
REFLECTION IN THOUGHT AND ACTION: MATERNAL PARENTING REFLECTIVITY PREDICTS MIND-MINDED COMMENTS AND INTERACTIVE BEHAVIOR

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ABSTRACT: Recent research has identified mothers' mental reflective functioning and verbal mind-minded comments as important predictors of subsequent infant attachment security. In the present study, we examine associations between mothers' ($N = 95$) parenting reflectivity expressed in an interview and observed parenting behavior, including verbal mind-minded comments and interactive behavior during interaction with their 7-month-old infants. Parenting reflectivity was coded from the Working Model of the Child Interview. Maternal behavior was assessed via observations of mother–infant interaction during free play and structured teaching tasks. Both maternal *appropriate mind-minded comments* as well as other indicators of maternal *interactive behavior* were coded. Parenting reflectivity was positively correlated with mind-minded comments and behavioral sensitivity. Hierarchical multiple regression analyses indicated that parenting reflectivity contributed to maternal behavior beyond the contributions of mothers' educational status and depression symptoms. Discussion emphasizes the importance of individual differences in parental capacity to accurately perceive and mentalize their infants' experience, and the consequences of these differences for caregiving behavior.

RESUMEN: La investigación reciente ha identificado el funcionamiento reflexivo de las madres y sus comentarios verbales mentalmente orientados como importantes factores de predicción de la subsecuente seguridad del infante en la afectividad. En el presente estudio examinamos las asociaciones entre la habilidad de las madres ($N = 95$) de reflexionar sobre la crianza, tal como lo expresaron en una entrevista y la conducta de crianza observada, incluyéndose los comentarios verbales mentalmente orientados y la conducta interactiva durante la interacción con sus infantes de siete meses de edad. La habilidad de reflexionar sobre la crianza fue codificada según la Entrevista de Modelo de Trabajo del Niño. La conducta materna fue evaluada por medio de observaciones de la interacción entre la madre y el infante durante el juego libre y las tareas de enseñanza estructuradas. Se codificaron tanto los *comentarios apropiados mentalmente orientados* de la madre como otros indicadores de la *conducta interactiva* materna. La habilidad de reflexionar sobre la crianza fue positivamente correlacionada con los comentarios mentalmente orientados y la sensibilidad de conducta. Los análisis de la regresión jerárquica múltiple indicaron que la habilidad de reflexionar sobre la crianza contribuyó a la conducta materna más allá de las contribuciones

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de la condición educativa de las madres y los síntomas de depresión. La discusión enfatiza la importancia de las diferencias individuales en la capacidad de crianza para percibir acertadamente y mentalizar la experiencia de sus infantes, y las consecuencias de estas diferencias para la conducta de prestar cuidado.

RÉSUMÉ: Des recherches récentes ont identifié le fonctionnement mental de mères et les commentaires réflexion-réfléchis comme des facteurs de prédiction importants de la sécurité de l'attachement du nourrisson subséquente. Dans cette étude nous examinons les associations entre la réflexion de parentage des mères (N = 95) exprimée dans un entretien et le comportement de parentage observé, y compris les commentaires verbaux réflexion-réfléchis durent l'interaction avec leurs nourrissons de 7 mois. La réflexion de parentage a été codée à partir de la Structure de Travail de l'Entretien de l'Enfant. Le comportement maternel a été évalué à partir d'observations d'interaction mère-nourrisson durant des séances de jeu libre et des exercices d'enseignement structurés. Les *commentaires réflexion-réfléchie appropriés* et les autres indicateurs de *comportement interactif* maternel ont été codés. Le parentage réfléchi était lié de manière positive aux commentaires réflexion-réfléchis et la sensibilité du comportement. Les analyses de regression multiple hiérarchiques ont indiqué que le parentage réfléchi a contribué au comportement maternel au delà des contributions du niveau d'éducation des mères et des symptômes de dépression. La discussion met l'accent sur l'importance des différences individuelles dans la capacité parentale à percevoir de façon précise et à mentaliser l'expérience de leurs nourrissons, et les conséquences de ces différences sur le comportement de mode de soin.

ZUSAMMENFASSUNG: Kürzlich erschienene Forschung hat bei Müttern Reflexionsfähigkeit und verbale an die Vernunft adressierte Kommentare identifiziert, die eine hohe Voraussagewertigkeit bezüglich kleinkindhafter Bindungssicherheit haben. In der gegenwärtigen Studie untersuchen wir die Verbindung zwischen der mütterlichen (n = 95) Reflexion über Elternschaft, die mittels eines Interviews untersucht wurde und dem beobachtbaren elterlichen Verhalten, inklusive der verbalen an die Vernunft adressierten Kommentare und dem interaktiven Verhalten während einer Interaktion mit ihren sieben Monate alten Kindern. Die Fähigkeit elterliches Verhalten zu reflektieren wurde von dem Arbeitsmodell des Kindinterviews entlehnt. Das mütterliche Verhalten wurde durch Beobachtung von Mutter – Kind Interaktionen während des freien Spiels and strukturierten Lernaufgaben untersucht. Sowohl mütterliche - an die Vernunft adressierte Kommentare - als auch andere Indikatoren des mütterlichen interaktiven Verhaltens wurden kodiert. Reflexive Elternschaft war positiv korreliert mit an die Vernunft adressierten Kommentaren und mit Feinfühligkeit im Verhalten. Hierarchisch multiple Regressionsanalyse zeigte, dass elterliche Reflexion sich stärker auf das mütterliche Verhalten auswirkte, als die Ausbildung, oder depressive Symptome. Die Diskussion geht auf die Wichtigkeit ein individuelle Möglichkeiten entsprechend wahrzunehmen und bewusst zu erleben. Bei den Kindern werden die Unterschiede zwischen Erlebnissen und Kommentaren im Hinblick auf das Betreuungsverhalten besprochen.

抄録：最近の研究から、母親のこころのリフレクティブな機能 *mental reflective functioning* と言葉によるこころ志向のコメント *verbal mind-minded comments* は、その後の乳児の愛着の安定性の重要な予測因子であることが確かめられてきた。この研究では、われわれは、面接で表現された母親(N=95)の育児のリフレクティブ性 *parenting reflectivity* と、観察された育児行動との間の関連を調べた。その育児行動には、7カ月の自分の乳児との相互交流の間の言葉

によるこころ志向のコメントと相互交流行動が含まれた。母親のリフレクティブ性は、子どもの作業モデル面接 the Working Model of the Child Interview からコード化された。母親の行動は、自由遊びと構造化された教える課題 teaching tasks の間に、母親と乳児の相互交流を観察することを通して評価された。母親の適切なこころ志向のコメントとそのほかの母親の相互交流行動の指標の両者がコード化された。リフレクティブな育児は、こころ志向のコメントおよび行動の感受性と、正の相関があった。階層的重回帰分析から、育児のリフレクティブ性は、母親の学歴と抑うつ症状の寄与を超えて、母親の行動に寄与していることが示された。考察では、乳児の体験を正確にとらえてメンタライズする mentalize 親の能力における個人差の重要性と、これらの個人差が結果として育児行動に与える影響を強調する。

* * *

Mothers' ability to perceive, tolerate, and/or comment upon their own and their infants' emotional experience is an important predictor of infant attachment security as well as theory of mind task performance in preschool-aged children (Fonagy & Target, 1997; Meins et al., 2003). An individual's ability to mentalize, or appropriately attribute mental states and beliefs to others, has been termed "reflective functioning" (RF; Fonagy & Target, 1997). High RF permits individuals not only to respond to others' behavior but also to their perceptions of what beliefs, feelings, wishes, desires, and mental states underlie the others' behavior. The capacity for RF has been coded both from parents' adult attachment narratives as well as from interviews designed to assess the parents' representation of the child, and has been related to concurrent and subsequent infant attachment security (Fonagy, Steele, & Steele, 1991; Schechter et al., 2005; Slade, Grienenberger, Bernbach, Levy, & Locker, 2005).

In addition, recent attention has been directed towards mothers' verbal comments made during interaction with their infants, specifically those comments reflecting mental state awareness and appropriate verbal mental state attributions, termed "mind-minded comments" (Meins, Fernyhough, Fradley, & Tuckey, 2001; Meins et al., 2003). Conceptually, mind-minded comments may be considered a type of "RF" in action; that is, mothers' attributions of mental states to their infants during interaction may depend on their capacity to mentalize more generally. Consistent with this hypothesis, maternal mind-mindedness, like maternal RF, has been found to predict infant attachment security as well as children's subsequent theory of mind task performance (Meins et al., 2003).

The constructs of RF and mind-mindedness have received substantial attention in recent years, with publications examining links between these characteristics and later child outcomes (e.g., Fonagy, Steele, & Steele, 1991; Meins et al., 2001; Meins et al., 2003; Schechter et al., 2005; Slade et al., 2005). Despite the striking conceptual similarities in these constructs, prior research has not directly examined their association.

In the present study, we examine associations between maternal parenting reflectivity scored from maternal narratives about their infants, mind-minded comments directed toward the infant

during interaction, and other indices of maternal behavioral sensitivity during interaction in the first year of life.

MATERNAL REFLECTIVE FUNCTIONING AND CHILD EMOTIONAL DEVELOPMENT

Fonagy, Target, Steele, and Steele (1998) defined RF as the mental function that organizes the experience of one's own and others' behavior in terms of mental state constructs. In the case of mothers and their young infants, this capacity refers to maternal understanding of the motivational forces underlying their own and their infant's actions, thus making their own and their infants' behavior more meaningful and predictable. Importantly, RF is posited to be directly associated with the individuals' ability to tolerate ambivalent or painful affect without the need to minimize, distort, or split off such unwanted emotional experiences. Therefore, the parent who has the capacity to engage in RF is likely to respond to the child's emotional needs and reactions with an openness and acceptance, which in turn fosters in the child a sense that both positive and negative emotions are tolerable and can be integrated.

Extant research has supported the notion that parental RF holds consequences for the child's early attachment relationships and behavioral adjustment. For example, Fonagy, Steele, Moran, Steele, and Higgitt (1991) reported that parents' ability to reflect on the mental states of their own parents is predictive of their infant's attachment security. High RF in adoptive mothers has been associated with lower reports of child externalizing problems (Priel, Melamed-Hass, Besser, & Kantor, 2000).

It has been proposed that maternal sensitivity is a likely behavioral mechanism through which maternal mental states are transmitted to child attachment security (Fonagy & Target, 1997; van IJzendoorn, 1995). However, there are limited data exploring associations between parental RF and observed parenting during interaction with the infant.

Considering the likely possibility that mental processes assessed from a mother's narrative about parenting may confound her education and verbal fluency with the capacity to mentalize, an additional limitation to several prior studies is that they have relied on samples that are fairly constricted with regards to sociodemographic and psychiatric risks, relying either on low-risk middle- and upper middle-class, highly educated samples (e.g., Slade et al., 2005) or high-risk traumatized, inner city, low educational attainment families (e.g., Schechter et al., 2005). Thus, there remains a need to distinguish the contributions of RF, educational attainment, and psychiatric risk on parenting using a heterogeneous sample reflecting a range of educational backgrounds and mental health status.

MATERNAL MIND-MINDEDNESS

There has been a recent surge of interest in mothers' verbal attributions of mental states to their infants, or mind-mindedness (Lundy, 2003; Meins et al., 2001; Meins et al., 2003). Mind-mindedness refers to a mother's tendency to "treat her infant as an individual with a mind" (Meins et al., 2001; Meins et al., 2002, p. 1716). A mother low in mind-mindedness tends to view the child more concretely in terms of need states that must be satisfied. Parental mind-minded comments during interaction with 6-month-old infants have been significantly correlated with behavioral sensitivity and interactive synchrony (Lundy, 2003; Meins et al., 2001). Indeed, some evidence has suggested that mothers' appropriate mind-minded comments may be a better predictor of attachment security at 1 year than is maternal behavioral sensitivity (Meins et al., 2001).

Despite striking conceptual similarities in the concepts of RF and mind-mindedness, to our knowledge there have been no published data establishing associations between these two constructs. This is important in that recent findings have suggested that maternal RF may be an important mediator of the link between adult parenting representations and infant attachment; however, a more likely proximal mediator is the degree to which mothers' use their RF to engage in mental state understanding of the infant during actual parent–infant interaction, in the form of comments that reflect appropriate attributions about the infant's inner experience. Thus, establishing associations between parenting reflectivity and mind-minded verbal comments could contribute to the identification of possible proximal behavioral mediators from adult to infant attachment (Meins, 1999).

AIMS OF THE PRESENT STUDY

In the present study, we extend prior research by examining links between mothers' parenting reflectivity, behavioral sensitivity, and mind-minded comments. Mothers' parenting reflectivity was assessed via a newly developed "parenting reflectivity" scale, assessed separately from the observations of interaction used to assess mind-mindedness and interactive behavior, during a structured representational interview about the child. We hypothesized that (a) mothers scoring high on parenting reflectivity would make more mind-minded comments during interaction and would be more behaviorally sensitive, and that (b) maternal parenting reflectivity would explain variance in mind-minded comments and behavioral sensitivity beyond the contribution of other maternal characteristics such as education and depressive symptoms.

METHODS

Participants

Participants in this study were a community sample of 95 mother–infant dyads recruited from local pediatric clinics to participate in the Michigan Family Study (MFS), a longitudinal study of early infant development (McDonough, 1994). A total of 258 mothers and infants participated in the 7-month assessment of the MFS, which included both a home and a laboratory visit. Of these, complete maternal interview and observational data were available for 100 women. Adolescent mothers ($n = 5$) were excluded from the present analyses because the number was too small for separate analysis, and preliminary analyses indicated that these mothers were significant outliers, at the very low end of both educational attainment and parenting reflectivity.

Mothers in this sample comprised a range of demographic and socioeconomic circumstances, reflecting their community of residence. Of the sample, 79% were European American; 16% were African American; 5% were Asian, Latino, biracial, or "other;" and 3 mothers did not indicate their race or ethnicity. Mothers ranged in age from 20 to 42 ($M = 29.3$, $SD = 5.2$) years. Family income was reported by the mothers, who checked 1 of 16 categories, from less than \$5,000 to more than \$100,000, which best described their total household income for the past year. The median income category for the present sample was between \$45–\$49,999 (interquartile range = \$20,000–\$74,999). Family situations varied, with 77% married; 11% unmarried, but living with the child's father; 10% never married; 1% divorced; and 1% living with a partner who was not the child's father. The mothers' median level of education was completion of a 4-year college degree, 15% of the sample had a high-school education or less, and 17% had completed a graduate degree.

Procedures

The MFS protocol involved a home and a laboratory visit when the infants were 7 months old. Data for the present analyses were taken from the laboratory visit, and included both mother–infant interaction tasks and a maternal representational interview.

Mother–Infant Interactive Tasks During the laboratory play session, mothers and infants engaged in a series of videotaped interactive tasks. In the present study, we used data from three of these interactive segments: an unstructured free-play episode and two consecutive “teaching tasks.” During the free-play episode, mothers and infants were left alone in a room with developmentally appropriate toys and instructed to spend time playing with their infant. During the teaching tasks, mothers were given two challenging tasks to “teach their infants:” Task 1 involved placing small plastic balls into a clear-plastic container, and Task 2 involved stacking a set of blocks. Most infants were unable to independently do either of these tasks. All three interactive episodes (i.e., Free Play and Teaching Tasks 1 and 2) were videotaped for 3 min.

Representational Interview. Following the interactive tasks, a trained graduate student administered the representational interview, while the mother’s child was cared for in an adjacent room. A modified version of the Working Model of the Child Interview (WMCI; Zeanah & Benoit, 1995) was used to assess mothers’ representations (for details, see Rosenblum, Dayton, & McDonough, 2006).

The WMCI is a semistructured interview, typically 45 to 60 min in length, in which mothers were asked to describe their perceptions of the infants’ personality and development, characteristics of their relationship with the infants, and perceived and anticipated difficulties with infant behavior and development. Adaptations to the original WMCI interview included questions regarding current family experiences that the parent perceives as particularly stressful or difficult, and questions regarding the experience of the pregnancy were excluded (Rosenblum, McDonough, Muzik, Miller, & Sameroff, 2002).

The modified WMCI interviews were audiotaped, and verbatim transcripts were obtained from these recordings; all scoring was done from the written transcripts. Transcribers received extensive training and supervision to ensure adequacy of the transcriptions.

Measures

Mothers’ WMCI narratives were coded for *parenting reflectivity* using a newly developed scale designed for use specifically with the WMCI interview. Maternal mind-minded comments and interactive behavior were assessed via observations of mother–infant interaction during a free-play and structured teaching tasks. Videotapes were coded for (a) the number of appropriate *mind-minded comments* made by the mothers reflecting attributions of mental/emotional states to their infants (e.g., “I think you are happy playing with the ball”) and (2) maternal *interactive behavior*. Maternal interactive behavior and mind-minded comments were coded separately by research assistants blind to the scores assigned to the other dimensions. Maternal *education* and *depression* were based on self-report measures completed by the mother. Each of these measures is described in more detail next.

Maternal Parenting Reflectivity. Mothers' WMCI transcripts were coded for the level of maternal parenting reflectivity evident in their narratives. Parenting reflectivity refers to the degree to which mothers were able to perceive and understand their own and their babies' mind in terms of beliefs, desires, plans, thoughts, and feelings. The Parenting Reflectivity Scale employed was conceptually based on the Reflective Functioning (RF) scale (Fonagy et al., 1998). Adaptations were made to tailor the scale for use with the WMCI narratives, including a specific focus on mentalization regarding parenting experiences, interpretations of children's behavior, and attributions regarding children's mental states, as well as by reducing the scale from a 9-point to a 5-point scale (consistent with other WMCI scales coded). In addition, only one global parenting reflectivity score was assigned, without any corresponding subscales from Fonagy and Target's (1998) original RF coding system. One of the authors who assisted in the development of this scale received training in Fonagy and Target's RF coding system (M.M.), and the second had extensive experience coding parents' representations and substantial familiarity with the literature on RF (K.R.). While several of the interview questions pulled specifically for reflectivity [e.g., "How do you think your relationship has affected (child's) personality?"], coders considered the mothers' responses to all of the WMCI questions as opportunities for the mother to engage in reflective reasoning.

High parenting reflectivity scores were assigned when parents' engaged in significant reflective reasoning in the interview, for example, acknowledging and tolerating complex feelings about the parenting role, acknowledging intergenerational influences, and searching for the mental meaning that motivates their own and their child's behavior. Low scores were assigned when throughout the interview the mother was almost always unable or only very rarely able to acknowledge feelings or mental states. Low scorers did not acknowledge the influence of psychological processes on their own or others behavior nor did they acknowledge the influence of psychological processes on her own or others' experiences and perceptions of the world. Explanations regarding their own and their infants' behavior were extremely stereotyped/limited or almost always focused on actions versus emotions in response to questions about feelings.

Two coders scored only from the WMCI transcript and were blind to the mother–infant interaction ratings and mind-minded comments scores. Interrater reliability was assessed using scores from two coders who independently coded a subset of 30 interviews. Agreement on this scale dimension was strong, with an intraclass correlation coefficient of 0.86 between coders.

Mind-Minded Comments. Maternal mind-mindedness refers to the mothers' tendency to verbally attribute an independent mental state to her infant. Each interaction segment was transcribed verbatim, and maternal verbal utterances were scored for mind-minded content. These included all statements that referred to infant desire, perception, knowledge, and emotion as well as times the mother "spoke" for the baby (i.e., quoted speech), as these each imply the attribution of mental states to the infant. Examples are "Oh, you *missed* mama?" "You *recognize* that toy, hmm?" and "You *want* the keys more than the toy," inferring the mental states of emotion, cognition, and desire, respectively. We only considered mothers' mind-minded comments judged to be appropriate mental state attributions. Thus, two final scores were computed for each interactive episode: (a) the total number of mind-minded comments and (b) the total number of complete verbal utterances (i.e., a complete phrase) made by the mother. A composite *mind-minded comments* score was derived as an average of the number of comments made in each episode.

Interrater reliability in coding mind-mindedness was assessed using a subset of 15 mother–infant interaction sessions. Raters independently determined whether each utterance in a verbatim

transcript included an appropriate mind-minded comment, and if so, distinguished the type of minded comment made (i.e., desire/wanting, perception, thinking, emotion, or quoted speech). For these 15 dyads, there were 2,425 maternal utterances across the observational contexts, and Cohen's κ indicated excellent interrater agreement ($\kappa = .92, p < .0001$).

Maternal Interactive Behavior. Five scales were used to assess the mothers' interactive behavior during the interactive tasks (Miller, McDonough, Rosenblum, & Sameroff, 2002). Each dimension of maternal interactive behavior was assigned a global score along a 4-point scale from 0 (*absent*) to 3 (*high levels present*). The dimensions of behavior captured by these scales were sensitivity, intrusiveness, positive affect, anxiety, and rejection/anger. The *sensitivity* scale was designed to capture the degree to which the mother displayed sensitive, infant-focused behavior. The *intrusiveness* scale assessed mothers' controlling, overstimulating, or rough-handling behavior. The *positive affect* scale reflected the degree of positive affect displayed by the mother during interaction with the infant while the *rejection/anger* scale reflected the degree to which the mother rejected the infant's bids or made negative comments directly to or about the infant. Finally, the *anxiety* scale assessed mothers' apparent tendencies to express negative feelings or anxiety by fidgeting, sighing, retreating from interaction, looking worried, or using a high-pitched tone of voice.

All coders of the maternal interactive behavior were completely blind to mothers' parenting reflectivity and mind-minded comment ratings and to the hypotheses of the present study. Reliability for each interaction segment (e.g., Free Play, Teaching Task 1, Teaching Task 2) was established on a subset of at least 20 videotapes between the primary coder and the training coders. After establishing initial reliability (i.e., at least 80% exact agreement on 20 segments), continued double-coding at regular intervals was conducted to minimize any rater drift. Weighted kappa coefficients for the maternal behavior scales on a subset of 50 segments ranged from .61 to .87.

For the present article, composite maternal behavior scores were derived by averaging across the three interactive tasks, thus yielding five maternal behavior scores: rejection/anger, sensitivity, positive affect, anxiety, and intrusiveness.

Maternal Education. Maternal education was based on self-report descriptions obtained during face-to-face interviews. Each mother was assigned to one of five educational categories, ranging from 1 (*less formal education*) to 5 (*high levels of formal education*). Ten mothers had completed less than high school or completed a GED only (scored "1"), 25 had some college or were currently in an Associate of Arts or a job training/vocational program (scored "2"), 5 had completed an Associate of Arts or a vocational degree (scored "3"), 33 had completed a bachelor's degree (scored "4"), and 21 were in graduate school or had completed a graduate degree (scored "5"). One mother did not report her educational attainment.

Maternal Depression. The Center for Epidemiological Studies-Depression Inventory (CES-D; Radloff, 1977) was used to assess mothers' depressive symptomatology. The CES-D is a 20-item self-report checklist designed to assess current somatic and mood depressive symptomatology. Respondents rated along a 4-point scale how often, during the past week, each statement described them, from "rarely or none of the time" to "most or all of the time." Scores range from 0 to 60, with scores of 16 or higher commonly used to screen for possible depression (O'Hara & Swain, 1996).

RESULTS

Reflectivity in Interaction: Associations With Mind-Minded Comments and Sensitive Parenting

Table 1 presents the zero-order correlations between parenting reflectivity, interactive behavior, and mind-minded comments. As predicted, mothers' parenting reflectivity scores were associated with their total number of mind-minded comments during interaction as well as with their behavior during interaction with their infants. Reflective mothers were more sensitive and less rejecting/angry, anxious, and intrusive. Similarly, mothers who made mind-minded comments were rated as more sensitive and positive and less rejecting/angry, anxious, and intrusive during interaction.

We considered the possibility that reflective mothers actually said more during the interactive tasks. Parenting reflectivity was correlated with the total number of utterances ($r = .26, p < .05$); however, consistent with other reports utilizing mind-minded verbal-utterance scores, controlling for the number of utterances (i.e., using the proportion of mind-minded comments vs. the total number), did not alter any of the findings of significant or nonsignificant results (Meins et al., 2001; Meins et al., 2003). Thus, in the present analyses, only results using the total number of mind-minded comments are reported.

Maternal Characteristics Associated With RF

We considered factors that might be related to parenting reflectivity and behavior during interaction; specifically maternal depression and education. Bivariate correlations revealed that parenting reflectivity scores were significantly positively correlated with maternal education ($r = .46, p < .01$). Parenting reflectivity was only marginally correlated with the continuous depressive symptom scores ($r = -.19, p < .10$).

Although this was not a clinical sample, we considered that differences in parenting reflectivity might be more evident in association with high, clinically relevant levels of reported depressive symptomatology. We created an extreme group of high self-reported depressive symptomatology using the standard CES-D depression screening cutoff of 16. Twenty-one of

TABLE 1. Correlations Between Maternal Reflectivity, Maternal Characteristics, Interactive Behavior, and Mind-Minded Comments

	1	2	3	4	5	6	7	8	9
1. Reflectivity	–	.46**	–.19	–.34**	.41**	.15	–.29**	–.43**	.39**
2. Education		–	–.17	–.24*	.49**	.12	–.24*	–.47**	.45**
3. Depression			–	.12	–.14	.06	.18	.21*	–.04
4. Rejection/Anger				–	–.63**	–.20	.43**	.19	–.23*
5. Sensitivity					–	.30**	–.49**	–.56**	.41**
6. Positive Affect						–	–.28**	–.05	.18*
7. Anxiety							–	.22*	–.19*
8. Intrusiveness								–	–.40**
9. Mind-Minded Comments									–

$p \leq .05$. ** $p \leq .01$.

the women scored 16 or higher on the CES-D. A one-way analysis of variance test indicated that parenting reflectivity ratings were significantly lower for women in the high depression group ($M = 2.95$, $SD = 1.20$) than they were for those in the low depression group ($M = 3.55$, $SD = 1.09$), $F(1, 92) = 4.63$, $p < .05$.

Associations between maternal depression and education characteristics also were observed for the other indicators of maternal behavior (see Table 1). Maternal education was correlated with several indicators of maternal interactive behavior, including not only the number of mind-minded comments but also rejection/anger, sensitivity, anxiety, and intrusiveness. Findings were more limited for maternal depression; depressed mothers were more intrusive during interaction with their infants.

Identifying the Unique Contributions of Parenting Reflectivity

Our final set of analyses examined the degree to which maternal parenting reflectivity added to the variance explained in maternal interactive behavior and mind-minded comments, beyond the contribution of maternal education and depression. We conducted a series of six hierarchical multiple regression analyses; mothers' educational attainment was entered at the first step. Given prior analyses revealing associations for depression only in contrasting high ($CES-D \geq 16$) versus low ($CES-D < 16$) depression, at the second step, dichotomous depression scores of 0 (*not depressed*) or 1 (*depressed*) were entered; nondepressed mothers were thus the omitted reference group. Parenting reflectivity was added at the third and final step. Table 2 provides results of these analyses; reported coefficients in this table are taken from the final step of the model with all predictors entered. The total variance explained and significant R^2 change for each step are reported in the far-right column. Notably, results indicated that maternal parenting reflectivity added significantly to the variance explained in maternal intrusiveness and mind-minded comments, and marginally to maternal rejection/anger, beyond the combined contributions of maternal education and depressive scores.

Because both mind-minded comments and parenting reflectivity were considered to likely reflect the parents' underlying capacity for mentalization (i.e., the ability to appreciate the baby's experience), we were interested in whether each of these constructs was interchangeable or, conversely, might contribute independent variance to the observed dimensions of maternal behavior. We therefore repeated the hierarchical regression analyses for Models 1 through 6 (all but the one predicting mind-minded comments), entering mind-minded comments as a fourth and final step in the regression model. Results revealed that mind-minded comments did not explain variance beyond maternal parenting reflectivity in any of the five models tested. Furthermore, reflectivity remained a significant independent predictor of intrusiveness (controlling for mind-mindedness, education, and depression) and, consistent with prior results, was not independently related to resigned/anxious behavior, sensitivity, or positive affect when controlling for mind-minded comments. In sum, entering maternal mind-minded comments into these models did not significantly alter the pattern of results and suggested some independence in these constructs.

We considered the possibility that maternal parenting reflectivity interacted more complexly with indicators of risk status in the present sample (i.e., low education or high depression), operating as a protective factor in contexts of low versus high levels of risk. Thus, following the guidelines of Baron and Kenny (1986), we tested for interactions between maternal reflectivity, education, and depression by repeating the series of regression analyses, entering the multiplicative term between reflectivity and depression or reflectivity and education as a fourth and final

TABLE 2. Results of Six Hierarchical Multiple Regression Analyses (Models 1–6) Predicting Maternal Behavior by Maternal Education (Step 1), Depression (Step 2), and Reflectivity (Step 3)

	Unstandardized coefficients		Standardized β	Model $R^2/IR^2 \Delta$
	<i>B</i>	<i>SE B</i>		
1. Intrusiveness				
Step 1: Education	-.14**	.04	-.33**	.22**
Step 2: Depression	.14	.01	.10	.24**/.02
Step 3: Reflectivity	-.14**	.05	-.28**	.30**/.06**
2. Resigned/Anxious				
Step 1: Education	-.03	.03	-.12	.05*
Step 2: Depression	.13	.09	.14	.07*/.02
Step 3: Reflectivity	-.05	.04	-.16	.09*/.02
3. Sensitivity				
Step 1: Education	.15**	.04	.42**	.25**
Step 2: Depression	-.01	.11	-.01	.25**/.00
Step 3: Reflectivity	.07	.05	.17	.27**/.02
4. Positive Affect				
Step 1: Education	.03	.05	.07	.01
Step 2: Depression	.05	.15	.03	.01/.00
Step 3: Reflectivity	.06	.06	.11	.02/.01
5. Rejection (Anger)				
Step 1: Education	-.03	.03	-.14	.05*
Step 2: Depression	-.02	.07	-.03	.05*/.00
Step 3: Reflectivity	-.06 [†]	.03	-.22 [†]	.09*/.04 [†]
6. Mind-Minded Comments				
Step 1: Education	1.93**	.58	.35**	.20**
Step 2: Depression	-.27	1.72	-.02	.20**/.00
Step 3: Reflectivity	1.41	.70	.22*	.24**/.04*

Note. Regression coefficients are from final model with all three steps included. [†] $p \leq .10$.
* $p \leq .05$. ** $p \leq .01$.

step. None of the interaction terms were significant, and inclusion of the interaction terms did not add significantly to the variance explained in any of the regression models.

DISCUSSION

We were interested in the associations between maternal parenting reflectivity, mind-minded comments, and parenting behavior. Results indicated significant associations between mothers' parenting reflectivity and their ability to interpret and comment on infant emotional displays and mental states. While prior research has established links between mind-mindedness and infant attachment security, our results suggest that maternal mental state language also is associated with individual differences among parents. In other words, mothers vary in their attributions of mental states to their infant; mothers who evidence a greater ability to mentalize when thinking about and talking about parenting and their infant during an interview are more generative of mind-minded comments during interaction with their infants.

Although it is likely that both maternal parenting reflectivity and mind-minded comments are related to the mothers' capacity to appropriately consider their child's experience, our results suggest that mind-minded comments do not explain the variance accounted for in mothers' behavior by parenting reflectivity more broadly. This may suggest that parenting reflectivity is a more global capacity, influencing mind-minded comments, but not fully captured by the quality of verbal communication with the infant. However, also note that the interview used to assess parenting reflectivity allowed for a much more thorough assessment of parents' capacity to appreciate their baby's experience (i.e., to some extent, the questions all pull for this capacity). While we believe that both mind-mindedness and parenting reflectivity tap into the capacity for mentalization (and our results are consistent with this conclusion), mind-minded comments observed in brief observational contexts may be less reliable indicators of this capacity and are therefore less likely to explain large portions of variance in other parenting behaviors. Regardless, because mind-minded comments and other parenting behaviors are the characteristics that more proximally surround the young child's experience, it is likely that these characteristics of interaction may mediate the association between parenting reflectivity and other child outcomes, which is an important question for further research.

Differences in mothers' parenting reflectivity seem likely to create different social environments for infants, with corresponding differences in the caregivers' ability to help the infant make sense of his or her own internal experience. Research with older children certainly has suggested that input from the social environment helps young children develop increasing awareness and understanding of mental experience. For example, Dunn (2004) pointed to accumulating evidence that participation in discourse about inner states is related to young children's understanding of mind. Similarly, Newcombe and Reese (2004) examined mothers' and children's narratives during a task requiring them to reminisce about past events. They found that mothers' use of elaborative statements, which include statements that address inner mental states, predicted children's subsequent use of elaborative comments as well; mothers of securely attached children were more likely to use elaborative comments.

Taken together, these findings lead us to conclude that parents' ability to appropriately interpret and comment upon children's mental states increases the child's sense of being "understood," and provide a foundation for children's own developing theories of mind and capacity for effective mentalization. Comments that identify meanings behind behavior help children understand that others' behavior also may carry internal mental state meaning, thus promoting the child's mentalization.

Maternal education was related to mothers' ability to verbalize awareness of infant mental states, such that mothers with higher levels of education were more reflective and engaged in more mind-minded commenting. Similarly, mothers' education was related to more sensitive behavioral interactions. It is possible that other external variables, not included in the present analyses, accounted for part of the education effect. For example, low educational attainment is correlated with other socioeconomic and demographic risks (Sameroff, Seifer, & McDonough, 2004), and it may be that stressful life conditions overwhelm mothers' awareness of their own mental states or the ability to appropriately comment upon infant emotional and psychological experience.

Despite this strong association between maternal education and mothers' parenting reflectivity and mind-mindedness scores, our results are consistent with the work of a number of others who have suggested that these dimensions are not entirely redundant (Lundy, 2003; Meins et al., 2003). Parenting reflectivity made independent contributions to several domains of parent verbal

and interactive behavior, beyond the contribution of education. There appears to be something unique about the capacity to attribute mental states to behavior that suggests this is an emotional and social psychological process rather than a purely intellectual task. Indeed, comments that qualify as mind-minded often fail to be sophisticated or elaborate, but rather reflect common, everyday attributions (e.g., “you *want* that, don’t you?”).

Although an abundance of research has explored the effects of maternal depression on interactive behavior, relatively few associations were obtained for depression in the present study. Maternal depression was associated with higher levels of intrusiveness, though even this effect was reduced to nonsignificance when controlling for maternal educational attainment. Mothers high in depressive symptoms were less likely to be reflective, but in multivariate analyses predicting interactive behavior, low parenting reflectivity explained more variance than did depressive symptom reports.

Furthermore, our results did not reveal significant interactions between indicators of risk status (i.e., lower educational attainment or depressive symptomatology) and reflective parenting in predicting maternal behavior during interaction. Rather, our results suggest that parenting reflectivity independently and directly contributes to mind-mindedness and certain other parenting behaviors beyond these other maternal characteristics.

Taken together, these results strongly suggest the need for more research regarding the parents’ capacity to mentalize and its unique effects on parenting behavior. The building blocks of complex and sophisticated social understanding are likely to lie, at least in part, in the minute and day-to-day lived moments of shared understanding and meaning making. It is not only how a mother behaviorally interacts but also how she subtly verbally demonstrates an understanding of the infants’ mental experience that is likely to promote an increasing coherence in the developing child’s self-awareness and an appropriate integration of feeling and action.

CLINICAL IMPLICATIONS

Infant mental health interventions may be directed at the representational levels of the parent–infant relationship and/or the interactive behavior of the dyad (Sameroff, McDonough, & Rosenblum, 2004). These findings underscore the important function of mentalization, evident in both the mothers’ mental representations (parenting reflectivity) as well as the quality of mental state attributions verbally made toward the infant during interaction (mind-mindedness). These results suggest that directing attention towards supporting the mothers’ capacity to effectively mentalize is likely to hold positive consequences for both her mental experience of the child and the relationship as well as for her behavior during interaction. Ultimately, enhancing mothers’ capacity for reflective parenting also may support children’s own relationship security, developing theory of mind, and capacity for effective mentalization.

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