Low-Income Preschoolers' False-Belief Performance

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ABSTRACT: A group of 72 preschoolers (36 African Americans, 36 European Americans) enrolled in Head Start programs and other preschools serving low-income children were asked 3 variations of false-belief questions across 3 scenarios and given a language and cognition subtest. Children’s performance varied across the questions and tasks, but after covarying for children’s language and cognitive scores, those effects were no longer found to be significant. Age effects were still significant even after differences in children’s language and cognitive abilities had been accounted for. Although no language and cognitive differences were found among European Americans and African Americans, the European Americans still outperformed African Americans on 1 of the task scenarios. Those results demonstrate (a) the importance of considering testing procedures and language and cognitive abilities when assessing children’s social cognitive skills and (b) that age-related changes in false-belief understanding are associated with social cognitive conceptual changes that are independent of language and cognitive skills.

Key words: African American, false belief, low income, social cognition

THEORY OF MIND (ToM) is the study of how mental states relate to behavior. On the basis of a meta-analysis, investigators now widely accept that most children develop a ToM between the ages of 3 to 5 years, with the vast majority of children acquiring that understanding at age 4 years (Wellman, Cross, & Watson, 2001). One of the most widely used methods for testing children’s ToM is the false-belief task (Wimmer & Perner, 1983). That task enables one to test children’s ability to predict another’s behavior in relation to that person’s beliefs. The goal is to assess whether children understand that people sometimes have

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mistaken beliefs and that people's actions can be based on those mistaken beliefs. For example, if Joey wants a bowl of cereal and he thinks there is cereal in the cupboard, even though there is actually none there, he will still look in the cupboard because he thinks there is cereal there.

False-belief tasks have been used repeatedly with many samples of children, and researchers have found modest reliability for children's performance across false-belief testing procedures (Charman & Campbell, 1997; Mayes, Klin, Tercyak, Cicchetti, & Cohen, 1996). Thus, variation in testing procedures may be an important consideration when investigating children's ToM. Variation in testing procedures is one such consideration. Wellman et al. (2001) reported that when they examined variations in testing procedures across numerous studies in a meta-analysis, they found that testing procedures did not affect children's between-group age-related performance; nevertheless, they did report that testing procedures could increase children's performance overall. Researchers, whose individual studies were not included in the meta-analysis, reported variations in children's performance across testing procedures, and the results from those studies are particularly interesting when considered in light of children's language and cognitive skills. For example, younger preschoolers, whose language skills are typically poorer than their older counterparts, perform better on tasks that are embedded in sociodramatic play (Ritblatt, 2000; Szarkowicz, 1999) and affective contexts (Davis, 2001). In addition, task procedures affect the performance of children with cognitive delays, such as learning disabilities (Charman & Campbell). The findings from those studies lead one to speculate whether differences in task procedures will still be evident if children's language and cognitive skills are used as a covariate. In the meta-analysis, Wellman et al. did not consider children's language and cognitive skills in conjunction with variations in testing procedures. One of my purposes in this study, therefore, was to examine low-income children's false-belief performance by using a variety of testing procedures while controlling for their language and cognitive skills.

Research With Ethnic Minority and Low-Income Populations

Although Wellman et al. (2001) provided a thorough and insightful summary of children's false-belief performance in their meta-analysis, they did not include most studies examining the performances of children from low-income and ethnic-minority backgrounds (e.g., Cole & Mitchell, 1998; Cutting & Dunn, 1999; Dunn & Hughes, 1998; Holmes, Black, & Miller, 1996; Hughes & Dunn, 1998). Recently, there have been a few studies of the performances of children from low-income, racially diverse backgrounds. Some investigators have examined low-income children's performance by primarily using samples of African Americans (Holmes et al.). Others have examined low-income children's ToM performance by using racially diverse samples (Dunn & Hughes; Hughes & Dunn), but no comparisons were made between racial groups. In the present
study, equal numbers of African American and European Americans were included, and the differences between the two groups were compared.

Regardless of the racial diversity of the low-income samples, the results of the studies and conclusions about children's performance were discouraging. Cole and Mitchell (1998) indicated that low socioeconomic status is negatively correlated with passing false-belief tasks; likewise, Cutting and Dunn (1998) found higher maternal education and occupation levels to be positively correlated with children's performance on a battery of ToM tasks. In this study, I addressed two of the possible explanations for low-income children's lower false-belief performance: (a) language and cognitive skills and (b) testing procedures.

Researchers have shown that language and cognitive skills are related to children's false-belief performance. In some studies, assessments of language and cognition were combined (e.g., see Hughes, Dunn, & White, 1999; Jenkins & Astington, 1996), but other researchers have reported that even as separate variables, language (Aston & Jenkins, 1999) and cognitive skills (Frye, Zelazo, & Pulfal, 1995) are related to ToM skills. Thus, it may be argued that low-income children perform poorly because they have low language and cognitive skills. However, deficits in these skills cannot entirely explain children's performance. The performances of sample populations of low-income children who have advanced language skills (Hughes & Dunn, 1998) were still low. Moreover, in most studies examining false belief in disadvantaged populations, children's language and cognitive skills were not even assessed (Avis & Harris, 1991; Cole & Mitchell, 1998; Holmes et al., 1996; Vinden, 1996, 1999); therefore, no direct links between language and cognition and false belief can be established on the basis of these studies. In this study, I attempted to further explore the relationship between language and cognitive skills, testing procedures, and false-belief understanding by using children's language scores as a covariate when examining developmental changes in false-belief performance.

Another reason why low-income children may perform poorly is the testing procedures used. Socio-cultural differences, such as social cognitive reasoning and communication styles, may make it difficult for low-income and ethically diverse children to pass a task that was originally developed for use with a middle-class sample (see Wimmer & Perner, 1983). There are few studies in which socio-cultural status was examined as a factor in the nature of mental-state understanding (e.g., what people talk about when they talk about mental states and how they talk about them). In some cultures, individuals explain and make predictions about people's behavior by using situational variables or resorting to supernatural forces (see Lillard, 1998; Miller, 1984). Therefore, even if all cultures have the innate capabilities to predict or explain behavior based on mental states (Scholl & Leslie, 1999), there is variation in how often people use those abilities (Lillard, 1999), and the cause of that variation is that people internalize the folk concepts of their culture (see Astington, 1996). In the present study, I investigated the extent to which a low-income, ethically diverse sample of
preschoolers explained and predicted a character's false belief in terms of mental states. To my knowledge, there is no work examining the way in which low-income children both predict and explain a character's false beliefs. Perhaps low-income and ethnic minority children's poor performance on ToM tasks can be explained by sociocultural differences in reasoning (i.e., perhaps those children are less likely to reason about behavior in terms of mental states).

In the present study, I examined developmental changes in ToM associated with testing procedures, after controlling for language and cognitive abilities. Two hypotheses were proposed: (a) When controlling for language and cognitive scores, older children will outperform younger children, and (b) children's performance will vary across racial groups. In the third hypothesis, I postulated that children would be more likely to use situational explanations than mental-state explanations for behavior.

Method

Participants

The participants included 72 children from a Head Start program (n = 33) and other preschools serving low-income children (n = 39). All children who participated in the study lived in families that met the national standards for poverty, as evidenced by their enrollment in Head Start, or they lived in families receiving child-care subsidies for low-income families, which enabled the parents to send their child to any local preschool at a tuition rate that was based on their income. Parental permission forms were given to all parents with children attending Head Start programs, but parents with children enrolled in non-Head Start centers were given permission forms only if their family received child care subsidies. There were no significant differences between the number of African Americans versus European Americans, $X^2(1, N = 72) = .50$, or boys versus girls, $X^2(1, N = 72) = .10$, in the two types of preschools. In addition, there was no difference between the type of preschool and children's age, $F(1, 71) = .78$, or the type of preschool and children's language and cognitive skills, $F(1, 71) = 2.60$. The $p$ values were not statistically significant for any of the prior analyses.

Children were divided into three age groups (n = 24 for all groups): 3-year-olds ($M = 43$ months, $SD = 3.33$, 14 girls and 10 boys), 4-year-olds ($M = 53$ months, $SD = 3.18$, 15 girls and 9 boys), and 5-year-olds ($M = 63$ months, $SD = 2.60$, 11 girls and 13 boys). Equal numbers of African Americans and European Americans were in each age group.

Language and Cognitive Skills

The language and cognition subscale of the Early Screening Inventory—Revised (Meisels, Marsden, Wiske, & Henderson, 1997) was administered by one of three female experimenters in a quiet area of the child's preschool. The experi-
mentors were all from different ethnic backgrounds (i.e., African American, Latino, and European American). In the present study, this instrument was not used as a screening device. Instead, I used the subscale to gauge children’s language and cognitive skills.

The subscale contained questions designed to assess children’s open-ended descriptive expression and conceptual logic. The questions included activities such as counting blocks, describing objects, analytical verbal reasoning, and auditory sequencing. One of two versions of the test was administered: (a) the preschool version (ESI–P) designed for 3- to 4.5-year-olds or (b) the kindergarten version (ESI–K) for children 4.5 to 6 years old. I summed the children’s scores on the language and cognition subscale to obtain for the children a score for language and cognitive skills. A higher score indicated that children answered more questions correctly, and a lower score indicated that children answered fewer questions correctly (range: 1–12).

**Theory of Mind Measures**

**Question types.** In addition, one of the experimenters presented children with false-belief tasks. Within those tasks, children were asked three types of false-belief questions—prediction, explanation, and scaffolding. The prediction questions asked children to predict a character’s behavior based on the character’s false belief (viz., “Where is he going to look for his book?”), which essentially tested children’s understanding of what the puppet was going to do. For those questions, children were always presented with two choices, either the physical objects (i.e., a Band-Aid box versus a plain box and a toy box versus a closet) or the verbal choice (i.e., candle versus apple). The verbal and physical presentations of the answer choices were counterbalanced.

The explanation and scaffolding questions followed Bartsch and Wellman’s (1989) format. In their study, children received a point for correctly explaining the character’s action, but if children failed to answer the first question, they were asked a follow-up question about what the character was thinking. In my study, however, children’s responses to the two questions were scored separately and were classified as explanation or scaffolding. Explanation questions required the child to generate mental-state explanations, which are explanations that include mental state words, on their own, whereas scaffolding questions required that the child be able to describe what the character was thinking. All children were asked both types of questions.

The explanation questions assessed children’s ability to generate spontaneous behavior explanations that contain mental states (viz., “Why is he going to look in there?”). For these, the children were asked to explain why the puppet was going to do something. Responses to the three questions were open-ended, but children received a point only if their response contained information regarding the puppet’s cognition (e.g., thoughts, beliefs), a procedure that is con-
sistent with Bartsch and Wellman's (1989) system. Children's responses were also analyzed qualitatively.

Responses to children's explanation questions were transcribed from the audiotapes of the testing session. The responses were then classified according to four content areas—cognitive, desire-emotional, behavioral-situational, or uncodable. Cognitive explanations referred to the puppet's thoughts or beliefs (e.g., "She thinks Band-Aids are in there."). Desire-emotional explanations referred to emotions, desires, and intentions (e.g., "He wants his book."). Behavioral-situational explanations referred to the puppet's behavior or to characteristics of the immediate situation (e.g., "because he's looking for his book."). Children's responses were classified as uncodable if they refused to give an explanation or gave an incoherent one (e.g., "His book is not there."). Children's responses also were classified as logical or illogical. Responses were categorized as logical if the child answered the question by using a plausible explanation that fit with the scenario (e.g., "because he wants to read"); responses were categorized as illogical if the child failed to accurately answer the question with a plausible explanation (e.g., "no book"). Responses from 31 children (93 responses total) were randomly selected and classified by a second rater. Interrater agreement was high for both classification systems—content (average $K = .87$) and illogical versus logical (average $K = .96$).

A third type of question, the scaffolding questions (viz., "What does he think is in there?"), essentially assessed children's understanding of the reasoning behind the puppet's actions. For those questions, the puppet's thoughts were because they reduced the number of problem-solving steps. These questions did not require the child to decide between the situational reality versus the puppet's mental states; instead, they only required the child to attune to and correctly describe what the puppet was thinking. Bartsch and Wellman (1989) explained that even though the term think appeared in those questions, the questions still revealed the child's understanding of belief, because the correct answer did not reflect the situational reality or an action that would satisfy the puppet's desire.

**Task Types**

For ease of test administration, the prediction, explanation, and scaffolding questions were all embedded in various puppet tasks. Tasks were presented in a fixed order (viz., Band-Aid, apple, and book task). Complete scripts for those scenarios follow.

**Band-Aid task.** The experimenter randomly set up two boxes equidistantly in front of the children. The boxes were identical in size, shape, and type, except that one box displayed the Band-Aid logo and the other was plain. Children were asked to pick the box they thought contained Band-Aids (Control 1). To receive a passing score, the children had to pick the Band-Aid box. Next, they were shown that
the Band-Aid box was empty and that the plain box contained Band-Aids. Next, they were introduced to a puppet that had a cut and wanted a Band-Aid. The experimenter asked, “Where do you think she will look first for a Band-Aid?” (prediction question). The correct response was that the puppet will look in the Band-Aid box. The experimenter asked, “Will she find Band-Aids there?” (Control 2). The puppet was shown walking toward the Band-Aid box, and the children were told, “Look, the puppet, Pam, is going to look inside this box. Why do you think Pam is going to look in there?” (explanation question). “What does Pam think is inside that box?” (scaffolding question). Finally, children were asked the third control question, “Are there really Band-Aids in that box?” This task is a modified version of a false-belief task originally developed by Bartsch and Wellman (1989). Other researchers who have tested low-income children have used similar procedures (Hughes & Dunn, 1998; Hughes et al., 1999).

**Apple task.** Children were shown a candle that looked like an apple and were asked, “Does this look like an apple to you?” (Control 1). Children received a passing score on this question if they answered yes. The experimenter then told them, “But, you know what? It’s really and truly a candle. So what does this look like to your eyes right now, a candle or an apple?” (Control 2). “What is this really and truly, an apple or a candle?” (Control 3). Next, children were introduced to a puppet, Debbie, who was hungry and wanted something to eat. Children were asked the prediction question, “When Debbie first sees this, what will she think this is, a candle or an apple?” All of the answer choices for this task were counterbalanced within the scenario and across all the children. Debbie then was shown hovering over the apple with her mouth open, “Look, Debbie is going to take a bite. Why do you think Debbie is going to take a bite?” (explanation). “What does Debbie think this is?” (scaffolding). This question is a modified version of tasks developed by Gopnik and Astington (1988).

**Book task.** The experimenter randomly placed a miniature toy box and closet equidistantly in front of the child. The children were then shown a puppet holding a small book and told, “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.” Mark was placed out of sight, and children were asked, “Where did Mark put his book?” (Control 1). A second puppet, James, came onto the scene, and the children were told, “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. James then goes outside to play.” James was placed out of sight, and the experimenter asked, “Where did James put the book?” (Control 2). Next, Mark came back and the children were told that he wanted to read his book. They were asked the prediction question, “Where will Mark look for his book? Will he find his book there?” (Control 3). Mark was shown heading toward the closet, “Look, Mark is going to look in the closet. Why do you think Mark is going to
look in there?" (explanation). "What does Mark think is in the closet?" (scaffolding). "Is his book really in the closet?" (Control 4). This task is a modified version of Wimmer and Perner's (1983) false-belief task.

Control questions were asked during each task scenario. If children failed any of the control questions within the scenario, they received no points for all false-belief questions within that scenario. Failing control questions indicated that a child was not able to follow the task scenario; therefore, their test answers were not considered reliable. Preliminary investigations indicated that children's performance on the control questions was at ceiling, with an average of 95% correct across all control questions.

Results

Preliminary Analyses

A preliminary Race × Age analysis of variance indicated that children's language and cognitive scores increased with age, $F(1, 71) = 15.26, p < .01$. Three-year-olds ($M = 5.83, SD = 2.16$) had lower scores than 4- ($M = 8.34, SD = 3.06$) and 5-year-olds ($M = 9.50, SD = 1.62$), but the 4- and 5-year-olds were not significantly different from each other. Neither the main effect for race nor the interaction term was significant, indicating that there were no racial differences in terms of language and cognitive scores. Age differences in children's performance on language and cognitive tests have been commonly found in the literature and might imply normal developmental progression.

I also conducted preliminary analyses to demonstrate that performance varied as a function of testing procedures. Table 1 illustrates the variations across tasks and questions. Performance was better on the book task ($M = .96, SD = .93$) than on the apple task ($M = .57, SD = .93$), $t(71) = -3.33, p < .01$, and on the book task than on the Band-Aid task ($M = .60, SD = .82$), $t(71) = -2.66, p < .01$. In terms of questions, children's performance on the explanation questions ($M = .27, SD = .56$) was lower than their performance on the scaffolding ($M = .86, SD = .91$), $t(71) = 5.64, p < .01$; similarly, their performance on explanation questions...
was poorer than their performance on prediction questions ($M = 1.06, SD = .82$, $t(71) = -7.71$, $p < .01$). Therefore, those results demonstrated that when variations in language and cognitive skill were not accounted for, there was wide variation in performance because of testing procedures.

**False-Belief Performance and Language and Cognitive Skills**

Table 2 shows significant correlations between children’s age, language and cognition skills, and false-belief performance. To test the first two hypotheses, I conducted a repeated measures analysis of covariance (ANCOVA). For that ANCOVA, language and cognitive skills were used as the covariate, task and question were used as within-group variables, and age and race were used as between-group variables. Results revealed a significant Task × Race interaction, $F(2, 130) = 3.38, p < .05$, in which the European Americans ($M = .26, SD = .34$) were more successful on the Band-Aid task than were the African Americans ($M = .14, SD = .34$), but there were no other effects because of testing procedures (i.e., the task and question variables). In addition, there was a between-group age effect, $F(2, 65) = 3.22, p < .05$, in which the 4- (M = .25, SD = .31) and 5-year-olds (M = .32, SD = .33) outperformed the 3-year-olds (M = .16, SD = .35). Those results confirmed two of the hypotheses by demonstrating that, even after controlling for language and cognitive differences, children’s performance increased with age, and children’s race affected their performance on specific tasks.

**False-Belief Explanations**

To test the third hypothesis, I conducted qualitative results to characterize children’s responses to explanation questions. Given the open-ended format of the explanation question, children could explain the puppet’s behavior by using cognitive, behavioral–situational, desire–emotional, or uncodable types of explanations. The qualitative results indicated that the majority of the responses children gave were logical (57%), meaning that those responses were plausible explanations for the puppet’s behavior. Of those children who responded logically, 57%

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**$p < .01$.**
used behavioral–situational explanations, 23% used desire–emotional explanations, and 20% used cognitive explanations. These results confirmed the hypothesis that low-income children would be more likely to provide a situational or behavioral explanation for the actions of the puppets.

Discussion

In this study, I investigated whether language and cognitive skills mediate the relationship between testing procedures and false-belief performance. The results of previous work had suggested that language and cognitive skills and ToM are correlated (e.g., Astington & Jenkins, 1999; Frye et al., 1995; Hughes, Dunn, & White, 1998; Jenkins & Astington, 1996; Taylor & Carlson, 1997), and the results from this study provided further evidence for the relationship between the two. Astington (2001) and Frye, Zelazo, and Burack (1998) postulated that language and cognitive skills may be important in children’s ability to understand false beliefs. Specifically, Astington (2001) argued that age-related development in false beliefs might be a reflection of increasing language abilities, which can also be attributed to age-related development. However, the present results indicated that once differences in children’s language and cognition skills are controlled for, age-related changes in false-belief understanding are still evident, suggesting that age-related maturation in social cognitive reasoning is distinct from age-related maturation in language and cognitive skills.

African American Children’s Performance

Although covarying for language and cognition skills failed to eliminate age differences, it eliminated nearly all of the differences across testing procedures. However, testing procedures still influenced African American children’s performance, even when language and cognitive scores were covaried. European Americans outperformed African Americans on the Band-Aid task. Similar versions of Band-Aid tasks have been used with socioeconomically and ethnically diverse populations (Bartsch & Wellman, 1989; Cutting & Dunn, 1999; Hughes & Dunn, 1998; Hughes, Dunn, & White, 1998; Watson, Nixon, Wilson, & Capage, 1999), but none of those investigators have reported a difference in children’s performance on the Band-Aid task in comparison with other tasks. However, in a study by Holmes, Black, and Miller (1996), the authors reported an average passing rate of 46% for contents tasks (i.e., tasks similar to the Band-Aid task used in the present study) in comparison with a 69% passing rate for location tasks (i.e., tasks similar to the Book task in the present study) across both of their experiments with African American children enrolled in Head Start programs. Therefore, my study supports those previous findings that contents tasks may be more difficult for African American children.

There are several reasons why African American children may experience
more difficulty with the contents task. Holmes, Black, and Miller (1996) argued that the children in their study performed better on the locations tasks because these tasks were embedded in a story context, whereas the contents tasks were not embedded. This explanation cannot explain the performance of the participants in this study because all of the tasks were presented in scenarios (stories) that described the puppet’s desires. Specifically, for the Band-Aid task, the children were told that the puppet was hurt and wanted a Band-Aid; for the Apple task, the children were told that the puppet was hungry and wanted something to eat; and for the Book task, the children were told that the puppet wanted to sit down and read his book. Instead, the other two explanations Holmes, Black, and Miller suggested (viz., that the contents task is arbitrary and unrealistic) are more likely to explain the performance in the present group. The African American children in this study may have experienced difficulty with this task because the switch in the contents in the boxes was arbitrary and was not explained during the scenario, or the children may have experienced difficulty because the situation is unlikely to occur in real life (i.e., it is unlikely that someone would remove all the Band-Aids from a perfectly good Band-Aid box and place them in a plain box). On the contrary, the apple and book tasks reflected real-world experiences more accurately. For example, it is common for children to see an object that looks like something else, and it is common for children to have their belongings moved by someone else. The performance of the African American students was equivalent to that of European Americans on those tasks with more real-world application. Other researchers have found that when the abilities of African American children are assessed in realistic contexts, their performance on language assessments improves to age-appropriate levels (see Laing & Kumbi, 2003). In future studies, investigators should examine false-belief performance in low-income, African American children and incorporate tasks that are more contextualized and applicable in real life. In addition, future researchers within this area should obtain information about the family and community socialization practices and self-reports of ethnic identity so that sociocultural factors, such as ethnicity and race, can be seen as cultural process variables rather than merely descriptive variables.

Responses to Explanation Questions

Another interesting finding was the pattern of children’s responses on the explanation questions. In the original study assessing children’s false-belief explanations, Bartsch and Wellman (1989) found that one third of the children spontaneously produced a cognitive-based explanation to the question, “Why do you think he is looking in there?” The other two thirds of the sample responded correctly to, “What does he think?” (the scaffolding question). My findings are consistent with their results. Fewer children answered the explanation questions versus the scaffolding and prediction questions.
One possible reason why children’s scores were lower on the explanation question is that they had to generate an open-ended why response, and those forms of questions are more difficult to answer (see de Villers & Roeppe, 1995). Following that argument, it would seem that most children would have given illogical responses. However, most of the children provided logical explanations for the character’s behavior, but those explanations did not refer to the character’s thoughts. For example, when asked why the puppet was going to look in the closet, 18 children gave situational and behavioral responses, such as, “to find his book,” whereas 11 children gave desire-based responses, such as, “He wants to read,” and 9 children made comments like, “He thinks his book is in there,” which is a cognitive-based response. Overall, the qualitative results indicated that most of the children who provided logical responses gave situational and behavioral explanations.

Children’s performance on the scaffolding and prediction questions indicated that those children understood the puppet’s mental state even though they may not have explained its behavior using mental-state explanations. In a study by Nelson, Plesa, and Hensler (1998), 50% of adults from their socioeconomically diverse sample gave narrative–interpretative explanations of behavior, and these narrative–interpretative explanations focused on situations, emotions, and social norms, as well as mental states. Thus, when asked to explain behaviors, low-income children may focus more on situational or emotional factors because it is the norm of their social group to explain behavior in that way, even though they still understand people’s mental reasons for engaging in the behavior. These results support Lilard’s (1998) argument that the propensity to explain behavior in terms of mental states may be a middle-class, European and European American phenomenon. In future studies, diverse groups of low-income children’s explanations for behavior should be examined.

Limitations and Conclusions

These data provide new insight into how low-income African American and European American preschool children develop a theory of mind, but some researchers may criticize the children’s overall performance. Although the children demonstrated the appropriate age-related progression in false-belief performance, their performance was low because of the stringent passing criteria. To receive points for the test questions, children had to pass all of the control questions in a scenario. It is common in ToM studies for the experimenters to repeat the scenario if children fail the control questions, but in this study the experimenters did not repeat the scenario. Instead, if children failed any of the controls, they received zero points for all questions within that scenario. I used the multiple control questions and stringent passing criteria to guard against children randomly guessing the correct answer, which ultimately, resulted in lower—albeit more reliable—scores.
In summary, my results are consistent with those of literature in the field. The results both support and supplement Wellman et al. (2001). They are supportive in that they demonstrate that age-related conceptual changes in false-belief competence are not caused by testing procedures, and they are supplemental in that they demonstrate that conceptual changes are independent of language and cognitive skills. These results also support findings from false-belief literature on low-income children by demonstrating that even though those children have low performance levels, age-related developmental changes and correlations between false-belief understanding and language and cognitive skills are still evident in this socioeconomic group.

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