

Young preschoolers' ability to reference story characters: the contribution of gestures and character speech*

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ABSTRACT

The ability of 3- and 4-year-olds ($N = 48$) ability to (re)introduce main characters when narrating a picture-book was assessed, taking into account not only their use of nominal forms, but also their use of *deictic point gestures* and *character speech*. Using these paralinguistic means, 3-year-olds clarified a significantly larger proportion (43%) of their initially unclear (re)introductions than 4-year-olds did (21%), and attained the same final level of clarity. Thus, 3- and 4-year-olds appear similarly sensitive to the need to specify, unambiguously, referents in cases of (re)introduction, differing only in their linguistic ability to do so. These results support the view that gesture and affect form wholly integrated systems with speech, conveying nonredundant information.

INTRODUCTION

When we talk with other people, we all tell stories. These stories may recount something that happened to us, or they may be entirely about happenings to others, or they may even be purely fictional accounts of

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events involving ourselves or others. We live our lives in a world full of people, and our everyday conversations reflect this in the stories they contain. The stories we tell also reflect the fact that many of the events that happen to us or others involve other people interacting with us in different ways, with different perspectives and motivations. Recounting these events requires the ability to shift from the actions and perspective of one person to another in a manner that does not leave a listener confused. The aim of the present study was to investigate the emergence of this ability by examining the means by which 3- and 4-year-old children try to accomplish the task of shifting clearly between several principal actors in a story. In particular, this study sought to gain a more accurate measure of children's ability to convey clearly a shift between characters in a story by considering both the linguistic (i.e., use of nominal) and paralinguistic means (i.e., deictic point gestures and character speech) by which characters could be specified unambiguously. In considering these paralinguistic means, this study situates itself within a larger domain of research investigating gesture and affective expression as transitional mechanisms (e.g., Iverson & Thal 1998, Reilly 1992), providing children with a means of producing progressively more complex communicative forms beyond what they can achieve using linguistic means of communication. With respect to gestures, this study provides another domain (i.e., narrative referencing ability) within which to observe their integration with language and their potential to provide insight into the user's representation of the task at hand.

When telling a story, the ability to introduce and shift between actors or characters is fundamental to the story's comprehensibility and coherence. Ambiguous reference seriously impairs comprehension of a narrative or story (Bennett-Kastor 1983, Menig-Peterson 1975, Pratt & MacKenzie-Keating 1985). When discussing referencing in narrative, a distinction is usually drawn between the *introduction* or *switching* versus the *maintenance* of reference to the principal characters in a story (e.g., Bamberg 1986, 1987, Marslen-Wilson, Levy & Tyler 1982, McGann & Schwartz 1988, Wigglesworth 1990). The introduction of characters is usually accomplished through the use of nominals such as full noun phrases or proper names (e.g., Karen), whereas the maintenance of reference to characters is accomplished largely through the use of pronominals. It should be noted that introductions encompass not only the introduction of a new character to a story but also any instance in which the central focus of the action of the story shifts from one principal character to another principal character (i.e., reference switches) who may or may not be new to the story (i.e., reintroductions). In this

study we will be concerned only with 3- and 4-year-old children's introductions and reintroductions of principal characters, as this aspect has received less empirical attention than their ability to maintain discourse reference, and it represents, we believe, the more basic and earlier emerging skill of the two. That is, unless a narrator introduces or shifts to a new or different main character clearly, there is no question of maintaining reference to that character. Moreover, research suggests that it takes children at least until 5 to 7 years of age to master the maintenance of reference (e.g., Hickmann & Hendricks 1999, Wigglesworth 1990, 1997).

The ability of children to introduce characters in their stories has been investigated with a number of different approaches, and the general finding to date has been that 3- and 4-year-old children perform this task poorly, often using a pronoun where a nominal is required to avoid ambiguity or omitting the required referent entirely. None of these prior studies has included analyses of any paralinguistic aspects of children's narrations.

One approach, for example, has been to examine children's initial introductions to characters in a story. Using this approach, Wigglesworth (1990) found that, whereas only 5% of 4-year-old children used a noun phrase to *introduce* the main characters on the first page of a picture-book story in a spontaneous narration task, 40% of 6-year-olds and 50% of 8-year-olds did so. Similarly, when narrating past experiences in conversation, children under 4 years of age have been observed to provide little information as to 'who' the participants are in the narrative (e.g., Eisenberg 1985, Menig-Peterson & McCabe 1978, Peterson 1990).

A second approach has involved examining children's initial introductions of *new* elements *throughout* their narratives, and such studies have also generally found that 3-year-olds, and sometimes also 4-year-olds, introduce these new elements in an ambiguous manner approximately 20–25% of the time by using a pronoun or omitting mention of the referent entirely (Bamberg 1986, 1987, Menig-Peterson 1975, Peterson 1993, Peterson & Dodsworth 1991, Pratt & Mackenzie-Keating 1985). It should be noted that two of these studies required children to retell a story (Bamberg 1986, 1987, Pratt & Mackenzie-Keating 1985) and the other three studies assessed children's referencing skills in narratives about past personal experiences (Menig-Peterson 1975, Peterson 1993, Peterson & Dodsworth 1991).

Most similar to the approach of the current study, a number of researchers (Bamberg 1986, 1987, McGann & Schwartz 1988, Wigglesworth 1990) have analysed instances of reference switching in

which the narrator switches reference from one element to another element that has previously been introduced but that now requires the use of a nominal expression to be reintroduced. For example, Bamberg (1986, 1987) examined how German-speaking children at 3½ to 4, 5 to 6, and 9 to 10 years of age, and a group of adults, established reference to the two principal main characters – a boy and a dog – throughout their retelling of the picture-book *Frog, where are you?* (Mayer 1969). The data from the adults confirmed that in 92–99% of all instances in which these two protagonists were introduced or reintroduced, a nominal expression was used rather than a pronominal expression. In contrast, among the 3- to 4-year-olds, pronouns were used 65% of time. Among the oldest 9- to 10-year-old age group, the inappropriate use of pronouns had decreased to 30%. Similar results were found by McGann & Schwartz (1988) who elicited narratives from 60 children aged 3, 5, 8 and 10 years and a group of adults using 10 wordless storybooks, each featuring two different characters. When narrating these stories, the adults used nominals in all cases to switch between the two characters. In contrast, among the 3-year-olds, 95% of all switched references were pronominal. In contrast, among the three older groups, pronominal forms were observed to be used in approximately 30–60% of all switched references. A similarly poor level of performance was found among 4-year-old children by Wigglesworth (1990) who presented 4-, 6- and 8-year-olds and a group of adults with a storybook featuring multiple characters. Three opportunities for switching reference were examined in detail, and use of a full noun phrase was compared among the age groups. Although 70% of the adults and 50–70% of the 6- and 8-year-old children were observed to use a full noun phrase in all three instances, only 5% of the 4-year-old children showed this pattern of responding.

Overall, studies examining children's ability to introduce and reintroduce referents when telling a narrative from a picture storybook have found that both 3- and 4-year-old children generally perform poorly. But the number of such studies is limited, especially those in which the story to be narrated contains more than one or two characters. Some researchers have concluded that there occurs 'a significant qualitative and functional shift' (McGann & Schwartz 1988: 228) around 4 years of age in children's ability to refer to characters in their narratives and in their ability to control the number of characters introduced into a narrative (Bennett-Kastor 1983). However, given the limited number of studies, this conclusion may be premature.

For instance, from the studies to date it is unclear whether a shift is actually occurring between 3 and 4 years of age. Moreover, even if such

a shift is occurring, it is not known whether this difference in performance represents an ability on the part of the 4-year-olds to recognize the need to refer unambiguously to a character being introduced or reintroduced that is not recognized by 3-year-olds, or only a greater ability to achieve such unambiguous references linguistically in a narrative. That is, if younger children accomplish the task of referring to a character unambiguously in such situations using paralinguistic means, then older children's better performance may be due largely to a greater ability to execute this task linguistically and not to an increased ability to recognize the need to specify referents unambiguously in cases of referent introductions and reintroductions.

Thus, in the current study two paralinguistic means, observed to be used by 3- and 4-year-old children when narrating a picture-book, were taken into account: the use of *deictic point gestures* to a specific character and the use of *direct character speech* in which children spoke directly (as opposed to using indirect speech) for the characters using distinctive intonations and speech from a first person perspective (e.g., use of first-person pronouns). In previous studies such paralinguistic means have not been systematically investigated, although the use of gestures, for example, has been noted by Karmiloff-Smith (1981) and Wigglesworth (1997). Taking such paralinguistic means into account, we argue, provides a more sensitive measure of the ability of young children to recognize when it is necessary to specify a referent unambiguously (as in a case of reference switching).

Although gesture and character speech have not been the focus of systematic study with respect to the topic of referencing in narrative, both have been the subject of much previous research with respect to their ability to serve as mechanisms facilitating children's transition to more complex communicative forms that are beyond their current linguistic ability. We will now briefly consider these findings, first with respect to the use of gesture and then with respect to the use of character speech.

Children's combined use of gestures and words in more extended conversational interactions has been extensively studied during the transition period to predominantly linguistic means of communication around 12–18 months of age when their linguistic skills remain limited (Bates, Camaioni & Volterra 1975, Bruner 1974, Greenfield & Smith 1976, Harding & Golinkoff 1979). Around 14 to 16 months of age, children's first gesture-word combinations generally appear (e.g., Bates, Camaioni & Volterra 1979, Goldin-Meadow & Morford 1985, Greenfield & Smith 1976) in which the gesture and the word convey similar, often redundant, information (e.g., point to cup while saying 'cup'). By

16 to 18 months of age, children produce gesture-word combinations – *supplementary* combinations as they have been called (Iverson & Thal 1998) – in which the gestures contain information that is different from but related to that conveyed by words, e.g., point to a book while saying ‘Daddy’ to mean Daddy’s book (e.g., Butcher & Goldin-Meadow 1993, Goldin-Meadow & Morford 1985, Greenfield & Smith 1976, Iverson, Volterra, Pizzuto & Capirci 1994, Masur 1983, Morford & Goldin-Meadow 1992, Zinobar & Martlew 1985). The emergence of supplementary combinations appears to be a good indicator of the imminence of the transition to two-word speech (e.g., Butcher & Goldin-Meadow 1993, Capirci, Iverson, Pizzuto & Volterra 1996, Iverson *et al.* 1994). Indeed, there appears to be a general consensus that supplementary combinations ‘reflect a compromise between readiness to produce word combination and constraints (e.g., phonological and articulatory skill; Johnson, Lewis, & Hogan, 1995) on the ability to produce two words in succession... [and seem] to indicate that a child is cognitively equipped to produce two-word utterances but has not reached the moment of full transition into two-word speech (Morford and Goldin-Meadow, 1992)’ (Iverson & Thal 1998: 76).

Beyond the two-word period, in toddler and preschool-aged children, gesture-word combinations have been less studied. However, evidence does exist that suggests that, similar to the situation with supplementary gestures in infancy, when gestures are taken into account, a more accurate picture is revealed of what a child is cognitively able to do, even though this understanding may not be reflected in their verbal productions (e.g., O’Neill 1996, Tomasello, Anselmi & Farrar 1984/85). For example, taking children’s gestures into account has revealed hitherto unsuspected abilities on the part of 2-year-old children in the domain of theory of mind with respect to their ability to adapt their communication to a listener’s knowledge state accordingly. In a request situation, O’Neill (1996) found that younger and older 2-year-old children will adapt their nonverbal and verbal communication depending on the knowledge state of their listener. In their requests for an out-of-reach, hidden toy, these children provided their parent with the location and name of a hidden toy more often when their parent had not seen the hiding of the toy than when the parent had seen the hiding and was knowledgeable about the toy’s identity and location.

Interestingly, among older elementary school-aged children, and even adults, gestures have been demonstrated to reveal aspects of an individual’s solution of a problem (e.g., Church & Goldin-Meadow 1986, Goldin-Meadow 1997, Goldin-Meadow, Alibali & Church 1993, Perry, Church & Goldin-Meadow 1988) or representation of a problem

(e.g., Alibali, Bassok, Solomon, Syc & Goldin-Meadow 1999), that are not evident in their verbal responses. Such studies have focused on 'discordant' gestures which provide information that is not redundant with the information provided verbally. For example, in solving a liquid conservation problem, a child may refer to the width of the container verbally, but indicate the height of the water only in gesture. Such findings are generally thought to support the view, first put forward by McNeill (1992), that gesture forms a wholly integrated system with speech and can reveal much about the way thoughts are transformed into communication as well as thoughts that are, at times, not evident in speech at all. With respect to children, Goldin-Meadow (1997) has argued that the use of gestures in a discordant manner offers them a way to bring new information into their repertoires without disrupting the current system. In a similar manner, in the current study we would argue that children's deictic point gestures may offer them a means by which to specify a referent unambiguously when they are still limited in their ability to incorporate this information linguistically into their narratives.

We turn now to consider the second paralinguistic means investigated in this study, namely the use of *character speech* (Bamberg & Damrad-Frye 1991) (which has also been referred to as use of the 'active voice', Bamberg 1991), 'voicing' (Wolf 1990, Wolf & Hicks 1989), 'quoted speech' (Bamberg & Reilly 1996, Reilly 1992), 'direct quotation' (Clark & Gerrig 1990, Emmorey & Reilly 1998) and 'character dialogue' (Wolf & Hicks 1989). Using character speech, the narrator conveys what characters say aloud. Such speech is encoded primarily in the first person using pronomial forms characteristic of direct speech by a participant in an ongoing action. Such speech often depicts characters' voices by marking such things as voice pitch (e.g., speaking in a higher voice for women than men), or emotion (e.g., speaking in an angry or excited tone of voice) and may be accompanied by relevant facial expressions (e.g., Clark & Gerrig 1990, Wolf & Hicks 1989).

Character speech, in the form of *direct speech* (e.g., The lady said, 'Yuck there's a frog in my salad!'), as opposed to indirect speech (e.g., The lady said that a frog was in her salad.), is regarded by narrative theorists (e.g., Bakhtin 1981, Labov 1972) as a device that lends texture and dimensionality and heightens interest for a listener (or reader). Indeed, character speech is often regarded as an evaluative device used by narrators (e.g., Bamberg & Damrad-Frye 1991, Kernan 1977, Labov, Cohen, Robins & Lewis 1968, Peterson & McCabe 1983). Labov & Waletzky (1967) originally described two basic constituents of narrative: *narrative* (or referential) *clauses* referring to the actual events

in sequential order and *evaluative clauses* in which the narrator provides insight into the perspective from which the narrative events are being organized (e.g., narrator's attitude, the events' significance to the narrator or character in a story). Character speech is generally viewed as a evaluative device because it provides an alternative perspective to that of the narrator (i.e., the perspective of the character) and distances the narrator from the plotline (e.g., Bamberg & Damrad-Frye 1991, Reilly, Klima & Bellugi 1990). Our categorization of character speech as a paralinguistic rather than linguistic device follows much previous work in which it is treated as an instance of 'affective expression' (e.g., Bamberg & Reilly 1996, Emmorey & Reilly 1998, Reilly 1992) or viewed as a device that illustrates or shows the speech of a character in the story, rather than telling or describing the events of the story (e.g., Bamberg & Reilly 1996, Clark & Gerrig 1990, Emmorey & Reilly 1990, Reilly *et al.* 1990, Wolf 1990).

By the age of 3, and even earlier, children have been observed to use character speech in their free play and narratives (Miller & Sperry 1988, Polyani 1986, Reilly 1992, Sawyer 1997, Wolf 1990, Wolf & Hicks 1989). For example, consider a portion of a replica play narrative from a 2-year-old child, Heather, as observed by Wolf & Hicks (1989: 338). The instances of character speech are placed to the right:

here's the lion coming

the lion ate Pierre [a human toy figure] up
(Heather has a toy girl run to a giraffe)

run, run, run!

the giraffe's scared of the lion
(said as giraffe)

go back in the house
and go to sleep

With respect to establishing reference to characters in a narrative, such instances of character speech are particularly interesting because young children often do not preface them with the identity of the speaker (e.g., 'and the giraffe said...'). And yet, as Wolf & Hicks (1989) note, these narratives are not incomprehensible or incoherent for the main reason, they argue, that the speech (or 'voice') created for each character has a distinct characteristic, 'its own linguistic signature' (Wolf & Hicks 1989: 330), that allows a listener to follow the interplay and switches between characters. Given these findings, we argue that if one is to gain an accurate picture of the ability of young children to introduce clearly or to switch between characters in their narratives, it is just as necessary to consider their use of character speech as it is their use of deictic point gestures, as both have the potential to specify unambiguously a

referent omitted verbally or unclearly specified through the use of a pronoun.

Thus, in this study the picture-book narratives of 48 3- and 4-year-old children were examined with respect to children's ability to introduce and reintroduce the main characters in the story. It was first determined how clearly children were able to introduce the characters by verbal means alone (e.g., the use of a noun such as *boy*). Following this, the contribution of their deictic point gestures and instances of character speech were examined to determine the proportion of linguistically unclear references remaining that were clarified through these paralinguistic means. Of particular interest was whether differences in the use of such paralinguistic means might exist between the 3-year-old and the 4-year-old children and whether, once these paralinguistic means had been taken into account, 3- and 4-year-olds would show a difference in their ability to specify characters unambiguously when introducing or reintroducing them, and what the nature of this difference might be.

METHOD

Participants

Forty-eight children participated: 24 3-year-olds (14 girls and 10 boys, mean age 3;6, range 3;5–3;11) and 24 4-year-olds (11 girls and 13 boys, mean age 4;3, range 4;1–4;11). The children were largely from middle-class families and were recruited from the general population via advertisements in newspapers, grocery stores, malls and community centres. All the children had acquired English as their first language. Six additional children were tested but, due to a refusal to participate or camera problems, they were dropped.

Procedure

Narrative task All children were tested individually while sitting at a small table with an experimenter. The entire session was videotaped. The narrative task given to children was administered originally as part of a larger study looking at relations between language skill and measures of visual attention (Cohen 1998). At that time, however, children's narratives were not transcribed or coded or analysed for any of the measures used in the current study.

Picture-book story stimulus The picture-book presented to children was a shorter 12-page adaptation of Mercer Mayer's (1974) picture-book entitled *Frog goes to dinner*, which was edited so that it was more suitable in length for 3- to 4-year-old children, yet maintained the

story-line cohesively. A brief synopsis of the story is provided in the Appendix. No text accompanied the pictures. It should be noted that in Mayer's original version some pages contained two separate pictures; we did not alter the presentation of these pages. The pages were copied to a size of 14 × 28.5 cm, laminated and spiral-bound into a book form that the children could easily manipulate. None of the children had seen or heard this story before.

Familiarization task To familiarize children with the story, the experimenter went page by page through the book, asking the child to look at each page and to say what was happening in the picture. On page 1 the experimenter introduced the story by telling children that this was a story about a boy who went to a fancy restaurant with his family and pet frog, and some funny things happened when they got there. For all pages except the first one, only the prompt 'What is happening in this picture?' was used, and at no time did the experimenter provide any text for the story. Previewing a picture story in this manner has been shown to facilitate preschoolers' production of cohesive narratives (Shapiro & Hudson 1992).

Experimental task Following the familiarization task, the experimenter brought out a Sesame Street doll – Big Bird or Ernie based on the child's preference – and told the children that Big Bird/Ernie loved stories and that he had never heard this story before. The children were asked to tell Big Bird/Ernie the story. On the stomach of each doll we had attached a strip of velcro that allowed them to be fixed to the edge of the table between the child and the book. In this manner, the doll was 'looking' at the pictures from the same perspective as the child (i.e., not upside down from the opposite side of the table) and his position also did not impede the child from turning the pages. The use of a 'naive listener' was crucial in terms of providing children with a more pragmatically natural story-telling situation which was enjoyable for children. Previous research suggests that children tell more complete and less confusing stories to listeners whom they believe to be naive rather than knowledgeable about the content of the story (Liles 1985, Menig-Peterson 1975, Pelligrini 1982). During the child's narrative the experimenter did not intervene in any manner, and children were free to say as much or as little about each page as they wanted. The entire narrative task generally took approximately 10 minutes to complete.

Transcription of narratives

Children's utterances during the experimental task were initially transcribed by one undergraduate research assistant using the conventions

of the CHAT (Codes for the Human Analysis of Transcripts) transcription system (MacWhinney 1995, MacWhinney & Snow 1985, 1990) and reviewed by a second undergraduate research assistant. Any discrepancies were resolved through discussion. Speech by the experimenter and speech by the child not related to telling the story (e.g., a child's comments about the room) were transcribed, but were excluded from the analyses reported here. In addition to transcribing children's verbal utterances, two further paralinguistic aspects of children's narrations were included in our transcriptions:

(a) *Character speech* Based on previous research (as discussed in the Introduction), instances of character speech were identified in which children spoke directly for a character. For example, in one event in the story in which an older female diner is surprised to find the frog in her salad, one child adopted a high-pitched voice and said, 'Aah! How did that get in there?' These instances could readily be identified by the child's change in tone and pitch and the use of speech from a first-person perspective (e.g., use of first-person pronouns). Any instance of character speech was noted in the transcriptions along with the identity of the character being voiced. In rare cases, if the identity could not be determined clearly (e.g., could have been one of two possible characters) then it was coded as 'unspecified'. Only the instances of character speech for which a character could be clearly identified were taken into account in the analyses presented here.

(b) *Point gestures* Starting with the CHAT transcription system, we developed a more detailed transcription system to include information regarding the kinds of point gestures children used when telling the story. These gestures were coded and categorized in the transcripts as one of three types which were all variations of a prototypical point gesture involving the extension of the index finger relative to the other fingers on the hand. The three gesture types coded are described below, and it should be noted that only deictic point gestures of the first type that specified *characters* in the story were taken into account in the analyses presented here.

(i) *Deictic points* were point gestures that clearly specified one character (e.g., boy), object (e.g., saxophone) or location (e.g., in salad), by making contact with that specific character, object, or location in the picture or by being held very specifically and closely over that specific character, object or location in the picture.

(ii) *Nonspecific gestures* were point gestures that were directed to

one area of a picture, but this area did not contain any specific character or object (e.g., point to empty space in drawing). These gestures at times made contact with the picture, but at other times were held over the picture.

- (iii) *Global* gestures were nonspecific point gestures that travelled over several locations in a row (i.e., that traced a continuous path over two or more nonspecific locations). These gestures at times made contact with the picture, but at other times travelled over the picture.

Reliability of the narrative coding of character speech and gestures

A third undergraduate research assistant was employed to code independently a random selection of 30% of all the transcripts in each age group for any occurrences of character speech and of the three gesture types. Overall, reliability was excellent. There were no disagreements over the occurrence or nonoccurrence of any instances of character speech. Percentage agreement for the three gesture types was excellent (99% agreement overall), with only three disagreements regarding gesture use: one involved the occurrence of a nonspecific gesture and two involved the character/object specified by a deictic point gesture.

Coding of reference to characters in the narratives

Identification of main events in story As has been done in several previous studies of children's referencing ability (e.g., Bamberg 1986, 1987, Stenning & Michell 1985), we chose to limit our analysis to an investigation of children's ability to introduce and switch to the characters in a predetermined set of main events for the narrative. Nineteen main events in the story were originally identified in a prior investigation of these narratives by O'Neill & Pearce (2001) and are shown in Table 1. These main events constituted the one or two main actions occurring on each page of the story. In three cases (events 2, 9, 19), two alternative descriptions were judged possible. The validity of including these 19 main events was confirmed in an adult control study described in O'Neill & Pearce (2001). To be credited with including an event, a child did not need to state an event exactly as described in Table 1, but did need to capture the gist of the event, which roughly corresponded to the main action occurring. In five instances, two events were mentioned out of order. As it seemed invalid to credit children with both events (as the events no longer cohered), a decision was made to credit children with only the first event mentioned. In the

TABLE 1. *Event analysis of adapted Frog goes to dinner story and corresponding (re)introduction of character(s)*

| Event | Description of event | Character (re)introduction |
|-------|---|----------------------------------|
| 1 | <i>Family</i> goes to restaurant | 1 |
| 2 | <i>Frog</i> jumps out of boy's pocket / <i>Frog</i> jumps into musician's instrument | 2 |
| 3 | <i>Musician</i> can't play | 3 |
| 4 | <i>Musician</i> looks in instrument | (3) ^a |
| 5 | <i>Frog</i> falls out | 4 |
| 6 | <i>Musician</i> falls in drum | 5 |
| 7 | <i>Frog</i> jumps into salad | 6 |
| 8 | <i>Lady</i> receives salad | 7 |
| 9 | <i>Lady</i> sees frog / <i>Frog</i> peaks out | (7) 8 (optional) ^b |
| 10 | <i>Lady</i> reacts | (7) or 9 ^b |
| 11 | <i>Frog</i> jumps out | 10 |
| 12 | <i>Lady</i> yells at manager | 11 |
| 13 | <i>Waiter</i> takes frog | 12 |
| 14 | <i>Boy</i> wants frog back | 13 |
| 15 | <i>Boy</i> gets frog back | (13) ^a |
| 16 | <i>Waiter</i> kicks family out | 14 |
| 17 | <i>Family</i> is mad at boy (in car on drive home) | 15 |
| 18 | <i>Boy</i> sent to his room (to go to bed) | 16 |
| 19 | <i>Boy and frog</i> are laughing in room about what happened/ <i>Boy and frog</i> are laughing instead of going to bed | 17 |

Note. Events 2, 9 and 19 could be described by either of the two alternatives given.

^a Brackets indicate that the event involves the same character as in the previous event and therefore constitutes a case of maintenance of reference and not an instance of introduction or reintroduction (unless the character is (re)introduced in this event rather than in the previous event).

^b See text for details regarding the coding of these two instances.

O'Neill & Pearce (2001) study, each child received a score out of 19 depending on how many of the identified events they included in their narrative. It was the introductions and reintroductions of characters involved in these events that were analysed in the present study (see details of coding below). For the purposes of the present study, it should be noted that children could be credited with including an event even if they did not reference the relevant character(s) either verbally

(using a noun or pronoun). For example, some children produced utterances such as 'jumped out' to describe the frog jumping out of the salad and were credited with capturing the gist of the event. Such utterances, representing instances of null reference, have been observed in preschoolers' narratives in previous research (e.g., McGann & Schwartz 1988, Peterson 1993). In the study of O'Neill & Pearce (2001), this event coding was carried out independently, and in full, for all transcripts for all children, by two undergraduate research assistants blind to the hypotheses of the study. Reliability was excellent ($\kappa = 0.94$).

Identification of main introductions and reintroductions of characters in main events For the present study, 17 instances of character introductions or reintroductions were identified from among the 19 main events described above. These 17 instances are numbered in Table 1 and correspond to the character or characters italicized in the description of the event (e.g., musician in event 3). In a few cases, describing an event did not require a shift in character reference from the previous event (i.e., events 4 and 15, and potentially events 9 and 10, depending on children's description of event 9 where two possible descriptions existed). These cases of maintenance were not included, unless a character happened not to be mentioned in the previous event and thus was being (re)introduced in describing these events. In addition, one optional shift in reference (reintroduction 8) could occur if children chose to describe event 9 in terms of the frog peeking out of the salad rather than maintaining reference to the lady. In all 17 instances of character (re)introductions it was expected that a *noun* (e.g., the *boy*) would be used to refer to the character to specify unambiguously this referent to the listener. The use of a pronoun was considered inappropriate given the shift in focus to a different character from the preceding event. This expectation was confirmed in a control study carried out with a sample of adults as described below.

Coding of clarity of children's character references

The analyses of O'Neill & Pearce (2001) revealed that, in total, 153 instances of the description of a main event were included by 3-year-old children in their narratives, and 185 by the 4-year-old children. Table 2 shows the number of children per age group including a description of each of the 19 main story events in their narrative. The average number of main events included per narrative was 6.38 (SD 3.63, range 0–13) among the 3-year-old children and 7.71 (SD 2.49, range 4–13) among the 4-year-olds. The difference in the number of

TABLE 2. *Number of children per age group (N = 24) including a description of each of the 19 main story events in their narrative*

| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | Total |
|-------|----|----|----|----|----|----|----|---|----|----|----|----|----|----|----|----|----|----|----|-------|
| 3 | 9 | 20 | 3 | 7 | 14 | 7 | 15 | 1 | 6 | 6 | 12 | 11 | 12 | 14 | 7 | 1 | 5 | 2 | 1 | 153 |
| 4 | 4 | 20 | 11 | 10 | 20 | 7 | 24 | 1 | 9 | 9 | 15 | 10 | 16 | 8 | 7 | 2 | 7 | 5 | 0 | 185 |
| Total | 13 | 40 | 14 | 17 | 34 | 14 | 39 | 2 | 15 | 15 | 27 | 21 | 28 | 22 | 14 | 3 | 12 | 7 | 1 | 338 |

events described by the two age groups was not statistically significant. For the present study we examined the manner in which the children introduced or reintroduced the character(s) in each of these main event descriptions, excluding 5 instances of maintenance among the 3-year-old children and 11 instances among the 4-year-olds. Thus a total of 148 event descriptions were examined among the 3-year-olds and 174 among the 4-year-olds. This coding was divided into the following two stages:

1. *Use of noun* In this first stage of the coding, only children's verbal utterances were taken into account. Children were credited with achieving clarity of reference (score = 1) if they used a noun alone (e.g., lady) or full noun phrase (e.g., the/a lady) to refer to the main character in the event. For simplicity's sake we will refer to this measure as use of a noun. Whether a child used a definite or indefinite article (i.e., a/the), or omitted the article altogether, was not considered as this was not the focus of investigation in the present study. It should be noted that in a small number of cases ($N = 5$) among the 4-year-old group, a noun was used to refer to a character in a clause preceding mention of the event in particular (e.g., 'Now the *frog*'s in the salad and *he* jumped out'). In such cases, although a pronoun was used to refer to the character in the main event *per se*, children were credited with providing a clear noun referent based on its earlier establishment in the utterance. The total corpus of nouns that could be included were, in order of first appearance: *family* (or boy and family), *frog*, *musician*, *lady*, *waiter*, *boy*, *family* (all members but boy), *boy and frog*. When referring to the family, credit was given if all family members were named separately (e.g., the mom, the dad, and the sister . . .).

Children were scored as unclearly specifying a referent (score = 0) if they either (a) used a pronoun, or (b) omitted any verbal reference to the character entirely (i.e., null reference). An example of an instance of null reference is the verbal description 'jumping out' for event 11. Such instances of omission have been observed in other studies among preschool-aged children (McGann & Schwartz 1988, Wigglesworth 1997). Infrequently, children used an ambiguous noun phrase such as 'the guy' or 'the man' when more than one adult male character was present in the picture. In such cases, children were scored as unclearly specifying the referent. Children also received a score of 0 if they used an incorrect pronoun (e.g., referring to the woman as 'he'), although this was rare, with only six instances observed.

2. *Use of character speech and/or deictic point* In the second stage of the coding, children's references that remained unclear following the

first stage of coding were examined, and it was noted whether any further clarity of reference was achieved via the use of character speech, the use of a deictic point gesture or the use of both. The following examples illustrate children's use of gestures and character speech. In one instance, in describing event 10 one child uttered 'then she's mad' while pointing at the lady during the words 'she's mad'. In another example, event 14 was described verbally using only character speech: 'But that's my frog! Don't throw him in the garbage!' In this case, the child adopted a higher pitch that clearly identified the speaker as the boy, although the boy was never identified verbally as the speaker, nor pointed to, during this utterance.

Reliability of the coding of the clarity of children's character references

An undergraduate research assistant blind to the hypotheses of this study independently coded the clarity of children's character references using the procedure described above for a random sample of 30% of the children in each age group. Kappas were calculated separately for the measures of initial clarity, coding of reference with respect to use of noun/null reference/ambiguous noun phrase/incorrect pronoun, clarification with use of gesture, clarification with use of character speech, and final clarity achieved. Reliability was very good to excellent. For each measure respectively, the kappa was 1, 0.93, 0.81, 0.95, 0.80.

Adult control study

To ensure that the 17 character introductions and reintroductions we had identified were indeed cases in which an adult would mark the shift in reference with a full noun phrase, 14 adults (4 men, 10 women) ranging in age from 23 to 33 years were presented with the picture-book given to children and instructed to tell the story, describing its main events. Their narratives were tape-recorded and transcribed. From these transcripts, the manner in which the referent in each of the 17 instances was described (full noun phrase versus pronoun) was coded. The results confirmed our predictions, with adults using a full noun phrase (and sometimes a proper noun if they decided to give the boy and/or the frog a name) in 96.6% of all instances of reference introductions and reintroductions ($N = 15-17$ (re)introductions per narrative).

RESULTS

Referential clarity achieved with use of noun

As already mentioned, the total number of main events included in children's narratives did not differ significantly between the age groups

TABLE 3. *Number of children per age group (N = 24) using a noun to introduce or reintroduce a character for each of the 19 story events*

| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | Total | |
|-------|---|----|---|---|---|---|----|---|----|----|----|----|----|----|----|----|----|----|----|-------|----|
| 3 | 0 | 6 | 0 | 0 | 3 | 0 | 3 | 0 | 3* | 0 | 3 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 20 | |
| 4 | 0 | 9 | 1 | 0 | 6 | 0 | 11 | 0 | 2* | 4 | 6 | 3 | 2 | 2 | 2 | 0 | 1 | 1 | 1 | 0 | 50 |
| Total | 0 | 15 | 1 | 0 | 9 | 0 | 14 | 0 | 5 | 4 | 9 | 4 | 2 | 3 | 2 | 0 | 1 | 1 | 1 | 0 | 70 |

* All references are to 'lady' among age 3, one reference to 'frog' and one to 'lady' among age 4.

TABLE 4. *Distribution of total number of noun references by character and age group*

| | Total appearances in story | Noun references | |
|----------------------|-------------------------------|-----------------|-------------|
| | | 3-year-olds | 4-year-olds |
| Family (with boy) | 1 | 0 | 0 |
| Frog | 5 | 15 | 32 |
| Musician | 2 | 0 | 1 |
| Lady | 3 | 4 | 8* |
| Waiter | 2 | 0 | 2 |
| Boy | 3 | 1 | 5 |
| Family (without boy) | 1 | 0 | 1 |
| Boy and frog | 1 | 0 | 0 |

* One additional reference is to 'frog' rather than 'lady' for event 9.

($N = 148$ for 3-year-olds, $N = 174$ for 4-year-olds). Table 3 shows the frequency with which children in each age group used a noun to introduce or reintroduce the characters in each of these main events, and Table 4 shows the distribution of nouns across all the characters in the story. Nouns were used most often by both age groups to refer to the frog in events 2, 5, 7 and 11. (The frog is the character that appears most frequently in the story.) Nouns were, however, also observed to be used to refer to other characters such as the boy, lady and waiter.

For each child a proportion score was calculated as a percentage, with the total number of main events included in their narrative in the denominator, and the total number of instances in which a *noun* reference was used to refer to the main character(s) in these events in the numerator. This score provided a measure of each child's use of nouns when introducing and reintroducing the characters in the main events of the story included in their own narrative. The mean percentage of noun references observed among the 3-year-olds ($M 12.7\%$, $SD 16.6\%$) was significantly lower than that observed among the 4-year-olds ($M 30.3\%$, $SD 25.9\%$), $t(46) = 2.80$, $p = 0.008$. That is, 3-year-old children, on average, (re)introduced only 12.7% of the characters in their narratives clearly, using a noun, as compared with 30.3% for the 4-year-old children.

The linguistically unclear events in which children did not use a

noun were examined to determine what proportion were due to: (a) the use of a pronoun, (b) the omission of any verbal reference at all (null reference), or (c) the use of an ambiguous noun phrase or incorrect pronoun. Among the 3-year-olds these percentages were 72.7% (pronoun) and 21.9% (null) and 5.5% (ambiguous noun or incorrect pronoun). Similarly among the 4-year-olds they were 79% (pronoun) and 12.9% (null) and 8.1% (ambiguous noun or incorrect pronoun).

Referential clarity achieved through use of gesture or character speech

Overall, the use of a deictic point gesture to a character in the story or character speech was not an uncommon occurrence among these young preschoolers: 88 instances were observed among the 3-year-olds (M 2.67, SD 3.07) and 65 instances among the 4-year-olds (M 3.54, SD 2.69). This difference between the two age groups in their frequency of use of these paralinguistic means was not statistically significant. Only three 3-year-old children and six 4-year-old children were observed never to use gestures or character speech in this manner.

The number of children observed to use gestures and character speech when recounting each event of the story is shown in Table 5. The frequency of character speech was approximately equal among the two age groups. The frequency of gesturing, although higher among the 3-year-old children, did not differ significantly between the age groups, $t(46) = 1.12$, n.s. Gestures to a character were most often observed with event 2 in which the frog first jumps out of the boy's pocket into the musician's instrument. The next most frequent uses of gesture were observed when the frog fell out of the instrument (event 5), when the frog jumped into the salad (event 7), when the lady yelled at the waiter (event 12) and when the boy wanted his frog back (event 14). Character speech was most frequently, and almost exclusively, observed with two events: event 10 in which the lady reacts to seeing the frog and event 14 in which the boy wants his frog back.

In Table 6 the percentage of events in which children's character references were clarified through the use of a gesture, character speech or a combination of both are shown. For comparison the first line of Table 6 provides the percentage clarified through the use of noun as described earlier. There was a statistically significant difference between the age groups in the mean percentage of their references clarified paralinguistically. The 3-year-old children were found on average to clarify 43% of their character references through the use of gestures or character speech (M 43.1%, SD 23.9%, range 0–86%), which was a significantly higher percentage than that observed among the 4-year-old children, who clarified on average only 21% of their character references

TABLE 5. *Distribution of gestures and character speech by each of the 19 events and age group (N = 24)*

| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | Total | |
|--------------------------------|---|----|---|---|----|---|----|---|---|----|----|----|----|----|----|----|----|----|----|-------|--|
| <i>Use of gestures</i> | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 | 14 | 2 | 2 | 7 | 5 | 6 | 0 | 2 | 2 | 5 | 7 | 5 | 8 | 3 | 0 | 3 | 1 | 0 | 73 | |
| 4 | 1 | 9 | 5 | 0 | 6 | 3 | 6 | 0 | 2 | 2 | 4 | 4 | 4 | 2 | 0 | 0 | 3 | 0 | 0 | 51 | |
| Total | 2 | 23 | 7 | 2 | 13 | 8 | 12 | 0 | 4 | 4 | 9 | 11 | 9 | 10 | 3 | 0 | 6 | 1 | 0 | 124 | |
| <i>Use of character speech</i> | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 10 | 0 | 1 | 0 | 1 | 0 | 15 | |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 1 | 0 | 6 | 0 | 1 | 0 | 1 | 0 | 14 | |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 3 | 0 | 16 | 0 | 2 | 0 | 2 | 0 | 29 | |

TABLE 6. *Percentage of total character references per child, clarified through linguistic means (use of noun) or through paralinguistic means (gesture and/or character speech), by age group*

| | 3 years | 4 years |
|---|---------|---------|
| Total no. character references | 148 | 174 |
| Referential clarity achieved: | | |
| (a) linguistically: | | |
| with noun | 12.7 | 30.3 |
| (b) paralinguistically: | 43.1 | 20.6 |
| with gesture only | 32.3 | 16.4 |
| with character speech only | 4.6 | 2.9 |
| with gesture + character speech | 6.2 | 1.3 |
| (c) linguistically + paralinguistically | 55.8 | 50.9 |

using these paralinguistic means (M 20.6%, SD 25.8%, range 0–67%), $t(46) = 3.134$, $p = 0.003$. Indeed, of all the gestures produced by the 4-year-olds, only 50.3% helped to clarify initially unclear referents, as opposed to 87.7% among the 3-year-olds. And similarly, although only 50% of 4-year-old children's instances of character speech clarified initially unclear referents, 100% of 3-year-old children's instances did so. That is, half of the instances of 4-year-old children's use of gestures or character speech accompanied instances of referencing that were already clear through the use of a noun, while almost all the instances of gesture or character speech produced by the 3-year-olds helped to clarify their initially unclear references. If the contribution of gesture is considered apart from character speech, the difference between the age groups in the proportion of references clarified remains statistically significant, $t(46) = 2.241$, $p = 0.03$.

Interestingly, overall, the 3- and the 4-year-olds were not found to differ significantly in the total mean proportion of references clarified after their use of gestures and character speech was taken into account, $t(46) = 0.563$, n.s. For both groups, in approximately half of children's main event descriptions, the intended character referent was not clearly specified linguistically or paralinguistically (e.g., use of pronoun only).

DISCUSSION

The results of our study confirm that gestures and character speech play a large, hitherto underestimated and largely unrecognized, role in children's early attempts to introduce and reintroduce characters in their narratives. If children's use of nouns only is taken into account, the 3-year-old children (re)introduced a significantly lower proportion (12.7%) of the characters clearly in their narratives than did the 4-year-old children (30.3%). Nevertheless, the performance of both age groups was fairly poor, as observed in previous studies.

When children's use of gestures and character speech was taken into account, the 3-year-olds were found to clarify a significantly larger portion of their initially unclear (re)introductions – to the point that they attained approximately the same final level of clarity as the 4-year-olds. That is, in both age groups, approximately 51–56% of children's (re)introductions could be clearly identified when both linguistic and paralinguistic factors were taken into account. This proportion is higher than that seen in previous studies using a similar picture-book methodology, in which only 5% to 35% of preschool-aged children's introductions and reference switches were judged as being clear, and is no doubt due in part to our use of the additional dependent measures of gesture and character speech that have not been included in previous research and that provide a more sensitive measure of the ability of young children to recognize when it is necessary to specify a referent unambiguously.

Notably, the 4-year-old children used gesture and character speech less often in instances in which these means would have clarified an unclear reference, despite the fact that their overall clarity was far from ceiling, with approximately half of their references remaining unclear. We can only speculate at this point as to why 4-year-olds did not use gesture or character speech to help to clarify their intended referents. Perhaps they have come to regard the task of storytelling *per se* as one that should be accomplished largely through linguistic means. It might also be the case that our 4-year-old children were simply overconfident regarding their ability to specify the referents verbally, given the demanding task of narrating the story.

These results underscore the need to consider all available communicative means at young children's disposal when assessing early communicative competencies. In this study, including gesture and character speech as dependent measures along with children's verbal behaviour was crucial in assessing accurately their ability to specify

clearly the characters being introduced or reintroduced. If we had considered only their verbal utterances, not only would we have underestimated 3-year-old children's ability to recognize the need to specify clearly instances of referent introduction and switching, but the nature of the change between age 3 and 4 in the strategy used to accomplish this would have remained obscure. That is, the results of this study suggest that the shift observed between 3 and 4 years has perhaps more to do with an increased ability to mark new character introductions and reintroductions linguistically in a narrative than it has to do with an increased recognition that characters in such situations must necessarily be specified clearly.

Taking children's gestures into account may have been especially important in the current study because our narrative task utilized a picture-book methodology in which gestures could be easily used by children to supplement their verbal productions. Whether children would also rely on gestures to the same degree when recounting narratives without any pictorial support remains a question for further study. However, it should be noted that, as reviewed in the Introduction, children have generally performed much more poorly (when only verbal utterances are considered) in terms of identifying referents clearly in picture-book narrative studies than in cases where they are asked to recount a personal experience. This discrepancy has been suggested to be due to the fact that telling a story from pictures is a more demanding task, requiring greater organizational skill and measuring to a greater extent the ability of children to sequence events analytically and create a story-line that is not under their own control (e.g., Karmiloff-Smith 1981, Wigglesworth 1990). In the current study, children's ultimate level of correct performance (51–56%) when both paralinguistic and verbal utterances were considered was better than that found in all previous studies using picture-book methodology (5–35%), but remained lower than that found in studies of children's recounting of personal experience (in which generally $\frac{1}{3}$ – $\frac{1}{2}$ of referents were clearly specified). It is too early, however, to know how to interpret this finding exactly, as many other features distinguish these two types of studies that may have influenced performance (e.g., number of characters in the narratives, the number of reference switches involved).

It is interesting to note that, even among adults, it has been observed that gestures may continue to be used to help to emphasize and to specify clearly the introduction of new characters. Marslen-Wilson *et al.* (1982) documented that, when telling a comic book story, adults were most likely to point to a picture of a character on the front cover of the comic book they were holding when making an initial reference

to that character in a story episode and using a nominal form, than when maintaining reference to that character and using a less explicit pronominal form. Marslen-Wilson *et al.* (1982) interpreted these findings as suggesting that gestures are used when it is imperative that the listener recognizes that the speaker is shifting reference from one character to another. Similarly, when McNeill & Levy (1993) analysed adults' retellings of a cartoon or film, they observed the use of gestures to distinct areas in space to refer to the two different characters in a narrative, and further noted that these areas in space were gestured to more frequently when characters were reintroduced than when the narrative maintained focus on one character.

The findings of this study with respect to children's use of deictic point gestures provide further support for arguments that gesture and speech form an integrated system in which gesture can provide information that is not redundant with speech. That is, in this study children's deictic point gestures served to specify the intended referent unambiguously when the referent had either been omitted in speech entirely or had been specified with only a pronoun which, given that the referent was being newly introduced or reintroduced, left the referent unclear.

However, it must also be kept in mind that, in addition to using gesture and speech, children in this study also used character speech. Researchers who view character speech as a form of affective evaluation (e.g., Reilly 1992) have suggested that this paralinguistic means is used with an evaluative function in the narrative by younger children until their increased linguistic sophistication allows them to express this function via the linguistic channel. Reilly (1992), in particular, has suggested that paralinguistic means may be used by younger children because, by preschool age, the affective and linguistic system are well integrated, and the affective system can serve as a support to language, bolstering the child's storytelling and supplementing their immature linguistic narrative skills. Our results do support this view and, overall, may be capturing the integration of not only the systems of gesture and speech or the affective system and speech, but also the integration of all three systems.

As mentioned in the Introduction, with respect to the integration of gesture and speech, several authors have spoken of supplementary gestures as indicative of a transitional state in which children are ready to produce word combinations but are constrained linguistically from doing so (e.g., Iverson & Thal 1998). The question thus arises: are the deictic gestures and character speech observed in the present study similarly indicative of a transitional state among children and, if so,

what is the nature of this transitional state? It would most likely be incorrect to assume that these paralinguistic means are compensating for an inability to refer to a character linguistically by name. Children did have at their disposal names for the characters in question (e.g., boy, frog, lady). Rather, these paralinguistic means are probably more accurately viewed as providing children with a means to express some of the many aspects they are trying to include in their stories but are limited – as a result both of cognitive and linguistic demands of the task – from expressing solely using linguistic means. Thus, although children could easily name the character in the story as ‘the lady’, in the course of telling the story and having to deal with the many demands of this task (e.g., interpreting the scene depicted, translating the actions in the pictures into their own words, relating these actions orally in the proper sequence, ignoring irrelevant details), other paralinguistic means are recruited to help in this effort, because children’s linguistic *narrative* skills (e.g., use of cohesion devices, temporal terms) for dealing with all these aspects of storytelling remain limited. In our particular case, deictic gestures and character speech are employed to help to accomplish the task of unambiguously specifying a character being newly introduced or reintroduced.

In recent work it has been argued that people’s spontaneous gestures can be used as a tool for illuminating their mental representations of problems (Alibali *et al.*, 1999). For example, Alibali *et al.* (1999) asked adults to describe word problems about constant change and found that, when their gestures reinforced the representation expressed in the spoken description, adults were more likely to use a strategy compatible with this representation than when their gestures did not reinforce the spoken description. Similarly, we would argue that children’s deictic gestures and character speech, in conjunction with their speech, illuminated their representation of the narrative in terms of the introduction of a character who is new to narrative or a switch in attentional focus from one character to another. That is, when considering characters and situations within adult narratives, approaches since the 1980s have involved pragmatic inference and ‘mental models’ (Johnson-Laird 1983) incorporating a notion of foreground and attentional focus (e.g., Morrow 1985). In such approaches, narrators are viewed as telling a story from the perspective of a character whose actions determine the ‘here and now’ (Bower & Morrow 1990) or the ‘deictic center’ (e.g., Duchan, Bruder & Hewitt 1995, Hudson, Tanenhaus & Dell 1986). In cases of character introductions and reintroductions, the ‘here and now’ or ‘deictic center’ of the story has clearly shifted from one character to another, necessitating the use of a full noun phrase according to the

mental models approach (or 'centering approach' as it has also been referred to, e.g., Brennan 1995, Gordon, Grosz & Gilliom 1993). This indeed was confirmed in our adult control study in which a noun phrase is used by adults in all the instances we classified as reference shifts. With respect to the 3- and 4-year-old children in our study, the fact that both age groups did not differ in their final level of clarity, once paralinguistic means of reference were taken into account, suggests that they were both similarly sensitive to the need to specify a referent unambiguously in cases of introduction or reintroduction and differed only in their linguistic ability to do so (i.e., use of nominal). Without taking these paralinguistic means into account, one might have falsely concluded that the 3- and 4-year-olds differed more fundamentally in their ability to distinguish, for example, when the focus of attention has switched to a new character, necessitating a clear reference. Nevertheless, given that both age groups correctly referred to a character unambiguously in such situations a little more than half the time, it remains for further research to elucidate the nature of the further developments taking place beyond the age four.

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APPENDIX

Synopsis of abridged version of *Frog goes to Dinner*

A boy and his family arrive at a fancy restaurant, with the boy's pet frog in his pocket. While the family is ordering their dinner, the frog jumps out of the boys' pocket and into the saxophone of a musician playing with a band in the restaurant. The musician tries to blow, but can't, and looks into his saxophone to see what is inside. The frog falls out onto

the musician's head and the musician falls backwards into the drum of the drummer in the band. The frog jumps away into a salad being carried by a waiter. The waiter hands the salad to a lady diner, unaware that the frog is inside the salad and, as the woman is eating the salad, the frog peeks out from under the salad. The woman reacts with great surprise, falling backwards in her chair, and then yells at the manager. The waiter catches the frog and proceeds to take the frog outside. The boy asks for his frog back and is given it back, but the waiter orders the family to leave the restaurant. In the car on the way home, the boy's father, mother and sister are all very angry with him. Once they are at home, the father tells the boy to go to his room. In his room, the boy and the frog laugh about what happened.

Note. Each sentence describes one of the 12 pages of the story.

