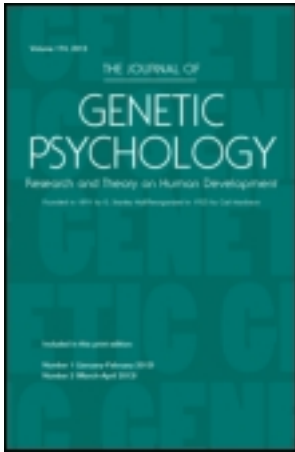


This article was downloaded by: [University of Virginia, Charlottesville], [Rebecca A. Dore]
On: 17 March 2014, At: 19:14
Publisher: Routledge
Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered
office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



The Journal of Genetic Psychology: Research and Theory on Human Development

Publication details, including instructions for authors and
subscription information:

<http://www.tandfonline.com/loi/vgnt20>

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Accepted author version posted online: 03 Jul 2013. Published
online: 31 Jan 2014.

To cite this article: Rebecca A. Dore & Angeline S. Lillard (2014) Do Children Prefer Mentalistic Descriptions?, *The Journal of Genetic Psychology: Research and Theory on Human Development*, 175:1, 1-15, DOI: [10.1080/00221325.2013.805712](https://doi.org/10.1080/00221325.2013.805712)

To link to this article: <http://dx.doi.org/10.1080/00221325.2013.805712>

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Do Children Prefer Mentalistic Descriptions?

Rebecca A. Dore and Angeline S. Lillard

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ABSTRACT. Against a long tradition of childhood realism (Piaget, 1929), A. S. Lillard and J. H. Flavell (1990) found that 3-year-olds prefer to characterize people by their mental states (beliefs, desires, emotions) than by their visible behaviors. In this exploratory study, we extend this finding to a new cohort of 3-year-olds, examine how these preferences change from 3–4 years, and explore relationships with theory of mind and parental mind-mindedness. The results showed a developmental change and a possible cohort difference: at 3 years, children in the sample preferred behavioral descriptions, although by 4 years of age, they preferred mentalistic ones. Interestingly, mentalistic preferences were unrelated to theory of mind or parental mind-mindedness, concurrently or over time. Perspective-taking skills at 3 years, however, predicted an increase in mentalistic responses from 3 years to 4 years. Possible explanations for each finding are discussed.

Keywords *mental state language, mind-mindedness, theory of mind*

Early research suggested that young children are behaviorists and do not focus on internal mental states. For example, children often categorize actions that adults would consider mental, such as thinking or pretending, as physical actions (Lillard, 1996; Selman, 1980) and most commonly describe others in terms of physical characteristics, rather than describing internal or mentalistic traits (Peevers & Secord, 1973). Research on children's theories of mind, however, has revealed that children are by no means essentially behaviorists. For example, young children use mental state language, including terms relating to desires, beliefs, and emotional states, in their everyday conversations with parents and siblings (Bartsch & Wellman, 1995; Brown & Dunn, 1991; Symons, 2004), and by 3 years, appear to correctly use these words to refer to inner mental phenomena (Kristen, Sodian, & Licata, 2012; Miller & Aloise, 1989; Pascual, Aguado, Sotillo, & Masdeu, 2008; Recchia & Howe, 2008; Shatz, Wellman, & Silber, 1983; Tardif & Wellman, 2000). Thus, it appears that children do have at least a rudimentary understanding of basic mental states (desires, beliefs, and emotions) at a young age. However, surprisingly little research has examined whether children actually favor this kind of mental state language over other types of language. That is, when both types of information are equally salient, do children prefer thinking about people in terms of their mental states or their behaviors?

Received January 21, 2013; accepted May 8, 2013.

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Lillard and Flavell (1990) designed a mentalistic–behavioral task (MB Task) to address this question. For each of 12 items in this task, an experimenter sequentially showed children three pictures that were identical but differed in their coloring in order to make them appear somewhat different from one another. The experimenter described the first two pictures, using a mentalistic description for one and a behavioral description for the other, with the order of these descriptions counterbalanced. Then, the child was asked to tell a puppet about the third picture, effectively to choose between the mentalistic and behavioral description. Counter to the characterization of young children as mental realists or behaviorists (Shantz, 1983), 3-year-olds showed a slight preference for mentalistic descriptions over behavioral ones (Lillard & Flavell, 1990). This finding was later replicated by another laboratory (Youngstrom & Goodman, 2001).

To our knowledge, these are the only two published studies that have examined this question or used the MB task. In the present research we sought to replicate with a new cohort the finding that children prefer mentalistic descriptions. We also sought to extend the prior research in three ways.

Change Over Time

Although the prior studies with the MB task showed a slight preference for mentalistic descriptions at 3 years, an open question is how this develops, or whether that preference is even stronger at 4 years. Across the preschool years, theory of mind (ToM) skills improve and naturalistic mental state language increases (Dunn & Brown, 1993; Hughes & Dunn, 1998; Wellman & Liu, 2004). Children's tendency to refer to traits also increases in this period (Eder, 1989). Does children's preference for using mentalistic descriptions also increase during preschool? Both previous studies used 3-year-olds; within that age range, one did not find an age effect (Youngstrom & Goodman, 2001) and the other did not examine potential age effects (Lillard & Flavell, 1990). Here we examined age effects both across children and within individual children from 3–4 years.

Stability of Individual Differences Over Time

The second extension was to investigate whether individual children's preference for mentalistic or behavioral descriptions are stable over time. Seemingly related measures, such as ToM and naturalistic mental state language, are relatively stable within individuals over time (Hughes & Dunn, 1998; Hughes, Ensor, & Marks, 2011), but stability of the MB Task is unexamined. To investigate this stability, we tested children at two time points approximately seven months apart.

Relationship Between Preference for Mentalistic Descriptions and ToM

A third issue addressed here is the relationship between children's preference for mentalistic descriptions and ToM. It might be the case that children with more advanced ToM might be more inclined than others to discuss mental states. In this case, preference for mentalistic descriptions

would be positively related to ToM. Supporting this possibility, ToM is related both concurrently and longitudinally to the amount of mental state language children use in naturalistic contexts (Ensor & Hughes, 2008; Hughes & Dunn, 1998; Hughes et al., 2011; for a review, see de Rosnay & Hughes, 2006). In the present study, ToM and preference for mentalistic descriptions were measured at two time points in order to investigate their concurrent and longitudinal relationships.

Parental Mind-Mindedness as a Predictor of Preference for Mentalistic Descriptions and ToM

Parental mind-mindedness is a parent's tendency to view his or her child as an individual with a mind, as measured by coding of parent–infant interactions or of parents' open-ended verbal description of the child (Meins & Fernyhough, 2010).¹ Parents who are high in mind-mindedness tend to focus on their children's mentalistic attributes, rather than behavioral or physical traits. Theoretically, Meins et al. argued that parents who treat their children as mental agents may be more likely to focus on mental states in their interactions and conversations with children. Through these interactions, children might begin to focus more on mental states and gain a better understanding of others' minds. Indeed, research shows that early maternal mind-mindedness predicts later ToM (Laranjo, Bernier, Meins, & Carlson, 2010; Meins & Fernyhough, 1999; Meins, Fernyhough, Russell, & Clark-Carter, 1998; Meins et al., 2003). However, some research has shown that maternal mind-mindedness is not concurrently related to ToM (Meins et al., 2003). Further exploration of this important construct in other laboratories is needed. We examined both concurrent and short-term predictive relationships between parental mind-mindedness and ToM, as well as the relationship of parental mind-mindedness to children's performance on the MB Task.

The Present Study

The basic goal of the present study was to replicate with a different sample Lillard and Flavell's (1990) finding that 3-year-olds prefer mentalistic over behavioral descriptions, and to extend it in several ways. First, we examined whether children's preference for mentalistic descriptions increases over this time period, and also whether individual differences in this preference are stable over a 6–8-month period between 3 and 4 years. Both stability and an increase with age have been found with other, seemingly related constructs, such as naturalistic mental state language and ToM.

Second, we examined whether there is a relationship between a preference for mentalistic descriptions and ToM. Past research has shown that children's use of mental state language in a naturalistic context is related to ToM, but the relationship of the MB task to ToM is untested. We tapped children's ability to contrast mental states (from reality or others' mental states) in two ways: the ToM Scale (Wellman & Lui, 2004) and Visual Perspective-Taking Tasks (Masangkay et al., 1974) in which children must describe another person's visual perspective. Whereas the ToM Scale is a widely used measure and includes a standard false belief task, the Visual Perspective-Taking Tasks are derived from earlier Piagetian tasks and are considered strongly related to false belief (Flavell, 1988). Despite the strong theoretical link between visual perspective taking and false belief, published reports providing empirical evidence of a relationship are lacking. Thus,

these two measures may not follow similar trajectories and relate to other measures in similar ways.

Finally, we examined whether parental mind-mindedness, a parent's tendency to view their child as an individual with a mind, predicts preference for mentalistic descriptions and ToM. Some studies have found a relationship between parental mind-mindedness and ToM, and others have not. Most studies of the construct have occurred in a single laboratory and replication is important.

To examine these questions, we tested preschool children at two time points, 6–8 months apart. The data from the first time point showed whether Lillard and Flavell's (1990) findings would replicate in a new sample, as well as revealing whether concurrent relationships exist between the MB task, ToM, and parental mind-mindedness. The data from the second time point allowed examination of the stability of children's preference for mentalistic descriptions and whether it increases with age, as well as potential longitudinal relationships between the MB task, TOM, and parental mind-mindedness. At the first time point, all children were 3 years old. We chose to test children of this age in order to replicate past findings. We used a test interval of 6–8 months because this time period is sufficient to show advances on ToM, and we expected it might show change in preference for mentalistic descriptions as well.

METHOD

Participants

Eighty-four children participated at Time 1 (42 girls, M age = 3;5 [years; months], SD = 3.7 months, range = 3;0 to 3;11). Approximately 6–8 months later (M time between visits = 6.94 months, SD = 0.73 months, range: 5.7–9.0 months), 57 children (25 girls) of these returned for their Time 2 visit (M age at Time 2 = 4;0, SD = 3.9 months, range = 3;7 to 4;7). Based on prior studies (Hughes & Dunn, 1998; Laranjo et al., 2010; Meins et al., 1998; Meins et al., 2003), we expected that this sample size would provide sufficient power to find existent effects. Children were primarily white and middle to upper-middle class and were recruited from a database of families willing to bring their children to the laboratory for research. Parents were contacted by phone and email to schedule visits. During the visit, parents provided written informed consent and children provided verbal assent before entering the testing room.

Procedure

At both time points, children were tested individually in one session. Testing was done in a quiet room by the same female experimenter at both time points. Parents either remained in the waiting room or sat quietly in the back of testing room, behind the child.

Time 1

Children completed the Visual Perspective-Taking Tasks, the MB Task, and the ToM Scale, in that order. As part of a larger study, 60 children also received the Test of Emotion Comprehension (Pons, Harris, & de Rosnay, 2004) prior to the ToM Scale.² Parents completed the Mind-Mindedness Questionnaire.

Time 2

During the second visit, children completed these same three tasks: the Visual Perspective-Taking Tasks, the MB Task, and the ToM Scale. The order of these tasks was systematically varied across participants using a Latin Squares design (18–20 children per order, where possible orders were PT-MB-ToM, MB-ToM-PT, and ToM-PT-MB) to allow us to examine potential order effects. We had used a single task order at Time 1 because we were conducting a larger study of group differences; using a systematic order at Time 2 allowed us to ensure task order did not have an effect). As part of a larger study, prior to the rest of the study procedures, children participated in another task in the waiting room that involved choosing between two toys.

Measures

Visual perspective-taking tasks

Two standard tasks measured Level 1 and Level 2 perspective taking. In the Level 1 task, children saw a card with a picture of a dog on one side and a picture of a cat on the other side. The experimenter held the card vertically between herself and the child, and asked the child which animal he or she saw and then which animal the experimenter saw. To pass the task, the child must indicate that when he or she sees the dog, the experimenter sees the cat. In the Level 2 task, children saw a card with a picture of a turtle on it. The experimenter placed the card flat on the table between herself and the child, and asked the child whether he or she saw the turtle right side up or upside down and then whether the experimenter saw the turtle right side up or upside down. To pass the task, the child must indicate that when the turtle looks upside down to the child, it looks right side up the experimenter (Masangkay et al., 1974). Children received one point for each task they answered correctly, so scores could range from 0 to 2.

MB task

This task included 12 items (Lillard & Flavell, 1990, Study 2), four in each of three categories: emotion, other mental states, and unsuggested mental states (in which the mental state is not suggested by the picture; see Table 1). For each item, children were shown three differently colored copies of the same picture. The experimenter described the first two pictures, one using a mentalistic description and the other using a behavioral description. Children were asked to tell a puppet about the third picture and usually gave one of the two descriptions previously provided by the experimenter. Coders categorized other responses as behavioral or mentalistic. For example, “He likes cupcakes” was mentalistic, whereas “He’s looking at the cupcakes” was behavioral. A second coder coded a randomly selected 20% of the participants’ responses and agreement was 100%.

For each of the 12 items, mentalistic responses were coded as 1 and behavioral responses were coded as –1 (Lillard & Flavell, 1990). Thus, scores could range from –12 to 12, where 0 indicates no preference, negative numbers indicate a preference for behavioral descriptions, and positive numbers indicate a preference for mentalistic descriptions.

TABLE 1
Mentalistic–Behavioral Task Items

<i>Mentalistic</i>	<i>Behavioral</i>
<i>Emotion</i>	
He's scared of the dog.	He's holding his mommy's hand.
She's happy with the puppy.	She's patting the puppy.
She's mad about the drawing.	She's talking about the drawing
He's feeling sad about his spilled milk.	He's wiping up his spilled milk.
<i>Other mental states</i>	
She's choosing a book that she likes.	She's taking a book off the shelf.
He wants to get a cupcake.	He's on tiptoes by the cupcakes.
He's thinking about what to paint.	He's holding a paintbrush.
She's looking for a toy.	She's opening the toy box.
<i>Unsuggested mental states</i>	
She's thinking about her big sister.	She's wearing her black shoes.
He's wondering what game to play.	He's standing still.
She's having a dream.	She's got her eyes closed.
He's hoping his teacher will read a story.	He's sitting on the floor with his legs crossed.

At Time 1, the items were presented in one of two random orders and which six items were described with the mental state description first was counterbalanced across participants. Neither order nor placement of the mental state description influenced performance ($ps > .44$), so at Time 2 these features were held constant. Finally, for exploratory reasons a subset of these children told a king puppet (eight children) or the experimenter (eight children) about the picture rather than the stuffed animal. Regression analyses showed that neither of these conditions altered performance ($ps > .27$) so responses were combined.

For 60 of the 84 children, at Time 1, the MB Task was administered in two phases (six items each) with an intervening experience (a 10-min play session), to test if the intervening experience would influence performance. The intervening experience had no effect on this or later tasks and the total score is used here.

ToM scale

Children completed the five-item version of the scale (Wellman & Liu, 2004). The scale includes the following tasks: (a) diverse desires, which tests children's understanding that others can have desires that differ from the child's own; (b) diverse beliefs, which tests children's understanding that others can have beliefs that differ from the child's own; (c) knowledge access, which tests children's understanding that others do not necessarily have the same knowledge as the child does; (d) contents false belief, which tests children's understanding that others can have false beliefs despite the fact that the child knows the truth about a given situation; and (e) real-apparent emotion, which tests children's understanding that a person can feel one emotion inwardly and display a different emotion outwardly. An alternate version was used at Time 2, which retains the basic structure and constructs but changes names and items in the vignettes.

Parental mind-mindedness questionnaire

To measure parental mind-mindedness, parents wrote in response to the open-ended question, “How would you describe your child?” (Meins et al., 1998). Coders categorized each attribute mentioned as mental, behavioral, physical, or general, according to Meins’s scoring system (Meins & Fernyhough, 2010). Any descriptions relating to the child’s intellect, imagination, emotion, or metacognition were coded as mentalistic. Attributes describing activities the child likes to do or the child’s typical behavior were coded as behavioral. Physical descriptions or references to the child’s age were categorized as physical, whereas general comments that did not fit into another category were categorized as general. Mind-mindedness scores were computed by taking the number of mental attributes divided by the total number of attributes used to describe the child. A second coder coded a randomly selected 20% of participants’ data. Cohen’s kappa was .7 (mental vs. not mental).

RESULTS

We first describe the results for the MB Task at Time 1 and Time 2 and the relationship between scores on this measure across time points. Next, we discuss the relationship between the MB Task and ToM. Finally, we examine the relationship between these measures and parental mind-mindedness. All analyses were conducted using the statistical package R (R Core Team, 2013).

MB Task

Time 1

Forty-four percent of children’s Time 1 description choices were mentalistic; 56% were behavioral. For example, when presented with the descriptions, “She’s taking a book off the shelf,” and “She’s choosing a book that she likes,” the children tended to choose “She’s taking a book off the shelf,” or create another behavioral description. The mean score was -1.15 ($SD = 3.52$). A one-sample t test comparing this mean to 0 showed that children’s responses were significantly more behavioral than would be expected were they responding haphazardly or without preference, $t(81) = -2.94$, $p = .004$, $d = .65$. This contrasts with Lillard and Flavell’s (1990) and Youngstrom and Goodman’s (2001) findings that 3-year-olds preferred mentalistic descriptions.

Next we examined mentalistic choices by category (emotion, other mental state, and unsuggested mental state) using a logistic regression model in which score on a particular item was predicted from category.³ Children’s responses on items in the unsuggested category were more behavioral than responses on items in both the emotion category ($B = -.54$, $p < .001$) and the other mental state category ($B = -.46$, $p < .003$), consistent with Lillard and Flavell’s (1990) findings. The regression model indicated that children’s degrees of preference for mentalistic description for items in the emotion and other mental states categories were not significantly different from each other ($p = .62$) and they were also quite close to 0 (indicating no preference). As can be seen

TABLE 2
Mean Score and Standard Deviation on Mentalistic–Behavioral Task, by Time and Category

Time	Category							
	All items		Emotion		Other mental state		Unsuggeste mental state	
	M	SD	M	SD	M	SD	M	SD
Time 1	−1.15	3.53	0.00	2.16	−0.14	2.00	−1.04	1.86
Time 2	1.05	3.69	0.39	1.67	0.74	1.95	−0.07	2.14

from Table 2, the unsuggested mental state category, in which the mental state is not suggested by the picture, drove the overall finding that children preferred behavioral descriptions.

Time 2

In contrast to Time 1, at Time 2, 53% of children's responses were mentalistic and 47% were behavioral. The mean score of 1.05 ($SD = 3.69$) reflects a significant preference for mental descriptions, $t(56) = 1.31, p = .04, d = .35$. Lillard and Flavell (1990) obtained a mean score of 2.0, showing their 3-year-olds were marginally more mentalistic than were slightly older children here at the Time 2 test point, $t(56) = -1.90, p = .06, d = .51$.

Next we examined Time 2 mentalistic choices by category using a logistic regression model as at Time 1. In line with the Time 1 findings, children's responses on items in the unsuggested category were more behavioral than responses on items in the other mental states category ($B = -0.41, p = .03$). Still, as can be seen in Table 2, the mean Time 2 unsuggested mental states score is very close to 0, indicating no preference, and means for the other two categories at Time 2 show a slight mentalistic preference. Neither the emotion and other mental states categories ($p = .34$), nor the emotion and unsuggested mental state categories ($p = .22$), were significantly different from each other.

Relationship between MB score at Time 1 and Time 2

Children's scores on the MB Task at Time 1 and Time 2 were not significantly correlated ($ps > .33$). Thus, children's preference for mentalistic or behavioral descriptions was not stable over this time period.

To examine how children's performance on this task changed over time, regression models were estimated. Estimates of effects were obtained from a full model (including all factors, interactions, and covariates that might be of interest) and compared to simpler, nested models (using Akaike information criterion, a measure of the relative goodness of fit; see Anderson, 2008).

Children's mean score at Time 2 was 1.05, compared to -0.87 at Time 1. To examine whether this is a significant difference, as well as to control for other variables and potential interactions, the initial model predicting children's MB score included age, time (Time 1 or Time 2), intervening

time between visits (in months), gender, and condition at Time 1 (play intervention), as well as the two-way interactions between these variables. Nonsignificant predictors were systematically removed using model comparison. The best-fitting model included time as the only predictor and showed that children at Time 2 gave more mentalistic responses than children at Time 1 ($B = 1.93, p = .01, r^2 = .07$). No other variables or interactions significantly predicted MB score.

We also examined change over time at an individual level. Of the 57 children who participated at both time points, 34 changed in a mentalistic direction from Time 1 to Time 2, 10 showed no change, and 13 changed in a behavioral direction. A binomial test excluding children had the same score at both time points showed that significantly more children became more mentalistic from Time 1 to Time 2 than would be expected by chance ($p = .003$).

We also examined a regression model in which we predicted MB score from age rather than from time point. In this model, age is a significant predictor of giving more mentalistic responses ($B = 0.15, p = .027, r^2 = .04$), again suggesting that true developmental change is occurring from Time 1 to Time 2.

Relating ToM and Perspective Taking and Preference for Mentalistic Descriptions

Means and standard deviations for ToM and Visual Perspective-Taking Tasks can be seen in Table 3. Correlation and partial correlation analyses were conducted to examine the relationship between ToM and visual perspective taking and preference for mentalistic descriptions. Partial correlations were used to examine whether the independent variable measured at Time 1 was related to the dependent variable at Time 2, controlling for the dependent variable at Time 1, thus effectively predicting change in the dependent variable from Time 1 to Time 2 (Hauser-Cram & Krauss, 1991). We expected that these measures, similar to naturalistic mental state language, might be related to a preference for more mentalistic descriptions.

Surprisingly, at Time 1, better ToM was related to preference for more behavioral descriptions ($r = -.37, p < .001$). This relationship held when controlling for age ($r = -.33, p = .002$). Time 2 ToM was unrelated to Time 1 or Time 2 MB score ($ps > .35$).

As expected, children's score on the Visual Perspective-Taking Tasks was correlated with ToM ($r = .29, p < .01$). This relationship was marginally significant when controlling for age ($r = .19, p = .089$). Also, similar to ToM, score on the Visual Perspective-Taking Tasks was related to preference for more behavioral descriptions concurrently at Time 1 ($r = -.32, p = .004$). Unlike

TABLE 3
Mean Score and Standard Deviation on Theory of Mind and Perspective Taking at Each Time Point

Time	Theory of mind scale		Visual erspective-taking task	
	M	SD	M	SD
Time 1	1.95	1.05	1.21	0.64
Time 2	2.51	1.04	1.72	0.53

Note. Possible range for the perspective-taking score was 0–2; possible range for theory of mind scale was 0–5, with higher values indicating better performance.

ToM, however, a higher score on the Visual Perspective-Taking Tasks was related to becoming more mentalistic from Time 1 to Time 2 ($r = .30, p = .02$).

Relationship Between Parental Mind-Mindedness and ToM and Preference for Mentalistic Descriptions

Parental mind-mindedness, measured at Time 1, did not predict children's ToM score, Visual Perspective-Taking score, or preference for mentalistic descriptions, either concurrently or over time, when controlling for age ($ps > .19$).

DISCUSSION

In the present study we examined children's preferences for mentalistic or behavioral descriptions and extended past findings in three ways. First, we examined how children's preference for mentalistic or behavioral descriptions changed with age. Second, we examined the relationship between this preference and children's ToM and visual perspective-taking skills. Third, we examined whether this preference, and ToM, can be predicted by parental mind-mindedness.

Our first finding was a failure to replicate Lillard and Flavell (1990) and Youngstrom and Goodman (2001), both of which found that 3-year-olds prefer mentalistic descriptions to behavioral ones. Three-year-olds in the present study preferred behavioral descriptions. When children were tested at Time 2, 6–8 months later, they preferred mentalistic descriptions.

This nonreplication was unexpected, and although we see no clear explanation, we speculate on a few possibilities. One possibility relates to the specific population being sampled. Prior research has found that more rural samples are less psychologistic than more urban ones (Lillard, 2006). The sample in Lillard and Flavell (1990) was recruited from Bing Nursery School at Stanford University and the Youngstrom and Goodman (2001) sample was from nursery schools in Atlanta—both densely populated urban areas—whereas the present study used a community sample far less densely populated mid-Atlantic town. This might account for the approximately seven-month difference in when children show a preference for mentalistic descriptions.

A second possibility concerns testing conditions. In this study, children came into the laboratory with a parent, whereas the two prior previous studies were conducted in preschools. Preschoolers use more mental state language in conversations with friends than with their mothers (Brown, Donelan-McCall, & Dunn, 1996), so perhaps the different experimental settings explains the difference. In other words, in the prior studies, children's environment might have primed them to focus more on mental states at a transitional age when they might not have focused on mental states in another context. In the present study, by Time 2, the tendency to use mental state descriptions might be strong enough such that the environment (coming into the lab with a parent) is overridden by the intrinsic tendency to discuss mental states.

Generational differences between these two samples could also account for the discrepancy. The original study took place over 20 years prior to the present study, conducted in 2011–2012. Although there are a variety of important societal differences across the 20-year time span, two aspects in particular might affect MB preferences.

First, in recent years there has been a greater focus on academics for children at increasingly younger ages (Elkind, 2001; Tullis, 2011). Related changes, both in preschool curricula and in parental mindsets, might influence children's performance on the MB task in that children today might be more focused on giving the right answer to questions in this task. This bias would likely make children more literal, as they might assume that the right answer would be the clearly visible one—the behavioral description—rather than the implied mentalistic description.

Another potentially important generational difference is the increased levels of media use among young children in today's society (Rideout, Vandewater, & Wartella, 2003). If this screen time has replaced face-to-face interaction with parents, siblings, and others, children may have fewer encounters with others' mental states in their daily lives, which could lead to a decrease in children's preference for talking about mental states.

Despite failure to see a mentalistic preference emerging at 3 years, we saw similar differences between the item categories at both time points. Children in both Lillard and Flavell (1990) and the present study preferred behavioral descriptions more for the unsuggested mental state items than for either the emotion or other mental state items. Youngstrom and Goodman (2001) did not use an unsuggested mental states category. Given that the unsuggested mental state items drove the nonreplication, it is notable that the more recent replication did not include this category. Children likely choose behavioral responses more often for the unsuggested mental state category because they partially rely on the visual suggestion of mental states in the other categories (Lillard & Flavell, 1990).

Looking at individual response patterns, children's preference for mentalistic or behavioral descriptions was not stable within this time period (6–8 months). This lack of stability differentiates this measure from measures such as ToM and naturalistic mental state language in which individual differences remain relatively stable across the preschool years (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Hughes & Dunn, 1998; Hughes et al., 2011; Wellman, Lane, LaBounty, & Olson, 2011). Lack of stability in children's performance on this task does not preclude it from being a meaningful construct. The current research found consistent change toward being more mental with age, as well as evidence that perspective-taking skills predicted becoming more mentalistic over time. As discussed further subsequently, the MB task appears to be a revealing measure of a child's tendency to focus on internal states.

Our finding that children increased in their preference for mentalistic descriptions over time is consistent with and extends past research showing that children's naturalistic mental state language increases across the preschool years (Dunn & Brown, 1993; Hughes & Dunn, 1998). Thus, not only do children improve in their ability to understand and use mental state language over the preschool years, they also increase in their desire to use this kind of language, even when the paradigm makes both a mentalistic and a behavioral description equally available.

Although both mentalistic thinking and ToM improved over this time period, the two were not related. Although this finding might seem to contrast with past research showing that mental state language in a naturalistic context relates to ToM (Dunn & Brown, 1993; Ensor & Hughes, 2008; Hughes & Dunn, 1998), it is actually in keeping with other research. In particular, others have shown that mental state language in another noninteractive context, wordless picture book narration, is unrelated to ToM (Lillard & Kavanaugh, 2012; Meins, Fernyhough, Johnson, & Lidstone, 2006). Meins et al. (2006) suggested that such noninteractive measures assess children's tendency to focus on internal states, rather than their ToM, and that this tendency is "part of an individual's social-cognitive style, influenced by motivational and personality factors as much as

by cognitive competence” (p. 194). Similar to the wordless picture book task, the MB Task is noninteractive: Children are describing people in pictures, rather than talking with social partners with whom they are interacting. Perhaps interactive contexts motivate children to draw on their ToM and thus talk about mental states, whereas noninteractive ones simply assess children’s preferences. To clarify this, future research should directly compare interactive and noninteractive contexts’ influence on children’s use of mental state language, and how both relate to ToM.

Despite finding no significant relationship between ToM and children’s preference for using mentalistic descriptions, we did find that children’s score on the Visual Perspective-Taking Tasks at Time 1 predicted becoming more mentalistic from Time 1 to Time 2. This finding suggests that, although ToM and perspective taking are related, visual perspective taking might be distinct in its ability to predict children’s preference for mentalistic descriptions—an unanticipated result. Careful examination of patterns revealed that children tended to pass the Level 2 visual perspective-taking task earlier than the highest levels of the ToM Scale. If this Level 2 perspective-taking ability comes in before the more advanced ToM abilities, it may serve as an early indicator of a child’s tendency to discuss mental states. If this conjecture is correct, it could explain why we see a relationship between the Visual Perspective-Taking Tasks and the MB Task, but not between ToM and the MB Task.

Parental mind-mindedness did not predict ToM or perspective taking either concurrently or over time, when controlling for age. That these constructs are not related concurrently is in line with some past research (Meins et al., 2003), but other studies have found that mind-mindedness at 3 years predicts later ToM (Meins & Fernyhough, 1999; Meins et al., 1998). These predictive findings, however, have all been over longer periods of time (at least a year vs. 6–8 months in the present research). Perhaps effects of parental mind-mindedness emerge slowly and this time period is too short to capture significant differences.

Limitations and Future Directions

This investigation was exploratory in nature and future research is needed to more pointedly examine these issues. Our nonreplication of past research on 3-year-olds’ preference for mentalistic explanations calls for further investigation focused on providing support for or against potential explanations for the discrepancy, should it hold.

Although we found developmental change in children’s preference for mentalistic descriptions, it is unclear exactly when change is occurring and how this change fits into a larger developmental context. More intensive testing over a larger age range would show individual trajectories from more behavioral to more mentalistic preferences in person description.

The distinction made here between naturalistic and noninteractive measures of mental state language is preliminary in nature and should also be investigated in future research. Measuring both of these constructs in the same study, in addition to ToM, could further our understanding of the value of these constructs and their relationship.

Finally, this study adds to others questioning the reliability of the relationship between parental mind-mindedness and ToM. Further research should attempt to resolve this. One possibility is that exact test times of eliciting parent descriptions and child responses are important to seeing a relationship; another possibility is that the discrepancy derives in part from sampling in places where parents may have different cultural ways of viewing children.

Conclusion

This research revealed a number of characteristics of the MB Task that differentiate it from measures of naturalistic mental state language and provide evidence that it taps a meaningful construct. The MB Task measures preference for mentalistic descriptions in a noninteractive context, making it distinct in important ways from measures of naturalistic mental state language. First, it does not appear to be as stable over time as naturalistic measures. Second, it was not related to ToM as measured by the ToM Scale, but was related to the Visual Perspective-Taking Tasks. Despite these differences from naturalistic mental state talk, MB Task is measuring a meaningful construct, an assertion supported by the consistent change in children's performance with age. We propose that whereas naturalistic language measures children's ability to use their ToM skills in a social context, the MB Task measures how much an individual focuses on mental states when social pressures are not brought to bear.

ACKNOWLEDGMENTS

This research was supported by National Science Foundation Grant #1024293 and a grant from the Brady Education Foundation awarded to Angeline S. Lillard. Many thanks to Vikram Jaswal, Eric Smith, and Emily Hopkins, as well as to the editor and two anonymous reviewers for their helpful comments, and to Jeffrey Spies and Matthew Lerner for statistical advice. Special thanks to Rekesha Greenwood for assistance in conducting this study and Brianna Stith for assistance in recruitment and coding.

NOTES

1. Meins et al. used maternal measures; here we accepted reports of either parent, thus we use the term *parental*. Recent research has found that mother and father mind-mindedness reports are significantly correlated; they also found no differences overall in mothers' and fathers' degree of mind-mindedness (Lundy, 2013). Most parents in the current study, however, were mothers.
2. Scores were correlated with ToM scores ($r = .41, p = .001$) and these data are not discussed here.
3. Logistic regression was used because the outcome on a particular item is a binary variable, either behavioral or mentalistic (see Agresti, 2002).

AUTHOR NOTES

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REFERENCES

- Agresti, A. (2002). *Categorical data analysis*. Hoboken, NJ: Wiley.
- Anderson, D. R. (2008). *Model-based inference in the life sciences: A primer on evidence*. New York, NY: Springer.
- Bartsch, K., & Wellman, H. M. (1995). *Children talk about the mind*. New York, NY: Oxford University Press.
- Brown, J. R., Donelan-McCall, N., & Dunn, J. (1996). Why talk about mental states? The significance of children's conversations with friends, siblings, and mothers. *Child Development*, 67, 836–849.
- Brown, J. R., & Dunn, J. (1991). "You can cry, mum": The social and developmental implications of talk about internal states. *British Journal of Developmental Psychology*, 9, 237–256. doi:10.1111/j.2044-835X.1991.tb00874.x
- De Rosnay, M., & Hughes, C. (2006). Conversation and theory of mind: Do children talk their way to socio-cognitive understanding? *British Journal of Developmental Psychology*, 24, 7–37. doi:10.1348/026151005x82901
- Dunn, J., & Brown, J. R. (1993). Early conversations about causality: Content, pragmatics and developmental change. *British Journal of Developmental Psychology*, 11, 107–123. doi:0.1111/j.2044-835X.1993.tb00591.x
- Dunn, J., Brown, J., Slomkowski, C., Tesla, C., & Youngblade, L. (1991). Young children's understanding of other people's feelings and beliefs: Individual differences and their antecedents. *Child Development*, 62, 1352–1366. doi:10.2307/1130811
- Dunn, J., & Hughes, C. (1998). Young children's understanding of emotions within close relationships. *Cognition and Emotion*, 12, 171–191.
- Eder, R. A. (1989). The emergent personologist: The structure and content of 3 1/2-, 5 1/2-, and 7 1/2-year-olds' concepts of themselves and other persons. *Child Development*, 60, 1218–1228.
- Elkind, D. (1986). Formal education and early childhood education: An essential difference. *The Phi Delta Kappan*, 67(9), 631–636.
- Ensor, R., & Hughes, C. (2008). Content or connectedness? Mother-child talk and early social understanding. *Child Development*, 79, 201–216. doi:10.1111/j.1467-8624.2007.01120.x
- Flavell, J. H. (1988). The development of children's knowledge about the mind: From cognitive connections to mental representations. In J. W. Astington, P. L. Harris, & D. R. Olson (Eds.), *Developing theories of mind* (pp. 244–267). Cambridge, England: Cambridge University Press.
- Hauser-Cram, P., & Krauss, M. W. (1991). Measuring change in children and families. *Journal of Early Intervention*, 15, 288–297.
- Hughes, C., & Dunn, J. (1998). Understanding mind and emotion: Longitudinal associations with mental-state talk between young friends. *Developmental Psychology*, 34, 1026–1037. doi:10.1037/0012-1649.34.5.1026
- Hughes, C., Ensor, R., & Marks, A. (2011). Individual differences in false belief understanding are stable from 3 to 6 years of age and predict children's mental state talk with school friends. *Journal of Experimental Child Psychology*, 108, 96–112. doi:10.1016/j.jecp.2010.07.012
- Kristen, S., Sodian, B., & Licata, M. (2012). The development of internal state language during the third year of life: A longitudinal parent report study. *Infant and Child Development*, 21, 634–645. doi:10.1002/icd
- Laranjo, J., Bernier, A., Meins, E., & Carlson, S. M. (2010). Early manifestations of children's theory of mind: The roles of maternal mind-mindedness and infant security of attachment. *Infancy*, 15, 300–323. doi:10.1111/j.1532-7078.2009.00014.x
- Lillard, A. S. (1996). Body or mind: Children's categorizing of pretense. *Child Development*, 67, 1717–1734.
- Lillard, A. S. (2006). The socialization of theory of mind: Cultural and social class differences in behavior explanation. In A. Antonietti, O. Sempio-Liverta, & A. Marchetti (Eds.), *Theory of mind and language in developmental contexts* (pp. 65–76). New York, NY: Springer.
- Lillard, A. S., & Flavell, J. H. (1990). Young children's preference for mental state versus behavioral descriptions of human action. *Child Development*, 61, 731–741. doi:10.1111/j.1467-8624.1990.tb02816.x
- Lillard, A. S., & Kavanaugh, R. D. (2012). *The contribution of symbolic skills to the development of an explicit theory of mind: Scale models, language, and pretend play*. Manuscript submitted for publication.
- Lundy, B. L. (2013). Paternal and maternal mind-mindedness nad preschoolers theory of mind: The mediating role of interactional attunement. *Social Development*, 22, 58–74. doi:10.1111/sode.12009
- Masangkay, Z. S., McCluskey, K. A., McIntyre, C. W., Sims-Knight, J., Vaughn, B. E., & Flavell, J. H. (1974). The early development of inferences about the visual percepts of others. *Child Development*, 45, 357–366. doi:10.1111/1467-8624.ep12154629

- Meins, E., & Fernyhough, C. (1999). Linguistic acquisitional style and mentalising development: the role of maternal mind-mindedness. *Cognitive Development*, 14, 363–380. doi:10.1016/S0885-2014(99)00010-6
- Meins, E., & Fernyhough, C. (2010). *Mind-mindedness coding manual, version 2.0*. Unpublished manuscript. Durham, England, Durham University.
- Meins, E., Fernyhough, C., Johnson, F., & Lidstone, J. (2006). Mind-mindedness in children: Individual differences in internal-state talk in middle childhood. *British Journal of Developmental Psychology*, 24, 181–196. doi:10.1348/026151005X80174
- Meins, E., Fernyhough, C., Russell, J. A., & Clark-Carter, D. (1998). Security of attachment as a predictor of symbolic and mentalising abilities: A longitudinal study. *Social Development*, 7, 1–24. doi:10.1111/1467-9507.00047
- Meins, E., Fernyhough, C., Wainwright, R., Clark-Carter, D., Das Gupta, M., Fradley, E., & Tuckey, M. (2003). Pathways to understanding mind: Construct validity and predictive validity of maternal mind-mindedness. *Child Development*, 74, 1194–1211. doi:10.1111/1467-8624.00601
- Miller, P. H., & Aloise, P. A. (1989). Young Children's Understanding of the Psychological Causes of Behavior: A Review. *Child Development*, 60, 257–285.
- Olineck, K. M., & Poulin-Dubois, D. (2007). Imitation of intentional actions and internal state language in infancy predict preschool theory of mind skills. *European Journal of Developmental Psychology*, 4, 14–30. doi:10.1080/17405620601046931
- Pascual, B., Aguado, G., Sotillo, M., & Masdeu, J. C. (2008). Acquisition of mental state language in Spanish children: A longitudinal study of the relationship between the production of mental verbs and linguistic development. *Developmental Science*, 11, 454–466. doi:10.1111/j.1467-7687.2008.00691.x
- Peevers, B. H., & Secord, P. F. (1973). Developmental changes in attribution of descriptive concepts to persons. *Journal of Personality and Social Psychology*, 27, 120–128.
- Piaget, J. (1929). *The child's conception of the world*. New York, NY: Harcourt Brace Jovanovich.
- Pons, F., Harris, P. L., & de Rosnay, M. (2004). Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization. *European Journal of Developmental Psychology*, 1(2), 127–152. doi:10.1080/17405620344000022
- R Core Team. (2013). *R: A language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing.
- Recchia, H. E., & Howe, N. (2008). Family talk about internal states and children's relative appraisals of self and sibling. *Social Development*, 17, 776–794. doi:10.1111/j.1467-9507.2007.00451.x
- Rideout, V. J., Vandewater, E. A., & Wartella, E. A. (2003). *Zero to six: Electronic media in the lives of infants, toddlers and preschoolers*. Retrieved from <http://www.kff.org/entmedia/3378.cfm>
- Selman, R. L. (1980). *The growth of interpersonal understanding*. New York, NY: Academic Press.
- Shatz, M., Wellman, H. M., & Silber, S. (1983). The acquisition of mental verbs: A systematic investigation of the first reference to mental state. *Cognition*, 14, 301–321.
- Symons, D. K. (2004). Mental state discourse, theory of mind, and the internalization of self–other understanding. *Developmental Review*, 24, 159–188. doi:10.1016/j.dr.2004.03.001
- Tardif, T., & Wellman, H. M. (2000). Acquisition of mental state language in Mandarin- and Cantonese-speaking children. *Developmental Psychology*, 36, 25–43.
- Tullis, P. (2011). Death of preschool?: The trend in early education is to move from a play-based curriculum to a more school-like environment of directed learning. But is earlier better? And better at what? *Scientific American Mind*, 22, 36–41. Retrieved from <http://www.blcclmhurst.org/blcarticledeathofpreschool.pdf>
- Wellman, H. M., Lane, J. D., LaBounty, J., & Olson, S. L. (2011). Observant, nonaggressive temperament predicts theory-of-mind development. *Developmental Science*, 14, 319–326. doi:10.1111/j.1467-7687.2010.00977.x
- Wellman, H. M., & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development*, 75, 523–541. doi:10.1111/j.1467-8624.2004.00691.x
- Youngstrom, E. A., & Goodman, S. (2001). Children's perceptions of other people: Mentalistic versus behavioristic descriptions of peers and adults. *Developmental Science*, 4, 165–174. doi:10.1111/1467-7687.00162