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ORIGINAL PAPER

The Association Between Reflective Functioning and Parent–Child Relationship Quality

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Abstract Research consistently links adult and infant attachment styles, yet the means by which attachment is transmitted is relatively elusive. Recently, attention has been directed to the psychological underpinnings of caregiver sensitivity—originally thought to be the mechanism of transmission—as indicated by caregivers' ability to keep in mind children's mental states when interpreting children's behavior, or reflective functioning. Unfortunately for researchers, extant measures of reflective functioning are time-consuming and require extensive observation and coding. A self-report measure could help facilitate the study and assessment of reflective functioning in research and clinical settings. This study investigated the relationship between parental reflective functioning and multiple aspects of the parent–child relationship, by using a new, self-report measure of reflective functioning. Participants were 79 caregivers (M_{age} = 31.8 years) who completed self-report measures assessing reflective functioning, parent–child relationship characteristics, perceived rejection in early relationships, attachment anxiety and avoidance in current close relationships, depression, and substance use. The results indicated that reflective functioning is a strong predictor of parent–child relationship quality (i.e., parental involvement, communication, parent satisfaction, limit setting, and parental support), independent of other potential indicators. Findings support parental reflective functioning as a contributor to the quality of parent–child relationship and suggest that a parent's capacity to reflect on the mental states of his or her child in parent–child interactions may provide a key target for interventions that aim to improve parent–child relationships.

Keywords Reflective functioning · Mentalization · Parent–child relationships · Attachment

Introduction

Research has consistently demonstrated the significant influence of early relationships with caregivers on children's development (Thompson 2008). Not surprisingly, parenting practices significantly affect the quality of those relationships, and in turn, children's socio-emotional development. While it is undisputed that the quality of caregiving has profound implications for development, there is less consensus about the mechanisms that contribute to the quality of parent–child relationships and the child's attachment security (De Wolff and van IJzendoorn 1997; Slade 2005; van IJzendoorn 1995). Early research focused on caregiver behavior, or maternal sensitivity in observed responding to the child's needs (Sharp and Fonagy 2008; van IJzendoorn 1995). However, caregiver behavior did not sufficiently explain the significant relationship between adult and infant attachment (Sharp and Fonagy 2008), which has been referred to as the *transmission gap* (van IJzendoorn 1995). Because of this, recent attention has been directed to mentalization, or in the context of attachment relationships, reflective functioning. Reflective functioning is a caregiver's ability to understand and interpret her child's behavior in terms of the mental states—intentions, feelings, thoughts, motivations, and

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beliefs—of her child and herself. In other words, reflective functioning is a parent's ability to treat the child as a psychological agent (Slade et al. 2005).

The hypothesis that reflective functioning is important to the quality of parent–child relationships is rooted in attachment theory. Attachment theory claims that the quality of children's interactions with their caregivers will contribute to the type of attachment bond formed, which in turn, significantly influences children's development (Bowlby 1958; Weinfield et al. 2008). Early experiences with caregivers are encoded into representations of relationships that guide children's expectations about the behavior of social partners and about how to interact with the social world (Bowlby 1958). These *internal working models* influence how children interact with others, most notably, their own children and intimate partners. Thus, the caregiver's own internal working model or state of mind regarding attachment relationships is an important contributor to the child's emerging attachment strategy (George and Solomon 1996; van IJzendoorn 1995). Indeed, several studies have found a significant relationship between adult and infant attachment classifications (Sharp and Fonagy 2008; Slade 2005). However, mediating variables such as reflective functioning are proposed to be the mechanism through which working models influence children's attachment security (Slade 2005). That is, reflective functioning—the caregiver's ability to understand her child's behavior in terms of the child's mental states—is thought to permit caregivers to respond sensitively and appropriately to their children's attachment-related needs, thereby engendering attachment security; in other words, reflective functioning underlies caregiver sensitivity. Despite current interest in reflective functioning, it has traditionally been overshadowed by a focus on observed behavior.

Early research attempting to understand the mechanisms by which attachment is transmitted from one generation to the next primarily focused on observations of maternal sensitivity to explain the transmission (Belsky and Pasco Fearon 2008; Fonagy and Target 1997; van IJzendoorn 1995). One model suggested that parental state of mind regarding attachment underlies caregiving behaviors, which then influence the parent–child attachment (van IJzendoorn 1995). That is, a parent's internal working model influences caregiving behaviors by guiding the interpretation of the child's needs and responses to those needs (Main 1990). For instance, a secure-autonomous parent who is able to coherently regulate, organize, and reflect upon his or her own thoughts and emotions concerning experiences with primary caregivers would be able to sensitively respond to the child's needs for proximity, comfort, and support (Slade et al. 2005). In contrast, caregivers with an insecure state of mind regarding attachment "would reject, overwhelm, or fail to regulate their children's need for proximity" (Slade et al. 2005, p. 284). Accordingly, the extent to which caregivers were sensitive in responding was believed to directly influence the child's attachment security, and served as the primary explanation for the transmission of attachment from parent to child. However, when caregiver sensitivity—as traditionally measured by the parent's level of acceptance, cooperation, appropriate and prompt responding, and positive affect (Grienenberger et al. 2005)—is considered as a mediator, it only accounts for about 23 % of the relationship between adult attachment representations as measured by the Adult Attachment Interview (AAI; George et al. 1984) and infant attachment as classified by the Strange Situation Procedure (SSP; Ainsworth et al. 1978; De Wolff and van IJzendoorn 1997; Sharp and Fonagy 2008; van IJzendoorn 1995). Thus the mechanism by which attachment strategies are passed down to subsequent generations was not as well understood as thought. As a result, researchers were left with the problem of bridging the transmission gap, particularly given its potentially crucial importance to parenting intervention programs (Belsky and Pasco Fearon 2008; De Wolff and van IJzendoorn 1997).

Researchers directed attention to the psychological functioning of caregivers, or in other words, the psychological underpinnings of caregiver behavior, to explain the ways in which attachment security is passed down to subsequent generations (Fonagy and Target 2005; Grienenberger et al. 2005; Sharp and Fonagy 2008; Slade et al. 2005). Initial responses to the question of the transmission gap were inspired by the concept of mentalization, or an individual's "capacity to ascribe thoughts, feelings, ideas, and intentions to ourselves as well as to others, and to employ this capacity in order to anticipate and influence our own and others' behavior" (Sharp and Fonagy 2008, p. 738). For attachment researchers, mentalizing played a dual role in the transmission of parental attachment representations to children, as the parent–child relationship influences both the child's attachment security and sociocognitive development through the parent's appropriate and accurate mentalizing of her child (Fonagy and Target 1997).

In the context of attachment relationships, mentalization, or more commonly, reflective functioning, refers to a caregiver's ability to reflect on the child's as well as one's own mental experiences in understanding and interpreting the child's behavior (Sharp and Fonagy 2008). Ultimately, the ability to understand children's behavior in terms of mental states gives the child's behavior meaning and predictability (Rosenblum et al. 2008). A tantrum is not simply perceived as annoying misbehavior, but as an indicator of underlying emotions and needs expressed through misbehavior. In turn, the caregiver's ability to perceive the

child's misbehavior in consideration of mental states allows the caregiver to respond more sensitively to the child's misbehavior instead of resorting to instinctual responses that may be harsh and insensitive to the child's underlying needs. It has been suggested that since attachment relationships often involve intense and negative emotions, "any notion of the internal processes inherent to security of attachment and intergenerational transmission must include a consideration of the capacity to think about feelings and their relation to behavior" (Slade et al. 2005, p. 286). Accordingly, reflective functioning has been identified as a potentially major contributor to caregiver behavior and parent–child relationship quality, which in turn influences attachment security (Belsky and Pasco Fearon 2008).

Researchers have primarily depended on pre-existing interview formats to measure a parent's capacity for reflective functioning (Fonagy and Target 2005; Sharp and Fonagy 2008; Slade et al. 2005). For instance, Fonagy et al. developed a scale to be used with the Adult Attachment Interview (AAI), in which responses to certain questions are coded on an 11-point scale, from "bizarre" to "high reflective functioning," based on their capacity to reflect upon the feelings and intentions of their own primary caregivers and discuss how those mental states were linked to their parents' behavior (Fonagy et al. 1998). Initial research using data from the London Parent–Child Project found that parents classified as secure-autonomous on the AAI were more likely to be rated high on reflective functioning and to have an infant classified as secure in the SSP at one year old (Fonagy et al. 1991). In contrast, parents who were rated low on reflective functioning were more likely to be classified as insecure with regard to attachment relationships and have children who were also insecure.

Other work has attempted to measure reflective functioning using the Parent Development Interview (PDI; Slade 2005; Slade et al. 2005), an interview that targets the parent's relationship with his or her children. The PDI is similar to the AAI in its attempt to measure internal representations of relationships. However, the PDI differs in that it focuses on the parent's representations of the child, his or herself as a parent, and the parent–child relationship. To assess reflective functioning with the PDI, Slade et al. (2005) modified the scale created to measure reflective functioning from the AAI (Fonagy et al. 1998), and used it in a study of 40 women pregnant for the first time. In Slade et al.'s study, expectant women completed an AAI prior to their children's birth and a PDI following birth. Mother–infant dyads also participated in the Strange Situation Procedure. Results revealed significant group differences on reflective functioning among all four and two (secure vs. insecure) adult attachment classifications; secure-autonomous mothers were significantly higher on reflective functioning than were insecure mothers. Thus, maternal attachment during pregnancy was predictive of reflective functioning after her baby's birth. Further, results revealed significant group differences among all four and two infant attachment categories on maternal reflective functioning; secure infants had mothers who were rated higher on reflective functioning.

Existing procedures to measure reflective functioning require costly and labor-intensive training, administration, and coding (Fonagy et al. 1998; Fonagy and Target 2005; Sharp and Fonagy 2008; Slade et al. 2005). For example, administering and coding the AAI requires professional training, and the interview itself requires up to 90 min of time, plus time to code. A self-report, pencil-and-paper measure of reflective functioning is of interest to researchers and clinicians as it would allow for much quicker administration and assessment, and has the potential to promote future empirical and clinical work on the construct.

Luyten et al. (2009) utilized a self-report questionnaire to measure reflective functioning with the potential to greatly minimize costs associated with studying this construct (Luyten et al. 2009). The development and validation of the Parental Reflective Functioning Questionnaire (PRFQ) was guided by standards for the development of other psychometric tests (Nunnally and Bernstein 1994). First, a pool of items was generated based on the relevant mentalization literature, as well as the manuals used to score reflective functioning for the AAI and PDI (Fonagy et al. 1998; Luyten et al. 2009). Experts in the area of mentalization and social cognition rated the items with regard to the extent that each item exemplified dimensions of reflective functioning, keeping in mind parents with low and high mentalization capacity. Following expert opinions, various items were re-written or removed. The measure was then used in a pilot study to establish factor structure and validity. In its current form, the (PRFQ) is an 18-item measure on which caregivers respond to various statements concerning the extent to which they are interested and curious in knowing and understanding mental states as well as the extent to which they are unable to recognize the opaqueness of mental states and struggle to take their children's perspective. Accordingly, the PRFQ contains three subscales: interest and curiosity in mental states, certainty of mental states, and pre- or non-mentalizing modes (i.e., defense or denial of mental states). The three-factor structure is consistent across mothers and fathers, and two independent studies (Luyten et al. 2009).

As a measure in its infancy, the PRFQ has rarely been used in empirical research, but has demonstrated potential utility in the studies it has been employed (Rutherford et al. 2013; Rutherford et al. 2015). For instance, recent research

found that reflective functioning, as measured by the PRFQ, was related to the time mothers would persist in trying to soothe a simulated infant in distress (Rutherford et al. 2013). Specifically, mothers who had greater interest and curiosity in mental states exhibited more tolerance for the simulated infant's distress (a likely contributor to parent-infant relationship quality), but not distress in general, suggesting that the measure is tapping into what it purports to (i.e., construct validity). Using a larger sample, another project aimed to replicate those findings by examining the relationship of the PRFQ to self-reported and observed behavioral distress tolerance as well as blood pressure and heart rate during the observation (Rutherford et al. 2015). Mothers who reported struggling identifying and understanding their children's mental states (i.e., scored higher on pre-mentalizing modes) demonstrated lower distress tolerance as indicated by both self-report and observational measures. In addition to distress tolerance, the PRFQ subscales have been related to parental attachment, emotional availability, and infant attachment as measured by the SSP, all of which help demonstrate its construct validity (Rutherford et al. 2015).

In this study, we sought to examine the relations between reflective functioning, as measured by a recently developed self-report questionnaire (Luyten et al. 2009), and various aspects of the parent–child relationship that may contribute to the quality of relationship and child's attachment security. Given the increasing evidence demonstrating the importance of reflective functioning to parent–child relationship quality, we examined three core dimensions of reflective functioning—pre- or non-mentalizing modes, certainty of mental states, and interest and curiosity in mental states—as they relate to several dimensions of the parent–child relationship, including parent satisfaction, communication and involvement with the child, allowance for autonomy, limit setting (i.e., discipline practices), and perceived support in the parental role. Moreover, we also investigated whether reflective functioning was a predictor of positive parenting and parent–child relationship variables, after controlling for other potential indicators such as participants' perceived rejection by parents in childhood, amount of anxiety and avoidance experienced in current close relationships, depression, and substance use. We hypothesized that all dimensions of reflective functioning would be related to, and predictive of, parent–child relationship quality. As the quality of caregiver-child relationship significantly influences the quality of attachment the child forms with his or her caregivers (Belsky and Pasco Fearon 2008), if results are consistent with our hypothesis, they will provide support for the importance of reflective functioning to attachment transmission.

Method

Participants

The sample for the current study included 79 participants (M_{age} = 31.78, SD = 9.05) who were taking part in a larger longitudinal study that examined the effectiveness of an attachment-based parent education group. The data for this study was collected at the baseline assessment. Participants were recruited in a medium-sized Montana town from the community, local agencies, and Head Start programs, which typically serve less advantaged families as well as caregivers involved with child welfare services. We attempted to sample families and caregivers who most often receive parent education services as this was the population to which we hoped to generalize results, and thus, our sample included mostly low-income parents who may have past or current involvement with child welfare systems.

Most participants identified as European American (85.5 %) and female (79.2 %). A majority of the sample was married (31.2 %) or in a steady dating relationship (31.2 %); a sizable portion were single (22.1 %) and not in a steady relationship. In addition, 54 % of participants reported living with their romantic partner. Participants had an average of 2.17 children (SD = 1.58), whose average age was 3.20 years (SD = 2.17). A majority of the sample reported an annual household income of less than $20,000 (61.8 %), while most participants reported less than $40,000 (80.3 %). Many worked full time (39.0 %), although even more were unemployed (42.9 %). With regard to education, many participants had obtained a high school degree or GED (29.5 %) or attended some college (29.5 %); fewer participants had obtained a 4-year (11.5 %) or advanced degree (11.5 %). Finally, 36.4 % of the sample reported having been investigated by a child welfare agency at some point.

Procedure

Participants completed the series of assessments at one time in a quiet room at a local agency or, in a few instances, at home. Once signed informed consent had been obtained, participants were given a manila envelope containing the measures. They were instructed to complete the questionnaires in the order in which they were presented in the envelope to minimize any concerns of priming (i.e., responding to one questionnaire influences responses on subsequent ones); the order was as follows: PARQ, ECR-R, PCRI, PRFQ, CAGE-AID, PHQ-8, and the demographic survey. It is possible that some participants did not complete the measures in that order. Participants were told to

answer as accurately and honestly as possible about their current behaviors, practices, and experiences. However, for the PARQ, participants were instructed to report on their memories of experiences in early relationships with their caregivers. Questionnaires required between 30 and 60 min to complete.

Measures

Participants completed several questionnaires that assessed reflective functioning, various aspects of the parent–child relationship, perceived rejection in early relationships, experiences in close relationships, substance use, and depression.

Parental Reflective Functioning

Reflective functioning was measured using the *Parental Reflective Functioning Questionnaire* (PRFQ; Luyten et al. 2009); the survey assesses the caregivers' capacity to understand their children and their behavior in terms of underlying mental states (e.g., thoughts, intentions, emotions, and beliefs). Participants endorsed their agreement to each statement on a 7-point, Likert scale from 1 (Strongly disagree) to 7 (Strongly agree). The PRFQ contains three subscales: Pre-Mentalizing Modes, on which higher mean scores indicate a participant's struggle to understand and interpret the child's mental experience accurately ("I find it hard to actively participate in make believe play with my child"); Certainty of Mental States, which measures the extent to which participants are unable to recognize that children's feelings, thoughts, and intentions are not always readily apparent ("I can always predict what my child will do"); and Interest and Curiosity in Mental States, indicating the level of interest in thinking about the child's internal experience and in taking the child's perspective ("I am often curious to find out how my child feels"). The subscales have been found to have good reliability, with all having Cronbach's alphas reported at 0.70 or greater.

Parent–Child Relationship Characteristics

The quality of multiple aspects of the parent–child relationship were examined using the *Parent–Child Relationship Inventory* (PCRI; Gerard 1994). The PCRI contains several subscales that were under investigation in the current study: (1) parental support; (2) satisfaction with parenting; (3) involvement; (4) communication; (5) limit setting; and (6) autonomy. Each subscale reflects a different aspect of the parent–child relationship. The questionnaire is comprised of 64 questions, to which respondents are asked to indicate the extent to which they agree with a given statement about parenting, the parent–child relationship, or their child on a 4-point Likert scale ranging from 1 (Strongly agree) to 4 (Strongly disagree). Lower scores on each subscale indicate possible problems in that area of the parent–child relationship. Internal reliability for the current sample was calculated at 0.92; individual subscale reliabilities were all over 0.75, except for autonomy, which was somewhat low at 0.58. The low reliability for autonomy is consistent with other research noting problems with the scale (Coffman et al. 2006).

Experiences in Close Relationships

The *Experiences in Close Relationships-Revised* questionnaire (ECR-R; Fraley et al. 2000) inquires about the respondent's comfort with closeness and intimacy in attachment relationships as well as the extent to which respondents are anxious about being rejected or abandoned. The two subscales—avoidance and anxiety—each comprise 18 questions to which participants respond on a Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree). Higher mean scores (maximum score of 7) on each subscale indicate greater anxiety and avoidance in attachment relationships. Reliability for the current sample was calculated at 0.95; the reliability for each subscale was calculated at 0.94.

Parental Acceptance and Rejection

The *Parental Acceptance and Rejection Questionnaire* (PARQ; Rohner and Khaleque 2005) assessed participant recollections of maternal and paternal acceptance or rejection during early childhood. Two scales make up the PARQ: warmth/acceptance and hostility/neglect/rejection. The PARQ is composed of 24 statements about past experiences of parental caregiving. Participants indicate the extent to which each statement is an accurate representation of their early relationships, from 1 (Almost always true) to 4 (Almost never true). The hostility/neglect/rejection scale was combined with the reverse-scored warmth scale to produce a total acceptance-rejection score, as is recommended by the instrument's authors (Khaleque and Rohner 2002). Higher scores indicate greater perceived parental rejection and less warmth. The maternal scale had a reliability of 0.66 for the current sample, while reliability for the paternal scale was 0.71.

Substance Use

The *CAGE-Adapted to Include Drugs* (CAGE-AID; Brown and Rounds 1995) was used to measure substance use and was included because of its strong relationship with child maltreatment and parent–child relationship quality, and to help describe the composition of the sample (Ondersma

2002; Wells 2009). It contains four questions that ask about how participants, as well as their acquaintances, feel about their own drinking and drug use. Each question is answered with a "Yes" or a "No," with positive answers given one point for a possible maximum score of four; a score greater than one indicates a potential problem. The measure has established a 79 % sensitivity score and 77 % specificity score. The current sample had a reliability of 0.86.

Depressive Symptoms

The *Patient Health Questionnaire-8* (PHQ-8; Kroenke et al. 2009) measured participants' depressive symptoms. The PHQ-8 includes eight items based on eight of the nine criteria for a diagnosis of depressive disorders in the DSM-IV. Participants are prompted to respond how often they have been bothered by various problems in the past 2 weeks, such as "Little interest or pleasure in doing things" and "Poor appetite or overeating," rated on a Likert scale from 0 (Not at all) to 3 (Nearly every day). Higher scores indicate the presence of more depressive symptoms, with a maximum score of 24; scores above 10 are considered major depression. The internal reliability for the current sample was calculated at 0.89.

Demographics

A brief demographic survey inquired about participant age, gender, relationship status, number of children and their ages, and participant's and romantic partner's education and income. It also asked participants about any previous involvement with child welfare services.

Data Analyses

Preliminary analyses focused on the descriptive composition of the sample, as well as the bivariate associations to examine the hypothesis that reflective functioning is related to aspects of the parent–child relationship. To examine the hypothesis that reflective functioning is a significant predictor of parent–child relationship quality, several hierarchical regression analyses were conducted to investigate the contribution of reflective functioning to parent–child relationship characteristics after controlling for other potential predictors. We utilized hierarchical regression because of its ability to analyze the relative independent predictability of a variable, in the context of other potential predictors in the model. In the hierarchical regression models, perceived rejection in early relationships, attachment anxiety and avoidance, and depressive symptoms were entered in the first step, and the three reflective functioning subscales (pre-mentalizing modes, certainty of mental states, and interest and curiosity in mental states) were entered in the second step. The three subscales were analyzed separately to identify whether certain dimensions of reflective functioning are more predictive of quality than others. In contrast to previous research (Ondersma 2002; Wells 2009), substance use was not related to any outcome variables and was not included in any models. It could be that substance use was not related to parent–child relationship quality because over half (58 %) of the sample reported no problems with drugs or alcohol, limiting variability, and thus covariance with the outcome variables (Jackson 2015). The same modeling procedure was used for each aspect of the parent–child relationship (i.e., parental support, satisfaction with parenting, involvement, communication, autonomy, and limit setting), resulting in six dependent variables. Using Cohen's standards, effect sizes of 0.10 were interpreted as small, 0.30 as moderate, and 0.50 as large (Cohen 1977).

Results

The average score for anxiety about attachment relationships was reported at 3.27 (SD = 1.36), while the avoidance score was slightly lower at 3.06 (SD = 1.25). These scores are slightly higher than has been reported in previous research with community samples, in which averages for each subscale were around 2.00 (Butzer and Campbell 2008). In addition, participants perceived greater rejection from their fathers ($M = 46.03$, SD = 17.09) than their mothers ($M = 40.48$, SD = 16.04), on average. However, both average scores were higher than has been reported in previous research (Putnick et al. 2012). On average, participants reported a substance use score of 1.14 (SD = 1.49), which indicates that the sample scored above the limit representing a possible problem with alcohol and/or other drugs. In addition, the average depression score was reported at 6.45 (SD = 5.51), less than the threshold indicating major depressive symptoms.

Bivariate correlations (see Table 1) were used to test the hypothesis that reflective functioning is related to parent–child relationship quality. Multiple significant—and strong—correlations were detected. Interestingly, very few significant associations were found among parental rejection and the variables of interest. On the other hand, both anxiety and avoidance were strongly and inversely related to parental support, while only avoidance was inversely related to parental satisfaction, and communication and involvement reported with the child. Moreover, more anxiety was related to less limit setting and support of the child's autonomy.

Table 1 Correlations between variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Father rejection														
2. Mother rejection	**0.253***													
3. Anxiety	**0.279***	**0.269***												
4. Avoidance	**0.248***	0.106	0.514											
5. Support	−0.149	−0.147	**−0.538****	**−0.555****										
6. Satisfaction with parenting	0.119	−0.004	−0.033	**−0.246***	**0.358****									
7. Involvement	0.076	−0.184	−0.126	**−0.246***	**0.548****	**0.661****								
8. Communication	−0.038	−0.065	−0.134	**−0.296***	**0.548****	**0.499****	**0.778****							
9. Limit Setting	−0.028	−0.225†	**−0.259***	−0.041	**0.572****	**0.325****	**0.461****	**0.473****						
10. Autonomy	−0.219†	−0.214†	**−0.271***	0.005	0.093	0.143	0.092	−0.011	**0.241***					
11. Substance use	0.058	0.140	0.189	0.140	0.002	−0.046	0.065	0.007	0.129	−0.030				
12. Depression	**0.336****	**0.318****	**0.431****	**0.391****	**−0.581****	−0.146	−0.212†	**−0.267***	**−0.353****	**−0.375****	0.007			
13. Pre-mentalizing modes	−0.005	0.082	0.023	0.064	**−0.343****	**−0.515****	**−0.628****	**−0.531****	**−0.443****	**−0.285***	−0.207	**0.274***		
14. Certainty of mental states	−0.158	−0.191	−0.165	**−0.237***	**0.392****	0.200	**0.432****	**0.439****	**0.466****	0.064	−0.114	−0.181	−0.173	
15. Interest and curiosity in mental states	0.015	0.030	−0.061	**−0.288***	0.087	**0.283***	**0.387****	**0.234***	0.026	−0.025	−0.041	−0.006	**−0.296***	−0.064

Bold indicate correlations that are significant at $p < .05$

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

The reflective functioning subscales were related to parenting variables in several instances. For instance, participants' certainty about their children's mental states (i.e., certainty of mental states) was positively related to nearly all aspects of the parent–child relationship including more positive parenting experiences (i.e., parental support, satisfaction) and practices (i.e., communication, involvement, and limit setting) reported by participants. Similarly, interest and curiosity in children's mental states was positively related to satisfaction derived from being a parent, involvement and concern for the child, and communication with the child. Conversely, the extent to which participants reported struggling understanding and interpreting their children's mental states (pre-mentalizing modes) was negatively related to all of the PCRI subscales, such that reporting difficulty in reflective functioning was associated with reports of more problematic parenting. Namely, increasing scores for pre-mentalizing modes was related to less perceived support, parental satisfaction, involvement and communication, limit setting, and allowance of autonomy.

As hypothesized, reflective functioning was a significant predictor after controlling for parental rejection, experiences in close relationships, and depression for most subscales of the PCRI (i.e., parent satisfaction, involvement, communication, limit setting, and parental support). Specific results are discussed below.

The addition of the reflective functioning subscales resulted in a significant change in R^2 of 21.4 % ($p < .01$) for satisfaction with parenting independent of parental rejection, attachment anxiety and avoidance, and depression; altogether, the model accounted for 22.3 % of the variability in parenting satisfaction (see Table 2 for findings). However, the significant predictor of parenting satisfaction, as indicated by the beta-weight, was pre-mentalizing modes ($\beta = -0.441$, $p = .001$). Thus, increasing pre-mentalizing modes, or difficulty in understanding children's mental states, resulted in a decrease in satisfaction with parenting, holding all other variables constant.

The results for involvement with the child were even more substantive; that is, the addition of the reflective functioning subscales resulted in a 40.4 % change in R^2 ($p < .001$), while the entire model accounted for 49.6 % of the variability in parent–child involvement (see Table 3). All three subscales were significant predictors independent of parental rejection, anxiety and avoidance, and depression. That is, pre-mentalizing modes ($\beta = -0.411$, $p < .001$), certainty of mental states ($\beta = 0.285$, $p = .005$), and interest and curiosity in mental states ($\beta = 0.293$, $p = .007$) were all statistically significant predictors of parent–child involvement. Similar results were revealed for communication with the child. The inclusion of the reflective functioning variables resulted in a significant change in R^2 of 28.6 % ($p < .001$), with the complete model accounting for 34.1 % of the variability in parent–child communication. Both pre-mentalizing modes ($\beta = -0.387$, $p = .002$) and certainty of mental states ($\beta = 0.335$, $p = .004$) were statistically significant in predicting communication, independent of all other variables; decreasing participants' difficulty with understanding and interpreting children's mental states predicted an increase in parent–child communication (see Table 4). Interestingly, a greater inability to recognize the opaqueness of children's mental states predicted greater involvement and communication. Perhaps a caregiver's certainty about her child's mental states reflects confidence in her knowledge about her child, which may result from greater communication and involvement.

For discipline practices (i.e., limit setting), an initial model including parental rejection, attachment anxiety and avoidance, and depression accounted for a significant amount of variability (adj. $R^2 = 0.166$, $p = .008$). Still, the inclusion of the three reflective functioning variables accounted for an additional 19.1 % of the variability in limit setting ($p = .001$); collectively, all variables accounted for 33.9 % of the variability. Pre-mentalizing modes ($\beta = -0.278$, $p = .025$) and certainty of mental states ($\beta = 0.317$, $p = .006$) were significant predictors of limit setting, in which increasing reflective functioning—by minimizing pre-mentalizing modes—was predictive of increases in the reported use of more positive discipline practices, over and above perceived parental rejection, experiences in close romantic relationships, and depression (see Table 5).

For parental support, the addition of reflective functioning subscales resulted in a significant change in R^2 of 7.1 % ($p = .038$); the model including all 8 predictors accounted for 51.3 % of the variability in parental support (see Table 6). Significant predictors of parental support—in the context of reflective functioning—were attachment anxiety ($\beta = -0.276$, $p = .014$) and avoidance ($\beta = -0.301$, $p = .010$), and depression ($\beta = -0.274$, $p = .016$). Not surprisingly, greater anxiety and avoidance in close relationships, and depression were predictive of less reported emotional and practical support.

Interestingly, reflective functioning was not predictive of participants' willingness to support the child's autonomy. Indeed, the model that did not include reflective functioning measures accounted for more variability in autonomy than the model that included them (adj. $R^2 = 14.5$ vs. 12.2 %). Moreover, the only significant predictor of autonomy allowance was attachment avoidance ($\beta = 0.310$, $p = .045$). In other words, the more avoidance reported by participants, the more willingness the participant reported in encouraging the child's

Table 2 Hierarchical regression analysis predicting satisfaction with parenting (N = 63)

	B	SE (B)	β	ΔR^2
Step 1				0.108
Father rejection	0.053	0.034	0.210	
Mother rejection	−0.014	0.035	−0.053	
Attachment anxiety	0.248	0.473	0.079	
Attachment avoidance	−0.987	0.509	−0.283	
Depression	−0.098	0.117	−0.121	
Step 2				0.214**
Father rejection	0.039	0.030	0.152	
Mother rejection	−0.007	0.033	−0.025	
Attachment anxiety	0.276	0.426	0.088	
Attachment avoidance	−0.969	0.485	−0.278	
Depression	0.029	0.112	0.035	
Pre-mentalizing modes	−3.077**	0.915	−0.441**	
Certainty of mental states	0.170	0.450	0.045	
Interest in mental states	0.490	0.651	0.095	

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 3 Hierarchical regression analysis predicting parent–child involvement (N = 61)

	B	SE (B)	β	ΔR^2
Step 1				0.158
Father rejection	0.078	0.040	0.257	
Mother rejection	−0.076	0.042	−0.238	
Attachment anxiety	−0.057	0.580	−0.015	
Attachment avoidance	−0.768	0.608	−0.182	
Depression	−0.163	0.148	−0.158	
Step 2				0.404***
Father rejection	0.057	0.030	0.189	
Mother rejection	−0.052	0.032	−0.164	
Attachment anxiety	−0.009	0.421	−0.002	
Attachment avoidance	−0.269	0.479	−0.064	
Depression	−0.027	0.118	−0.026	
Pre-mentalizing modes	−3.456***	0.907	−0.411***	
Certainty of mental states	1.287**	0.441	0.285**	
Interest in mental states	1.848**	0.656	0.293**	

* $p < .05$; ** $p < .01$; *** $p < .001$

independence, which is consistent with attachment theory and the empirical literature (Solomon and George 1996).

Discussion

In this study, we expected major dimensions of reflective functioning to be statistically significant predictors of various aspects of the parent–child relationship indicative of relationship quality, with a greater self-reported capacity for reflective functioning related to more positive parent–child relationships. Most results were in support of the anticipated relationships and the predictive utility of reflective functioning for multiple aspects of the parent–child relationship (e.g., parent satisfaction, parent–child communication and involvement, and limit setting). Indeed, many of the relationships were medium or large according to Cohen's standards (Cohen 1977), and the addition of reflective functioning as a predictor in regression models provided significant changes in explained variability in parent–child relationship quality.

Table 4 Hierarchical regression analysis predicting parent–child communication (N = 63)

	B	SE (B)	β	ΔR^2
Step 1				0.138
Father rejection	0.019	0.027	0.092	
Mother rejection	−0.006	0.028	−0.026	
Attachment anxiety	0.009	0.375	0.004	
Attachment avoidance	−0.615	0.403	−0.219	
Depression	−0.165	0.093	−0.251	
Step 2				0.286***
Father rejection	0.008	0.023	0.040	
Mother rejection	0.017	0.025	0.077	
Attachment anxiety	0.082	0.317	0.032	
Attachment avoidance	−0.455	0.361	−0.162	
Depression	−0.083	0.083	−0.126	
Pre-mentalizing modes	−2.178**	0.680	−0.387**	
Certainty of mental states	1.019**	0.334	0.335**	
Interest in mental states	0.386	0.483	0.093	

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 5 Hierarchical regression analysis predicting limit setting (N = 63)

	B	SE (B)	β	ΔR^2
Step 1				0.232**
Father rejection	0.054	0.038	0.175	
Mother rejection	−0.075	0.040	−0.232	
Attachment anxiety	−0.953	0.535	−0.248	
Attachment avoidance	0.819	0.576	0.193	
Depression	−0.271*	0.132	−0.272*	
Step 2				0.191**
Father rejection	0.042	0.034	0.137	
Mother rejection	−0.045	0.037	−0.138	
Attachment anxiety	−0.855	0.480	−0.223	
Attachment avoidance	1.056	0.546	0.249	
Depression	−0.185	0.125	−0.186	
Pre-mentalizing modes	−2.364*	1.029	−0.278*	
Certainty of mental states	1.456**	0.506	0.317**	
Interest in mental states	0.459	0.732	0.073	

* $p < .05$; ** $p < .01$; *** $p < .001$

While all the reflective functioning subscales (pre-mentalizing modes, certainty of mental states, and interest and curiosity in mental states) were related to aspects of the parent–child relationship, the most consistently significant relationships were found with pre-mentalizing modes, or the extent to which the participant struggled to take the child's perspective. All of the associations between pre-mentalizing modes and aspects of the parent–child relationship were inversely related, as expected. Moreover, pre-mentalizing was a consistent predictor of indicators of parent–child relationship quality, with the exception of limit setting, parental support, and allowance of autonomy. For instance, the more struggle a participant reported (i.e., more pre-mentalizing), the less satisfaction they reported in their parental role, and the less communication and involvement he or she reported with the child. Accordingly, if one finds it difficult to understand the child's mental experience, he or she also derived less satisfaction as a parent and was less involved and communicative with the child. This is consistent with suggestions put forth by attachment researchers that a greater capacity for reflective functioning allows the parent to be attuned with the child's needs, as indicated by greater communication and involvement with the child, and respond sensitively to

Table 6 Hierarchical regression analysis predicting parental support (N = 62)

	B	SE (B)	β	ΔR^2
Step 1				0.504***
Father rejection	0.043	0.025	0.171	
Mother rejection	−0.007	0.027	−0.026	
Attachment anxiety	−0.876*	0.353	−0.282*	
Attachment avoidance	−1.171**	0.385	−0.337**	
Depression	−0.269**	0.090	−0.323**	
Step 2				0.071*
Father rejection	0.039	0.024	0.154	
Mother rejection	0.003	0.026	0.010	
Attachment anxiety	−0.859*	0.337	−0.276*	
Attachment avoidance	−1.047*	0.393	−0.301*	
Depression	−0.228*	0.092	−0.274*	
Pre-mentalizing modes	−1.269	0.721	−0.183	
Certainty of mental states	0.593	0.359	0.156	
Interest in mental states	0.327	0.517	0.064	

* $p < .05$; ** $p < .01$; *** $p < .001$

those needs, which enhances attachment security and contributes to more positive interactions and a higher quality relationship between parent and child (Slade 2005). Further, the predictive utility of pre-mentalizing modes is consistent with another study using the PRFQ, in which mothers with higher pre-mentalizing scores exhibited lower self-reported and observed distress tolerance while trying to soothe a simulated crying infant (Rutherford et al. 2015).

Reflective functioning affords caregivers the capacity to understand their children's behaviors and actions in terms of mental states; in other words, reflective functioning gives children's behavior meaning and predictability (Slade et al. 2005). As a result, a crying infant is not inexplicable and baffling to a caregiver, but signals a child communicating a need, such as a need for comfort because the child is distressed. Understanding the behavior in terms of needs (i.e., reflective functioning) allows parents to fulfil the needs underlying behaviors that would otherwise be meaningless. In turn, a caregiver with this capacity for understanding can enjoy more positive interactions with his or her child and enjoy a higher quality relationship with him or her, and as a consequence, derive more satisfaction as a parent. Results from the current study support this hypothesis; that is, reflective functioning was related to greater involvement and communication with the child, more positive discipline practices, and parent satisfaction, all of which reflect the quality of parent–child relationship, a significant contributor to children's attachment security.

Interestingly, the more certain a caregiver felt about his or her child's mental states, the more positive involvement and communication with the child, as well as more positive discipline practices reported. The developers of the PRFQ, however, would suggest that a greater inability to acknowledge the opaqueness of children's mental states—as indicated by greater certainty—would not be related to more positive parenting practices, as an understanding that children's mental states are not always readily apparent should help parents troubleshoot when caregivers are uncertain (Luyten et al. 2009). It could be the case that participants in the current sample overestimated their knowledge of their children's mental states, or were reporting in a self-serving way; that is, caregivers may have responded that they were usually certain about their children's mental states to feel better about themselves as a parent. On the other hand, it could be that caregivers are more certain as a result of increased involvement and communication with their child. More research is needed to understand the relationship between a caregiver's certainty of mental states and its influence on parenting practices.

Given its influence on parenting practices, reflective functioning provides a key target for interventions that aim to improve parent–child relationships, such as those programs that are recommended, and often mandated, to parents involved with child welfare systems (Berlin et al. 2008; Powell et al. 2013; Sadler et al. 2006; Slade 2006; Suchman et al. 2008). Several interventions currently have an explicit focus on enhancing caregivers' capacity for reflective functioning, including the Circle of Security Intervention (COS; Powell et al. 2013), Minding the Baby (MTB; Sadler et al. 2006), and the Mothers and Toddlers Program (MTP; Suchman et al. 2008), to name a few. For example, the COS is a 20-week, group-based program that utilizes video feedback and a graphic depicting children's

basic needs to teach parents attachment theory (Cooper et al. 2005; Powell et al. 2013). By teaching parents about children's basic needs for both proximity and exploration, the program aims to enhance awareness of the link between children's internal experiences and their attachment behaviors, and thus increase caregivers' sensitive responding. In other words, the program aims to enhance caregiver reflective functioning by increasing caregivers' focus on children's mental states, as well as their own, when interpreting their children's behavior. The findings from the present study provide support for the use of intervention frameworks that target caregiver reflective functioning with families to enhance parent–child relationship quality, particularly among caregivers with a limited capacity for reflective functioning initially, as can be the case with those who have histories of abuse and neglect or may be involved with child welfare systems for alleged child maltreatment (Berthelot et al. 2015).

The present study entailed several limitations. Since all assessments relied on participants' self-report of current relationships, behaviors, parenting practices and capacities, and past experiences, method bias is a concern (Podsakoff et al. 2003). For example, responses may have been biased by current mood and inaccurate memory. Indeed, significant associations between depression and multiple outcome variables were detected, such as parental rejection, attachment anxiety and avoidance, parental support, parent–child communication, limit setting, and support of autonomy. However, it is not known whether depressive symptoms influenced responding or if depression was indeed related to the behavior and parenting practices on which they were reporting. Moreover, social desirability may evoke caregivers to report that their current parenting is more optimal than it is in reality. It could be that parents are reporting they engage in more supportive and positive parenting practices than may be the case. However, the Social Desirability subscale of the PCRI did not show evidence that any parents were responding in a manner to yield a better impression of themselves as caregivers. Nevertheless, associations among variables may have been overestimated and should be interpreted with some caution. Ultimately, observational methods would have been more desirable, and thus, should be used instead of, or incorporated with, self-report measures in the future.

This study used a new, self-report measure of reflective functioning that has rarely been used in research. As such, it is still in the early phases of establishment as a reliable and valid measure. Nonetheless, recent research found that reflective functioning as measured by the PRFQ was related to the time mothers would persist in trying to soothe a simulated infant in distress (Rutherford et al. 2013, 2015). Specifically, mothers who had greater interest and curiosity in mental states exhibited more tolerance for the simulated infant's distress (a likely contributor to parent-infant relationship quality), but not distress in general, suggesting that the measure is tapping into what it purports to. Moreover, the results of the current study detected significant relationships between the measure's subscales and all indicators of parent–child relationship quality in the direction one would expect if it is measuring what it is intended to measure (i.e., the caregiver's capacity to mentalize about children's internal experiences). Therefore, this study helps endorse the potential of this new measure for clinical and research settings, which is beneficial empirically as it is much easier and cheaper to administer than existing methods to assess reflective functioning. Still, future research will benefit from the use of interviews coded for reflective functioning to corroborate the use of self-report measures. Moreover, because participants' reports may not accurately represent actual behavior, it will be essential that future studies examining the association between reflective functioning and parent–child relationships utilize observational methods to validate these findings and the use of self-report measures of reflective functioning.

A final limitation is that substantially more mothers participated and those that did were primarily from low-income families, reducing the representativeness of the sample of parents. Only 15 fathers were included in the sample compared to 64 mothers, and thus, caution should be exercised when generalizing results to fathers.

The addition of the reflective functioning subscales resulted in significant and often large, substantive additions in explained variability. The importance of reflective functioning to the parent–child relationship was not surprising based on current theorizing and literature (Fonagy and Target 2005; Slade et al. 2005), but the strength with which it was predictive of each aspect of the parent–child relationship was striking, even in spite of method bias (i.e., all measures were self-report). Caregivers who had a greater capacity to keep their child in mind reported greater communication and involvement with their child, practiced more positive discipline strategies, and experienced more satisfaction in their role as a parent. Accordingly, this study helps support the significant relationship between reflective functioning and the quality of parent–child relationships.

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