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Mothers' *and* Fathers' Use of Internal State Talk with their Young Children

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Abstract

The present study extends previous results demonstrating a relation between maternal discourse and child social understanding to include paternal discourse. Emotion understanding (EU) and theory of mind (ToM) were considered as two distinctive aspects of social understanding. Participants were 106 children (54 boys and 52 girls) studied at 3.5 and 5 years. Discourse measures came from separate parent–child conversations during a picture-book task; measures of EU and ToM came from children's performance on social cognition tasks. Differences in parental talk translated into important differences in the influence of each parent on children's social-cognitive understanding. Mothers' references to emotion and emotion causal explanatory language predicted children's concurrent EU. Fathers' use of causal explanatory language referring to desires and emotions predicted children's concurrent and later ToM. These results highlight important differences between mothers and fathers in their use of internal state language and its impact on children's social-cognitive understanding.

Keywords: internal state language; parental socialization; emotion understanding; theory of mind

Introduction

The development of social-cognitive ability, the child's understanding of the cognitive and emotional underpinnings of human behavior, is necessary for successful social interactions and for the fostering of meaningful relationships (Hughes & Dunn, 1998). Social cognition encompasses several constructs and accomplishments, but two especially important foci are 'theory of mind' (ToM) and 'emotion understanding' (EU). Both are influenced by parents' conversational interaction with their children.

Briefly, ToM refers to a child's developing understanding of other people's mental states and their capacities to see people as psychological beings with thoughts, desires, and beliefs that may differ from one's own (see Wellman, 2002). Research consistently shows that central aspects of ToM develop during the preschool years. A much used measure of ToM development is the false-belief paradigm where, to be correct, the child must demonstrate knowledge that people act on their beliefs and that those beliefs

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can be based on false information (leading to mistaken actions). Children generally reveal an understanding of false belief between the ages of three and five (Wellman, Cross, & Watson, 2001), with sizable individual differences in the timing of acquisition (Jenkins & Astington, 1996).

EU, sometimes referred to as 'affective perspective taking', includes the understanding of emotional expressions, internal feelings, and the antecedents and consequences of emotions in the self and in others (see Thompson & Lagattuta, 2006). During the preschool years, children make significant gains in their ability to recognize and label basic (e.g., happy, sad, mad, afraid) as well as self-conscious emotion displays (e.g., pride, shame, guilt) and demonstrate emerging knowledge about mixed emotions and emotion display rules, again with evidence for individual differences in development (Denham, Zoller, & Couchoud, 1994; Thompson & Lagattuta, 2006; Tracy, Robins, & Lagattuta, 2005). An often used measure of EU is the Denham puppet task where children are asked to identify emotional expressions and to judge the emotional state felt by protagonists in emotion-eliciting situations (Denham, 1986).

ToM and EU are both necessary for mature social interaction and are sometimes thought of as merely different aspects of a unitary social cognition. Following Dunn, however, we assess and discuss them separately. Dunn and colleagues have shown that EU, measured with the Denham puppet task, appears earlier in childhood and shows greater individual variation at 40 months than ToM, as measured by false belief (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). EU and ToM are also associated with different social outcomes at school (Cutting & Dunn, 1999; Dunn, 1995). Our focus is parental influences on these forms of social cognition, as measured in parents' talk to their children; in prior research, family conversations about the social world has emerged as an especially important influence on children's social cognition.

With regard to ToM, for example, Ruffman, Slade, and Crowe (2002) found that preschool-aged children whose mothers used more mental state talk showed greater improvement in ToM ability than those whose mothers did not. Moreover, Peterson and Slaughter (2003) report that mothers differ greatly from one another in their use of mental state talk and that these differences correlate significantly with their children's false-belief outcomes, even when controlling for the child's verbal ability. Even very early in development, maternal mind-mindedness (a mother's tendency to relate and to talk to their infants as separate psychological entities) at six months predicts later ToM performance at 45 and 48 months (Meins et al., 2002).

Research on the development of EU further underscores the influence of maternal language on children's conceptual development. In this case, Denham et al. (1994) showed that mothers' use of emotion discourse predicts children's advanced identification of facial expressions and emotion-eliciting situations. Mother's use of empathy-related language is also related to children's understanding of the situational antecedents of emotion, even when controlling for the children's own use of emotion state language (Garner, Jones, Gaddy, & Rennie, 1997). Relatedly, Dunn, Brown, and Beardsall (1991) found that increased use of emotion state talk at three years predicted advanced affective perspective taking at six years, again irrespective of the child's verbal ability.

As is clear in this brief review, prior research has focused on mother–child discourse almost exclusively. Surely, fathers also influence their children's understandings. In the present research we examine fathers' contributions as well. In addition, it is important to go beyond the mere mention of emotion and mental state terms by parents (mothers). More elaborate conversations, especially about cause and consequences, may be

especially influential. Suggestively, research by Dunn, Brown, & Beardsall (1991) showed that 33-month-olds with mothers who engaged in more frequent conversations about causality demonstrated a more sophisticated reasoning about false belief and EU at 40 months than children whose mothers talked about causality less often, and that child talk about causality to mothers at 33 months predicted EU at 40 months. Moreover, Peterson and Slaughter (2003) showed that maternal use of mental state explanations is significantly related to their children's performance on false-belief tasks.

In sum, in the present study we include fathers as well as mothers. Our investigation focuses not just on the mere usage of mental or emotion terms, but also on causal explanations involving internal states. We examine parental conversations in the context of storybook reading because this context has been found to promote parent–child conversations about the stories themselves as well as to provide a safe environment where children can talk about internal states while being guided by their more experienced parent (Cervantes & Callanan, 1998; Dyer, Shatz, & Wellman, 2000; Ontai & Thompson, 2002; Ruffman et al., 2002).

Including fathers as well as mothers raises concern about gender effects in parents' use of internal state language—not just regarding gender of parent but also regarding gender of the child. Previous studies have shown that mothers tend to talk more to daughters than to sons, and the language they use with daughters tends to be more supportive (Leaper, Anderson, & Sanders, 1998). As well, mothers have been found to converse more frequently about emotions, including the causes and consequences of feeling states, with daughters vs. sons (Dunn, Bretherton, & Munn, 1987; Garner et al., 1997); however, this gender difference has not been consistently found (see Jenkins, Turrell, Kogushi, Lollis, & Ross, 2003). Most applicable to the current study, Jenkins et al. found that mothers speak more frequently to their children about mental states than fathers do. In their research, however, mothers and fathers were not tested separately. Therefore, paternal data reflected how fathers talk to children in the presence of mothers. In the current study we examine father–child and mother–child conversations on separate occasions. In doing so, the current research is the first to separately analyze fathers' use of emotion and mental state language with their children in order to discover unique and common influences of fathers' and mothers' conversational input on sociocognitive development in early childhood, both with respect to EU and ToM.

Methods

Participants

Participants were part of an ongoing longitudinal study known as the Michigan longitudinal study (MLS). The primary focus of the MLS is the development of externalizing behaviors, and therefore it oversamples children in the medium-high to high range of externalizing problems, as assessed by the Achenbach child behavior checklist. Children with pervasive developmental disorders, chronic health problems, or mental retardation were not included in this study. For the current study, only data from children whose mothers and fathers both participated are included. This included 106 children aged approximately 3.5 years at Wave 1 and approximately 5.5 years at Wave 2. Data for Wave 1 were collected between May 1999 and November 2002. Data for Wave 2 were collected between October 2001 and July 2004. At Wave 1, there were 54 girls and 52 boys ranging in age from 34 to 45 months old ($M = 40.99$, $SD = 1.85$

months). At Wave 2, these same 54 girls and 52 boys ranged in age from 60.43 to 80.50 months old ($M = 68.87$, $SD = 3.84$ months). Ninety-three percent of the children were White, 1.9 percent were African-American, 1 percent were Hispanic American, and 1 percent were Asian American. Most of the children (96 percent) lived in married, two-parent households, 2.8 percent lived in unmarried, two-parent households, and 1 percent lived in single-parent households. About half (47 percent) of the mothers worked outside of the home. Most of the parents (83 percent of mothers and 77 percent of fathers) had attended college or graduate/professional training. The median annual family income of the participants was $75 000 (range: $20 000–$100 000).

Procedure

Central analyses focus on data collected during Wave 1 of the MLS, when children were three years of age. Assessments were conducted in the home as well as in the laboratory.

In the home, parents completed questionnaires and undertook several other assessments including a picture-book reading task with their child. The home visit at Wave 1 consisted of a parent interview with a social worker, a play/teaching/compliance task, and the story/discussion task that is a focus of the current report, conducted with the mother and the child together and then again with the father and the child together.

The laboratory assessment began with 20–30 minutes of rapport building followed by a three-to-four-hour session that included a battery of intellectual, social, and cognitive assessments. These tasks included the Kochanska (1991) effortful control and moral reasoning battery, assessments of general cognitive ability such as the Wechsler preschool and primary intelligence scale-revised (WPSSI-R). The social-cognitive reasoning batteries, central to our analyses, included the Denham emotional understanding tasks (Denham, 1986) and eight belief–desire reasoning tasks that comprise the Bartsch and Wellman (1989) false-belief reasoning set that we discuss in detail below.

Picture-book Task. Parental conversation to the child was measured during the context of talking about a wordless picture-book task, a paradigm commonly used in research to elicit conversation between parents and young children (Ruffman et al., 2002; Sabbagh & Callanan, 1998). This picture-book interaction was videotaped on two separate occasions, with mother–child interactions and father–child interactions occurring on separate days, on average about 30 days apart. Whether father–child or mother–child interactions were assessed first was counterbalanced between families; however, the order in which the stories were presented was always the same.

The picture book depicted parents and children in six emotion-eliciting situations selected to represent a diverse range of emotions and precipitating events. The gender, age, and race of the characters were matched to the family being studied. The six pictures included: ‘a child figure is sitting in a living room, looking out the window, a parent walks out the door with an angry expression’, ‘a child figure is sitting in the kitchen while his/her parent is on the phone crying’, ‘a peer pushes a child figure off his/her tricycle’, ‘a child is at his/her birthday party surrounded by presents and friends’, ‘a child with an apprehensive expression is shown sitting next to a broken vase as his/her parent walks through the door’, and ‘a child is shown sitting alone in a playroom crying, with peers in the distance’. The experimenter gave the book to the parent and asked the parent to discuss each picture with their child using questions

such as: 'How is the child in the pictures feeling? Why? How are others in the picture feeling? Why? What is going to happen next?'

Clearly, these materials present a preponderance of negative stories rather than positive situations. Lagattuta and Wellman (2002) examined parent–child conversations about emotions and found that it was conversations about negative emotions that more frequently included causal discourse and references to the connections between emotions, desires, and thoughts. Thus, these materials were likely to be conducive to our aim of sampling relevant, influential mental state communication between parents and children.

Social-cognitive Tasks. The Denham task is widely used by researchers to measure preschool-aged children's ability to both label emotional expressions and correctly infer a protagonist's emotional reaction to a given situation (e.g., Denham, 1986; Dunn, Brown, Slomkowski et al., 1991). The task has three parts: an emotion labeling component, a stereotypical (matching) affective-perspective taking component, and a non-stereotypical (non-matching) affective perspective taking component. The labeling portion of the task requires the subject to identify and label each of four velcro-detachable faces with line drawings of facial expressions depicting the emotions of happy, sad, mad (angry), and scared. The stereotypical (matching) half of the affective perspective taking measure involves the experimenter acting out a situation with a puppet, where the puppet's emotional response to the situation matches that of children in general (e.g., acting frightened after a scary dream). The non-stereotypical (non-matching) half of the task involves the experimenter acting out a situation where the puppet's emotional response is opposite to the child participant's typical response (as reported by each child's parent). For instance, a story about going to the pool to swim is acted out by the experimenter as either frightening (where the puppet is worried they will get water on their face) or joyfully exciting (the puppet is happy to go swim in the cool water).

The Bartsch and Wellman (1989) belief–desire reasoning tasks are frequently used as a measure of young children's ToM understanding in large-scale studies (Dunn, Brown, Slomkowski et al., 1991; Dunn & Brown, 1994). This task measures children's developing understanding that people's actions are often based on their thoughts and desires. To pass these tasks, children must appreciate that beliefs are not always true and that people will sometimes act on these false beliefs. Half of the tasks ask children to predict and half ask children to explain behavior based on their understanding of story characters' beliefs and desires.

In the false-belief prediction tasks, the experimenter asks the subject to predict where a story character will look for a desired object based on what that character knows about that object's location (which, in this case, is mistaken or a false belief about the object's location). For example, the experimenter shows the child a crayon box and a plain box, and then proceeds to take the crayons out of the crayon box and put them in the plain box. The experimenter then explains to the child that the story character did not see them play this trick, and the child is then asked to predict where the story character will look for the crayons. Correct answers predict that the character will look for the crayons where he or she mistakenly believes them to be, and not where the crayons are really located.

The false-belief explanation tasks follow the same format; for example, raisins are moved from a raisin box to a plain box. The explanation tasks differ in that the experimenter then shows the story character looking for the desired object in the

Table 1. Assessments Conducted at Wave 1 and Assessments Conducted at Wave 2

Wave 1	Wave 2
Wellman belief–desire reasoning	Wellman belief–desire reasoning
Denham EU	Appearance–reality EU
Kochanska effortful control battery	
Kochanska moral reasoning battery	
WPPSI-R	
Parent–child picture-book task	

EU = emotion understanding.

original location (raisin box), and the child is asked to explain why the story character did that. Correct responses refer to the story character's false belief about the situation, such as 'he thinks the raisins are in the raisin box', or to ignorance of the situation, such as 'he doesn't know where the raisins are'.

Although the primary focus of our report concerns Wave 1, the nature of the MLS provided the opportunity for a limited examination of longitudinal relations. Table 1 presents a list of the assessments collected at each wave. Although parental conversational data was only collected at Wave 1, Wave 2 included a ToM assessment (the identical Bartsch and Wellman tasks that were administered at Wave 1) and an EU task (adopted from Harris, Donnelly, & Guz, 1986). The Wave 2 EU score was derived from children's participation in two appearance–reality EU tasks. Firstly, children were asked to label line drawings of faces depicting the emotions of happy, sad, and OK. Then the children were read a story about a child experiencing a positive or negative emotion that they had to hide from the other story protagonists (e.g., a boy wants a toy car but gets a book for a present from his aunt instead). The child is then asked to describe how the boy in the story really feels inside and how the boy is trying to look on his face. In the first story, the protagonist is trying to hide a negative emotion; in the second story, the character is trying to hide a positive emotion.

Coding and Scoring

Picture-book Task. The picture-book interactions were videotaped and the conversations transcribed according to the CHAT (codes for the human analysis of transcripts) format used within the child language data exchange system language database (MacWhinney, 1991). Each line of the transcripts consisted of a new conversational turn. The mother–child and the father–child conversations were transcribed separately for each child.

The transcripts were examined using the CLAN (computerized language analysis) program (MacWhinney, 1991). The CLAN program was used to calculate total conversation turns for each speaker (mothers and fathers), as defined by one speaker's utterance bounded by the utterance of another speaker (see also Dunn, Brown, Slomkowski et al., 1991). We also calculated the frequency of all emotion state words, the frequency of all belief/thought words, and the frequency of desire words. The words

included in this analysis were used in previous studies of parents' use of internal state language (see Bartsch & Wellman, 1995; Brown & Dunn, 1991, 1996; Dunn et al., 1987; Dyer et al., 2000; Jenkins et al., 2003; Lagattuta & Wellman, 2002; Shatz & Gelman, 1973). Every derivation of each word was searched for in the transcripts; for example, the word 'surprise' was searched for as 'surprise', 'surprised', and 'surprising'.

To examine causal explanatory language referring to emotion, desire, thought, and physical events, we searched for instances where each parent used explicit causal terms 'because', 'how', and 'why'. By looking at these utterances as well as their larger context (especially the lines of conversation before and after the target utterance), each causal statement was coded as either an emotion, belief/thought, desire, or physical explanation. For instance, utterances such as '*how* did she *feel* when the lamp broke' were coded as emotion causal language; '*because* she *thinks* he did it on purpose' were coded as belief/thought causal language; 'she pushed her off the bike *because* she *wants* to ride the bike' were coded as desire causal language; 'the girl has an owie *because* he *pushed* her off her bike' were coded as physical causal language. In instances where an utterance included more than one causal explanatory reference, each reference was coded as a separate statement.

Reliability coding of a random sampling of 20 percent of mothers causal explanatory statements and 20 percent of fathers causal explanatory statements produced a kappa measurement of agreement between coders of .74, which is very good (.75 and above is excellent).

Summary variables were calculated by summing uses of sets of words. 'All emotion' was the sum of emotion words used by each parent. 'Most frequently used emotion words' was the sum of the most frequently mentioned words used by each parent. (Empirically, it turned out that 11 emotion words were used frequently by many of the parents in this study whereas other emotion words were used by many fewer parents. Thus, 'most frequently used emotion words' was the sum of each parents' use of these 11 terms.) 'Basic emotion' was the sum of the basic emotion words used by each parent (happy, sad, mad, and scared; see Ekman, Sorenson, & Friesen, 1969). 'Negative emotion words' was the sum of negative emotion words (e.g., afraid, angry, upset, mad) used by each parent. Similarly, 'belief/thought words' was the sum of cognitive mental state terms (e.g., believe, think, know) used by each parent, and 'desire words' was the sum of volitional terms (e.g., want, wish, hope) words used by each parent. See the Appendix for complete lists of the internal state words used in each of the summary variables.

Aggregate variables for each of the above categories were then calculated by dividing the summary scores by the total conversation turns taken by each parent. This was done so that direct comparisons of mothers' and fathers' use of internal state terms and causal language could be made without being confounded by the total amount of language used.

False-belief Tasks. Subjects received a score of 2 for any false-belief explanation item on the Bartsch and Wellman belief–desire task if they correctly answered the control question (i.e., 'where are the crayons really?') and spontaneously provided a mental state explanation (false-belief or ignorance explanation) for the story characters' search behavior (e.g., 'because he *thinks* there are crayons in there'). They received a score of 1 for any false-belief explanation item if they correctly answered the control question and only provided a mental state explanation for the story characters'

behavior in response to the prompt, 'what does he/she think?' Subjects received a score of 2 on any false-belief prediction item if they correctly answered the control question and correctly predicted where the story character would search for the item (based on that character's false belief). All other responses for the false-belief prediction items received a score of 0. An aggregate ToM score for Wave 1 was then calculated for each child by summing their total score on the ToM tasks (which included each subject's correct responses to the prediction and explanatory belief–desire tasks) divided by 16 (the total possible correct score). This scoring system was implemented again at Wave 2. As Wave 2 only included three false-belief prediction and three false-belief explanation stories, however, the Wave 2 aggregate ToM score was calculated by summing each subject's total belief–desire score divided by 12 (the total possible correct score).

Emotion-understanding Task. An aggregate Wave 1 EU score was calculated for each child by summing their total score on the Denham EU task (including the affect labeling score, the stereotypical affective perspective taking score and the non-stereotypical affective perspective taking score) divided by 36 (the total possible EU score). An aggregate Wave 2 EU score was calculated based on the subjects' total score from the emotion labeling portion of the task, and their total scores from the appearance–reality negative and appearance–reality positive stories divided by a total possible score of 18.

IQ Score. An IQ score was calculated by summing each child's WPPSI-R (Wechsler preschool and primary scale of intelligence, revised) block and vocabulary scaled scores.

Results

We begin with preliminary analyses on the influence of child gender on social-cognitive measures as well as the influence of parent and child gender on total talk. Then, we present initial findings on the influence of parent and child gender on parental talk about different kinds of internal states. After that, we present our focal analyses on the influence of fathers' and mothers' internal state talk on children's concurrent performance on ToM and EU tasks (Wave 1 data). Finally, we examine whether parental internal state talk at Wave 1 is predictive of Wave 2 social-cognitive understanding.

Preliminary Analyses

Preliminary analyses examined the influence of gender on children's performance on the social-cognitive tasks. Two separate one-way analyses of variance (ANOVAs) comparing girls' and boys' aggregate scores on the Wave 1 data showed no significant differences between the boys and girls on their ToM scores, $F\ (1, 99) = 2.05$, $p > .10$, or their EU scores, $F\ (1, 104) = 1.77$, $p > .10$. Additionally, two separate one-way ANOVAs analyzing girls' and boys' aggregate scores for Wave 2 data also revealed no gender differences for ToM scores, $F\ (1, 78) = 2.081$, $p > .10$, or for EU scores, $F\ (1, 77) = 2.46$, $p > .10$.

Next, we considered whether there were parental gender differences in sheer amount of conversation by conducting a one-way ANOVA comparing the total words uttered by mothers ($M = 728.07$) with the total words uttered by fathers ($M = 660.52$). Gender of parent was not significant, $F\ (1, 104) = .48$, NS, $p > .10$. Moreover, an additional

one-way ANOVA showed that there was no significant difference between mothers ($M = 79.65$) and fathers ($M = 83.14$) in the total number of conversational turns taken.

Mothers and fathers also talked equivalently to sons vs. daughters. Two separate ANOVAs for total words and total conversation turns showed no significant effects for mothers' or fathers' total language to sons vs. daughters. Moms did not use more words, $F(1, 104) = .01$, NS, $p > .10$, or take more conversation turns, $F(1, 104) = .66$, $p > .10$, with either girls or boys. Dads did not use more words, $F(1, 104) = 2.92$, $p > .05$, or take more conversation turns, $F(1, 104) = 3.36$, $p > .05$, with daughters vs. sons.

These preliminary findings lay the foundation for our focal analyses on the connection between mothers' and fathers' internal state talk and children's social-cognitive knowledge. Most centrally, they indicate that differences in how mothers vs. fathers talk to their children about internal states do not simply reflect differences in total amount of talk. Nonetheless, because of individual variability in parent talk, the following analyses of parent influence on children's social-cognitive understanding were conducted using aggregate scores of various social-cognitive conversation measures divided by each adult's total conversation turns.

Influence of Parent and Child Gender on Internal State Language

Table 2 presents data from a series of one-way ANOVAs on the aggregate parental variables to determine whether mothers or fathers used more internal state language with their daughters vs. their sons when talking about a wordless storybook featuring emotion-eliciting situations. As shown in Table 2, mothers used more thought and desire language with girls than with boys (ps $< .05$), but not more emotion state language. Fathers did not speak differently with sons vs. daughters about thought, desire, or emotion states.

Table 2. Mean Number of Internal State Terms used by Mothers and Fathers by Child Gender

	Boys		Girls		
Internal state terms	*M*	*SD*	*M*	*SD*	*F*(1, 104)
Mom thought	25.31	20.13	29.31	18.99	5.20*
Mom desire	3.25	3.40	3.98	3.77	5.37*
Mom total emotion	34.63	18.62	35.74	17.11	2.55
Mom basic emotion	19.83	11.05	18.22	8.53	.19
Mom frequent emotion	32.87	17.95	33.94	16.70	2.31
Mom negative emotion	19.02	10.42	17.35	8.90	.06
Dad thought	24.54	19.40	23.54	18.05	.19
Dad desire	3.87	3.75	3.20	3.85	.27
Dad total emotion	30.25	20.29	27.11	13.20	.63
Dad basic emotion	18.56	13.06	16.24	10.00	.04
Dad frequent emotion	28.77	20.14	25.59	12.88	.54
Dad negative emotion	15.19	8.32	14.06	6.85	.34

* $p < .05$.

Next, we examined whether parents differed from each other in the amount of internal state language they directed toward their child during the picture-book task. As shown in Table 2, mothers talked significantly more about internal states than fathers. Specifically, mothers used thought words ($M = 27.35$) more frequently than fathers ($M = 24.03$), $F\ (1, 105) = 6.57$, $p < .05$. Mothers ($M = 35.20$) also used emotion words significantly more frequently than fathers ($M = 28.65$), $F\ (1, 105) = 26.34$, $p < .001$. Indeed, mothers used total emotion words, basic emotion words, the most frequent emotion words, and negative emotion words more frequently than fathers (all *ps* < .01). Moreover, mothers' use of internal state language was not correlated with fathers' use across the sample (all correlations were below $r = .23$, $p > .05$).

Beyond mere mention of internal states, what about explanatory language using internal states? Overall, mothers used more explanatory language referring to emotion ($M = 8.81$) than fathers ($M = 6.83$), $F\ (1,104) = 12.22$, $p < .01$. Mothers and fathers did not differ significantly in their use of explanatory language referring to desire. Fathers used more explanatory language referring to thought ($M = 1.25$) than mothers ($M = .88$), $F\ (1, 104) = 6.49$, $p < .05$; however, such explanations occurred relatively infrequently.

Parental Internal State Language and Children's Theory of Mind Scores

As described in the introduction, a key question involves whether differences in mothers' and fathers' use of internal state language are predictive of children's scores on the laboratory tests of social cognition. We focus initially and primarily on Wave 1 data. Because children's EU and ToM scores did not significantly correlate, we analyzed relations between parental internal state language separately for ToM and for EU.

Firstly, consider 'ToM' understanding (as measured by scores on the Bartsch and Wellman belief–desire reasoning task). Table 3 shows a series of correlation analyses conducted to determine if each parent's use of internal state language during the wordless picture-book task is related to children's concurrent aggregate social-cognitive scores. As shown there, neither mothers' nor fathers' talk about thoughts or desires related to children's current understanding of beliefs. However, fathers' use of negative emotion words significantly correlated with ToM scores ($p < .01$).

Importantly, however, because an initial regression analysis showed that children's IQ scores were predictive of ToM scores ($R^2 = .12$, $\beta = .35$, $r = .35$, $F = 12.81$, $p < .001$), analyses of the influence of parent language on children's ToM scores were also tested controlling for the effects of children's IQ. Additionally, we want to know whether each parent's language use makes a significant contribution to their children's social-cognitive understanding over and above the language used by their partner. In order to answer these questions, regression analyses examined whether parent language was still a significant predictor of ToM even when controlling for IQ and the other partner's language use.

When IQ and mothers' negative emotion language were entered into the regression analysis together before fathers' language, fathers' use of negative emotion language was still predictive of ToM ($R^2 = .19$, $\beta = .26$, $r = .43$, $F = 7.06$, $p < .01$). Moreover, fathers' use of negative emotion language accounted for significant variance beyond all the control variables entered in the first step ($\Delta R^2 = .07$, $\Delta F = 7.95$, $p < .01$).

The influence of fathers' (rather than mothers') talk on children's ToM understanding is further confirmed in analyses of parents' explanatory language. Table 3 shows a

Table 3. Correlations between Child Theory of Mind (ToM) and Emotion Understanding (EU) Scores and Parent Internal State Language and Causal Explanations

	ToM	EU
Parent internal state language		
Mom thought	.05	.06
Mom desire	−.14	−.04
Mom total emotion	.01	.24*
Mom basic emotion	.05	.21*
Mom frequent emotion	.03	.26**
Mom negative emotion	.03	.30**
Dad thought	.14	.15
Dad desire	−.01	−.01
Dad total emotion	.13	.00
Dad basic emotion	.18	.15
Dad frequent emotion	.14	.04
Dad negative emotion	.29**	.00
Parent causal explanations		
Mom thought causal explanation	.03	.09
Mom desire causal explanation	−.08	−.03
Mom emotion causal explanation	−.03	.29**
Dad thought causal explanation	.11	.14
Dad desire causal explanation	.22**	.13
Dad emotion causal explanation	.20*	.13

Notes: Values are shown for Wave 1 correlations; Wave 1 internal state language correlated with Wave 1 social-cognitive scores.
* $p < .05$, ** $p < .01$.

series of correlational analyses examining whether each parents' causal explanatory language made a contribution to the children's ToM scores. As shown in Table 3, fathers' explanations referring to desire and fathers' explanations referring to emotion were positively related to children's ToM scores. In contrast, none of the mothers' explanatory language was correlated with ToM scores.

Additional regression analyses showed that fathers' use of desire causal explanatory language moderately predicted children's concurrent ToM understanding even when controlling for the influence of children's IQ and the desire causal language used by the mother ($R^2 = .16$, $\beta = .19$, $r = .41$, $F = 6.03$, $p < .06$). Moreover, fathers' use of causal explanatory language referring to desires accounted for a moderately significant amount of variance beyond all of the control factors entered in the first step ($\Delta R^2 = .03$, $\Delta F = 3.77$, $p < .06$). Fathers' emotion explanatory language, however, was no longer predictive of ToM scores after controlling for IQ and mothers' use of emotion explanatory language.

Parental Internal State Language and Children's Emotion Understanding Scores

Table 3 also shows results from correlational analyses investigating whether children's performance on Denham's EU task was associated with mothers' and fathers' internal state language during storybook reading. Here, maternal language consistently emerged as significant. Indeed, as shown in Table 3, mothers' use of total emotion words, basic emotion words, frequently used emotion words, and negative emotion words were correlated with children's scores on the EU laboratory tasks. In contrast, no type of paternal internal state language emerged as significant.

Again, an initial regression analysis showed that children's IQ scores were predictive of their EU scores ($R^2 = .25$, $\beta = .50$, $r = .50$, $F = 30.92$, $p < .001$). As well, it was important to consider whether mothers' language use makes a significant contribution to their children's EU while controlling for the fathers' language use. When IQ and partner's language were entered together into the regression analysis before mothers' language, mothers' use of all emotion language ($R^2 = .30$, $\beta = .20$, $r = .54$, $F = 12.85$, $p < .05$), most frequent emotion language ($R^2 = .30$, $\beta = .21$, $r = .54$, $F = 12.85$, $p < .05$), and negative emotion language ($R^2 = .31$, $\beta = .26$, $r = .56$, $F = 13.88$, $p < .01$) all remained significant predictors of children's EU. Moreover, in each case, mothers' language accounted for significant variance beyond the variance accounted for by the control variables (for all emotion language: $\Delta R^2 = .04$, $\Delta F = 4.79$, $p < .05$; for most frequent emotion language: $\Delta R^2 = .04$, $\Delta F = 5.40$, $p < .05$; for negative emotion language: $\Delta R^2 = .06$, $\Delta F = 8.41$, $p < .01$). Only mothers' use of basic emotion language was no longer predictive of EU scores after controlling for father basic emotion language and child IQ.

Analyses of parental use of causal explanatory language further confirm the connection between maternal emotion conversation on children's concurrent EU. Table 3 shows correlational analyses relating parental causal explanatory language to child EU. Only mothers' explanatory language referring to emotion correlated with children's EU scores. Mothers' use of emotion causal explanatory language also predicts EU over and above the influence of children's IQ and the emotion causal language used by the father ($R^2 = .28$, $\beta = .19$, $r = .53$, $F = 12.07$, $p < .05$) and accounts for a significant amount of variance beyond the influence of the control items ($\Delta R^2 = .03$, $\Delta F = 4.29$, $p < .05$).

Longitudinal Analyses

Having thus established the importance of parent language for concurrent child internal state understanding, we were also able to investigate the influence of parent language over time, in a limited fashion. We did so by analyzing the influence of parent internal state language (at Wave 1) on children's ToM and EU using the Wave 2 assessments of those understandings.

A series of regression analyses were conducted to determine if the children's Wave 2 aggregate ToM (assessed by the Bartsch and Wellman Belief–Desire reasoning task) scores were predicted by each parents' Wave 1 use of internal state language. One predictor was significant: fathers' causal desire explanations ($R^2 = .06$, $\beta = .25$, $r = .25$, $F = 5.07$, $p < .05$). Although Wave 1 IQ did not predict Wave 2 ToM scores ($R^2 = .00$, $\beta = -.04$, $r = -.04$, $F = .11$, $p = .75$), the influence of Wave 1 parent causal language on children's Wave 2 ToM scores were also tested controlling for the effects of children's Wave 1 IQ, as well as children's Wave 1 ToM score, and the other partner's language

use. When IQ, Wave 1 ToM score, and mothers' causal explanatory language referring to desire were entered together into the regression analysis before fathers' language, fathers' use of causal explanatory language referring to desire was still predictive of children's Wave 2 ToM scores ($R^2 = .09$, $\beta = .23$, $r = .30$, $F = 1.76$, $p < .05$). Moreover, fathers' use of desire causal explanatory language accounted for a significant amount of variance in children's ToM scores beyond the influence of the control variables ($\Delta R^2 = .05$, $\Delta F = 3.97$, $p < .05$).

What about EU at Wave 2? Scores on the Wave 2 appearance–reality emotion task were compared with parent Wave 1 language measures. Fathers' use of causal explanatory language referring to thoughts ($R^2 = .06$, $\beta = .24$, $r = .24$, $F = 4.63$, $p < .05$) and fathers' causal explanatory language referring to emotion ($R^2 = .11$, $\beta = .33$, $r = .33$, $F = 9.16$, $p < .01$) both significantly predicted children's Wave 2 EU laboratory scores. However, after controlling for IQ as well as Wave 1 EU score and mothers' use of emotion and thought causal language, neither variable continued to predict children's Wave 2 EU, although thought causal language approached significance (fathers' explanatory language referring to thoughts: $R^2 = .23$, $\beta = .19$, $r = .48$, $F = 4.93$, $p < .10$) accounting for a small amount of the variance in children's EU scores ($\Delta R^2 = .03$, $\Delta F = 2.92$, $p < .10$).

Discussion

The present study confirms and extends several previous findings relating to parents' use of internal state language and its relationship to children's understanding of mind and emotion. Most centrally, our data suggest that mothers and fathers differ in their use of internal state language and that those differences have important implications for children's social understanding.

The current data provide evidence that mothers and fathers talk equivalently to their daughters and to their sons about internal mental states, at least when talking about pictures featuring emotion-arousing situations. This is in contrast to previous reports that mothers and fathers direct more speech in general to daughters than sons (Leaper et al., 1998) and that parents direct more emotion-based speech to daughters than sons, consistent with a theory of gender socialization where girls are more heavily socialized toward emotion-related themes (Dunn et al., 1987; Garner et al., 1997). For our purposes, however, it is useful that parents directed equivalent amounts of internal state talk to sons and to daughters in these situations because it means that our finding as to differences in talk about emotion vs. mind are not accounted for by mere total amounts of internal state talk.

Although mothers and fathers talked to girls and boys equivalently, they differed from one another in terms of the types of internal state conversations they emphasized and in terms of their influence on children's understandings. Mothers in our study made more frequent references to emotions and used more causal explanatory language referring to emotions than fathers. The finding that mothers tend to use more emotion-based language than fathers is consistent with previous research using both laboratory tasks and everyday conversations (Kornhaber & Marcos, 2000; Kuebli, Butler, & Fivush, 1995; Leaper et al., 1998).

These differences in parental use of emotion state language had important implications for children's internal state understanding. That is, a robust and consistent finding of the study was that mothers appear to be particularly influential socializing agents in the domain of EU whereas fathers may be important for ToM development.

Specifically, mothers' (but not fathers') total use of emotion terms and their emotion causal explanatory language predicted children's concurrent scores on the Denham EU measure. This evidence adds further support to the notion that mothers are the primary socializing agent when it comes to issues involving emotions during early childhood (Denham et al., 1994; Dunn, Brown, & Beardsall, 1991; Dunn, Brown, Slomkowski, et al., 1991). One important caveat, however, is that mothers who frequently engage in emotion explanations also tend to use more emotion terms in their everyday conversations as well and vice versa (Dunn, Brown, & Beardsall, et al., 1991). It is therefore difficult to determine whether either emotion explanations, the mere mention of emotion terms, or both emotion terms and explanations combined are necessary or sufficient to help children develop their early affective perspective talking skills. Moreover, it is unclear from these correlational data whether children's own interest in and ability to talk about emotions may likewise influence maternal emotion talk.

Intriguingly, fathers appear to be important socializing agents in children's developing understanding of mental states. Specifically, fathers' use of negative emotion state terms and fathers' explanatory references to desires and emotion significantly predicted children's Wave 1 ToM scores. The fact that talk about negative emotions might be especially influential is consistent with Lagattuta and Wellman's (2002) finding that parent–child discussions of negative emotions often refer to and explain the connections between emotions and other mental states (such as beliefs and thoughts). Given that our pictorial stimuli predominately depicted negative emotions (five out of six pictured situations), it was not feasible for us to informatively compare the nature of explanations for positive vs. negative internal states in these data. However, the overall amount of fathers' explanatory references to desires and emotions, coupled with their overall talk about negative emotions, clearly impacted children's understandings of the mind.

One interesting question here concerns why it might be explanatory references to desires and emotions rather than explanatory references to thoughts that seem to influence children's understanding of actions based on false belief. Bartsch and Wellman (1995) suggest that language referring to desire and emotion leads young children to attend to a variety of mental states and that this growing awareness of their own and others' minds is the impetus for later belief understanding, including knowledge about false belief. The mental states of desire and emotion are more easily grasped by young children because they often refer to concrete, real-world objects and situations, not to someone's representation of the world. Therefore, fathers' explicit reference to and explanations of these real world-oriented mental states may allow children to think about the world in terms of things that they can see to begin with, and then arguably they are led to think more about abstract mental themes such as thoughts and beliefs.

Our longitudinal data, although limited, further confirm the important role for earlier conversations about internal states in shaping young children's understanding of the mind. Again, it was language that referred to desires and emotions that was particularly influential on ToM development. Fathers' increased use of causal explanatory language referring to desire predicted concurrent ToM scores *and* fathers' use of causal explanatory language referring to desire at the age of three predicted children's ToM scores at the age of five. These findings are intriguing again with respect to Bartsch and Wellman's (1995) claim that children's early desire and EU evolves into a more sophisticated understanding of thoughts and beliefs over time. Fathers may be especially influential in facilitating this later understanding through their use of desire and emotion language earlier on in children's lives.

Fathers' references to the causes of emotions and causes of thoughts at Wave 1 also significantly predicted children's Wave 2 'EU', although this relationship disappeared when IQ and maternal language were controlled for. Moreover, we put EU in quotes because at follow-up, children's understanding of emotion was assessed by a single task. The appearance–reality emotion task used at the age of five assesses an understanding that sometimes emotional displays can be deceptive. In this way, the task requires both an understanding of several mental states, including the thoughts, as well as the emotions of the stories' protagonists. Perhaps children's understanding of emotions is inter-mixed with their understanding of thoughts in this task. Thus, earlier conversations about both thoughts and emotions influenced performance on this task.

Note that especially in these longitudinal analyses, fathers were revealed to play a consistently influential role in their children's mental state understandings. To our knowledge, this is the first comparative study of mothers' and fathers' separate conversations. Our data thus add substantially to prior findings and point to the need for the inclusion of fathers as well as mothers in further research examining the socialization of social understanding.

We refer to our longitudinal data as limited primarily because we lack information regarding parent internal state conversations at Wave 2. If these data were available it would allow a more comprehensive, cross-lagged analysis and it would enable us to examine the possibility of two-way influences in the relationship between parent conversations about internal states and children's understanding of those inner states over time. Although our data do allow us to conclude that parent talk is important to children's social-cognitive understandings both concurrently and longitudinally, we do not claim that this relationship is unidirectional. In fact, it is likely that this relationship is bidirectional, with children's current level of social-cognitive conceptualization requiring parents' to portray the psychological world in different ways both concurrently and in the future, just as this portrayal affects children's understanding. Future studies would benefit from the use of a fully longitudinal design that allows for such an analysis of direction of influence.

A related limitation is the fact that we analyze only parent contributions to parent–child conversations about internal psychological states. This is because our primary aim was to examine the differences between mother and father contributions to these interchanges, which required a focus on parents' discourse. We do not claim, however, that parents are the only important participants in these conversations (e.g., that they essentially are lecturing to their children about the mind, with children passively absorbing this information). On the contrary, we believe that parents and children reciprocally shape these conversations. However, it is not at all clear how to best analyze these influences. Indeed, evidence from Lagattuta and Wellman (2002) suggests that parent–child conversations about inner states are intertwined such that parents who talk more about emotions pair with children who talk more about emotions (and vice versa). For our analyses, rather than code parent talk about internal states, and additionally, separately do the same for children, we focus *a priori* on parent contributions. Note, however, that for our primary contrast between mothers and fathers, each parent is talking about the exact same stories with the exact same child. We leave to future research investigating the nature of two-way influences both over time and within conversations between parents and children.

It is worth considering whether the use of the story format may be more conducive to mothers' facilitative use of internal state language than fathers'. Mothers do tend to interact more often with their children in educational or care activities and have been

shown to be more comfortable using a reading task in an instructional capacity, where fathers seem to be more interested in achieving the goal of reading the story (Jenkins et al., 2003; Kornhaber & Marcos, 2000). However, this possibility is unlikely to account for our findings. Firstly, our initial analyses showed that mothers and fathers did not differ in their total amount of language spoken (in terms of total words and total conversation turns taken). Therefore, fathers in this study were comfortable enough with the picture-book task and the story-based interaction with their children to speak as much at length as the mothers. Moreover, in our data, fathers' conversations were at least as powerful as mothers. For example, it was fathers' but not mothers' references to desires and to emotions that were most associated with children's ToM understandings.

Of course, even including longitudinal analyses, our data are correlational in nature, so causal interpretations of the link between parents' use of internal state language and outcomes on social-cognitive tasks require caution. Theoretically, parents could be facilitating ToM ability through language or parents could be merely directing more mental state talk to children who are already advanced in social-cognitive aptitude. Experimental evidence from a number of researchers, however, suggests that language input can have a profound impact on children's social-cognitive understanding (see Astington & Baird, 2005 for a review). For example, Guajardo and Watson (2002) manipulated children's mental state input by exposing a treatment group of children to training sessions that involved the discussion of mental state concepts. Children in the treatment condition showed improved performance on ToM tasks compared with children in the control group. A seminal study by Lohmann and Tomasello (2003) also showed that particular types of linguistic input have an impact on the ontogeny of ToM understanding. In this between-subjects design, children were exposed to three different types of linguistic input. Children in the perspective-shifting and sentential complement syntax conditions showed a marked improvement in their false-belief understanding.

Taken together, results of the current study, informed by results from previous studies, provide mounting evidence that the kind of internal state language that children are exposed to can have a significant impact on their developing understanding of mental states and emotions. Training studies, of course, must be complemented by investigations showing that children indeed receive differential inputs about mental states, and these differences in input are sensibly related to differences in social understandings. That is the sort of data we provide in the current research, including some informative longitudinal confirmation as well. Importantly, by separately analyzing mothers' and father's use of internal state language, we have found that fathers may be especially important in the development of ToM understanding whereas mothers may be particularly influential in the ontogeny of EU. These data add substantially to our understanding of the socialization of social cognition and point to the need for the inclusion of fathers as well as mothers in further research.

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Appendix

Internal State Words

Thought Words

- care (thought reference)
- dream
- expect
- forget
- guess
- knew
- know
- adjusted know (total 'know' words excluding references to 'I don't know')
- unhappy
- mean (thought reference)
- means
- pretend
- recognize
- remember
- suppose
- think
- thought
- understand
- wonder
- worry (thought reference)

Desire Words

- hope
- like (reference to objects)
- love (references to objects)
- want
- wish

All Emotion Words

- afraid
- amaze
- angry
- calm
- concerned
- crabby
- cross
- cry
- disappointed
- embarrassed
- enjoy
- excited
- feel
- frightened
- fun
- glad
- happy
- hate
- like (reference to a person)
- lonely

- love (reference to a person)
- mean (personal trait)
- mean (behavior)
- nice (behavior)
- sad
- scared
- shy
- smile
- startled
- surprised
- unhappy
- upset

Most Frequent Emotion Words

- angry
- cry
- feel
- fun
- happy
- mad
- nice
- sad
- scared
- smile
- worry

Negative Emotion Words

- afraid
- angry
- crabby
- cross
- cry
- disappointed
- embarrassed
- frightened
- hate
- lonely
- mad
- sad
- scared
- shy
- startled
- mad
- upset
- concerned
- mean (personality trait)
- mean (behavior)
- worry (emotion reference)

Basic Emotion Words

- happy
- sad
- mad
- scared