THE ROLE OF PERCEPTUAL AND DISCOURSE CUES IN THE CHOICE OF REFERENTIAL EXPRESSIONS IN ENGLISH PRE-SCHOOLERS AND SCHOOL-AGE CHILDREN

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Abstract

In the current studies we investigated English-speaking pre-school and young school-age children's choice of referential expressions in a referential communication game. In study 1 we crossed two variables: the type of question asked (general vs. specific) and the availability of the listener (present vs. absent). In study 2 we manipulated the number of referents (one vs. two) and the availability of the listener (present vs. absent). The results showed that all children were very sensitive to the type of question asked, the number of referents was also a reliable predictor of type of referential expression, while the presence of the listener was the variable that posed the largest number of difficulties, even to the oldest six-year-olds. These findings are interpreted against the relative contribution of lexical- and construction-specific knowledge and of perspective-taking abilities in the presence of converging and diverging discourse and perceptual cues.

1. Introduction

The unambiguous identification of entities in the real world is crucial to successful communication. This process is both facilitated and complicated by the absence of a one-to-one correspondence between referents and linguistic expressions inasmuch as the availability of a multiplicity of referential expressions both allows and requires the speaker to make a choice. Such choice will depend on a number of variables such a as the speaker and the listener's familiarity with the referent, the uniqueness of the referent and its newness, to name but a few. Because the same referent can be identified by a number of different referential expressions (e.g. "Mr Blair, the Prime Minister, Tony, he"), the burden of the choice rests with the speaker and with her ability to take her listener's perspective into account when making her decision. According to Clark & Marshall's (1981) influential account, successful communication rests on the establishment of common ground, i.e. on a shared representation of a situation model (see also Clark, 1992, 1996). The speaker's task is to select the referential expression that will

uniquely identify a referent for the listener. At all times the speaker must monitor to what extent the referent that she wants to talk about is part of the common ground. If it is not, it is her responsibility to provide as much information as possible to ensure that it can be successfully identified by the listener. The speaker's starting point is necessarily egocentric inasmuch as she will start from her own perspective in the formulation of the message. Nevertheless this egocentric point of view must be compared with that of the listener and, if necessary, it must be revised in the light of the differences between the speaker's and the listener's perspective.

There is evidence that, at least in certain circumstances, even young children can take into account another's perspective and use the relevant referential expressions. Recent work on young pre-schoolers' referential abilities in a range of languages has shown that children as young as 2;6 can select discourse-appropriate referential expressions in naturalistic conversation with an adult interlocutor (Clancy, 1993; Allen, 2000;Guerriero, Cooper, Oshima-Takane & Kuriyama, 2001; Skarabela & Allen, 2002; Skarabela, 2006; Allen & Schröder, 2003; De Cat, 2003, 2004; Guerriero, 2005; Serratrice, 2005). One of the common findings from these studies is that pre-school children are significantly more likely to use an overt referential expression like a full noun phrase or a demonstrative pronoun in cases in which the referent is not part of the shared common ground than when it is. Children appear to be sensitive to the discourse status of the referent not only from their own egocentric perspective; they also seem to appreciate that their listener might see things differently if they do not have access to the same type of information as they do.

Evidence from spontaneous face-to-face interaction is an important starting point to understand how children negotiate referential choices. This type of setting has however clear limitations as young children and adults tend to talk about referents that are generally physically present and perceptually available to both interlocutors. In such a supportive environment children do not usually have to assume that their perspective is very different from that of their adult listener. Children's ability to select appropriate referential expressions in contexts in which there is no shared common ground may therefore have been overestimated. A small number of experimental studies have recently contributed to shed some light on this issue by manipulating variables such as the

presence of the referent and of the listener, and the type of linguistic information solicited (Campbell, Brooks & Tomasello, 2000; Matthews, 2005; Wittek & Tomasello, 2005). Although these studies have made a first important contribution to a better understanding of young children's referential choices, nevertheless there is one crucial methodological flaw that makes it difficult to interpret their results. Because of the information content of the question used to elicit children's responses ("What happened?"), it is not clear whether children's use of full noun phrases when the experimenter did not share access to the pictures was actually motivated by children's sensitivity to the absence of common ground or rather by the information content of the question posed by the experimenter

In the first of two experiments with children aged 2;6 and 3;6, Campbell et al. (2000) manipulated the presence of the main experimenter (E1) during a transitive action with a toy object, and the referential expressions used by the experimenter to identify the object in the target action (either both a noun and a pronoun, or only a noun). The manipulation of the two variables yielded four conditions: two in which E1 was present during the target action, and two in which E1 was absent during the target action which was performed by a second experimenter (E2) in her absence. In two conditions the experimenter performing the action (either E1 or E2) would identify the object using a noun and a pronoun (e.g. "I'm hitting the bus! Look, I'm hitting it.") while in the remaining two conditions she would only use a noun (e.g. "I'm hitting the bus! Look, I'm hitting the bus."). The test question asked by E1 was always "What happened?/What did I/X do?". Regardless of whether E1 had been present during the target action, the younger children did not differ in their choice of referential expressions. They used null reference or a pronoun approximately 70% of the time in all conditions. By contrast, the older children used significantly more nouns than null reference and pronouns when E1 had not been present and needed as much information as possible to understand what had happened in her absence. Although the presence of the reference did not have a significant effect on the use of pronouns alone for either group of children, the three-year-olds showed some ability to take their listener's perspective into account when they chose more nouns in the absence of shared common ground.

In a second experiment Campbell et al. (2000) manipulated the type of question the children had to answer and the familiarity and length of the name of an object used in the

target action. The experimenter used the object's name four times during the performance of the action (e.g. "Look, the ball is falling. The ball is falling. The ball is falling. The ball fell."), she then asked the children either a general question ("What happened?") or a specific question using the object's name (e.g. "What did the ball do?"). Both the younger and the older children used significantly more nouns than null reference and pronouns when asked a general question, and neither group was affected by the familiarity or the length of the object's name in their use of referential expressions. These findings show a very clear effect for the discourse cue; even the two-year-olds modified their referential choices on the basis of the type of question they were being asked.

In two recent studies on the referential communication skills of pre-school children, Matthews (2005) and Wittek & Tomasello (2005) expanded on Campbell et al.'s work on children's sensitivity to the perceptual availability of referents and on the role of the discourse context. Matthews (2005) showed that three- and four-year-olds, but not two-year-olds, were more likely to use full nouns, instead of less informative pronouns or null reference, when referring to characters in a video that their addressee could not see. Similarly to the Campbell et al.'s findings, these results confirm that full nouns are more likely to be used in the absence of shared common ground. Unfortunately a further manipulation in which the children were required to answer the general questions "What happened?/What did you see?" while the video was either still playing or had been stopped was not successful. Matthews's prediction was that the unavailability of the event in the 'video stopped' condition would lead the children to produce more full nouns as they would be referring to an entity that was not perceptually available either to themselves or to their addressee. The children however tended to talk when the video was still playing, this led to a considerable loss of data and to non-significant results.

The manipulation of previous discourse with a general question was successful in a second experiment. In her critique of Campbell et al.'s (2000) study Matthews suggests that, although children successfully used more full nouns with a general question ("What happened?") than with a specific question ("What did the clown do?"), the possibility remains that children had simply learnt to associate lexically different constructions with different types of request for information. To ascertain whether children are sensitive to the question format rather than to the prior use of a full noun Matthews used the same

general question either on its own (“That sounds like a fun video! What happened?”) or prefaced by the name of the character featured in the video (“Was that the clown? What happened?”). In this second experiment not only the three- and the four-year-olds, but even the two-year-olds produced more full nouns when there was no prior mention of the referent. These results are in line with the findings of Wittek & Tomasello (2005) for German-speaking two-year-olds, two-and-half-year-olds and three-and-half-year-olds. Although they report that the younger two-year-olds in their study did not produce a significantly different proportion of nouns with general and specific questions; they did however use null reference twice as often with specific questions indicating that some sensitivity to the discourse appropriateness of referential expressions is beginning to emerge at this younger age.

While the manipulation of the discourse context with general, specific and contrast questions was successful in this study, the changes to the perceptual scene did not elicit the expected response. In an attempt to assess whether children would formulate their request for an object they could not reach differently depending on its location, Wittek & Tomasello set up three different conditions. In the first condition the object was on its own on a shelf, in the second it was on a shelf together with other objects, and in the third condition it was out of sight in a box. Because the objects were out of reach for the children, they had to ask an adult to get them for them. Wittek & Tomasello’s prediction was that in the first condition the object was uniquely identifiable and therefore null reference, a pronoun, or simply pointing would be sufficient to get the adult to retrieve it. In the second and in the third condition only a full noun would unambiguously identify the object in question. In actual fact the results did not show an effect of experimental condition because the children tended to use full nouns regardless of the perceptual availability of the referent. As noted by the authors, the use of full nouns across the board was probably motivated by the fact that the children’s request contained the first mention of the object for the adult in question. In a sense the object’s perceptual availability was overridden by the absence of a previous discourse mention addressed to their interlocutor.

The results of these experimental studies clearly show that children as young as 2;6 are sensitive to prior discourse in their selection of a referential expression. There is also evidence that three-year-olds can provide more informative referential expressions as a

function of their listener's accessibility to the referent. Both Campbell et al. (2000) and Matthews (2005), report that from the age of three children did indeed use proportionally more nouns when they were describing an event to an experimenter who had not witnessed it. The use of nouns for the benefit of one's addressee requires the speaker to relinquish her own egocentric perspective and take her listener's point of view in making her linguistic choice. The fact that three-year-olds could do so successfully is remarkable considering that there is evidence that not only much older school-age children (Epley, Morewedge & Keysar, 2004), but even adults have considerable difficulties in correcting an initial egocentric bias in the assessment of another's perspective (Keysar, Lin & Barr, 2003). Crucially, the evidence for children's ability to assess another's perspective in the referential communication studies reviewed above is mediated by the type of question the children were asked. A general question like "What happened?" requires an answer where the subject and the predicate form an informational unit in which the subject has no discourse salience before it enters into a focus relation with the predicate in the given utterance (Lambrecht, 1994). These sentence-focus constructions are therefore likely to include a subject that will be realized by a maximally informative expression such as a full noun phrase. In essence, regardless of whether the speaker asking "What happened?" has witnessed the event they are asking about or not, the expectation is that the answer should contain both information on the event or state of affairs (expressed by the predicate), and on the participants (expressed by a noun phrase), and this is indeed borne out by Matthews' results. Although the children in her study did use proportionally more nouns when the addressee could not see the video, nevertheless they also provided a substantial proportion of nouns in contexts in which the addressee did have access to the video (approximately 55-80% of the time). The fact that the children used so many nouns in a context in which a less informative form would have sufficed indicates that the discourse cue provided by the general question played a greater role than the perceptual cue provided by the presence of the addressee. If this is correct it is not entirely clear that the children's use of nouns in the absence of the addressee was actually solely motivated by their ability to take their interlocutor's perspective. Because both the focus structure of the question asked and the absence of the listener call for the use of full noun phrases it is difficult to decide to what extent children rely on one or the other source of information

when they use full noun phrases in the absence of common ground answering a general question. A more stringent test of children's perspective taking abilities would be to pit the discourse cue against the perceptual cue to tease apart the relative contribution of each in the selection of referential expressions.

The purpose of the present studies was precisely to assess to what extent pre-school and school-age children can choose discourse-appropriate referential expression in the face of converging and conflicting cues. In two experiments children looked at a series of coloured drawings and played a sort of bingo with an adult experimenter. The children's task was to answer general and specific questions about the pictures presented on a laptop computer so that the experimenter could find the largest possible number of matching pictures in a folder of her own. In study 1 we crossed two variables: presence vs. absence of the listener while the picture was displayed on the laptop screen, and type of question asked (general vs. specific). In study 2 we manipulated the listener's presence and the number of animate referents displayed in the pictures (one vs. two).

2. Study 1

The aim of study 1 was to investigate the effect of the type of question asked by the experimenter, and the effect of the listener's presence on the informativeness of the expressions used by the participants to identify subject referents in their answers. The questions were of two types: general ("What's happening there?") and specific ("What's that person doing?"). In previous elicitation studies with two- and three-year-olds using toy props, general questions like "What's happening?/What do we need to get?" typically yielded more answers containing nouns than specific questions already including a definite noun phrase like "What happened to the clown?/What did the clown do?". To specific questions children were more likely to respond with a null reference. In the current study we manipulated the focus structure of the questions we asked the children. We used a sentence focus question of the "What's happening?" general type used in previous studies, and we modified the predicate focus question to include a more general subject noun phrase ("that person"), rather than a full noun phrase including the actual name of the referent in question (e.g. "the clown"). By doing so we were still asking a question about a specific individual, but at the same time we deliberately failed to

provide a label for it. The rationale for this modification was to investigate whether children operate at the level of the focus structure information provided by different interrogative constructions, or whether they rely on a referent's previous mention. If indeed they omit nouns in their answers only when they have heard them verbatim in a preceding question, the expectation is that a question like "What's that person doing?" should elicit as many answers including subject noun phrases as a generic question like "What's happening?". If, by contrast, they are indeed sensitive to the information structure of the question we would expect that, even with a rather general subject like "that person", they would provide fewer subject noun phrases with "What's that person doing?" than with "What's happening?" questions.

The second variable manipulated in this study, fully crossed with the first, is the effect of the listener's presence on children's choice of referential expressions.

Study 1 included four conditions: general question/'listener present' (condition 1), general question/'listener absent' (condition 2), specific question/'listener present' (condition 3), specific question/'listener absent' (condition 4). If speakers are sensitive to the listener's accessibility to the referents we predicted that, regardless of the type of question asked, the conditions in which the listener was not present would elicit maximally informative referential expressions (noun phrases). In the conditions in which the listener was present we expected that the type of question asked would elicit significantly different types of referential expressions. For condition 1 we anticipated more informative referential expressions (e.g. noun phrases) than for condition 2 where subject pronouns or null reference would be preferred. Our prediction was that the adults would comply with these constraints, and we wanted to investigate to what extent pre-school and the school-age children would show a similar sensitivity.

2.1. Methods

2.1.1. Participants

Seventy typically developing monolingual English-speaking children and twenty-three monolingual English-speaking adults participated in the study. The children were divided into three groups: a three-year-old group (N=19) with a mean age of 3;6 (range

3;3-3;8), a five-year-old group (N=27) with a mean age of 5;5 (range 5;3-5;7), and a six-year-old group (N=24) with a mean age of 6;3 (range 6;1-6;5).

2.1.2. Materials and design

The stimuli included twenty-six coloured drawings representing an animate agent acting upon an inanimate patient (e.g. a girl eating a piece of cake; a cook peeling a carrot), two were practice items and twenty-four were test items. There were four versions of each test item where different characters would perform the same target action (a girl eating a piece of cake, a boy eating a piece of cake, a woman eating a piece of cake, a man eating a piece of cake). Children were randomly allocated to one of the lists. The drawings were embedded in PowePoint presentations and were presented on a widescreen laptop computer in two different conditions. In the 'listener present' condition the experimenter and the participant were sitting next to each other facing the computer screen, in the 'listener absent' condition the experimenter turned her back to the participant and to the computer and sat facing in the opposite direction. For each condition half of the questions asked by the experimenter were "What's happening there?" and half were "What's that person doing?". The order of presentation was counterbalanced so that half of the participants took part in the 'listener present' condition first, and half in the 'listener absent' condition first. The order of question was such that no more than two questions of the same type were presented in a sequence. The participants' responses were audio-recorded by the laptop used to present the stimuli.

2.1.3. Procedure

The participants were tested individually on school and on university premises. The experimenter explained to the children that they would be looking at some pictures on the computer and would play a sort of bingo. The aim of the game was to match as many pictures as possible between the ones that would appear on the laptop screen and the ones contained in a folder held by the experimenter. The experimenter showed the children a folder containing a copy of the pictures that they would see on the screen. She explained that the folder contained all of the pictures that they were going to look at and some others as well. The experimenter made it clear to the children that she did not know exactly what pictures they would see in the presentation as they were chosen by the computer. As each of the pictures appeared on the computer the children would have to

answer a question about it posed by the experimenter, the question they would have to answer was either "What's happening there?" or "What's that person doing?". The experimenter then explained that for half of the pictures she would sit next to them and they would look at the pictures together, for the other half she would turn her back to them and they would have to help her find the right picture in her folder. She added that when she could not see the pictures they would have to be extra helpful when answering her questions, they would have to tell her who was doing what every time so that she could choose the right drawing. The experimenter explained that she had several different people performing the same action and that therefore they would have to be very precise when answering the questions. The children were then shown that for the action of eating a piece of cake, for example, there were four pictures: in one it was a little girl that was eating a piece of cake, in one it was a woman, in one it was a young boy, and in the last one it was a man. When the experimenter had her back turned the children would have to tell her not only what was happening (someone eating a piece of cake), but also who exactly was involved in the action, whether it was a girl, a boy, a man or a woman that was eating a piece of cake, so that she could tick the right one. The adults were given the same set of instructions. After this introductory explanation the participants were shown two practice pictures, for one of the pictures the experimenter sat next to the participant facing the screen, for the other she turned her back to the laptop and faced in the opposite direction. The question asked in the 'listener present' condition was "What's happening there?" and in the 'listener absent' condition it was "What's that person doing?". Half of the participants were shown the first practice picture in the 'listener present' condition, half in the 'listener absent' condition. In the 'listener present' condition, regardless of the type of referential expression used by the participant, the experimenter always successfully matched the picture on the screen with the corresponding one in her folder. In the 'listener absent' condition the experimenter would be able to tick the right picture only if the participant used a noun in their answer. If the participant did not provide an answer containing a noun phrase subject the experimenter would remind the participant that she could not see the picture and that she had several people performing the same action. She would repeat that, for example, she had four different people jumping over a wall and an answer like "(he/she) is jumping over a wall" was not sufficient to find the

right picture. A this point the older children and the adults would usually provide the required information, some of the younger children would repeat the same uninformative answer at which point the experimenter gave them the four options available in her folder and she would explicitly ask whether it was a girl, a boy, a man or a woman that was jumping over a wall. All the children would then select the appropriate referent and the experimenter would show them that she had found the corresponding picture and she showed them again the other possible alternative in her folder. This kind of feedback was only provided in the practice session and not for the test items.

2.1.4. Coding

The participants' responses were digitally audio-recorded and later coded by the experimenter. Twenty percent of transcripts were checked by an independent coder; inter-coder agreement was 100%. Only referential expressions for subject referents were coded for the purpose of this study. The coding categories were the following: indefinite and definite noun phrases (ex. (1) and (2) respectively), subject person pronoun (ex. (3)), null reference (ex. (4)), indefinite pronoun (ex. (5)), repetition of "that person" from the previous question (ex. (6)).

(1) A woman is opening a door.
(2) The woman is opening a door.
(3) She is opening a door.
(4) Opening a door.
(5) Someone is opening a door.
(6) That person is opening a door.

3. Results

Table 1 reports the mean proportion and standard deviation of noun phrases, personal pronouns, null reference and 'other' referential expressions including indefinite pronouns and repetitions of "that person" from the previous question in the four conditions for the four age groups.

Table 1. Mean proportion and standard deviation of noun phrases, personal pronouns, null reference and 'other' referential expressions for study 1 as a function of condition and age

	Condition 1		Condition 2		Condition 3		Condition 4	
	M	SD	M	SD	M	SD	M	SD
3-year-olds								
Noun phrases	.38	.43	.36	.44	.01	.07	.08	.24
Pronoun	.26	.34	.21	.38	.17	.30	.19	.27
Null	.27	.37	.33	.44	.80	.30	.70	.39
Other	.06	.20	.08	.24	0	0	.01	.07
5-yr-olds								
Noun phrases	.88	.29	.91	.19	.03	.13	.36	.38
Pronoun	.02	.08	.01	.06	.09	.25	.11	.22
Null	.02	.12	.03	.13	.86	.31	.51	.37
Other	.06	.18	.03	.13	0	0	0	0
6-yr-olds								
Noun phrases	.94	.21	.98	.06	.13	.32	.60	.32
Pronoun	.05	.21	0	0	.27	.41	.06	.16
Null	0	0	0	0	.58	.44	.32	.30
Other	0	0	.01	.06	0	0	0	0
Adults								
Noun phrases	.81	.38	.91	.28	.31	.46	.97	.09
Pronoun	.14	.34	.08	.28	.33	.46	.02	.09
Null	0	0	0	0	.34	.45	0	0
Other	.04	.20	0	0	0	0	0	0

Given the non-normal distribution of the data, differences within and between groups were analyzed using non-parametric statistics. Individual Friedman ANOVAs were carried out on the proportion of noun phrases in the four conditions for each of the four age groups. There was a significant difference in the proportion of noun phrases across

the four conditions for the group of three-year-olds (χ^2 = 22.169, d.f. = 3, $p \leq 0.001$). Post-hoc Mann-Whitney *U* tests revealed that the three-year-olds used a significantly larger proportion of noun phrases in condition 1 ("What's happening?"/listener present) than in condition 3 ("What's that person doing?"/listener present) ($p = 0.005$), and a significantly larger proportion of noun phrases in condition 2 ("What's happening?"/listener absent) than in condition 3 ($p = 0.007$), the other comparison were not significant above the p<.008 α level. The difference in the proportion of noun phrases in the four conditions was significant for the five-year-olds (χ^2 = 66.166, d.f. = 3, $p \leq 0.001$). Post-hoc Mann-Whitney *U* tests revealed that the only non-significant difference was between conditions 1 and 2 ($p = 0.68$), all the other paired comparisons were highly significant ($p \leq 0.001$). A similar picture emerged for the six-year-olds; a Friedman ANOVA showed a significant difference in the proportion of noun phrases across the four conditions (χ^2 = 55.978, d.f. = 3, $p \leq 0.001$). For this group too the only non-significant difference was between condition 1 and condition 2 ($p = 0.41$), all the other paired comparisons were highly significant ($p \leq 0.001$). A Friedman ANOVA performed on the adult data yielded a significant difference across the four conditions (χ^2 = 48.051, d.f. = 3, $p \leq 0.001$). According to post-hoc Mann-Whitney *U* tests there were significant differences in the proportion of noun phrases used between condition 1 and condition 3 ($p \leq 0.001$), between condition 2 and condition 3 ($p \leq 0.001$), and between condition 3 and condition 4 ("What's that person doing?"/listener absent). Differences between condition 1 and 2 ($p = 0.034$), between condition 1 and 4 ($p = 0.105$), and between condition 2 and 4 ($p = 0.083$) were not significant.

Four additional Kruskal-Wallis tests were performed, one for each condition, to investigate significant differences in the proportion of noun phrases across the four groups. The only condition for which there was no significant difference was condition 3 ("What's that person doing?"/listener present) where the proportion of noun phrases tended to be relatively small overall for all groups (χ^2 = 5.714, d.f. = 3, $p = 0.126$). Significant differences were found for condition 1 (χ^2 = 27.453, d.f. = 3, $p \leq 0.001$), condition 2 (χ^2 = 45.091, d.f. = 3, $p \leq 0.001$), and condition 4 (χ^2 = 48.571, d.f. = 3, $p \leq 0.001$). The results of post-hoc Mann-Whitney *U* tests for the four conditions are presented in Table 2.

Table 2. Mann-Whitney scores, significance values and effect sizes for between-groups comparison in the four conditions in study 1

	Condition 1			Condition 2			Condition 3			Condition 4		
	U	*p*	*r*	*U*	*p*	*r*	*U*	*p*	*r*	*U*	*p*	*r*
3yr-5yr	101.0	.000	-.59	89.0	.000	-.62	250.5	.754	-.04	131.5	.002	-.46
3ry-6yr	75.5	.000	-.66	63.5	.000	-.73	200.0	.219	-.18	55.0	.000	-.68
3yr-Adults	109.0	.002	-.48	57.5	.000	-.76	170.5	.061	-.29	13.0	.000	-.89
5yr-6yr	302.5	.468	-.06	276.5	.109	-.22	291.0	.266	-.15	220.0	.043	-.28
5yr-Adults	286.5	.485	-.09	253.0	.031	-.30	248.5	.058	-.27	72.5	.000	-.71
6yr-Adults	237.5	.185	-.02	264.5	.328	-.14	249.0	.421	-.11	93.0	.000	-.63

The group of three-year-olds was significantly different from all other groups for each of the three conditions where significant differences were found between groups. Five- and six-year-olds were not significantly different from each other in any condition and both groups were significantly different from the adult group only in condition 4 where the proportion of noun phrases produced answering the question "What's that person doing?" when the experimenter was not facing the laptop was significantly smaller.

3.1. Order effects

To verify whether the order of the listener condition in which the participants were tested affected the proportion of noun phrases used we carried out additional tests. We divided each age group into two groups according to whether the testing session started with the 'listener present' or the 'listener absent' condition, and we performed a series of Mann-Whitney *U* tests for each of the four conditions. As shown in table 3 there

were no significant differences in any of the conditions for any of the groups showing that the listener condition in which the participants started did not affect their response pattern.

Table 3. Mann-Whitney scores, significance values and effect sizes for between-groups order effects in study 1

	Condition 1			Condition 2			Condition 3			Condition 4		
	U	*p*	*r*	*U*	*p*	*r*	*U*	*p*	*r*	*U*	*p*	*r*
3yr	23.0	.320	-.23	22.0	.263	-.26	26.0	.107	-.38	27.5	.367	-.21
5yr	82.5	.661	-.08	88.0	1.0	0	77.0	.232	-.23	56.5	.105	-.31
6yr	56.0	.087	-.35	63.0	.237	-.24	63.0	.528	-.13	57.5	.255	-.23
Adults	49.5	.546	-.12	56.0	1.0	0	44.0	.297	-.22	45.5	.230	-.25

3.2. Discussion

The results of Study 1 show a clear effect of question type, with general questions eliciting a significantly larger proportion of full noun phrases than specific questions for all groups. Even for the three-year-olds, who only produced a full noun phrase less than 40% of the time with general questions, the effect of question type was significant suggesting that focus structure has a clear impact on the choice of referential expression even at this younger age. Crucially all the participants, including the younger children, used fewer noun phrases to identify a referent answering a specific question with a predicate focus structure even though the referent itself was not mentioned in the question. This suggests that children are sensitive to the type of information requested on the basis of the information structure of the question and that their choice of referential expression does not depend purely on the referent's name being mentioned in the previous discourse.

The effect of the listener's presence is very clear for the adult participants and less so for the children. The adults' responses confirmed our predictions: when the listener did not have access to the pictures they used a significantly larger proportion of full noun phrases than when the listener could see the pictures. Crucially they did so regardless of the type of question asked. Even when the question was specific, and the linguistic bias might have been to provide a less informative referential expression such as a pronoun, the adults were still very aware of the need to be as informative as possible, they were ready to comply with the experimenter's goal and they knew that to do so they had to include a more informative referential expression than the question called for. For the adults there was no significant difference between the proportions of full noun phrases in the 'listener absent' condition with either generic or specific questions.

The children's behaviour is somewhat different from the adults'. The use of six post-hoc Mann-Whitney *U* tests required a correction of the critical level of significance (0.05/6 = 0.008). In the case of the three-year-olds this resulted in a spurious lack of significance between the proportion of noun phrases in conditions 1 and 4, and between conditions 2 and 4. The pattern from Table 1 is nevertheless quite clear, the presence of the listener did not affect the children's production of full noun phrases, and only the type of question did. By contrast, the five- and the six-year-olds behaved differently from both the younger children and the adults, but similarly to one another. When the question was general there was no significant difference between the 'listener absent' and the 'listener present' conditions, in both conditions they consistently provided full noun phrases in the vast majority of cases. Interestingly, when the question was specific they provided more full noun phrases in the 'listener absent' than in the 'listener present' condition, suggesting that they could override the linguistic bias of the question type to some extent when they were required to be as informative as possible to comply with the experimenter's goals. Nevertheless, differently from the adults neither the five- nor the six-year-olds produced as many full noun phrases in the 'listener absent' condition with a specific questions as they did when the question was general, an indication that, unlike the adults, they could not completely overcome the linguistic bias when required to do so by the experimenter's explicit instructions.

4. Study 2

The results of study 1 show that children as young as three are sensitive to the type of linguistic information requested and that they can select discourse appropriate referential expressions as required. At the same time children as old as six cannot completely overcome the linguistic bias in the absence of shared common ground.

The aim of study 2 was to further explore children's sensitivity to different sources of information that may affect their choice of referential expressions. In study 2 we investigated the effect of the number of referents present in the visual setting, and the interaction between this source of perceptual information and the listener's presence on the proportion of noun phrases produced by the participants to identify subject referents. The questions asked were always specific and similarly to Study 1 they contained the subject phrase "that person/those people" rather than the actual name of the target referents. The two variables were fully crossed to yield four conditions, two of which were the same as in study 1: condition 1 (one referent/'listener present'), condition 2 (one referent/'listener absent'), condition 3 (two referents/'listener present'), condition 4 (two referents/'listener absent'). Our prediction was that mature speakers would be sensitive first and foremost to the presence of the listener and in conditions 2 and 4 we therefore expected the largest proportion of noun phrases. In condition 1, where there was only one referent that was equally accessible to the speaker and the listener, we expected the largest proportion of pronouns and null reference. Finally in condition 3, where there were two referents of different gender that were perceptually available to the listener we expected that minimally gender-marked pronouns would be used, or alternatively full noun phrases. In the children's case we expected age differences with older children becoming gradually more sensitive to the constraints imposed by the different discourse settings.

4.1. Participants

A subset of the children who participated in study 1 took part in study 2 on a different day. A total of sixty children and twenty adults took part in study 2: a group of three-year-olds (N=19) with a mean age of 3;6 (range 3;3-3;8), a group of five-year-olds (N=21) with a mean age of 5;7 (range 5;4-5;9), and a group of six-year-olds (N=20) with a mean age of 6;2 (range 6;0-6;4).

4.2. Materials and design

The pictorial stimuli were similar to those used in study 1 with animate human agents acting upon inanimate patients, with the exception that in this second study we varied the number of human agents, in half of the picture there was only one human agent acting upon an inanimate patient (e.g. a man reading a newspaper), and in the other half of the pictures there were two human agents of different gender engaged in separate actions on different inanimate patients (e.g. a girl eating ice-cream and a boy drinking a glass of juice). The questions posed by the experimenter were "What's that person doing?" if there was only one animate agent, and "What are those people doing?" if there were two. Similarly to study 1 we had a 'listener present' condition and a 'listener absent' condition. Because the pictures with one human agent were identical in the two studies, in study 2 the participants were allocated to a different list from study 1. For example, if in study 1 they saw a picture of a girl eating a piece of cake, in study 2 they would be shown the picture with a boy, a man or a woman eating a piece of cake.

4.3. Procedure

The procedure followed in study 2 replicated the protocol in study 1. Half of the participants took part in the 'listener present' condition first, and half in the 'listener absent' condition first. The participants who started with the 'listener present' condition in study 1 started with the 'listener absent' first in study 2. Those who started with the 'listener absent' condition first in study 1 started with the 'listener present' condition first in study 2.

4.4. Coding

The participants' responses were digitally audio-recorded and later coded by the experimenter. Twenty percent of transcripts were checked by an independent coder, inter-coder agreement was 98%. Disagreements were resolved by listening to the audio files together. Only referential expressions for subject referents were coded for the purpose of this study. The coding categories were the following: indefinite and definite noun phrases, subject person pronouns (he, she, they), null reference, indefinite pronoun

(someone, somebody), repetition of "that person/those people" from the previous question, and the use of "one…and the other…" as in (7)

(7) One is reading a paper and the other is writing a letter.

4.5. Results

Table 4 reports the mean proportion and standard deviation of noun phrases, personal pronouns, null reference, 'other' referential expressions including indefinite pronouns and repetitions of "that person" from the previous question, and "one…and the other.." expressions in the four conditions for the four age groups.

Non-parametric statistics were used for the analyses because of the non-normal distribution of the data. Individual Friedman ANOVAs were performed on each age group to test for significant differences between the proportions of noun phrases in the four conditions. For the group of three-year-olds we found no significant difference across the four conditions ($\chi^2 = 6.36$, d.f. = 3, $p = 0.095$). The three-year-olds produced a small proportion of noun phrases overall, and neither the number of referents nor the presence of the listener affected their referential choices in any meaningful way. By contrast, the five-year-olds used significantly different proportions of noun phrases in the four conditions ($\chi^2 = 22.043$, d.f. = 3, $p \leq 0.001$). A series of post-hoc Mann-Whitney *U* tests showed a larger proportion of noun phrases in condition 2 (one referent/listener absent) than in condition 1 (one referent/listener present) ($p \leq 0.001$) replicating findings from study 1. The five-year-olds also used more noun phrases in condition 3 (two referents/listener present) than in condition 1 ($p \leq 0.001$), and in condition 4 (two referents/listener absent) than in condition 1 ($p \leq 0.001$). No significant differences were observed for the other post-hoc comparisons. For the six-year-olds there was a significant difference in the proportion of noun phrases across the four conditions ($\chi^2 = 33.147$, d.f. = 3, $p \leq 0.001$). Post-hoc Mann-Whitney *U* tests showed significantly larger proportions of noun phrases in condition 2, 3, and 4 when compared to condition 1 (all differences highly significant with $p \leq 0.001$). No significant differences existed between the other conditions.

Table 4. Mean proportion and standard deviation of noun phrases, personal pronouns, null reference and 'other' referential expressions for study 2 as a function of condition and age

	Condition 1		Condition 2		Condition 3		Condition 4	
	M	SD	M	SD	M	SD	M	SD
3-year-olds								
Noun phrases	.02	.06	.08	.22	.17	.35	.21	.38
Pronoun	.20	.28	.16	.21	.12	.27	.01	.07
Null	.78	.30	.73	.42	.56	.48	.63	.44
One/the other	0	0	0	0	.10	.27	.14	.33
Other	0	0	.01	.05	.03	.15	0	0
5-yr-olds								
Noun phrases	.03	.11	.36	.39	.34	.47	.44	.45
Pronoun	.10	.25	.10	.22	0	0	0	0
Null	.87	.36	.53	.37	.38	.48	.34	.44
One/the other	0	0	0	0	.27	.43	.19	.32
Other	0	0	0	0	0	0	.01	.06
6-yr-olds								
Noun phrases	.11	.29	.62	.29	.69	.43	.79	.37
Pronoun	.29	.40	.04	.11	.01	.06	0	0
Null	.58	.42	.33	.30	.16	.38	.05	.21
One/the other	0	0	0	0	.12	.30	.15	.34
Other	0	0	0	0	0	0	0	0
Adults								
Noun phrases	.28	.48	.98	.08	.79	.38	.97	.13
Pronoun	.37	.44	.02	.06	.08	.28	.02	.13
Null	.34	.47	0	0	.07	.24	0	0
One/the other	0	0	0	0	.04	.11	0	0
Other	0	0	0	0	0	0	0	0

The adults followed a similar pattern with a significant difference between the proportion of noun phrases across the four conditions (χ^2 = 38.405, d.f. = 3, $p \leq 0.001$), and significantly larger proportions of noun phrases in condition 2, 3 and 4 when compared to

condition 1 (all differences highly significant with $p \leq 0.001$). By contrast, the proportions of noun phrases used in condition 2, 3, and 4 were not significantly different from each other.

Four additional Kruskal-Wallis tests were performed, one for each condition, to investigate significant differences in the proportion of noun phrases across the four groups. Confirming the results from study 1, in condition 1 there were no significant differences between the four groups ($\chi^2 = 2.556$, d.f. = 3, $p = .465$). Overall the proportion of noun phrases when there was one referent in the 'listener present' condition was low for all groups. Significant differences between the four groups were found for condition 2 ($\chi^2 = 43.732$, d.f. = 3, $p \leq 0.001$), condition 3 ($\chi^2 = 25.370$, d.f. = 3, $p \leq 0.001$), and condition 4 ($\chi^2 = 34.296$, d.f. = 3, $p \leq 0.001$). The results of post-hoc Mann-Whitney *U* tests are presented in Table 5.

Table 5. Mann-Whitney scores, significance values and effect sizes for between-groups comparison in the four conditions in study 2

	Condition 1			Condition 2			Condition 3			Condition 4		
	U	*p*	*r*	*U*	*p*	*r*	*U*	*p*	*r*	*U*	*p*	*r*
3yr-5yr	249.0	.690	-.04	134.5	.002	-.41	201.0	.133	-.22	181.5	.062	-.27
3ry-6yr	211.5	.207	-.17	57.0	.000	-.70	83.5	.000	-.59	82.0	.000	-.61
3yr-Adults	170.0	.060	-.28	10.0	.000	-.85	72.0	.000	-.63	37.5	.000	-.82
5yr-6yr	285.0	.234	-.13	220.5	.043	-.29	194.5	.007	-.38	186.0	.004	-.40
5yr-Adults	244.0	.062	-.27	70.5	.000	-.73	175.5	.004	-.41	112.5	.000	-.63
6yr-Adults	251.0	.436	-.11	91.0	.000	-.63	266.5	.806	-.03	218.0	.046	-.29

For all groups the results for conditions 1 and 2, where there was only one human agent referent, replicated the findings from study 1. In the following discussion we will therefore focus on the comparisons across the four groups for conditions 3 and 4 where answers were elicited with two referents. In both of the 'two referent' conditions the three-year-olds did not differ significantly from the five-year-olds in the use of noun phrases, but they produced significantly fewer noun phrases than the six-year olds and the adults. The five-year-olds were also significantly less likely to use a noun phrase when answering a question with two human agents than both the six-year-olds and the adults, while no significant differences were observed between the oldest group of children and the adults.

4.6. Order effects

Additional tests were carried out to establish whether the order of the listener condition in which the participants started the experiment affected the proportion of noun phrases used. We divided each age group into two groups according to whether the testing session started with the 'listener present' or the 'listener absent' condition, and we performed a series of Mann-Whitney *U* tests for each of the four conditions. As shown in Table 6 there were no significant differences in any of the conditions for any of the groups.

Table 6. Mann-Whitney scores, significance values and effect sizes for between-groups order effects in study 2

	Condition 1			Condition 2			Condition 3			Condition 4		
	U	*p*	*r*	*U*	*p*	*r*	*U*	*p*	*r*	*U*	*p*	*r*
3yr	25.5	.102	-.37	27.0	.360	-.21	24.5	.278	-.25	25.0	.348	-.22
5yr	73.0	.240	-.22	56.0	.115	-.31	67.5	.245	-.22	70.0	.342	-.18
6yr	63.5	.602	-.11	59.5	.275	-.24	54.5	.276	-.22	64.0	.643	-.09
Adults	46.0	.280	-.19	42.5	.201	-.27	51.0	.681	-.08	52.5	.508	-.14

4.7. Discussion

There are three clear sets of findings from study 2. Firstly, The three-year-old children used a small number of noun phrases overall and although they produced marginally more full noun phrases in the listener absent conditions and when there were two referents, these differences were not statistically significant. Neither the presence of the listener, nor the number of referents affected the younger children's choice of referential expressions in any meaningful way. Secondly, from age five onwards contexts with two referents elicited more noun phrases than contexts with one referent. Interestingly this difference between one- and two-referent contexts was significant only between the two 'listener present' conditions; in the 'listener absent' condition all groups, except the three-year-olds, produced similarly high proportions of noun phrases. When the experimenter could not see the pictures, the older children and the adults used predominantly full noun phrases so that she could unambiguously identify the picture that they were looking at in her own folder. By contrast, when both the participants and the experimenter had access to the pictures the number of referents had a clear effect on the older children's and on the adults' referential choices, regardless of the fact that they were being asked a specific question on both occasions. Similarly to the findings for the specific question/'listener present' condition in study 1, when there was only one referent in the picture all the participants tended to use less informative expressions such as personal pronouns or null reference. However, when they had to make reference to two entities rather than one, they chose to use more informative expressions, largely full noun phrases for the six-year-olds and the adults. This shows that the presence of two referents clearly prompted the older children and the adults to use a more informative expression, possibly for contrast purposes, notwithstanding the specificity of previous discourse

A third finding worthy of notice is the underuse of pronouns in the two-referent/listener present condition (see Arnold & Griffin, in press, for the effect of the number of referents on the choice of pronouns vs. proper names). In principle a gender-marked pronoun would have been sufficient to contrast the two referents when the experimenter could see the pictures, nevertheless the adults and the six-year-olds used full noun phrases almost exclusively, while the three-year-olds privileged null reference, and the five-year-olds' referential expressions were equally distributed between null

reference, noun phrases and "one … and the other…". The use of "one … and the other…" to contrast two referents of different genders engaged in different actions seems to be an intermediate strategy used by children who are beginning to appreciate the need to mark the contrast linguistically, but do not yet do so using the maximally informative expression available, i.e. nouns.

5. General discussion

The aim of the present studies was to investigate the relative contribution of discourse and perceptual cues to the choice of referential expressions in pre-schoolers and young school-age children in an experimental setting. The findings show a clear age divide between younger children (three-year-olds) older children (five-year-olds and six-year-olds) and adults in terms of the ability to unambiguously identify a referent for the benefit of the listener. The three-year-olds were not as successful as the older children when they had to take into account perceptual cues such as the number of referents and the availability of said referents to the listener. They were however sensitive to the focus structure of the questions they were being asked and used significantly more informative expressions such as nouns when the question was a sentence focus question ("What's happening there?") than when it was a predicate focus question ("What's that person doing?"). Interestingly, the use of "that person" in the predicate focus question did not prevent any of the participants from opting for more reduced expressions such as pronouns and null reference in the 'listener present' condition, in line with the results obtained by Campbell et al. (2000), who used the actual name of the referent in their specific question (e.g. "What's the ball doing?"), and with those of Matthews (2005) who instead used the name of the referent in conjunction with a general question (e.g. "Was that the clown? What happened?"). Matthews rightly observed that children's differential responses to "What happened?" and to "What's the ball doing?" questions might simply reflect an *ad hoc* strategy based on lexically specific knowledge. By this rationale the answer to a question like "What did X do?" is pronoun/null reference + verb, while the answer to the question "What happened?" must include a full noun. To test for the actual role played by previous mention Matthews kept the discourse cue provided by the referent's name and eliminated the information structure cue of the "What's X doing?" question by prefacing the name to the general sentence-focus "What happened?"

question. Her results showed that children seemed indeed sensitive to the previous discourse mention of the referent because they used more pronouns and null reference when the general question was preceded by the referent's name than when it was not. This suggests that children do not rely, at least not exclusively, on focus structure when they answer a question. In study 1 we did the opposite of what Matthews did in her study, we kept the information structure cue and we eliminated the previous mention cue. Our findings show that information structure does play a role because our participants used a larger proportion of less informative expressions in their answer to the predicate focus question even in the absence of previous mention of the referent. The current findings and Matthews's are however not necessarily mutually exclusive, taken together they show that children respond both to the focus structure of a question, and to the previous mention of a referent. In a question like "What's the clown doing?" both the previous mention cue and the focus structure cue converge, thus increasing the chances that the answer will contain a less informative referential expression, but even the presence of only one of the two cues is sufficient to elicit the same type of response. As Allen (2000) observed in the case of her naturalistic Inuktitut data, there seems to be a hierarchical and/or cumulative effect of informativeness features whereby some cues are strong enough to require a more informative referential expression in their own right, while others can do so only when they co-occur with other cues. For example newness was the third best predictor of overt argument realization in Allen's data, i.e. new referents were twice as likely to be realized overtly than given referents, and their chances were even higher if the referent was also third person and contrasted. Nevertheless, as Allen noted, there are also cases in which informative and uninformative features enter in competition and the strongest features wins out. In Matthews's study, for example, the general question type in "Was that the clown? What happened?" provided a focus structure cue to the use of a full noun in subject position, while the mention of the referent provided a strong previous mention cue to the use of a less informative expression such as a pronoun or null reference. When these two cues were pitted against one another the previous mention cue won and the children did indeed produce a larger proportion of null reference and pronouns in their answers.

In study 1 and study 2 we deliberately crossed variables so that cues would either converge or conflict with one another. This design allowed us to evaluate the relative contribution provided by perceptual and discourse cues and how this changes over the course of development. In both studies we had two conditions in which the two cues converged and two conditions in which they were in conflict. When the cues converged they either both required a subject realized by a full noun or by a personal pronoun/null reference. The cumulative effect of converging cues increased the likelihood that either maximally or minimally informative expressions would be chosen by the respondents.

The conditions in which the cues diverged are more interesting and crucial in the evaluation of how different sources of information affect the choice of referential expressions over time. In these cases one of the cues would call for a full noun as subject while the other favoured a more reduced expression (pronoun/null reference). The results for study 1 clearly show that the focus structure of the question plays a more important role than the presence of the listener ("What's happening there?"/'listener present'). Even in the presence of the listener, when a pronoun would have been sufficient to unambiguously identify the referent, the older children and the adults still privileged a full noun phrase. The younger children only produced full noun phrases 38% of the time in this condition, in line with a more general trend of low full noun phrase production overall. The situation is somewhat different in the condition in which the question's focus structure called for an answer containing a less informative expression but the absence of common ground required a more informative expression for the listener's benefit ("What's that person doing?"/'listener absent'). In this case the need to comply with the experimenter's goals and to take her perspective won over the question's focus structure leading the older children and the adults to opt predominantly for full noun subjects. Interestingly however, even the six-year-olds were significantly less efficient than the adults at overriding the focus structure bias and unambiguously identified the subject referent by using a full noun phrase only 60% of the time against 97% of the time for the adults. Because the aim of the game was to help the experimenter to match as many pictures as possible, the respondents' priority was to be as explicit as possible when the experimenter could not see the pictures for herself. At all times the participants had to remember that they had to look at things from their interlocutor's point of view. This was

undemanding when the participant's and the experimenter's perspectives coincided ('listener present' conditions), but it proved to be more problematic when they diverged ('listener absent' conditions). The older children responded differently to the specific question according to whether the listener was present or not and thereby showed some perspective-taking ability, but they did not do so as consistently as the adults. When they succeeded they did so because they heeded their understanding of the experimenter's goals instead of the demands of the question type to select a referential expression that would be more appropriate from the experimenter's point of view. This correction requires a non-trivial amount of effort and it appears to be considerably more demanding for three- and five-year-olds than for six-year-olds. If taking the listener's perspective taxed even the older children's referential abilities, the perceptual cue made available by the number of referents posed no particular difficulties, except to the three-year-olds who again used a small proportion of full noun phrases overall but who nevertheless used more full noun phrases with two-referents scenes than with one-referent scenes. By introducing pictures with two referents in study 2 we wanted to investigate whether children are sensitive to the need to contrast two entities that are co-present in the same scene. The results of one of Wittek & Tomasello's (2005) studies showed that contrast questions like "Did the clown have a vacuum cleaner?" elicited responses containing a pronoun subject and an object realized by a noun phrases (e.g. "No, he had a broom"), or simply an object noun phrase (e.g. "No, a broom"). As the authors observe, the high proportion of object noun phrases produced by the two- and the three-year-olds in these contexts are in line with the predictions of 'preferred argument structure' (DuBois, 1987) whereby full noun phrases are more likely to be objects (O) or subjects of intransitive verbs (S) than subjects of transitive verbs (A). In study 2, unlike in Wittek & Tomasello's contrast questions, our specific questions were not focused on the object (e.g. "What are those people eating/reading/chopping?") but on the whole event (e.g. "What are those people doing?"). In addition, differently from Wittek & Tomasello's study, in our study the referents of interest were always the subjects of transitive actions (A), therefore theoretically less likely to be realized by a full noun according to 'preferred argument structure'. Despite this discourse constraint we still expected the presence of two referents engaged in different actions to be an ideal set-up for contrast, and hence to

provide a strong cue to overt argument realization (see Allen, 2000 for the key role of 'contrast' in overt argument realization). Because the two referents in our picture were of different gender and were each engaged in two different actions (e.g. eating and drinking), we anticipated that the question "What are those people doing?" would either call for the use of two gender-marked pronouns in the 'listener present' condition, or possibly noun phrases, depending on how strongly the speaker intended to emphasise the contrast between the two referents. In the 'listener absent' condition we expected full noun phrases for the purpose of unambiguous referential identification. Similarly to study 1, in study 2 we had two conditions in which the two cues converged and two conditions in which they diverged and called for different types of referential expressions. One of the two conditions in which the cues conflicted was the same as in study 1 ("What's that person doing?"/'listener absent'), the other concerned the two-referent scene in the presence of the listener. Here we predicted that the strong perceptual cue of contrast would be privileged over the perceptual cue of the listener's presence. The results of study 2 for the one-referent condition replicated the findings of study 1. The results for the two-referent condition did indeed show that the perceptual cue provided by the number of referents played a greater role in determining the choice of referential expression than the presence of the listener. Even the three-year-old children used more noun phrases in the 'listener present' condition when there were two referents than when there was only one, although the difference was not significant. The six-year-olds behaved like adults with more than two thirds of noun phrases in the two-referent/'listener present condition and just over 10% of noun phrases in the one-referent/'listener present' condition, while the behaviour of the five-year-olds was unique inasmuch as they used noun phrases, null reference and "one…and the other…" equally often. The use of "one…and the other…" is perfectly acceptable in a context in which the listener has access to the pictures, but it was not the preferred option of either the six-year-olds or the adults who predominantly opted for full noun phrases to maximally distinguish the contrast between the two referents. Our findings showed that the perceptual cue provided by the number of referents was stronger than the perceptual cue provided by the presence of the listener, and incidentally also stronger than the preferred argument structure non-lexical A constraint.

The findings of the current studies lend support to the idea that in the transition from pre-school age to the early school years children become progressively more attuned to different types of perceptual and discourse cues in the choice of referential expressions. The only significant finding for the younger children was an obvious appreciation of the information structure of different question types. The perceptual cue provided by the number of referents was also partially appreciated by the younger children, but it was the listener's presence that posed the largest number of problems for all children, even the five- and the six-year-olds. In the current studies we deliberately limited the role of feedback to the practice session, future research should investigate what kind of support would be beneficial to increase the proportion of children's appropriate referential choices.

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