listener, so it is not clear whether the person actively attends to his/her body part.

B.4. PHYSICAL PRESENCE: Physical presence can be coded under one of the three categories below:

	Physical Presence	Operational Definition
1	Physically absent	The referent is not visually or audibly (such as sound of a person, sound of a phone) present in the physical context where the conversation takes place. For example, a referent in another room (a ball in the bed room) rather than the room where the conversation takes place (the living room) is accepted as physically absent.
2	Physically present	The referent is visually or audibly (such as sound of a person, sound of a phone)

		present in the physical context where the conversation takes place.
3	Non-codable (NC)	The coder cannot decide on whether the referent is physically present or absent in the context that the conversation takes place, because of insufficient evidence in the video segment.

B.5. PRIOR MENTION: Prior mention can be coded under one of the four categories below:

	Prior Mention	Operational Definition
1	New	The referent is not mentioned as a noun within the previous five utterances.
2	Very immediate	The referent was mentioned as a noun in the previous utterance.
3	Immediate	The referent is mentioned as a noun in one of the previous five utterances (not in the previous utterance). In other words, the referent is overtly mentioned somewhere among the previous 5 utterances (2., 3., 4., or 5. utterance).
4	Non-codable (NC)	The coder cannot decide on the category

		of prior mention. Furthermore, the first five utterances of the video are coded as "non-codable" as long as the referent does not take place within the first five utterances of the video-recording.
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C. CODING DECISIONS

C.1. GENERAL DECISIONS

- ❖ Utterances, meaningful words, and gestures of the children and their any regular caregivers such as grandmother, father, baby sitter will be coded as long as they take place **within a reference set**. Therefore, any utterance is out of any reference sets and utterances of other partners in the video rather than a regular caregiver (such as utterances of a recorder) will not be coded.
- ❖ Unlike the caregivers, the children's vocalizations and actions (when the child initiates the conversation through an action or a gesture) as well as their words and utterances **in a reference set** will be coded as long as they are relevant to the set.
- ❖ If the same referent takes place within 3 different but relevant/related utterances of either the child or the caregiver or both of them (referents in the utterances rather than regular caregivers and children are not counted in determining reference sets), this chain of utterances will be accepted as a **reference set**. In other words, a referent must be repeated at least three times within an utterance chain. The same referent can be actor in the first utterance while it can be patient in the second utterance and can be recipient in the further utterances within the same reference set.
- ❖ Although it is accepted that the referent must be repeated at least three times to form a reference set, there is an exception: If the child initiates the interaction by a gesture or

an action, only two mentions of the referent are enough to create a reference set. For example, if the child initiates the interaction by pointing gesture and then the caregiver says something about the same referent, this chain of interaction will be accepted as a reference set.

- ❖ Syntactic functions (actor, patient, recipient) of all arguments placed in the caregivers' speech are coded. However, syntactic functions of the arguments in the children's speech are not coded.
- ❖ Only third person utterances will be coded. **First and second person referents** (I, you, we) **WILL NOT** be coded.
- ❖ Generics will not be coded as long as there is not a clear reference to the object talked about. For example, the first utterance : Burada ne yapıyorlar ? (What are they doing here?) (ACTOR: they) The second utterance: Amca ne yapıyor? (What is the old man doing?) (ACTOR: amca/the old man). Third utterance: Amca ne satıyor? (What is the old man selling?) (ACTOR: amca/the old man). In such a case, the first utterance will not be coded since the actor of this utterance is a generic.
- ❖ Recipients referring to a **location** or a **person** such as buraya (here), oraya (there), bana (to me), sana (to you), etc. **WILL NOT** be coded.
- ❖ All **third-person noun predicates** such as “var”, “yok”, etc. will be coded.
- ❖ Utterances will be omitted from the analyses:
 - Imitation
 - First and second person arguments
 - Imperatives (Only third person arguments of imperative sentences will be coded; but intransitive IMPS (koş, gel) will be left out)
 - The sentences where the child herself/himself is the third person referent as actor, patient or recipient
- ❖ **Motion verb** analysis will not be conducted.

- ❖ If there is no actor, patient or recipient in an utterance; but the utterance can take any of them; possible actor, patient or recipient will be written in English such as “bird”, “REC (recorder)”, etc. in the ELAN tool.
- ❖ The categories of "Patient" and "Recipient" are broaden. That is, non-patient and- non-recipient words (such as words referring to a location) are also included under this category.

ex: ağaçta ne var ? (What is on the tree?)

ağaçta/ on the tree can be coded under the category of recipient.

ex: Çocuklar bahçede oynuyorlar. (The children play in the garden.)

bahçede/in the garden can be coded under the category of recipient.

- ❖ The coder should use “non-codable” as a coding choice as long as he/she can really not decide which coding category a referent belongs to. However, non-codable **MUST NOT** be used very often.
- ❖ The sentences joined to each other with a conjunction will be written as two separate sentences/utterances on the Elan and each part of the sentence will be coded separately.

Ex: Gel de seni seveyim--> should be written and coded as "gel de" and "seni seveyim" on the elan.

C.2. DECISIONS ABOUT GESTURE

- ❖ Gestures will be coded as a dependent tier.
- ❖ Both **hand** and **head/eye gestures** (facial stuff) will be coded. If the coder cannot see either the head or the hand of a speaker, it will be accepted as NA.

C.3. DECISIONS ABOUT JOINT ATTENTION

- ❖ Joint Attention refers only **physically present** objects.

- ❖ There are some special cases in the coding of joint attention. For example, when the speaker (the father) initiates the listener's attention (the child's attention), joint attention for the argument in this sentence will be coded as "initiating". Then, if another person (the mother) incorporates with the child's attention already initiated by the father, joint attention for the argument in this utterance will be coded as "follow". If the attention of the listener (the child) is initiated by a speaker who is not a regular caregiver (the recorder) and incorporated by any caregiver, joint attention for the argument in the caregiver's utterance will be coded as "follow".

C.4. DECISIONS ABOUT PHYSICAL PRESENCE

- ❖ In order to code a referent under the category of "physically present", the referent must be in the same environment/room with the caregiver and the child must be within the sight of a coder. For example, if the discourse takes place in the living room and the object/referent is in the kitchen, it will be coded as "physically absent". However, if the interaction takes place in the living room with an open door to the corridor and the object/referent is in the corridor (so, inside the sight of a coder), it will be coded as "physically present".
- ❖ A referent can be accepted as "physically present" as long as the referent is either visually or audibly present.
- ❖ There are some special cases for physical presence: If the speaker and the listener are looking at the referents outside the house through the window and the scene outside the window is not seen in the video, the referent will be assumed as "physically present" throughout the referent set even there are the words such as "gitti" (gone), "kayboldu" (disappeared).

C.5. DECISIONS ABOUT PRIOR MENTION

- ❖ Prior mention **for the first five utterances in the video** should be coded carefully. If there is a mention of a referent in the first five utterances of the video, prior mention

for this referent can be coded. Otherwise, it should be coded as “non-codable” rather than "new". The reason for such a coding is the fact that the video does not let us know all of the previous five utterances.

- ❖ Words which do not have any referential value should not be counted for prior mention analyses.

ex: senemmm!, haydi!, haydi bebeğim!--> do not count these utterances in order to decide on prior mention (immediate vs. very immediate vs. new).

- ❖ Sometimes some parts of the video recordings are broken. In such cases, prior mention for the first sentence following the disrupted part in the video should be coded as non-codable.
- ❖ The referent must be placed as a noun in order to talk about prior mention.

C.6. DECISIONS ABOUT FORM

- ❖ For the form of the children's speech, there are three additional categories which are: vocalization, action/gesture (no vocalization/word) and vocalization+gesture/action.

D. CODING EXAMPLE

Utterance: Ağzına sokma ! (Do not put (the toy) into your mouth!)			
-	Actor	Patient	Recipient
-	You DO NOT CODE!	toy	Ağzına/your mouth
Physical Presence	-	Physically present	Physically present
Prior mention	-	It would be any choice depending on whether the mouth	It would be any choice depending on whether the mouth

		have been mentioned before and where it has been mentioned	have been mentioned before and where it has been mentioned
Joint attention	JOINT ATTENTION UNIT is the utterance itself; NOT actor, patient or recipient separately. The whole utterance will be coded in order to decide whether there is joint action or not.		
Form	-	zero form	noun

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