

The Association Between Narratives and Theory of Mind
for Low-Income Preschoolers

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This study investigated the relationship between narrative skills and theory of mind for low-income children. Two groups of low-income preschoolers, one African American ($n = 33$) and one European American ($n = 36$), created a narrative and participated in a false belief task. The European Americans outperformed African Americans on the false belief task, but there were no differences in the narrative skills across the groups. After controlling for children's age, false belief performance had no effect on European Americans' narrative abilities. However, African Americans who passed the false belief task told stories that were more grammatically coherent and social cognitively sophisticated than those African American children who did not pass the task.

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During the preschool period children begin to incorporate social cognitive reasoning into their fictional narratives (Benson, 1997; Trabasso, Stein, Rodkin, Munger, & Baughn, 1992). The specific forms of social cognitive reasoning preschoolers incorporate include information about the protagonist's goals, desires, beliefs, and emotions. Consider the following narrative by a 5-year-old, African American girl:

Once there was an elephant who lived in a dark cave. She thought she picked up the penny. And then she thought she was rich, but she wasn't. And she buy something with it. And nothing. And with the one penny she could buy nothing with it. So she was sad.

Her narrative projects mental states onto characters and alludes to the notion that people's thoughts guide their behavior. She demonstrated her social cognitive abilities by talking about the character's internal states (i.e., "So she was sad") and introducing a plot (i.e., the character does not have enough money to buy anything) that reflected the character's mistaken belief (i.e., "She thought she was rich, but she wasn't"). Examples like the previous one illustrate that preschoolers are capable of creating stories that demonstrate social cognitive reasoning. However, more research is needed to investigate how children's social cognitive reasoning relates to their narrative ability. Thus, the purpose of this study is to investigate the association between children's social cognitive reasoning and their narrative skills.

Theory of Mind in Low-income and Ethnic Minority Preschoolers

Theory of mind is a form of social cognition specifically related to the study of how internal states relate to behavior. One of the most widely used methodologies for testing children's theory of mind is the *false belief* task (Wimmer & Perner, 1983). This task tests children's ability to predict someone's behavior in relation to that person's beliefs. Versions of false belief tasks have been used repeatedly over the past two decades. The two traditional versions are the *contents task* and *location task*. In a typical location task (Wimmer & Perner, 1983) children are shown a doll (viz., Maxi) who places a candy bar in the cabinet then leaves the scene. Another doll finds the candy and moves it to the drawer. When Maxi comes back, the child is asked to predict where she will look for her candy. The correct answer is in the cabinet because Maxi has no knowledge of the switch. The other task is the contents task (Gopnik & Astington, 1988), in which children are shown a familiar box containing unexpected contents (e.g., a Crayon box with toothpicks inside) and asked to predict what someone who has not seen the contents of the box will think is inside. Children who answer correctly will say Crayons because people usually assume that Crayon boxes contain Crayons, unless they have been shown otherwise. Although Wellman, Cross, & Watson (2001) reported no differences in the children's performance across these two tasks, some researchers indicate that contents tasks are more difficult for children to pass (Fabricius & Khalil, 2003), particularly low-income, African American children (Curenton, 2003; Holmes, Black, & Miller, 1996). Therefore, in the current study only children's performance on a false belief location task will be analyzed.

The vast majority of theory of mind studies has consisted of Caucasian children from middle- to upper-income, well-educated backgrounds (for a review see Lillard, 1998), but recently there have been a few studies examining the performance of children from low-income and ethnically diverse backgrounds. In general, these studies report that low-income children are performing more poorly than their middle-income peers. Cole and Mitchell (1998) found that low-socioeconomic status is negatively correlated with false belief performance (i.e., children from families with more financial distress were less likely to pass false belief tasks). Likewise, in a study examining theory of mind in children from various family backgrounds, those from middle-class backgrounds had higher scores on false belief tasks than working-class children had (Cutting & Dunn, 1999). Holmes, Black, and Miller (1996) reported that the majority of African American children enrolled in Head Start did not pass false belief tasks until they were 5, approximately 6 months later than the passing age reported in the meta-analysis (Wellman, Cross, & Watson, 2001). Finally, in a study comparing the false belief skills of low-income preschoolers, African Americans performed more poorly on a false belief contents task than European Americans did (Curenton, 2003).

To date, there is no clear explanation as to why low-income and/or ethnic minority children perform more poorly than their middle-income peers on false belief tasks. One speculation for the socioeconomic discrepancy points to the differences in low-income and middle-income children's language skills. However, differences in language skills may not be a sufficient explanation because even low-income children who have advanced language skills have performance rates below the established middle-class norms (see Hughes & Dunn, 1998). Second, Lillard (1998) speculates that using mental states to explain behavior is an affluent Western European view of human behavior. Curenton (2003) provides support for Lillard's theory when she reports that the majority of preschoolers in her low-income sample who provided rationale responses for a puppet's behavior used situational/behavioral explanations rather than mental/internal state explanations. Third, Curenton (2003) speculates that low-income children, particularly those from ethnic minority backgrounds, may perform more poorly on false belief tasks because the task that was originally developed using a White middle-class sample (see Wimmer & Perner, 1983); therefore, low-income children from ethnic minority groups may be at a particular disadvantage when trying to pass false belief tasks. This paper attempts to further explore low-income children's false belief skills by comparing African American's and European American's performance on a false belief location task and examining how children's performance is related to their narrative skills.

Narratives as a Language Assessment Tool

Although many studies comprising samples of middle-income children or children from diverse socioeconomic backgrounds report significant correlations between false belief skills and scores on standardized measures of language assessment (Astington & Jenkins, 1999; Jenkins & Astington, 1996; Happe, 1995), fewer studies have examined the relationship between narrative assessments of language and false belief. It is important to consider narrative ability in the conceptualization of the association between language and theory of mind because narrative assessments can have several advantages over standardized language assessments.

One advantage is that researchers who study children's speech and language development believe narratives are the most precise method for testing language skills. In fact, children's storytelling ability has proven to be a valid predictor of their later language skills (Bishop & Edmundson, 1987), literacy skills (Kaderavek & Sulzby, 2000), and age-related maturational changes. For instance, as children mature they are more likely to use conjunctions (McGregor, 2000; Shapiro & Hudson, 1991) and mental and linguistic verbs in their narratives (Curenton & Justice, in press). In addition, older preschoolers' narratives are more likely to be causally linked than younger preschoolers' (Benson, 1997).

Secondly, unlike standardized tests, narratives are less socioeconomically biased. Research examining narrative production and comprehension in socioeconomically diverse samples has found that low-income children perform according to their age appropriate norms on narrative measures (Craig & Washington, 1994; Craig, Washington, & Thompson-Porter, 1998; Murray, Woolgar, Briers, & Hipwell, 1999; Snow, Tabors, Nicholson, & Kurkland, 1995).

A third advantage of narrative methods is the wealth of information gathered from children's narratives. Researchers can analyze children's narratives for sociolinguistic features, such as African American English Vernacular (Craig et al., 1998), storytelling skills (Kaderavek et al., 2000; Fletcher, Briggs, & Linzie, 1997), and story recall and comprehension (Beck & Clarke-Stewart, 1998).

Lastly, narratives are particularly useful tools for assessing syntactical skills. Whitehurst (1997) found low-income children's syntactic skills used in narratives were less affected by poverty than were other areas of language. Additionally, Craig and Washington (1994) found that even low-income, African American children who spoke African American English Vernacular produced utterances that were syntactically complex. Therefore, assessing low-income children's syntactic skills using narratives may provide a socioeconomically and ethnically non-biased assessment of their language skills. In the present study children's oral narratives will be used as a measure of language assessment.

Narratives and Theory of Mind

Despite the advantages narrative assessments of language have over standard assessments, most theory of mind researchers fail to use children's narrative ability to investigate their theory of mind. When researchers *do* examine narrative skills in relation to theory of mind, they typically use two methods, and both methods have yielded contradictory findings. One method has examined how children's *understanding* of narratives aids the development of their theory of mind. The format for this line of studies asked children false belief questions based on the narrative an experimenter told them. Using this approach, Lewis, Freeman, Hagestadt, and Douglas (1994) found that false belief questions were easier for children. On the other hand, Olver and Ratner (1994) found no difference between children's performance on standard false belief tasks and on narrative false belief tasks. Even more contradictory is a cross-cultural study with Chinese preschoolers which found that children were more successful on standard false belief questions than they were on narrative false belief tasks (Chen & Lin, 1994).

The prior studies asked children false belief questions based on the narratives they were told, but the other method of investigation examines how children's narrative *production*

relates to their theory of mind. Intuitively, it seems that narrative production would be a useful method for studying theory of mind because narrators "must have some understanding of human motives, and how these [motives] are rooted in feelings and cognitions (internal states)" (Benson, 1997, p. 439). Similarly, Astington (1990) argues that narrative thought "deals with issues of human experience, with beliefs and doubts, intentions and emotions" (p. 152). In fact, narratives often contain social cognitive information, such as internal state talk and talk about the protagonist's interpretation of what is happening in the story (i.e., his consciousness). Hence, the association between social cognitive reasoning and narrative ability seem to be strongly rooted in our folk psychology about how people come to understand minds and behavior.

In the present study, the association between theory of mind and narratives will be assessed by examining how children's performance on a false belief task relates to four indicators of narrative skill—syntactic features (i.e., *coherence* and *complexity*), *internal state talk*, and *quality*. The syntactic features represent children's ability to create linguistically structured narratives, whereas the internal state talk and quality represent children's ability to use social cognitive reasoning in narratives.

Syntactic Features. When studying children's narratives, investigators can gain a measure of syntax by segmenting children's utterances and calculating the average utterance length. One of the most popular and widely used procedures for segmenting and calculating children's narratives is the mean length of utterance (MLU). Research has demonstrated that MLU is a useful predictor of children's age and linguistic complexity during the early stages of language development (Miller & Chapman, 1981). However, other investigators have found that MLU is less associated with linguistic complexity once children reach 4 years of age (Scarborough, Wyckoff, & Davidson, 1986).

One reason that traditional MLU may be less predictive during the later years could be due to its segmenting method. The procedures for parsing traditional MLU stipulate utterances be segmented based on intonation patterns and pauses (see Johnston, 2001). Therefore, even utterances that do not conform to syntactic standards (e.g., "On the reindeer's head") would be calculated in the mean sentence length. Since the purpose of the present research was to analyze children's syntactic features, a segmenting procedure based on syntactic properties was determined to be more useful.

An alternative method for assessing the syntax of narratives is the *communication unit* (Loban, 1976). A communication unit (C-unit) is defined as an independent clause and all its modifiers; it is a syntactic unit that is based on a clausal structure (i.e., a subject-verb proposition). Because a C-unit is a measure of syntactically constructed units, it demonstrates the child's ability to tell a linguistically coherent story, which provides a measure of syntactic *coherence*. In addition, C-units can provide a measure of syntactic *complexity* because they accurately measure the complexity of longer utterances produced by older children. Like the more traditional MLU, there is a significant correlation between average C-unit length and age (Craig et al., 1998). However, C-units are superior to the standard MLU because, the average length of a C-unit can be used to measure syntactic complexity in longer utterances, whereas the relationship between syntactic complexity and MLU weakens once children's utterances exceed 3 words (Scarborough, Rescorla, Tager-Flusberg, Fowler, & Sudhalter, 1991). Therefore, in the present study the syntactic features of children's narratives, both coherence and complexity, will be examined using C-units.

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A few studies have examined the association between narrative syntax and children's theory of mind; however, those studies have either used older children or children with developmental disorders in their sample. Charman and Shmueli-Goetz (1998) investigated narrative and theory of mind skills in normally developing 7-year-olds and found that children's false belief understanding was not associated with narrative complexity or coherence (i.e., subject-verb propositions). On the contrary, Tager-Flusberg and Sullivan (1995) found a correlation between autistic children's use of subject-verb propositions and false belief performance. Hence, the literature on narrative syntax and false belief indicates coherence may be related to children's false belief performance whereas complexity may not be. This study will provide further insight into the link between narrative syntactic skills and false belief understanding for typically developing preschoolers.

Internal State Talk. The bulk of the literature on narratives and theory of mind has examined children's use of internal state talk. Theoretically, internal state talk is viewed as an important feature of narratives because this type of talk permits the narrator to create the meta-representational world of the character (Astington, 1990). When studying low-income, European American kindergartners narrative production, Benson (1997) found that 68% of her sample used internal state talk as a source of psychological causation, and those who used psychological causation were more likely to attribute goals to the protagonist's actions. Some research has even indicated that normally developing children were better at producing narratives that addressed the protagonist's internal states than they were at producing narratives that did not (Baron-Cohen, Leslie, & Frith, 1986).

Marschark, Green, Hindmarsch, and Walker (2000) suggest that the ability to attribute internal states in a narrative and the ability to pass a false belief task are not necessarily synonymous. Work by Charman and Shmueli-Goetz (1998) provided support for Marschark's et al. claim: They found that normally developing children's use of internal state terms was not correlated with their understanding of false belief. Contrarily, Tager-Flusberg and Sullivan's (1995) research with children with autism and children with mental retardation showed a positive correlation between the ability to pass false belief tasks and the use of cognitive mental state terms in narratives. Likewise, Moore, Pure, and Furrow (1990) found a relationship between children's false belief performance and comprehension of cognitive terms. The present study attempts to further investigate the link between internal state talk in narratives and false belief understanding.

Quality. Although all researchers have their own specific description of narrative quality, in general they all agree that children's stories move from brief, non-casually linked descriptions, which are characteristic of young children, to longer, evaluative, causally linked stories, which are characteristic of older children (Applebee, 1978; McCabe, 1997; Stein & Glenn, 1979). Researchers concerned with narrative quality rarely examine the link between narrative quality and children's social cognitive reasoning even though Bruner's (1986) theory of narrative development clearly postulates a link between the two.

According to Bruner (1986), narratives have 2 landscapes—Action and Consciousness. The landscape of action addresses *what* happens during the story; for example, it provides information about the character's actions and goals, the setting, and the situational plot. On the other hand, the landscape of consciousness addresses *why* things are happening; it provides information about the character's psychological states. In order to truly understand a story,

one must comprehend both of the landscapes simultaneously. For instance, one cannot understand *why* something has happened in the story if he/she doesn't understand or remember *what* has happened. Both landscapes are important, interrelated aspects of narratives, but only the landscape of consciousness is meta-representational because it comprises the character's internal representations (or interpretation) of what is happening in the story. Therefore, only the landscape of consciousness contains information about the protagonist's social cognitive reasoning (i.e., the protagonist's conscious reasoning about *why* something has happened)

Astington (1990) theorizes that once a child understands that people's beliefs represent their reality then he or she is able to synchronize the two narrative landscapes. Thus, the advancements in theory of mind preschoolers are making during early childhood can influence children's narrative ability. Despite Bruner's (1986) and Astington's (1990) theoretical accounts of why narrative and social cognitive ability should be related, few empirical studies have answered the question of when children begin to produce stories with dual landscapes and how this relates to their general narrative and social cognitive skills. Bruner described a good narrative as one embodying both an action and consciousness landscape. His definition is similar to other oral narrative theorists, such as Labov and Waletzky (1967). In the present study, children's narrative quality is assessed using the theoretical definition of high quality narratives proposed by Bruner (1986); specifically, the quality ratings are based on whether children's stories combine the landscapes of action and consciousness.

The Present Study

The primary purpose of this study was to determine the relationship between theory of mind and oral narrative skills in low-income children. There were two aims for this research. The first aim was to compare African American and European American children's false belief performance. Based on previous work (Curenton, 2003; Holmes, et al. 1996), it is hypothesized that African American children would have lower false belief scores than European American children. The second aim was to determine the association between children's false belief performance and their narrative skills. Children who passed the false belief task are expected to create narratives that are more linguistically and social cognitively advanced.

Method

Participants

Seventy-two children (36 African American, 36 European American) participated in the study. There were approximately equal numbers of African American and European American children in both types of preschools. The sample comprised 40 girls and 32 boys. Children were divided into three age groups: 3-year-olds ($M = 43$ months, $SD = 3.33$, $n = 24$), 4-year-olds ($M = 53$ months, $SD = 3.18$, $n = 24$), and 5-year-olds ($M = 63$ months, $SD = 2.60$, $n = 24$). All age groups contained equal numbers of African American and European American children.

Since the research examining false belief performance in African American children has employed samples from low-income backgrounds (Hughes & Dunn, 1998; Cutting et al., 1999; Holmes, Black, & Miller, 1996), the sample for the present study is also drawn

from a low-income population in order to compare this sample's performance to peers who are similar in socioeconomic status. Children from middle-income and low-income backgrounds often have vastly different language experiences (Whitehurst, 1997), and language skills are related to theory of mind. Therefore, by confining the sample to all low-income children, we are eliminating socioeconomic variation that could be confounded with verbal skills.

Forty-six percent of the children who participated in the study lived in households that met the federal poverty guidelines as evidenced by their enrollment in Head Start. The other 54% lived in households receiving childcare subsidies for low-income families, which enabled the parents to send their child to any local preschool at an income-based tuition rate. Parental permission forms were given to all parents, but parents with children enrolled in non-Head Start centers were only given permission forms if their family received child care subsidies. These permission forms asked for children's date of birth and race/ethnicity. Children were only selected to participate in the study if their parent described them as Black/African American or White/Caucasian/European American and if the parent's racial/ethnic identity matched the child's.

There were no significant differences between the number of African Americans versus European Americans ($\chi^2 [1] = .50, p = ns$) or boys versus girls ($\chi^2 [1] = .10, p = ns$) in the two types of preschools (viz., Head Start vs other local preschools). Additionally, there was no difference between the type of preschool and children's age ($F [1,71] = .78, p = ns$).

As part of a larger study on children's social cognitive and narrative development, children's language/cognitive skills were assessed using the Early Screening Inventory-Revised (Meisels, Mardsen, Wiske, & Henderson, 1997). There was no effect for type of preschool and children's language/cognitive skills ($F [1,71] = 2.60, p = ns$). Additionally, a Race x Age analysis of variance (ANOVA) indicated that children's language/cognitive scores increased with age, $F(1,71) = 15.26, p = .00$. Three-year-olds had the lowest scores, but the 4- and 5-year-olds were not significantly different from each other. Age differences in children's performance on language/cognitive tests are commonly found in the literature and imply normal developmental progression. The main effect for race was not significant, indicating that there were no racial differences in terms of language/cognitive scores, $F(1,71) = 2.72, p = ns$.

General Procedure

Data for the present study were collected during a larger study examining low-income children's social cognitive and narrative skills. Children were presented with a battery of social perspective-taking tasks (e.g., narrative comprehension, emotion exploration, theory of mind) and language assessments (e.g., cognitive/language skills and narrative production). However, only a false belief prediction task and the children's narratives are discussed here.

One of 3 female experimenters tested children individually in a quiet area of their preschool. Testing sessions ranged from 30-40 minutes per child. The experimenters were all from different ethnic backgrounds (i.e., African American, Latino, and European American), and they all tested both African American and European American children.

False Belief Task. Children were presented with a modified version of a false belief location task (Wimmer & Perner, 1983). Children were asked to predict a puppet's behavior based on the scenario the experimenters presented. The experimenter presented the scenario to each child only once; the scenario was not repeated if children failed to pass the control questions. The scenario is described in detail below:

[*Experimenter randomly pulls out and places a miniature closet and toy box on the table. She shows puppet holding a small book.*] "Mark is reading a book. He wants to finish reading it later. He's going to put his book in the closet until later. Now he is going outside to play." [*Experimenter shows the puppet putting the book in closet, and then she places the puppet out of sight.*] "Now where did Mark put his book (Control 1 question)?" [*Experimenter brings in next puppet.*] "This is James. Look, James has found Mark's book. James starts to read the book. Now James wants to go outside to play. He's going to put the book in the toy box. Then James goes outside to play." [*Experimenter shows puppet putting the book in the toy box, then places the puppet out of sight.*] "Where did James put the book (Control 2 question)?" [*Experimenter shows Mark coming back.*] "Mark wants to sit down and read his book. Where will Mark look first for his book (Prediction question)? Will he find his book there (Control 3)?"

Children were given 1 point for each control and test question they answered correctly. Children's response to the test question was only scored as correct if they answered all of the corresponding control questions.

Narrative Task. Children were shown the wordless picture book, *Frog, Where Are You?* (Mayer, 1969). First, children were asked to view all of the pages in order to become familiar with the picture sequence because research has shown that children tell more coherent stories when they are permitted to view the stimuli before-hand (Shapiro & Hudson, 1991). After children had seen all the pictures, the experimenter asked them to make up a story using the pictures in the book. If children were hesitant, the experimenter probed them with a priori standard probes, viz. "Tell me about this page?" or "What about this page?" Children's narratives were audiotaped.

Narrative Transcription

Deletion Procedures. Children's narratives were first transcribed verbatim, including all experimenter and children's remarks. All narratives were checked for accuracy by a second transcriber. Only the children's spontaneous comments that were specifically related to the story were of interest; therefore, some of children's utterances were deleted based on the deletion procedures outlined in Appendix A. The final transcript consisted of only children's spontaneous remarks that were relevant to the story.

Communication Units. Two independent transcribers—one African American and one European American—who were blind to the children's age, race, and theory of mind performance divided the narratives into C-units (Loban, 1976). All C-units were required to adhere to a clausal structure by containing a subject-verb proposition. For example, "He looked in the hole" would be counted as one C-unit, but "A boy, a dog, and a frog" would not

because the statement does not contain a verb. C-units were parsed at coordinating conjunctions (e.g., and, or, but, so) and conjunctive adverbs (e.g., then) if they were preceded and followed by subject-verb propositions. For example the comment, "The reindeer picked him up *and* threw him in the water" was counted as two C-units: 1) "The reindeer picked him up" and 2) "And threw him in the water." Hence, it was possible for one utterance to be parsed into multiple C-units, if that statement contained two independent clauses. Subordinate clauses were not counted as separate C-units because subordinate clauses modify independent clauses. Subordinate clauses are preceded by subordinating conjunctions (e.g., because, if, when). For example, "The dog is licking him because he is mad and angry" was counted as one C-unit because the second subject-predicate proposition (viz., "he is mad and angry") was preceded by a subordinating conjunction (viz., "because").

Given that dialogue is an important and sophisticated component of narratives, special considerations were made regarding its inclusion and how it was counted. Fragments that were part of dialogue were not deleted. They were counted as C-units even if they failed to conform to a clausal structure. For example, the comment "The boy said, 'I want my frog back. I miss him. Frog, oh, frog!'" was counted as three C-units. One C-unit is "The boy said, 'I want my frog back,'" the second is "I miss him," and the third is "Frog, oh, frog!" These allowances were made in order to preserve the integrity of the dialogue.

Inter-rater reliability was conducted independently by two trained coders. Item-by-item comparisons were made to determine scoring agreement. An inter-rater agreement score was obtained by dividing the total number of agreements by the total number of item comparisons and multiplying by 100. For deletion procedures, 10% of transcripts were scored ($n = 7$); reliability was 98% ranging from 94-100%. For the C-unit segmentation procedures, 11% of transcripts were scored ($n = 8$); reliability was 99% ranging from 96-100%. Any disagreements were resolved through discussion.

Narrative Assessments

Four measures of narrative skill were analyzed. One measure was *Coherence*, as indicated by the number of C-units. Based on the deletion procedures, utterances that were irrelevant (i.e., those not specifically related to the story) or were not grammatically constructed (i.e., those without a subject-verb proposition) were deleted. Thus, the number of C-units represents the number of utterances that were syntactically constructed and relevant to the story. The number of C-units a child produced is *not* synonymous with narrative length because Coherence is not a measure of overall narrative talk. On the contrary, Coherence, by definition, is a measure of syntactically constructed units and indicates the child's ability to tell a grammatically structured, coherent story. The second measure of narrative skill was *Complexity*, as indicated by the mean length of C-unit, which is a measure of syntactic complexity. The third was *Internal State Talk*, which is a measure of genuine internal state language used during the narrative. Cognition words (e.g., think, understand, know), volition words (e.g., trying, want), and emotion words (e.g., angry, happy, etc.) were calculated. After CLAN generated a count of mental state words per transcript, each transcript was checked to ensure that the mental state words referred to genuine mental states. Children only received credit for genuine mention of mental states. Thus, responses such as, "You know what?" or "I don't know" were not counted. All three prior measures of narrative skill were analyzed using CLAN (MacWhinney, 1994).

The fourth measure of narrative skill was analyzed by two trained European American raters who individually assessed the transcripts for narrative *Quality*. Narratives were rated as *Illogical* (illogical stories with irrelevant descriptions), *Action-based* (stories with clear descriptions of the pictures and the character's action but no mention of plot or internal states), or *Consciousness-based* (stories with clear descriptions of the pictures and interpretations of the plot and the character's internal states). The Consciousness-based rating was the highest in quality because children who create this type of story are incorporating social cognitive reasoning. Appendix B describes the rating system for narrative quality and examples. The raters for narrative quality were blind to children's demographic characteristics, other narrative skills, and false belief skills. Inter-rater reliability for 31 transcripts was 91%. Any disagreements were conferenced.

Results

False Belief Performance

Children's performance on the control questions was at ceiling, with an average of 96% across the questions. If children failed any of the control questions, they were given zero points for the corresponding false belief questions. As a result, correct false belief responses from 8 children were scored as incorrect because those children failed the last control question (i.e., "Will he find his book there?"). Of those children who failed the controls but passed the false belief question, 3 were African American 4-year-olds, 2 were African American 5-year-olds, 2 were European American 3-year-olds, and 1 was a European American 5-year-old.

Traditionally, children's false belief performance is analyzed based on the number of children who pass the task. Table 1 lists the percentage of children by Age and Race who answer correctly. Logistic regression was used to evaluate whether Age and Race were significant predictors of children's false belief performance. Logistic regression is used when the dependent variable is categorical, and there is more than one predictor variable. Both Age and Race were significant predictors of children's false belief performance, $X^2(3) = 23.71, p < .01$. European Americans were more likely to pass than African Americans, and 3-year-olds were less likely to pass than 4- and 5-year-olds.

Table 1.

False Belief Passing Percentage
(and Number Passing/Total Number) by Race and Age

	African American	European American	Overall Age
3-year-olds	17% (2/12)	42% (5/12)	29% (7/24)
4-year-olds	58% (7/12)	75% (9/12)	67% (16/24)
5-year-olds	75% (9/12)	100% (12/12)	88% (21/24)
Overall Race	50% (18/36)	72% (26/36)	

Table 2 lists the statistics for each predictor.

Table 2.

Logistic Regression Statistics for Race and Age
Predicting False Belief Performance

Predictor	β	SE β	Wald	Odds Ratio
Race	-1.32*	.61	4.65	.27
Age				
3 vs. 4, 5	-3.08**	.82	14.23	.05
4 vs. 5	-1.34	.78	2.94	.26

** $p < .01$, * $p < .05$

Narrative Skills

Three African American children were excluded from all narrative analyses because they failed to produce any utterances that were relevant to the story. One child was a four-year-old who passed the control questions and the false belief question; the other two were 3-year-olds who passed control questions but failed the false belief questions.

A preliminary Race x Age multivariate analysis of variance (MANOVA) was conducted to examine children's narrative skills—Complexity, Coherence, Internal State Talk, and Quality. Children's narrative skills did not vary as a function of their race, Wilk's $\lambda = .95$, $F(4,60) = .87$, $p = ns$. Table 3 displays the mean for these null results by racial group. There was, however, a significant multivariate Age effect. Older children had better narrative skills than younger children, Wilk's $\lambda = .61$, $F(8,120) = 4.28$, $p = .00$, $\eta^2 = .22$. This multivariate effect was followed-up by a series of analyses of variance (ANOVAs). Results from these ANOVAs revealed age differences in terms of complexity ($F[2,63] = 6.73$, $p = .00$, $\eta^2 = .18$), coherence ($F[2,63] = 4.12$, $p = .02$, $\eta^2 = .12$), internal state talk ($F[2,63] =$

Table 3.

Mean Score (and Standard Deviation) for Narrative Skills by Race

	African Americans ($n = 33$)	European Americans ($n = 36$)
Complexity	5.60 (1.52)	5.56 (1.10)
Coherence	20.94 (11.15)	25.22 (10.24)
Internal State Talk	1.79 (2.22)	2.06 (2.04)
Quality	1.21 (.74)	1.28 (.78)

Note: These means are not significantly different.

4.08, $p = .02$, $\eta^2 = .12$), and quality ($F[2,63] = 18.07$, $p = .00$, $\eta^2 = .37$). For instance, 3-year-olds' narratives were less complex and of lower quality than the 4- and 5-year-olds' narratives. In addition, the 3-year-olds' created narratives that were less coherent and contained less internal state talk than the narratives created by 5-year-olds. Table 4 displays the means for each narrative skill by age group.

Table 4.

Mean Score (and Standard Deviation) for Narrative Skills by Age Groups

	3-year-olds ($n = 22$)	4-year-olds ($n = 23$)	5-year-olds ($n = 24$)
Complexity**	4.79 (1.20) ^A	5.82 (1.30) ^B	6.07 (1.12) ^B
Coherence*	18.27 (10.89) ^C	24.13 (10.20)	26.75 (10.07) ^D
Internal State Talk*	1.10 (2.27) ^E	1.91 (1.31)	2.71 (2.37) ^F
Quality **	.59 (.59) ^G	1.48 (.67) ^H	1.63 (.58) ^H

** $p = .00$; * $p = .02$

Note: A < B; C < D; E < F; G < H

A cross-tabulation of Age (3) x Quality (3) provides descriptive data of the differences between the age groups in terms of narrative quality, $\chi^2(4) = 25.21$, $p = .00$. Three-year-olds were more likely than older preschoolers to create stories that were rated as Incoherent, $\chi^2(2) = 11.23$, $p = .00$, and they were less likely to create stories that were rated as Consciousness-based, $\chi^2(2) = 12.60$, $p = .00$. Table 5 displays the percentage of children receiving each rating by age group.

Table 5.

Rating of Narrative Quality by Age

	Incoherent	Action	Consciousness
3-year-olds($n = 22$)	45%	50%	5%
4-year-olds($n = 23$)	9%	35%	56%
5-year-olds($n = 24$)	4%	29%	67%

Narratives and False Belief

Table 6 shows the correlations for narrative and false belief skills across all children. Because the African American children were passing the false belief tasks at a lower rate

than the European Americans, MANOVAs were conducted separately for each group in order to highlight the unique patterns of development within each group.¹ After controlling for children's age, there were no differences in the narrative skills of those European Americans who passed a false belief task versus those who did not, Wilk's $\lambda = .95$, $F(4,30) = .36$, $p = ns$. On the contrary, for African Americans the results indicated that even after controlling for children's age, those children who passed the false belief task told better stories than those who did not, Wilk's $\lambda = .62$, $F(4,27) = 4.088$, $p = .01$, $\eta^2 = .38$.

Table 6.

Correlations Across Narrative Skills and False Belief

	1	2	3	4	5	6
1. Age	—	.51**	.36**	.34**	.31**	.52**
2. False Belief		—	.26*	.38**	.12	.45**
3. Complexity			—	.42**	.14	.59**
4. Coherence				—	.36**	.55**
5. Internal State Talk					—	.34**
6. Quality						—

** $p < .01$, * $p < .05$

Follow-up ANOVAs indicated that African American children who passed the false belief task told stories that were more coherent, $F(1,30) = 6.76$, $p = .01$, $\eta^2 = .18$, and of better quality, $F(1,30) = 5.35$, $p = .03$, $\eta^2 = .15$, than those who did not pass. Of the African Americans who passed ($n = 17$), 35% had narrative Coherence scores that were *at least* $\frac{1}{2}$ a standard deviation *above* the mean. On the contrary, of those who failed ($n = 16$), none had Coherence scores at least $\frac{1}{2}$ a standard deviation above the mean. In fact, 56% of the children who failed had scores that were $\frac{1}{2}$ standard deviation or more *below* the mean. Similarly, 65% of the African Americans who passed the false belief task created Consciousness-based narratives, whereas 44% of those who failed created Incoherent narratives. Figures 1 and 2, respectively, illustrate this distinction between Coherence and Quality for those preschoolers who passed or failed the false belief task by ethnic group.

¹ The same analyses were conducted combining the two groups. The pattern of results were similar, but weaker, due to difference in the FB passing rate for African Americans versus European Americans. There was a trend for a FB multivariate effect, Wilk's $\lambda = .88$, $F(4,63) = 1.98$, $p = .10$. Likewise, the follow-up tests revealed trends for Coherence, $F(1,66) = 4.27$, $p = .04$, and Quality, $F(1,66) = 3.81$, $p = .06$. By separating the racial groups, it becomes apparent that among groups who are having difficulty with false belief understanding, those individuals with social cognitive skills tell better narratives.

Figure 1.

Coherence by false belief and race.

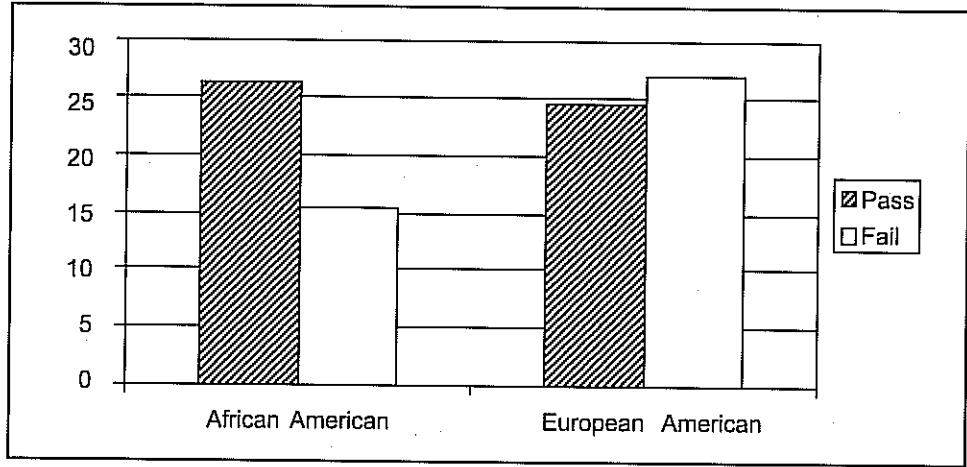
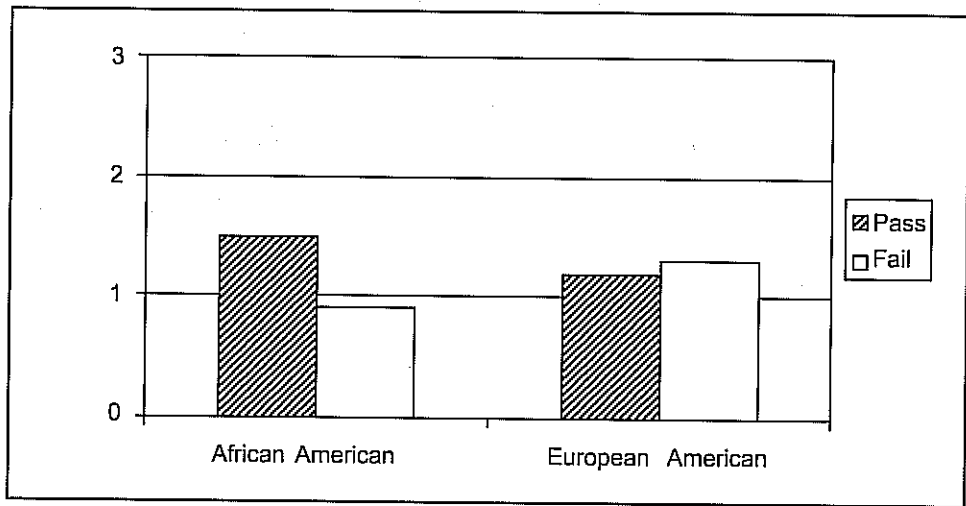


Figure 2.

Quality by false belief and race.



Discussion

This study investigated low-income preschoolers' narrative and theory of mind skills. First, it was hypothesized that European American children would outperform African American children. Secondly, it was hypothesized that those children who passed the false belief task would create more sophisticated oral narratives using a wordless picture book. For example, in comparison to those children who failed the false belief task, children who passed were expected to create stories that were more syntactically complex and coherent and that contained more internal state talk and higher quality.

Comparison of False Belief Performance

African American and European American children's false belief performance was examined. Both African Americans' and European Americans' performance increased with age: The 4- and 5-year olds were more likely to pass than the 3-year-olds. These age-related findings support those of the meta-analysis (Wellman, Cross, & Watson, 2001), which indicates that a conceptual change at age 4 enables preschoolers to accurately reason about a puppet's mistaken beliefs. Thus, as a whole this low-income sample demonstrated age-appropriate progression in false belief understanding.

Nevertheless, as hypothesized, African American children were less likely to pass the false belief task than European Americans were. This finding is consistent with Holmes, Black, and Miller's (1996) work, which found that their low-income (primarily African American) sample lagged behind the age norms for false belief mastery (see Wellman, Cross, & Watson, 2001). Similarly, Curenton (2003) found that European American children outperformed African Americans on a false belief contents tasks even after controlling for children's language and cognitive scores. Other studies including a large sample of Blacks reported overall passing rates for their samples that were lower than the established age norms (Hughes & Dunn, 1998; Vinden, 1999). Interestingly, ethnic group disparities were only evident for the false belief task. There were no differences between the African Americans and European Americans in terms of any of the narrative skills, which suggests that differences between the groups were due to their performance on the false belief task specifically rather than the children's overall language and social cognitive abilities.

The data from this present study highlight the point that children's poor performance on a task does not necessarily indicate that a child does not understand the concept. African American children's skills in using internal state talk and conscious-based narratives demonstrated that the children did indeed have a theory of mind. However, the false task was an unsuccessful method for testing their conception. These findings illustrate Greenfield's (1997) explanation that children's performance on tasks represents their cultural values, knowledge, and communication style. Standard false belief tasks ask children to reason about minds using propositional thought (see Churchland, 1984): "He wants X. He thinks X. Now what will he do?" These tasks require children to engage in a basic form of hypothetical-deductive reasoning. On the other hand, when reasoning about minds using narrative thought children are asked to engage in a contextualized, imaginative form of reasoning that requires them to use their understanding of human intentions, emotions, and interpersonal situations (see Astington, 1990 and Vitz, 1990). Given there was no difference between the African Americans and European Americans in terms of social cognitive reasoning measures within the narratives, one could assume that African American children are better at reasoning about minds using narrative thought (i.e., within the context of narratives) rather than propositional thought (i.e., within the context of false belief tasks).

This ethnic finding is intriguing because it forces one to question whether the false belief task can accurately measure theory of mind in disadvantaged, ethnic minority populations. Research has shown that when false belief tasks were given to Peruvian children living in an agricultural society, their performance did not improve with age (Vinden, 1996). Similarly, Vinden (1999) found that children of African-descent mastered false belief at a later age. The one exception to this finding is Avis and Harris' (1991) work in which a "real-

life" version of the false belief task was administered to children from a hunter-gather tribe in Africa; in their study children were passing the false belief task according to the age appropriate norms. The discrepancy between these studies could be due to testing procedures and/or modes of thought. Avis and Harris' participants were tested by familiar adults in a real-life context in which they actively participated, but Vinden's (1996, 1999) participants were tested by strangers in a hypothetical situation using dolls. Both Vinden's and the current work support the argument that perhaps puppet tasks administered by strangers is not the most effective method for testing disadvantaged, ethnic minority children's theory of mind. Perhaps instead ethnic minority children would be better at demonstrating their skills in a task that tapped more into the narrative mode of thought rather than the propositional mode of thought.

Narrative Skills

Age-related narrative development was evident, demonstrating that 4- and 5-year-olds have more sophisticated narrative skills. Their narratives were more coherent and complex. Older children's narratives were more social cognitively complex as evident by the amount of internal state talk and proportion of Consciousness-based narratives. Age differences in narrative skill are commonly found and other studies report similar results (Craig & Washington, 1994; Curenton & Justice, in press; Murray et al., 1999; Shapiro & Hudson, 1991). Although many researchers have cited Bruner's (1986) theory regarding narrative landscapes, this is the only study to date to provide empirical evidence supporting the theory. The results of this study indicate 4- and 5-year-olds are more likely to create stories that merge the Action and Consciousness landscape. Furthermore, in support of Astington's (1990) theory, the African American children who passed the false belief task demonstrate that children who possess an understanding of mental states are able to merge the story landscapes.

These results also highlight how various aspects of children's narratives abilities are interrelated. The present results found that Coherence (i.e., the number of subject verb propositions) was correlated with children's internal state talk, indicating that as children's stories become more linguistically complex, they also become more social cognitively complex. Charman and Shmueli-Goetz (1998) also found that internal state talk was correlated with the number of subject-verb propositions. Similar associations between narrative skills and internal state talk have been reported in work with other low-income children (Benson, 1997; Curenton & Justice, 2003).

Narrative Skills and False Belief

The second aim of this study was to investigate the association between false belief and narrative skills. After controlling for age, European American children's false belief performance did not account for any variance in children's narrative skills. On the contrary, African American children who passed the false belief task told better stories than those who did not. It could be argued that African Americans' false belief performance predicted their narrative skills because they had more sophisticated narrative skills than European Americans. However, the results indicated no significant differences between the racial groups in terms of narrative skills.

The distinct associations for false belief and narrative skills between the racial groups both contradict and support previous literature. The European Americans' performance supports Charman and Shmueli-Goetz (1998) who found that the coherence and complexity of children's narratives was not related to false belief reasoning. On the other hand, the African American children's performance supports Tager-Flusberg and Sullivan (1995) who found that the number of subject-verb propositions (i.e., referred to as Coherence in the present study) autistic children produced was related to their theory of mind skills. In general, the African American children's results support Astington's (1990) theory that false belief mastery is related to narrative abilities.

Ethnographic research suggests that oral narratives are common in African American communities; adults in these communities tell stories to entertain one another, and adults help and encourage children to tell stories (Heath, 1982; Sperry & Sperry, 1995, 1996). There is even research indicating that African American mothers attempt to socialize their children through narratives (Leslie, 1998; Strevy & Aldridge, 1994), which may explain why African American children's narrative skills predicted their false belief performance.

Another noteworthy finding regarding narrative skills and false belief is the relationship between false belief and internal state talk. Intuitively, it would seem that both internal state talk and false belief would be related indices of theory of mind, but this is not necessarily the case. Marschark et. al (2000) suggested that the ability to attribute internal states in a narrative requires that one *understand* the character's internal states and *recognize* that these internal states lead to behavior; on the other hand, the ability to pass a false belief tasks requires that one *predict* the protagonist's behavior. The results of the current study support Marschark et. al's theory given that children's internal state talk was not a significant predictor of false belief understanding. Therefore, attempts to correlate internal state talk in narratives and false belief skills may prove unfruitful. Instead, internal state talk and false belief skills should be viewed as separate indices of theory of mind.

Limitations and Future Directions

The results of the present study are intriguing, however, there are limitations to this work. The first limitation was sample size. Because of the time required to collect, transcribe, and code narratives, studies that examine narrative production and theory of mind tend to consist of moderate sized samples. Nevertheless, the sample size of the current study was slightly greater than the sample sizes of comparable studies (Tager-Flusberg & Sullivan, 1995; Baron-Cohen et al., 1986; Charman & Shmueli-Goetz, 1998).

A second limitation was the utilization of only one false belief task. In the present study only a false belief locations task was used because prior research with this sample has indicated that this task was the most reliable of those administered (see Curenton, 2003). Charman and Campbell (1997) argued that false belief mastery is not "all or none", and that poor performance on theory of mind tasks does not necessarily equate to a nonexistent theory of mind. The present researcher does not make claims about children's overall false belief performance based on children's response to one task; instead, the task is used as an indicator variable that distinguished one group of children from another.

Despite these limitations, the study had several strengths. First, to my knowledge, it is the only study designed to investigate how false belief skills relate to narrative abilities.

Secondly, it was designed so that race and socioeconomic status were not confounded. Lastly, it added to the general knowledge about children's theory of mind by providing insight into how these abilities may develop across ethnic groups. These results suggest that social cognitive skills have important implications for African American children's narrative abilities. Future work should further explore the narrative skills of African Americans and how these skills relate to other areas of social cognitive competence.

Implications for Practitioners and Educators

Many literary theorists suggest that stories can promote social skills in children (see Lamme, Krogh, & Yachmetz, 1992; Norton, 1995). By introducing children to complex protagonists, adults may help foster children's perspective-taking abilities and social cognitive reasoning. Stories can be used to provide insight into others' minds and motivational states (Benson, 1997) and to enhance moral development (Kilpatrick, 1993). Therefore, work that demonstrates an association between at-risk children's storytelling skills and social cognitive reasoning has implications for educators' and practitioners' ability to promote children's development both on a therapeutic level and a classroom level.

In terms of the therapeutic level, practitioners can use stories to build a bond with their young clients and to help them articulate their feelings and thoughts. Smith and Celano (2000) present a clinical case study that demonstrates how joint oral storytelling between the therapist and her client facilitated a low-income, African American boy's treatment. They provide a compelling example of how storytelling can allow adults to see inside a child's mind and help the child reason about his/her social situation in a more productive or protective manner. The results from the present study indicate that some African American children may already possess the skills necessary for linking social cognitive reasoning and narrative skills. Therefore, these children are the very ones who might be able to benefit most from a storytelling form of therapy.

In terms of the classroom level, educators and practitioners can implement interventions designed to use stories to enhance children's social skills. Trepanier and Romatowski (1982) used stories to influence 5- to 7-year old children's sharing behavior. At the end of their 3-week intervention, children who had been read stories about sharing were more likely to share than those who had not been read to. Similar results using stories told by puppets were found with preschoolers (Alvord & O'Leary, 1985). In addition, Bhavnagri and Samuels (1996) had two teachers read stories aloud to their respective classrooms. One classroom (the experimental class) was read stories involving peer-related themes (viz., sharing, taking turns, and empathy), and the other class (the control) was read books without peer-related themes (e.g., holiday and animal themes). Their results indicated that reading stories aloud to children and asking them questions emphasizing positive peer interactions had a positive effect on the children's knowledge about social situations. The results of these classroom interventions suggest that children's social skills are enhanced when they are told stories that have a moral or prosocial theme. The researchers who conducted these classroom interventions did not assess children's theory of mind or language skills before implementing the intervention. Yet still their results demonstrate that as a *group* children benefit from a story intervention regardless of their individual skills, which suggest that even those children who fail to link social cognitive reasoning and narrative skills on their own could still benefit from classroom level intervention.

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Appendix A.

Frog Story Transcript Deletions

1. The transcripts were modified to include only the child statements that were directly relevant to the story. All irrelevant remarks were deleted.
2. All experimenter statements were deleted.
3. Child statements that were responses to the experimenter's questions or request for elaboration/clarification were excluded, except for those statements that were responses to the standard probes.
4. False starts and retraces were deleted.
5. Filler words (e.g., hmm, uhuh, and huh) were deleted when they were the only words in the utterance. Additionally, untranscribable utterances that stood alone were deleted.
6. Children's denials ("I don't know") and refusals to read were deleted.
7. Children's questions and discussion about task procedures were deleted.
8. Noun fragments were deleted because they failed to adhere to the subject-predicate clause structure. For example, comments such as, "Reindeer" were excluded. However, fragments were not deleted if they were part of dialogue, such as "Frog, oh, frog!"

Appendix B.

Ratings of Narrative Quality

Illogical Narratives

Description: These stories seem illogical, and are hard to follow. When reading these stories it is difficult to determine to what page the child is referring. The child is not using the pictures to guide his story.

Example: That's a dog, and this a kid, and this a frog. This a dog, and this a kid. And the bumblebee come out. That's a dog. That's not a bumblebee.

Action-Based Narratives

Description: The descriptions of the pictures are clear and accurate. They are describing the actions and scenes from the pictures, but these descriptions are not linked. There is no evidence of a storyline; the child seems to be merely describing a sequence of pictures. These stories have no information about why the character is doing certain things (i.e., his internal states).

Example: It has a window. The dog has a glass on its head. The dog jumped out of the window. The boy jumped out of the window. It had [restart] . . . he's lost. It's raining. A bee come bited his nose. The boy's looking in the hole in the tree. The owl knocked him off the tree. He's on a rock. He's on a reindeer. He's still on the reindeer. He's falling into the water. The boy and the dog got on the log. There was frogs. He's holding the frog.

Consciousness-Based Narratives

Description: The descriptions of the pictures are clear and accurate. These stories reflect the basics of the plot: a) the frog is gone, and b) the boy is looking for his frog. There may be statements like, "The frog is gone," or "The boy is looking for him." These stories reflect the character's internal states. There may be statements like, "He is *trying* to find his frog," or "He looked in there, but the frog wasn't there." These stories may contain dialogue, such as "He said 'Frog, where are you?'" or "Frog, oh, frog!" There is resolution at the end, such as "He went home with his frog," or "He found his frog."

Example: The frog is in the can. The dog is going to eat. Then the frog got out. Then the boy went to sleep. And the then the boy wake up, and he said, "Where's the frog?" Then he looked in his food. And then he opened the window. Then his dog stuck his head in the can. Then the dog broke the can. Then he went outside, called for the frog. The boy thought it was in there. He thought it was in there, but he was [restart] . . . it was a beaver. Then he wasn't that, but it wasn't in there. Then the boy called in there. Then the owl came out. Then the boy climbed down a rock. Then called for his dog and frog. Then a deer came and carried the boy. And then there was the dog, and that was his dog. Then the deer dropped them. Then they fell in the water. And he was doing to get out. He got on the log. And there was a frog. And there was his frog! Then his pants fell down.