Preschool Children Can Assess Common Ground: Effect of (In)definiteness Status of Referential Terms

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1. Introduction

To communicate successfully about external objects, effective identification of referents is a must. For addressees, the ability to determine domains of interpretation for referential terms standing for physical objects rests upon combining nonlinguistic information (e.g., commonality of their visual perspective with their interactant) with linguistic information such as specificity status indicated by noun phrases (Chambers, Tannenhaus, Eberhard, & Carlson, 2002). Although contrary claims have been frequently made, some recent studies find preschoolers able to consider their partners' visual access to objects in their interpretations of definite noun phrases (Nadig & Sedivy, 2002). Whether this commonality assessment is sensitive to the specificity status of referential terms is unexplored.

Definite noun phrases, for example, noun phrases beginning with definite determiners such as *the* and *this,* carry a presupposition that a referent is uniquely identifiable with respect to a particular context (Chafe, 1976; Clark, 1992; Hanna, Tanenhaus, & Trueswell, 2003). Accordingly, when speakers use a definite reference, listeners identify the intended referent by searching for a unique referent in a mutually shared set of objects (Clark, 1992; Keysar, Barr, & Balin, 1998). If the condition of uniqueness is not satisfied, the listener might experience some indeterminacy about the intended referent of the referential term. On the other hand, such a presumption about uniqueness of a referent is not applicable to utterances where indefinite referents such as *a* or *an* are employed. In those cases, the listener might infer that the speaker is interested in *any* instance exemplified by the category of the NP, not necessarily experiencing ambiguity even if multiple instances of the mentioned category are in the shared context.

We conducted two experiments with Turkish speakers of different ages in order to determine whether preschool-age children differ from older speakers in assessment of commonality of perspective when they are asked to pick a certain object in different situations. Participants followed instructions to pick a certain object from an array of five objects (e.g., *bana makası verirmisin?* "will you give me the scissors?") while participating in a cooking or an art-craft activity.
There were three conditions: (1) the common ground condition, where two similar objects of different sizes were visible to the participants and their partner; (2) the privileged ground condition, where only one of two similar objects was visible to the partner; and (3) the baseline condition with no similar

objects on the ground. In the first experiment, only definite noun phrases were used in the direct object grammatical position to specify the required object. In the second experiment, we explored whether assessment of commonality is sensitive to linguistic form by manipulating the definiteness status of the referential term in both the grammatical subject and object positions.

1.1. Definite/indefinite marking in Turkish

The discourse status of a referent is indicated through a combination of devices such as indefinite numerals, case assignment, and word order in Turkish. There is no obligatory article system as in English or French. In Turkish, specific referents in direct object position bear accusative casemarking while non-specific referents do not feature casemarking (Enç, 1991; Erguvanlı, 1984; Ketrez, 2004). In addition, there is an indefinite numeral *bi(r)* that can be optionally used to express indefiniteness and non-specificity of referents (Dede, 1986). As seen in example 1, when the indefinite numeral precedes a noun phrase (*bir* NP), the interpretation of the referent is 'any NP'. On the other hand, the use of accusative casemarking on the object NP implies that the speaker has a specific entity in mind, as demonstrated by example 2.

(1) *Bi(r) kaşık al.*
INDEF spoon take
'Take a/any spoon.'

(2) *Kaşığ-ı al.*
spoon-ACC take
'Take the spoon.'

As for grammatical subjects, which are expressed by zero-marked NPs, the indefinite numeral *bi(r)* can be optionally used to indicate indefiniteness. There is no grammatical form to indicate definiteness in subject position; however, the absence of the indefinite numeral implies definiteness.

1.2. The present study

The task given to participants (5-year-olds, 9-year-olds, and adults) in this study is to pass certain objects from the ground to the confederate in a referential communication game, as specified by instructions given by the confederate. The first experiment is conducted using only definite noun phrases, thereby leading to a referential indeterminacy in the common ground condition that presents two objects of the same kind in shared view. It aims to demonstrate that preschool-age children show some awareness of commonality with their interactant in taking more time to respond in the common ground condition compared to the privileged ground condition.

In the second experiment, with different participants of same age, we explored whether assessment of commonality is sensitive to linguistic form by manipulating the definiteness status of the referential term. Thus, differently from Experiment 1, indefinite noun phrases such as in example 3 were used as referential expressions in addition to definite ones, both in grammatical subject and object positions.

(3) *Bana bir tencere verirmisin?*
to.me INDEF pot would-you-give
'Would you give me a pot?'

We expected to confirm Experiment 1 for conditions in which definite referents were used, i.e., to longer more response latency in the common ground as opposed to the privileged ground conditions. However, for indefinite noun phrases, we expect relatively less indeterminacy in the common ground condition compared to definite forms. In the privileged ground condition, on the other hand, we hypothesized indefinite forms lead to more response latency because no unique object is entailed, allowing both the privileged and the commonly shared pair to be potential referents. In other words, we expected an interaction effect between the condition (common vs. privileged) and the linguistic form of the referential term (definite vs. indefinite).

2. Method

2.1. Participants

15 preschoolers (mean age = 5;6), 15 primary school children (mean age = 9;5), and 15 college-age adults participated in Experiment 1. 14 preschoolers (mean age = 5;8), 14 primary school children (mean age = 9;7), and 14 college-age adults participated in Experiment 2. All of the participants were native speakers of Turkish from middle-SES backgrounds living in Istanbul.

An undergraduate research assistant who was trained about the procedures of the experiment played the role of confederate in all of the experimental sessions.

2.2. Setup and props

All of the experimental sessions took place on a table where the participant and the confederate were seated on opposite sides. The table was divided into two parts by an L-shaped wooden block of 50 cm in length and 15 cm in height. The participant was seated behind the area covered by this block from the confederate. The mutually visible part of the table is considered to be the common ground; the separated part accessible just to the participant is considered to be the privileged ground. There was a videocamera set up on a tripod in one corner of the room to record all the experimental sessions.

The participants were asked to follow the confederate's instructions as a helper in a cooking game in Experiment 1. A set of eight types of toy kitchen tools (pot, plate, knife, glass, spoon, tomato, grape, and jug) were used as props in a cooking activity. Two different colors of the pot, plate, knife, and glass were available to constitute four sets of contrasting objects. The tomato, the grape, and the jug were always placed on the confederate's side of the table and they were not tested in any of the trials, being used to make the cooking activity appear more realistic.

Because the manipulation of the linguistic form required more trials in Experiment 2, two different tasks (i.e., an art-craft session and a cooking game) were used. The first half of the trials were conducted using the art-craft activity; the second half were carried out with the cooking game. In the first task, the art-craft activity, materials necessary for an art-craft session (i.e., scissors, colored pencils, colored papers, and adhesives) were used as potential referents. There were two of each of these objects in different sizes. In the second task, the cooking game, a set of seven types of toy kitchen tools (pot, plate, knife, spoon, tomato, grape, and jug) were used as props in a cooking activity. Similar to the first experiment, two different colors of the pot, plate, knife, and spoon were available to constitute four sets of contrasting objects. As in Experiment 1, the tomato, the grape, and the jug were always placed on the confederate's side of the table to help in staging of the cooking activity.

2.3. Procedure

In both experiments, the children and the adults were tested individually in a quiet room in their respective educational institutions. The adult participants were told that the purpose of the experiment was to design a new game for children. For all the participants, the experimenter explained the two different regions of the setup accessible just to the participant (i.e., privileged ground), and both the participant and the listener (i.e., common ground), repeating the instructions twice. The child participants were also moved to the chair where the confederate will be seated to demonstrate that there is no visual access to the area blocked by the L-shaped barrier from that point. Then, all the objects that will be used in the experiment were held out by the experimenter to the participant to be labeled. In the few cases where the child was not able to provide a label, the experimenter supplied the label. Just before the experiment began, the confederate entered the room and was introduced to the child by her name.

In both experiments, before each trial, the experimenter asked the confederate to close her eyes and turn her back to the participant, and then placed the objects on the table. Once the experimenter reorganized the objects on the table, she asked the confederate to turn towards the participants, looking directly into the participants' eyes to avoid any nonverbal cues. At that point, the confederate asked for an object from the participant. Once the participant gave an object, the confederate pretended performing a relevant activity such as

cutting a tree from paper or stirring soup. These segments of play were carried out to motivate the child participants to move on with the remainder of the trials without difficulty. None of the children showed any signs of disinterest throughout the procedures. All of the experimental sessions were videotaped to be coded later.

2.4. Design and linguistic stimuli

2.4.1. Experiment 1

In Experiment 1, the participants followed the confederate's instructions in a cooking game. The confederate gave the instructions in acting as if a real meal was being prepared. Definite noun phrases were used in all instructions given to the participants, using the construction *bana tencereyi verirmisin?* 'to-me pot-ACCUSATIVE would-you-give'?

Three different conditions were assessed in this experiment. In the common ground condition, the participants were told to pick up a target object (e.g., a plate), when there were two contrasting objects of the same kind (e.g., two differently colored plates) were visible to both participant and the confederate. In the privileged ground condition, one object was in the common ground; the pair of the same object, which is in a different color, was in the privileged ground obscured from the confederate. The baseline condition was administered as a control condition, where the participants saw a target object in common ground (i.e., a plate) and an unrelated control object (i.e., a glass) in the privileged ground. The target object was visible to both the confederate and the participant.

In total, 12 trials (4 common ground + 4 privileged ground + 4 baseline conditions) were tested in this experiment. The order of trials was randomized once for all of the participants.

2.4.2. Experiment 2

Similar to Experiment 1, in both tasks of Experiment 2, participants were asked to follow the confederate's instructions. In the first task, the confederate gave the instructions while pretending as if she was creating interesting figures in an art-craft session. The size of the objects was used as a contrasting feature. The second task immediately followed the first task for all the participants. In this task, the participants followed the instructions of the confederate in a cooking activity, where color was used as the contrasting property. Both in the art-craft session and the cooking game, the target objects were tested across two different conditions (i.e., the common ground condition and the privileged ground condition). For each of these conditions, the referential term was placed either in the grammatical subject or the direct object position. For each of these grammatical positions, NPs were used with either definite or indefinite implications. In summary, there were 8 conditions where the ground (common vs. privileged), grammatical position (subject vs. object), and linguistic form of

NP (definite vs. indefinite) were crossed. Each condition was tested with two trials, amounting to 16 trials in total. The order of trials was randomized once for all participants. Table 1 provides examples of definite and indefinite linguistic stimuli used in the art-craft task in the two grammatical positions.

Table 1. Linguistic stimuli used in Experiment 2

	Direct Object	**Subject**
Definite	*Kalem-i verirmisin?* pencil-ACC would-you-give 'Would you give me the pencil?'	*Makas gel-sin.* scissors come-OPT 'Make/let (the) scissors come.'
Indefinite	*Bir kalem verirmisin?* INDEF pencil would-you-give? 'Would you give me a pencil?'	*Bir makas gel-sin.* INDEF scissors come-OPT 'Make/let a scissors come.'

A similar procedure was followed in both tasks: in the common ground condition, the participants were told to pick up a target object (e.g., a pencil or a plate), when there were two contrasting objects of the same kind (e.g., two differently sized pencils or two plates in different colors) were visible to both participant and the confederate. In the privileged ground condition, one object was in the common ground; the pair of the same object, which is in a different size or color, was in the privileged ground obscured from the confederate.

2.5. Coding and reliability

For both experiments, an undergraduate research assistant who was blind to the conditions and the hypotheses of the study calculated the time between the onset of the word used for the referent and the moment that the participant touched an object or asked a clarification question. The correlations between the first author's coding and the assistant's coding were .86 for Experiment 1, and .96 for Experiment 2.

In addition, for the first experiment, clarification requests such as *hangi tencere?* 'which pot?' were transcribed to investigate whether explicit indicators of uncertainty were used in the process of referential resolution.

3. Results

3.1. Experiment 1

The examination of verbal responses showed that none of the preschoolers made any clarification requests in any of the conditions. The 9-year-old children asked for a clarification from the confederate in 60% of the common ground trials, and the adults in 90% of the common ground trials. One 9-year-old child

and one adult each made a clarification request in one trial of the privileged ground condition.

Response latency values (see Figure 1) were analyzed by a mixed ANOVA with factors Condition (3) (repeated measures) and Age (3). There was a main effect of Age, F (2, 42) = 5.54, $p < 0.01$. Scheffé post-hoc tests revealed that there was a significant difference between the adults and the preschool children (mean difference = 363.5, $p < 0.005$). There was also a main effect of Condition, F (2, 84) = 8.84, $p < 0.001$. Planned comparisons of the main effect of Condition revealed that response latency values of participants differed only in the common ground conditions, where greater response latency values were exhibited compared to the baseline conditions, t (44)= 3.14, $p < 0.005$, and the privileged ground conditions, t (44)= 3.51, $p < 0.005$. The interaction between Condition and Age failed to reach significance except when we combined the two child groups into one group and compared them to adults by a mixed ANOVA with factors Condition (3) and Age (2), F (2, 86) = 3.24, $p < 0.05$.

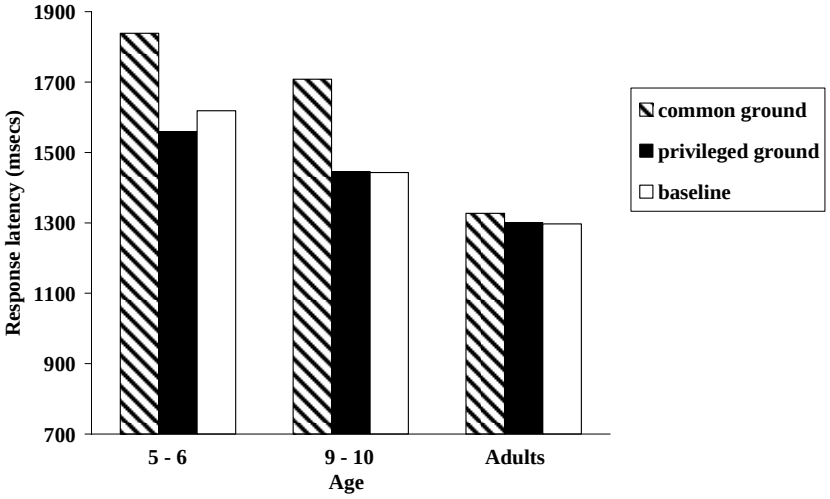

Figure 1. Mean response latency across conditions in each age group

3.2. Experiment 2

The participants differed in their speed of responding to different grammatical positions (i.e., subject position vs. direct object position), F (1, 82) = 7.20, $p < 0.01$. Greater response latency was observed in trials where the referent was placed in the subject position. This is either because such constructions (e.g., *makas gelsin* 'scissors come-OPT') are more unusual and/or the referential term is placed farther away from the end of the sentence.

The analyses were run separately for two grammatical positions in both tasks. A one-way ANOVA comparing the response latency was conducted for both direct object and subject grammatical positions to see whether there was a

difference between the two tasks. The analyses revealed no effect of task on response latency in either condition (F (1, 82) = 1.46, p = 0.230 for direct object position; F (1, 82) = 2.62, p = 0.109 for subject position). Therefore, the two data sets were averaged into a single value for each grammatical position. Subsequent analyses were conducted on this composite measure.

3.2.1. Direct object position

A three-way mixed ANOVA (Age X Condition X Referential Expression Type) was performed. There was a main effect of Age, F (2, 39) = 6.11, p < 0.005, and a main effect of Condition, F (1, 39) = 17.18, p < 0.001. Scheffé post-hoc tests revealed that there was a significant difference between the adults and the preschool children, (mean difference = 447.08, p < 0.05) and between the adults and primary school children (mean difference = 468.02, p < 0.05). The interaction between Condition and Referential Expression Type was significant, F (1, 39) = 7.81, p < 0.01. Simple comparisons revealed that with definite referential terms, the participants exhibited significantly greater response latency in the common ground condition than in the privileged ground condition, F (1, 39) = 21.07, p < 0.001. With indefinite referential terms, on the other hand, the difference between the conditions was almost equal and insignificant (see Figure 2).

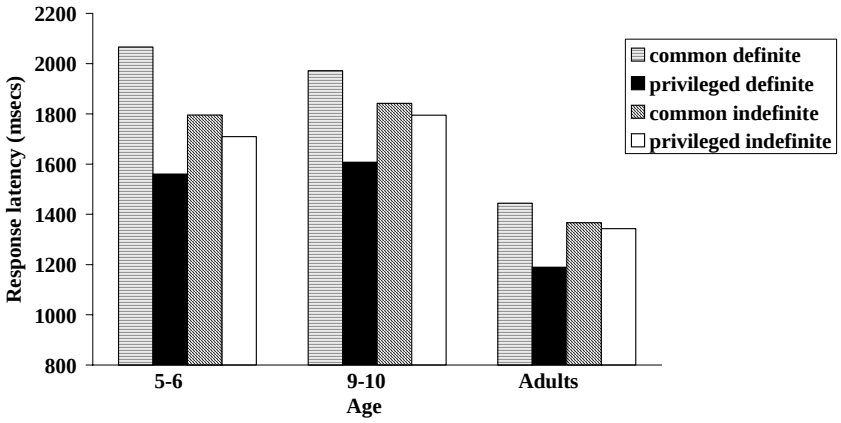

Figure 2. Response latency across conditions and referential expression types in each age group for direct objects

3.2.2. Subject position

A mixed ANOVA revealed a main effect of Referential Expression Type, F (1, 39) = 23.87, p < 0.001), and a marginal main effect of Age, F (2, 39) = 3.02,

$p < 0.06$. The interaction between Condition and Referential Expression Type was significant, F (1, 39) = 32.21, $p < 0.001$. Simple comparisons showed that for definite noun phrases, the participants exhibited significantly greater response latency in the common ground condition compared to the privileged ground condition, F (1, 39) = 10.64, $p < 0.01$. For indefinite noun phrases, on the other hand, the privileged ground conditions led to more time for responding than common ground conditions, F (1, 39) = 22.70, $p < 0.001$ (see Figure 3).

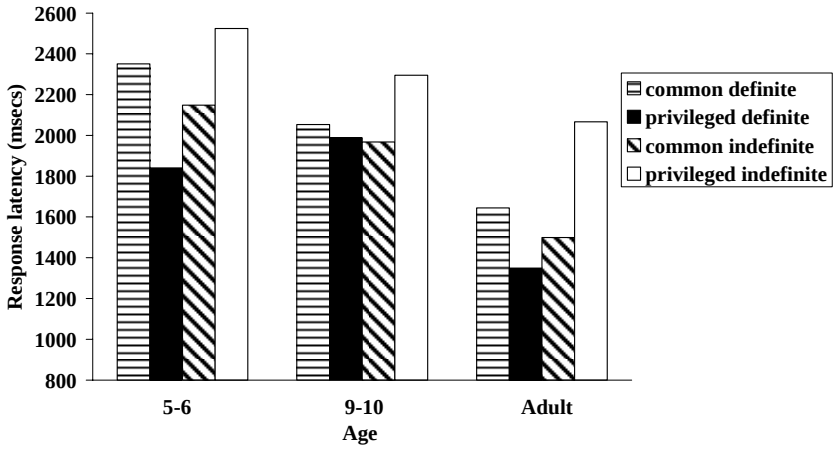

Figure 3. Response latency across conditions and referential expression types in each age group for grammatical subjects

4. Discussion

Both experiments indicated that when definite noun phrases were used in the instructions to refer to objects, all age groups exhibited greater response latency in the common ground condition than in the privileged ground condition. Although preschoolers never asked for clarification requests, explicitly indicating their indeterminacy, they show differential response times in the common ground and the other two conditions, similarly to older age groups. In line with Experiment 1, in Experiment 2, all age groups displayed longer response latency in the common ground conditions when the instructions included definite noun phrases.

However, the results of Experiment 2 also indicated an interaction between the nonlinguistic conditions (common vs. privileged ground) and the definiteness status of the noun phrase. For all age groups, indefinite noun phrases led to equal or more response latency in the privileged ground conditions than the common ground. That is, when the speaker said *bana* ***bir*** *tencere verirmisin?* 'can you give me **a** pot', listeners at all ages did not much

hesitate to reach for any of the pots as much as when a definite referential term was used such as in bana tencere**yi** verirmisin ‘‘can you give me **the** pot?’

The results of both experiments revealed that preschool children’s ability of assessing common ground information is responsive to the linguistic status of referential terms, not merely reflecting a problem-solving strategy of ignoring the privileged space. Although Experiment 1 indicates that preschoolers, at least implicitly, discriminate between the common ground condition and privileged ground condition, it does not show how they do it. In other words, the reason for greater response time in the common ground condition might be because they totally bracket off the privileged ground from consideration, not taking it into account at all as part of the referential resolution space. In the absence of further evidence, this is just a general problem-solving strategy, and does not show any linguistic-pragmatic sophistication on the part of preschoolers. Yet, the results of Experiment 2 indicate that preschool children’s ability of commonality assessment is responsive to the linguistic status of referential terms, not merely reflecting a problem-solving strategy of ignoring the privileged space. In sum, the results of the current study suggest that even in preschool years, detection of commonality with the conversational partner seems to be in place, and is sensitive to the pragmatic implications of the form of referential phrases. However, although the present experiment gave insights about the interaction between commonality assessment and (in)definiteness status of referential terms, future studies are needed to assess nonverbal signals of cognitive indeterminacy and the time course of referent resolution, possibly through tracking of eye movements.

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