# Parental Reflective Functioning:
# Theory, Research, and Clinical Applications

*Patrick Luyten*[a,b]*, Liesbet Nijssens*[a]*, Peter Fonagy*[b]*, and Linda C. Mayes*[c]

[a] Faculty of Psychology and Educational Sciences, KU Leuven, Belgium

[b] Research Department of Clinical, Educational and Health Psychology, University College London, London, UK

[c] Yale Child Study Center, Yale University, New Haven, CT, USA

**Submitted to *Psychoanalytic Study of the Child***

**Abstract**

This paper reviews recent theoretical, empirical, and clinical work related to parental reflective functioning (PRF) or parental mentalizing. PRF refers to the capacity of the parent to envision his/her child as being motivated by internal mental states such as feelings, wishes, and desires, and to be able to reflect upon his/her own internal mental experiences and how they are shaped and changed by interactions with the child. This paper first briefly discuss the historical and theoretical background of this concept and its purported role in child development, with a focus on the development of child attachment, affect regulation, and mentalizing. It then reviews recent thinking and research in four areas: (a) the neurobiology underlying PRF, (b) the multidimensionality of PRF, (c) the relationship between PRF and trauma, and (d) the broader relevance of attention to internal mental states for the development of epistemic trust as the basis of an evolutionary inbuilt capacity for learning from and within social communication. It closes with a brief review of the background of and empirical evidence supporting interventions rooted in theoretical considerations concerning the importance of PRF, as well as suggesting directions for future research and clinical practice.

***Keywords:*** mentalizing, reflective functioning, social cognition, attachment, trauma.

This paper provides a review and update of recent theoretical, empirical, and clinical work on the concept of parental reflective functioning (PRF) or parental mentalizing. Broadly speaking, PRF refers to the parent's/caregiver's capacity to envision his/her child as motivated by internal mental states such as feelings, wishes, and desires. It also entails the caregiver's capacity to reflect upon his/her own internal mental experiences and how they are shaped by interactions with the child, how they may change as a result of these interactions and the passing of time, and how they may influence the caregiver's thoughts, feelings, and behaviors toward his/her child (Ensink & Mayes, 2010; Sharp & Fonagy, 2008; Slade, 2005). PRF is thought to play an important role in the development of the child's own capacity for reflective functioning (RF), which in turn is thought to foster emotion regulation and effortful control and, ultimately, the development of a sense of autonomy and agency, as well as the capacity to develop secure attachment relationships (Cooper & Redfern, 2016; Ensink & Mayes, 2010; Slade, 2005). Recent theoretical developments in this area have emphasized the importance of a caregiving environment marked by attention to internal mental states to the development of *epistemic trust* (Fonagy, Luyten, & Allison, 2015), the basis of an evolutionary inbuilt capacity for social learning and communication that is associated with resilience and *salutogenesis*, that is, the capacity to benefit from the positive influence of others (Antonovsky & Sagy, 1986).

This paper first describes the origins of the concept of PRF and then goes on to describe recent theoretical and empirical developments in this area, including research concerning the neurobiological basis of PRF. It closes with an overview of clinical applications of the concept.

## Origins of the Concept of Parental Reflective Functioning

RF is the capacity "to hold others' minds in mind" (Allen, Fonagy, & Bateman, 2008; Fonagy, Gergely, Jurist, & Target, 2002; Luyten, Fonagy, Lowyck, & Vermote, 2012b). RF,

or *mentalizing*, refers to the capacity to think and feel about thinking and feeling, to look at oneself from the outside and at others from the inside. It is a central part of people's ability to navigate their complex social world, as it renders others (and oneself) understandable and predictable (Luyten et al., 2012b). Various psychological disorders demonstrate the unfortunate and sometimes devastating consequences of temporary or chronic impairments in this capacity for an individual's intrapsychic and relational functioning. These range from autism spectrum disorder and psychosis (Brent, Holt, Keshavan, Seidman, & Fonagy, 2014; Kovacs, Teglas, & Endress, 2010), both of which are marked by gross deficits in this capacity, to individuals with personality disorder, who tend to show considerable imbalances between different mentalizing capacities (see later) (Bateman & Fonagy, 2004, 2008), to eating disorders (Skårderud, 2007a, 2007b), and depression, which are typically characterized by less marked impairments in mentalizing, although a substantial number of these patients may also show a considerable imbalance in mentalizing capacities (Lemma, Target, & Fonagy, 2011; Luyten, Fonagy, Lemma, & Target, 2012a).

Studies suggest that RF first develops in the context of attachment relationships, and that the parent's level of PRF may play an important role in this regard, at least in the early stages of development (Ensink & Mayes, 2010; Fonagy, Gergely, & Target, 2007; Sharp & Fonagy, 2008; Slade, 2005). Later on, as is described in more detail below, other influences, including peers, teachers, mentors, and the broader sociocultural context, become more important in determining the development of this capacity.

In this context, the existence of a "loose coupling" among PRF, parental secure attachment, and parental emotional availability is assumed (Fonagy et al., 2007; Fonagy, Luyten, & Strathearn, 2011). This means that parents with secure attachment and high levels of emotional availability do not necessarily have high levels of PRF (Sharp & Fonagy, 2008). Indeed, among these parents, there is probably a considerable range in terms of capacity to

understand their child in terms of intentional emotional states, and to reflect upon the interaction between their own feelings, thoughts, and behaviors, and those of their child.

By contrast, caregivers with high levels of insecure attachment typically have impairments in RF, particularly in emotionally intense relationship contexts, such as in relation to their child and parenthood issues and their impact on their partner relationship and life more generally. When this happens, modes of thinking about subjectivity—so-called *prementalizing* modes—tend to emerge and start to dominate their experiences of their own subjectivity and that of their child (Fonagy et al., 2010). This is expressed in at least three ways, which often tend to overlap and co-occur (Ensink & Mayes, 2010; Leckman, Feldman, Swain, & Mayes, 2007; Sadler, Slade, & Mayes, 2006; Suchman, Decoste, McMahon, Rounsaville, & Mayes, 2011). First, parents with insecure attachment histories often show a lack of genuine interest and curiosity in their infant's mental states; this is often associated with an inability enter into the internal subjective world of their child, in particular the "pretend" or "as if" mode that is typical of much of the subjective experience of young children.

Second, these parents are often either overly certain about the mental states of their children, which in the extreme tends to lead to *hypermentalizing*, which can be quite intrusive. Conversely, they may show marked *hypomentalizing*, or even a combination of both hypermentalizing and hypomentalizing. Hence, there is either little recognition of the opacity of mental states, or mental states are felt to be completely opaque or even totally absent ("My child is too young to feel or think anything"). Often, this is associated with a lack of recognition of developmental influences on mental states (i.e., realization that the child's mental states may change over time) or a misguided understanding of developmental influences (i.e., attributing improbable mental states to children, or wrongly assuming that babies, for instance, have no emotional world). A failure to recognize the opacity of mental

states may thus be expressed as *deficient* (i.e., limited, concrete, and stimulus-bound) or *excessive* (i.e., RF that goes far beyond what is probable). It is easy to see how both hypomentalizing and hypermentalizing may go together with a lack of genuine interest and curiosity in the infant's mental states.

Third, parents with an insecure attachment history often have a tendency to lapse into prementalizing ways of thinking about the subjectivity of their child that are typically characterized by distorted and often malevolent attributions. They can develop very improbable accounts of the behaviors of their child that have little or no relationship with the child's real internal mental states (extreme *pretend mode* functioning), often typical of hypermentalizing. Alternatively, they can become overly certain about what their infant feels, thinks, or needs, which is typical of hypomentalizing. Or they may revert to a purely *teleological* mode of experiencing subjectivity, where only objective, goal-directed behaviors are considered to be able to meaningfully influence mental states (e.g., "When my child has food and shelter, he will be OK"; "I'm sure that illness she had when she was 2 has done something to her brain").

Studies have amply shown an association between PRF and the development of secure attachment in their children, as well as the development of their children's capacity for RF (Sharp & Fonagy, 2008). Fonagy, Steele, Steele, Moran, and Higgitt (1991) were among the first to find evidence for such a link in a study using the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) in a sample of 100 first-time mothers and 100 first-time fathers. These parents' AAI responses were coded for RF using the Reflective Functioning Scale (RFS; Fonagy, Target, Steele, & Steele, 1998). The RFS allows raters to code parents' narratives about their own developmental history with regard to (a) awareness of mental states, (b) explicit attempts to tease out mental states underlying behavior, (c) recognition of the developmental aspects of mental states, and (d) recognition of mental states

in relation to the interviewer. Parents' AAIs were made before the birth of their child. At 12 and 18 months after birth, child attachment was measured using the Strange Situation Procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978). This study showed that parents' prenatal RF was associated with infant secure attachment in the SSP, even when verbal IQ was controlled for. Security of attachment in infancy, in turn, was associated with better performance on a cognitive-emotion task when children were age 5.5 years.

The correlation between general RF, as assessed in this study, and child-specific PRF is not expected to be perfect. In fact, Steele et al. (2008) found only a modest correlation ($r$ = .50) between general RF as scored on the AAI and PRF scored on the Parent Development Interview (PDI; Slade, Aber, Berger, Bresgi, & Kaplan, 2004). It is of crucial importance to realize that RF is a dynamic, developmental, and bidirectional capacity that may be to a large extent context- and relationship-specific. This may explain why parents may show very different levels of mentalizing with regard to their different children, and why, much as in genetic research, at least within the confines of an average expectable environment, it may be primarily child features such as temperament, and contextual features such as early trauma, that may drive these interactions between the child, environmental factors, and PRF. A study by Bernier and Dozier (2003) in 6- to 30-month-old children in foster care may be a case in point. In this study, high levels of PRF appeared to be associated with foster parents' nonautonomous attachment classifications assessed with the AAI, and with insecure attachment in children in the SSP. Although this is perhaps surprising at first glance, if child effects drive interactions between parents and their children, and thus also the development of PRF over time, insecurely attached children may simply challenge their foster parent's capacity for PRF, which may in extreme cases lead to a tendency toward hypermentalizing in foster parents—something that has been clinically observed quite frequently. Yet, high levels of RF in foster (and adoptive) parents, despite their children

being classified as insecurely attached, may also be a tribute to these parents' capacity for resilience, that is, their ability to continue to keep their mentalizing capacities online when most parents would have simply given up. In fact, elsewhere the authors have made a case for a close relationship between RF and resilience (Fonagy & Luyten, 2009). Such evocative person–environment relationships warn against a simplistic and linear understanding of the relationship between PRF and child development (Luyten, 2015).

Despite the likely complexity of the relationship between PRF and child development, studies assessing PRF specifically have generally found a quite robust association with the development of secure attachment and mentalizing capacities in offspring (Grienenberger, Kelly, & Slade, 2005; Meins, Fernyhough, Fradley, & Tuckey, 2001; Slade, Grienenberger, Bernbach, Levy, & Locker, 2005a). Yet, as noted, future studies may uncover more complex relationships, particularly in parents of children who have increased risk for developmental problems and psychopathology, or in parents who show high levels of resilience.

For instance, in a series of ground-breaking studies, Meins and colleagues reported that PRF rated on the basis of the use of mind-related comments by mothers during mother–infant play (labeled "maternal mind-mindedness"; MMM) predicted attachment security in their infants as assessed with the SSP at 45 and 48 months follow-up (Meins et al., 2001; Meins et al., 2002), as well as their children's social-cognitive performance at 55 months (Meins et al., 2003), and effortful control at 18 and 26 months follow-up (Bernier, Carlson, & Whipple, 2010) (see also Arnott & Meins, 2007; Meins et al., 2012). Importantly, associations between MMM and child attachment, for instance, were found only for appropriate mind-related comments, and not for inappropriate or so-called nonattuned comments. Such inappropriate, nonattuned mind-related comments probably reflect hypermentalizing or pseudomentalizing (Luyten et al., 2012b). Similarly, in a study of 354 mothers of 7–11-year-old children, Sharp, Fonagy, and Goodyer (2006) found that children

of mothers who were "good enough" at guessing the response of their children in distressing peer-related scenarios were effective in social-cognitive reasoning during these scenarios, and had better levels of psychosocial adjustment. Interestingly, children of mothers with either very low or very high levels of accuracy were less effective in social-cognitive reasoning.

## Recent Developments

This section discusses four recent developments in the conceptualization and research on PRF that have taken the field forward in important ways in the past few years. First, it will discuss emerging research evidence concerning the developmental neurobiology of PRF in relation to attachment and affiliative behavior more generally. Second, it describes work that suggests that PRF is indeed a multidimensional construct rather than a unitary one. This is further substantiated by research suggesting the importance of considering PRF with regard to trauma. Finally, it discusses the relationship between the capacity for epistemic trust and PRF, which will lead to a consideration of the role of broader environmental factors in fostering the capacity for RF in general and PRF in particular.

### Developmental Neurobiology of Parental Reflective Functioning

A considerable body of research in animals and humans has documented the neurobiology underlying the capacity for caregiving/bonding and the closely associated capacity for PRF (Bartz, Zaki, Bolger, & Ochsner, 2011b; Gordon, Zagoory-Sharon, Leckman, & Feldman, 2010; Gunnar & Quevedo, 2007; Insel & Young, 2001) (see also van Mohr et al., this issue). Neural circuits that are activated in caregivers when interacting with their child involve a mesocorticolimbic dopaminergic reward circuit and hypothalamic-midbrain-limbic-paralimbic-cortical circuits (Fonagy et al., 2011; Rutherford, Williams, Moy, Mayes, & Johns, 2011; Swain, Lorberbaum, Kose, & Strathearn, 2007).

Important biological mediators in the former system are dopamine and neuropeptides such as oxytocin and vasopressin, which have been shown to play a key role in various types of affiliative behaviors, including sexual behavior, pair-bonding, and caregiving (Insel & Young, 2001; Neumann, 2008). Opioids and cannabinoids probably play a key role in regulating responses to separation from attachment figures (Panksepp & Watt, 2011). Neuropeptides such as oxytocin are also involved in mentalizing (Feldman, Weller, Zagoory-Sharon, & Levine, 2007), but also play a key role in regulating the behavioral and neuroendocrinological stress response (Neumann, 2008). Hence, at least in securely attached individuals, affiliative behavior is rewarding, which may explain its "addictive" nature (Insel & Young, 2001; Neumann, 2008); it reduces stress and fosters mentalizing, resulting in "broaden and build" (Fredrickson, 2001) cycles associated with attachment security and robust mentalizing (Fonagy & Luyten, 2009; Mikulincer & Shaver, 2007). Oxytocin also fosters explorative behavior (Insel & Young, 2001; Neumann, 2008) and thus links positive affiliative behaviors to feelings of autonomy and agency (Luyten & Blatt, 2013). Interestingly, in this context neuroscience suggests that the neural circuits involved in reflecting on the self and reflecting on others overlap, both involving cortical midline structures including the medial prefrontal cortex (PFC), posterior cingulate cortex, precuneus, and temporoparietal junction (TPJ) (Lieberman, 2007; Lombardo, Chakrabarti, Bullmore, Consortium, & Baron-Cohen, 2011; Lombardo et al., 2010; for a meta-analysis, see Northoff et al., 2006), suggesting that the capacity for RF about the self and about others are closely related. However, this does not preclude the possibility of self–other confusion and marked imbalances in mentalizing about the self and others; quite the contrary, in fact, as discussed later.

By contrast, for caregivers with insecure attachment histories, caregiving is not a rewarding experience, which, as discussed earlier, also gives rise to impairments and often

distortions in PRF. The neurobiology of these processes is increasingly understood. Strathearn and colleagues (Strathearn, Fonagy, Amico, & Montague, 2009; Strathearn, Li, Fonagy, & Montague, 2008), for instance, used the AAI to measure the attachment security of 30 first-time mothers before the birth of their child. When mothers viewed their own or other's infants' smiling or crying faces, 10 months after the birth of their child, mothers with secure attachment showed greater activation of brain systems associated with reward. In addition, they showed increases in peripheral oxytocin response when playing with their infant, and this increase was positively associated with brain activation in reward regions when viewing both their own infants' happy and sad faces. Insecure/dismissing mothers, by contrast, showed less activation in brain regions associated with the reward system, and at the same time showed greater insular activation when viewing their own infant's sad face. The insula has been associated with the processing of feelings of unfairness, pain, and disgust (see review by Montague & Lohrenz, 2007). For these mothers, interacting with their child was thus not only not a rewarding experience, but they also seemed to be unable to down-regulate negative feelings when viewing their infant in a sad state. It is possible that this triggered negative feelings related to their own developmental history—the so-called "ghost in the nursery" described by Fraiberg, Adelson, and Shapiro (1975)—impairing their capacity for genuine PRF. This is consistent with findings in individuals with an insecure attachment history that not only are they characterized by low endogenous levels of oxytocin, suggesting that attachment has little incentive value for them, but also that double-blind oxytocin administration tends to evoke negative feelings and memories as well as distrust in others (Bartz et al., 2011a; Bertsch, Schmidinger, Neumann, & Herpertz, 2013; Cyranowski et al., 2008; Stanley & Siever, 2010).

There is increasing evidence to suggest that there are important limits to the human capacity for RF and the rewarding nature of attachment relationships. For example, studies

have reported that, even in normal community individuals, double-blind oxytocin administration leads to increased levels of distrust, a hostile attribution bias, and decreased (instead of increased) cooperative behavior toward out-group members (Bartz et al., 2011b). If further replicated, these findings would emphasize how both attachment and (parental) mentalizing are mainly limited to close attachment figures and affiliative behavior. Trust toward others and for mentalizing about others outside this "intimate circle" appear to be quite challenging for most individuals, which sheds an interesting light on the limits of the human capacity for caring, empathy, and solidarity.

Within the general neural network associated with the activation of (parental) RF, different sub-networks can be delineated, each underpinned by relatively distinct aspects of (parental) mentalizing. Mentalizing is not a unitary capacity; this has important implications for conceptualizing the role of PRF and impairments in this capacity. Mentalizing can be seen as organized along four dimensions (Choi-Kain & Gunderson, 2008; Fonagy & Luyten, 2009; Luyten et al., 2012b; Meins et al., 2012): (a) automatic/fast/parallel versus controlled/slow/serial mentalizing; (b) mentalizing with regard to self or to others; (c) mentalizing based on external or internal features (e.g., facial expression, posture, and speech patterns, versus a direct focus on thoughts, feelings, and beliefs) of self and others; and (d) cognitive versus affective mentalizing (Fonagy & Luyten, 2009; Luyten et al., 2012b). Different features of mentalizing are thus dissociable, and "good" mentalizing is characterized by a relative balance between these dimensions, whereas psychopathology is about specific imbalances in mentalizing; different psychiatric problems seem to be characterized by different imbalances and resulting mentalizing profiles.[1]

[1] From this description, it is clear that mentalizing is an umbrella concept, which encompasses related constructs such as empathy, mindfulness, and Theory of Mind (ToM) (Choi-Kain & Gunderson, 2008). Empathy and ToM have originated from research traditions focusing on the capacity to mentalize about others. Mindfulness is more

The four dimensions underlying mentalizing seem to be underpinned by relatively distinct neurobiological systems (Luyten & Fonagy, 2015). Automatic mentalizing appears to involve, relatively speaking, greater activation of the amygdala, basal ganglia, ventromedial PFC, lateral temporal cortex (LTC), and dorsal anterior cingulate cortex (Satpute & Lieberman, 2006), brain areas that are primarily involved in threat detection and automatic modulation and processing of (social) information. Controlled mentalizing is more closely associated with the activation of the lateral and medial PFC, lateral and medial parietal cortices, medial temporal lobe, and rostral anterior cingulate cortex (Lieberman, 2007; Satpute & Lieberman, 2006; Uddin, Iacoboni, Lange, & Keenan, 2007). Developmentally, automatic mentalizing appears to be an inborn, prewired capacity in humans, and may be fairly well established by the beginning of the second year of life (Baillargeon, Scott, & He, 2010; Kovacs et al., 2010). More controlled mentalizing, by contrast, may be robust only in the fourth year of life (Carpendale & Lewis, 2006) or even later, perhaps after age 8 (Gweon, Dodell-Feder, Bedny, & Saxe, 2012); this is probably related to language acquisition (Beeghly & Cicchetti, 1994) and the development of effortful control (Fonagy & Luyten, 2009).

Stress or arousal inhibits controlled mentalizing while facilitating automatic mentalizing. This switch has been thought to serve a clear evolutionary function: faster, parallel, and automatic mentalizing has a clear survival value (Arnsten, Mathew, Ubriani, Taylor, & Li, 1999; Arnsten, 1998; Mayes, 2000, 2006). Yet, in the socially complex world, which often requires quite extensive "computational" power, reliance on automatic mentalizing is not always adaptive, as any parent confronted with a difficult baby, toddler, or

---

about the self (e.g., the capacity to attend to one's own internal mental states). Like empathy, mindfulness also primarily focuses on affective components of mentalizing, while ToM was at least initially considered to be about belief-desire reasoning, a more cognitive capacity.

adolescent can testify. This is particularly the case as automatic mentalizing tends to be dominated by nonreflective and biased assumptions about the self and others. Interestingly, again, research suggests that attachment security is generally related to the capacity to keep the controlled mentalizing system "online" for longer. A history of insecure attachment appears to have the opposite effect (Luyten & Fonagy, 2015).

The distinction between *internally focused* and *externally focused* mentalizing is particularly important from a developmental point of view. Mentalizing based on external features of self and others involves a lateral frontotemporoparietal network (e.g., posterior superior temporal sulcus [pSTS] and temporal poles), which largely relies on fast and automatic processes. The medial frontoparietal network (e.g., medial PFC), which is involved in more serial and controlled reflection (Lieberman, 2007), is primarily activated when there is a direct focus on internal mental states.

This may explain, at least in part, why many parents may struggle to make sense of the internal world of their babies, as they have to rely on external features, such as facial expression and gestures, before the infant is able to express internal mental states through language (Beebe et al., 2008; Beebe et al., 2007), and integrate this information with more controlled, reflective processes. This may carry the risk of self–other confusion, malevolent attributions, or a tendency to "give up" trying to figure out what their infant wants or needs. For these parents, things often change dramatically when their child acquires language and they can more fully rely on more internally based mentalizing to build a model of the mind of their child (Sharp & Fonagy, 2008). Some parents, however, seem to have the opposite problem, and are less able to build more complex models of the mind of their infant once it grows older. Parent–infant interventions using video feedback (Beebe et al., 2008; Slade, 2005) might be particularly helpful in this context, as they foster parents' ability to integrate

externally and internally directed mentalizing in the presence of a therapist who actively helps them to develop this capacity in relation to their own child.

With regard to the self–other dimension, neuroscienctific studies have consistently suggested that a shared network, consisting of the medial PFC, temporal poles, and the pSTS/TPJ in the LTC (Frith & Frith, 2006; Lieberman, 2007; Uddin et al., 2007; Van Overwalle, 2009; Van Overwalle & Baetens, 2009), is activated whenever people reflect on themselves and others. This overlap in neural circuits may not only help to explain the common difficulty in developing a solid and stable sense of self (which can be observed in a more pronounced form in many types of psychopathology), but also the tendency to confuse one's own mental states with those of others and vice versa, and thus to misunderstand and misread each other.

This tendency, which seems to lie at the core of many problems between parents and their infants, is facilitated by the fact that two neural systems appear to be involved in how people get to know their own mental states and those of others. The first system, called a *shared representation* (SR) system by Ripoll et al. Ripoll, Snyder, Steele, and Siever (2013), largely relies on automatic empathic processing of others' mental states, through the activation of a mirror-neuron system to understand actions of others and the visceromotor system to understand emotions in others (Lombardo et al., 2010). The SR system involves the amygdala, inferior frontal gyrus, inferior parietal lobule (both of these zones are rich in mirror neurons; Bernhardt & Singer, 2012; Van Overwalle & Baetens, 2009), anterior insula, and (dorsal) anterior cingulate cortex (activated in both observed and felt pain). Although the SR system helps people to understand how others feel and think, there is a constant risk of emotional contagion or of confusion of the mental states of self and others ("Is it me who is feeling sad, or the other person?"). Hence, there is the need for a more serial, controlled *mental state attribution* (MSA) system, which seems to have evolved more recently, and

which relies more on symbolic and abstract processing. The MSA system engages a cortical midline system consisting of the ventromedial and dorsomedial PFC, the TPJ, and the medial temporal pole (Lieberman, 2007; Uddin et al., 2007). Particularly for parents of young infants, it is often difficult to strike a balance between the SR and MSA systems in the absence of language as a means of communication ("Is she now really calm and asleep, or is she so ill that she can't move any longer and should we perhaps take her to see a doctor?"). Who is feeling what? Both traditional (Klein, 1975; Winnicott, 1956) and contemporary (Leckman et al., 2007; Leckman et al., 1999) psychodynamic thinking have amply demonstrated the level of preoccupation parents often have with their infant, which increases the risk of self–other conflation and the obsessive defense mechanisms and coping strategies this may activate. However, in later developmental stages there remains a constant threat of conflating one's own experience with that of one's child ("There is no way she is going to wear that dress to go out. What is she thinking?"). Both excessive mentalizing and hypomentalizing on the part of the parent may follow, which often tend to spiral out of control as poor mentalizing by the parent stimulates similarly poor mentalizing in the child, leading to vicious cycles characterized by increasing arousal and resulting lapses in mentalizing, miscommunication, and conflict.

Mentalizing, finally, is about the integration of *cognition* and *affect*. Again, finding a good balance between the two is often challenging, particularly for parents. Whereas some parents may have a tendency to be overly cognitive and rational about parenting and their child, and may be unable to attune themselves to the emotional world of their child, other parents may be easily overwhelmed by affect. These types of imbalance may be variously experienced by the child as confusing, overly distant, uncaring, or intrusive. However, what these experiences have in common is that the child does not feel understood, validated, and recognized as an agent, as someone with their own thoughts, feelings, wishes, and desires.

This is often an extremely painful experience for children, and may be at the core of the experience of emotional abuse and neglect.

More cognitive mentalizing engages several areas in the PFC, involving more abstract, serial, and controlled processes. In contrast, mentalizing affect primarily engages the ventromedial PFC, which thus may play a crucial role in integrating cognitive knowledge, such as belief-desire reasoning (Rochat & Striano, 1999), with affective input.

## The Multidimensional Nature of Parental Reflective Functioning

Narrative-based measures of (parental) RF, such as the RFS (Fonagy et al., 1998) as scored on the AAI (George et al., 1985) or the PDI (Slade et al., 2004), and observer-rated measures of this concept, such as the MMM scale (Meins & Fernyhough, 2006), yield a single score of (parental) RF. However, it quickly became clear that such a single overall score fails to capture the complexity and multidimensionality of (parental) RF. Taubner et al. (2013), for instance, showed that each question probing specifically for RF in the AAI (i.e., demand questions) is incrementally predictive of the total RF score. With regard to PRF, Meins and colleagues (Arnott & Meins, 2007; Meins et al., 2012) showed the importance of differentiation between appropriate mind-related comments made by mothers while playing with their infant and inappropriate, nonattuned mind-related comments. While the former type of comments were longitudinally related to secure attachment, the latter were not.

Work using the Parental Reflective Functioning Questionnaire (PRFQ), a brief and easy-to-administer screening tool for assessing PRF, provides further evidence for the complexity and multidimensionality of PRF (Luyten et al., 2009). The PRFQ is an 18-item self-report questionnaire primarily intended for use with parents of children aged 0–5 years. Parents are asked to score items tapping into various aspects of PRF on a 7-point Likert scale,

Based on both exploratory and confirmatory factor analyses, three theoretically consistent and clinically meaningful factors have been identified, each comprising six items (Luyten, Mayes, Nijssens, & Fonagy, 2016): (1) *prementalizing modes* (PM), which assesses a nonmentalizing stance that is often characteristic of parents with (severe) impairments in PRF (e.g., "My child cries around strangers to embarrass me"). Items reflect the repudiation of or defense against mentalization (i.e., the inability to enter into the subjective world of the child), characterized by the tendency to make maladaptive and malevolent attributions about their child; (2) *certainty of mental states* (CMS), which assesses the parent's ability to recognize the opacity of mental states. High scores on this scale reflect being overly certain (i.e., no recognition of the opacity of mental states, characterized by intrusive mentalizing or hypermentalizing), while low scores reflect a stance characterized by being overly uncertain (i.e., an almost complete lack of certainty about the child's mind, characterized by hypomentalizing) about the mental states of the child (e.g., "I always know what my child wants"); (3) *interest and curiosity in mental states* (IC), with items that reflect an active curiosity about and willingness to understand the mental states of the child (e.g., "I like to think about the reasons behind the way my child behaves and feels"). Very high levels of IC may reflect intrusive hypermentalizing, whereas very low levels of IC may reflect an absence of interest in the child's mental states.

Luyten et al. (2016) reported three studies that provided initial evidence for the reliability and validity of the PRFQ as a brief multidimensional measure of PRF. The three subscales had good internal consistency, were not or only modestly related to demographic features, and were generally related in theoretically expected ways to parental attachment dimensions, emotional availability, parenting stress, and infant attachment status in the SSP.

Rutherford and colleagues (Rutherford, Booth, Luyten, Bridgett, & Mayes, 2015; Rutherford, Goldberg, Luyten, Bridgett, & Mayes, 2013) investigated the associations

between various dimensions of the PRF dimensions as measured by the PRFQ and different measures of distress tolerance. In a pilot study (Rutherford et al., 2013), 21 mothers with children up to 2 years of age were asked to soothe a lifelike baby simulator (BSIM) that was inconsolable, crying for a fixed time period unless the mother chose to stop the interaction. Results showed that higher levels of IC were related to increased tolerance of infant distress (i.e., longer persistence times with the BSIM). Indeed, IC, or the willingness of the parent to reflect on and understand the child's expressed behavior in terms of mental states, is thought to help the parent in regulating and interpreting their own mental states when faced with an dysregulated, distressed infant, and subsequently to adequately respond to the infant's affective signals (Slade, 2005). Interestingly, in this study, PRF was not related to distress tolerance more generally (based on persistence times on a non-parent distress tolerance task, the PASAT-C; Lejuez, Kahler, & Brown, 2003), suggesting that PRF may reflect specific persistence behaviors in parenting contexts and not persistence capacities per se (Rutherford et al., 2013). In a second study, Rutherford et al. (2015) aimed to replicate and extend the findings from the pilot study in a larger sample of 59 mothers with infants aged 3–10 months, using multiple measures of distress tolerance and an extensive examination of peripheral physiology (i.e., blood pressure and heart rate) before and after the BSIM interaction. PRF was investigated in relation to a self-report measure of distress tolerance (the Distress Tolerance Scale` (DTS), which assesses an individual's perception of their (emotional) distress tolerance; Simons & Gaher, 2005) as well as two behavioral distress tolerance tasks (the BSIM and the PASAT-C). Results showed that in this sample, PM was negatively associated with tolerance of distress on the self-report measure (DTS) and with the parenting-related behavioral measure (BSIM), but not with the general behavioral measure (PASAT-C) of distress tolerance. Higher levels of PM were associated with a decrease in the mother's ability to tolerate distress. Interestingly, while the earlier study of this group in older infants

found that IC was associated with distress tolerance (Rutherford et al., 2013), the latter study suggested the importance of PM (Rutherford et al., 2015). It is possible that the relationship between PRF and distress tolerance, and the impact of the different dimensions of PRF, might vary across the postpartum period. Specifically, parents of infants might be particularly prone to misreading and misinterpreting their infant's mental states, which may be associated with less distress tolerance (Rutherford et al., 2015). When children are older, the lack of genuine and interest and curiosity in the child's mental states may give rise to more distress tolerance. Yet, more research is needed to replicate these findings, particularly given the small sample size of the first study.

Nijssens and colleagues (Nijssens, Bleys, Casalin, Vliegen, & Luyten, 2016a; Nijssens, Vliegen, & Luyten, 2016b) investigated the role of PRF in the relationship between parental attachment dimensions (i.e., attachment anxiety and avoidance) and both parent and child features in a 1-year longitudinal study of 53 biological first-time parental couples and their 8- to 12-month-old infants. The first study (Nijssens et al., 2016a) showed that PM mediated as well as moderated the relationship between attachment anxiety and avoidance as measured by the Experiences in Close Relationships Questionnaire Revised (ECR-R; Fraley, Waller, & Brennan, 2000) and parenting stress as measured by the four parent subscales of the Parenting Stress Index (PSI; Abidin, 1995), that is, feeling competent as a parent, role restrictions associated with being a parent, feelings of social isolation, and quality of the marital relationship. More specifically, PM fully mediated the relationship between attachment anxiety and the PSI subscales quality of marital relationship, role restrictions, and social isolation. Further, PM partially mediated the relationship between both parental attachment anxiety and avoidance and the fourth dimension of parental stress, parental competence. In addition, PM moderated the relationship between attachment anxiety and avoidance and the marital relationship quality subscale of the PSI. In both mothers and

fathers, PM moderated the relationship between attachment avoidance and the marital relationship quality subscale, with low levels of attachment avoidance leading to lower marital relationship stress, but only at low levels of PM, and these results were different for mothers and fathers. With regard to attachment anxiety, gender differences appeared: lower levels of maternal attachment anxiety were negatively related to the marital relationship quality subscale, but only at low levels of PM; in contrast, higher levels of paternal attachment anxiety were positively associated with higher marital relationship stress, and lower levels of attachment anxiety with lower marital relationship stress, but only at high levels of PM.

The second study (Nijssens et al., 2016b) also revealed mediation and moderation effects of PM in the relationship between parental attachment and the child's social-emotional development as assessed as assessed by the Ages and Stages Questionnaires (ASQ; Bricker & Squires, 1999) and the Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2002). More specifically, PM explained in part the relationship between parental attachment dimensions and child social-emotional competences and problems. It also moderated the relationship between parental attachment dimensions and child social-emotional capacities, in that low levels of attachment anxiety and avoidance were associated with higher child social-emotional skills, but only at low levels of PM. These results indicate that the PM dimension of PRF in particular seems to be related to higher levels of parenting stress and lower levels of child social-emotional development, even in samples of normally developing children.

Taken together, these findings (Arnott & Meins, 2007; Berthelot et al., 2015; Huth-Bocks, Muzik, Beeghly, Earls, & Stacks, 2014; Slade et al., 2005a) provide some preliminary evidence for PRF being a multidimensional construct, with each of the dimensions tapping into different features of parental psychological functioning.

Recently, a prenatal version of the PRFQ (the P-PRFQ) was developed to assess PRF in the peripartum period (Pajulo et al., 2015). Both exploratory and confirmatory factor analyses yielded three dimensions of PRF, namely: (1) recognition of the opacity of mental states; (2) reflecting on the fetus; and (3) acknowledgment of the dynamic nature of mental states. The reliability and validity of the P-PRFQ was investigated in a large cohort of 600 couples as part of the FinnBrain Birth Cohort Study. Results showed that prenatal PRF as assessed with the total P-PRFQ scale, as well as the separate dimensions of the P-PRFQ, were highly associated with interview-based prenatal PRF as coded on the Pregnancy Interview (Slade, Patterson, & Miller, 2007).

**Trauma-Specific Parental ReflectiveFunctioning**

Given the growing evidence that PRF is a multidimensional construct, with different dimensions tapping into different developmental outcomes, and different (interpersonal) situations eliciting different aspects of RF or PRF, it is important to investigate the role of RF and PRF in specific contexts and within different samples to shed further light on the intergenerational transmission of psychopathology. In this regard, the transition to parenthood is thought to be an important period. This transition requires a reorganization of the parent's identity, including gaining a new balance between autonomy and dependency, which can be accompanied by a considerable amount of distress (Blatt, 2008). In addition, this transitional phase is thought to remind the parent of his/her own childhood experiences, and reactivates the representations of his/her own parents (Fraiberg et al., 1975). Especially for parents with a history of childhood abuse and neglect (CA&N), this can be a harsh and stressful experience, leaving them at risk for the intergenerational transmission of trauma and attachment insecurities (Madigan et al., 2006; van Ijzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). Indeed, recent research has shown high concordance (70%) in attachment

classifications among mothers with CA&N and their infants, with the majority of these infants being classified as insecure (83%) and almost half as disorganized (44%) (Berthelot et al., 2015). However, CA&N is not necessarily associated with insecure attachment or the development of psychopathology in the parent (Ensink, Berthelot, Bernazzani, Normandin, & Fonagy, 2014; Stovall-McClough, Cloitre, & McClough, 2008). RF could be a key construct explaining the difference between adults with CA&N who develop insecure attachment and/or psychopathology in reaction to early maltreatment, and those who do not. Furthermore, impairments in the parent's RF—and particularly PRF—are thought to be important and useful indicators of risk for the infant's developing attachment style (Arnott & Meins, 2007; Fonagy et al., 1991; Fonagy & Target, 2005; Grienenberger et al., 2005; Meins, 2013; Meins et al., 2001; Slade et al., 2005a), and more specifically for the intergenerational transmission of trauma and attachment (Katznelson, 2014). Indeed, parental attachment security has been shown to be related to PRF in mothers who suffered from deprivation and trauma in early life. For example, Huth-Bocks et al. (2014) showed that attachment security as assessed by the Attachment Script Assessment (Waters & Rodrigues-Doolabh, 2004) was positively associated with PRF as assessed by the PDI in a sample of 115 mothers who were oversampled for CA&N. Schechter et al. (2005) showed that balanced classifications of mental representations (i.e., secure attachment) were significantly related to PRF, both measured on the Working Model of the Child Interview (WMCI; Zeanah et al., 1993), in 41 mothers with a history of violent trauma. In turn, RF and PRF in maltreated mothers have been shown to be related to infant attachment. For example, higher levels of RF as coded by the RFS on the AAI in mothers with CA&N were associated with attachment security in their children as evaluated by the SSP, whereas low levels of RF were associated with infant attachment insecurity (Fonagy, 1993; Fonagy, Steele, Steele, Higgitt, & Target, 1994). Similarly, Stacks et al. (2014) found that, among a socioeconomically diverse sample of 83

mothers oversampled for CA&N, PRF as assessed with the PDI was associated with secure infant attachment as evaluated by the SSP, and this relationship was mediated by parental sensitivity as coded by videotaped mother–child interactions.

These findings are consistent with recent research investigating RF in children with CA&N. Ensink et al. (2015) recently compared 94 children with ($n$ = 46) and without ($n$ = 48) a history of sexual abuse and investigated whether the trauma itself (i.e., the exposure to sexual abuse) and/or the nature of the trauma (defined as intrafamilial [$n$ = 22] or extrafamilial [$n$ = 24]) yielded differences in child RF in middle childhood as assessed by the Child Reflective Functioning Scale (CRFS; Target, Oandasan, & Ensink, 2001) on the CAI (Target, Fonagy, Shmueli-Goetz, Datta, & Schneider, 1998). Results showed that child RF was significantly lower in children with a history of sexual abuse; within this group, children who had experienced intrafamilial abuse had even lower levels of child RF than children who were subjected to extrafamilial abuse. Further, child RF was associated with PRF as assessed by the PDI, with both sexual abuse and PRF predicting child RF with regard to self, whereas child RF with regard to others was predicted only by sexual abuse. It is probable that parents who abuse their children have low levels of PRF, characterized by inability, unwillingness, or serious distortions in the capacity to envisage their child in terms of internal mental states (e.g., Edwards, Shipman, & Brown, 2005; Fonagy & Luyten, 2009; Shipman & Zeman, 2001). The child is subsequently likely to adapt to these circumstances by a permanent hyperactivation of the attachment system and associated hypervigilance for potential threat (Cicchetti & Toth, 2005; De Bellis, 2005).

Findings such as these have led to a growing interest in trauma-related RF (RF-T), that is, the ability to mentalize about traumatic experiences, in understanding the intergenerational transmission of trauma. Interestingly, a study in this context found that low levels of RF-T in particular (as coded by the Trauma Reflective Functioning Scale on the

AAI), rather than more general impairments in RF (RF-G; as coded by the RFS on the AAI), was characteristic of 100 pregnant women with CA&N (Ensink et al., 2014). Early deprivation and maltreatment thus seem to impair the ability to mentalize traumatic experiences (i.e., RF-T), but not necessarily the ability to reflect on early relationships (i.e., RF-G) as such. Further, RF-T uniquely predicted the amount of engagement and positive feelings toward pregnancy and future motherhood in these women (Ensink et al., 2014). A follow-up study among a subgroup of 57 of the mothers 20 months later showed that RF-T and unresolved trauma both made independent contributions to infant attachment status as assessed with the SSP (Berthelot et al., 2015). More specifically, significant differences in terms of infant attachment status were found between mothers with CA&N and high or low levels of RF-T, with mothers with high RF-T being more likely to have securely attached infants, whereas mothers with low RF-T were likely to have infants with attachment disorganization (Berthelot et al., 2015).

Taken together, these findings suggest that RF-T may protect the parent from repeating the trauma in the parent–infant relationship, as high levels of RF-T are likely to be associated with an awareness of the influence of trauma on one's own development and that of one's child (Berthelot et al., 2015; Fonagy & Luyten, 2009; Fonagy et al., 2011). By contrast, low levels of RF-T seem to increase the risk of the intergenerational transmission of trauma and attachment insecurity. Indeed, difficulties in considering traumatic experiences in terms of mental states (i.e., low RF-T) are assumed to make the parent vulnerable to experiencing intense unmentalized trauma-related affects such as fear, helplessness, or anger in current interpersonal relationships, such as the parent–infant relationship, particularly when the infant is showing distress (Ensink et al., 2014; Fonagy, 1993). It is thus not the traumatic experience per se, but the inability to maintain RF with regard to the trauma, that

may explain the intergenerational transmission of trauma and infant attachment disorganization (Berthelot et al., 2015; Ensink et al., 2014; Schechter et al., 2006).

**Parental Reflective Functioning, Epistemic Trust, and Salutogenesis**

Research findings summarized so far suggest an important role of PRF in explaining the development of secure attachment in the infant and, later, the child's own capacity to reflect on self and others. In the authors' opinion, the role of PRF should be seen as part of a broader socializing and learning process that extends far beyond the nuclear family. Recent theoretical developments emphasize the role of a broader caregiving environment that is focused on attention to internal mental states. Such an environment is thought to be essential for the development of *epistemic trust* (Fonagy et al., 2015), which in turn is seen as a necessary precondition for an evolutionary inbuilt capacity for learning through interpersonal communication. Further, the capacities for resilience and salutogenesis (Antonovsky & Sagy, 1986) are thought to be closely related to this social communication capacity .

Both evolutionary findings and theory (Sperber et al., 2010; Wilson & Sperber, 2012) and developmental research (e.g., Corriveau et al., 2009) suggest that it is within the context of secure relationships with caregivers who pay appropriate attention to the role of internal mental states that children develop the capacity for epistemic trust—the capacity to trust others as trustworthy sources of knowledge that is generalizable and relevant to the self. In this context, Csibra and Gergely's (2009) theory of natural pedagogy essentially posits that such a family environment opens up a channel of fast information exchange about the (interpersonal) world (an "epistemic superhighway") based on experiences with attachment figures who are felt to be trustworthy sources of personally relevant knowledge. Several studies to date have provided evidence for these assumptions. For instance, in a study in 6-month-old infants, children followed an agent's gaze-shift to an object only if the gaze-shift

had been preceded either by eye contact with the infant or by infant-directed speech (Senju & Csibra, 2008). In another eye-tracking study (Deligianni, Senju, Gergely, & Csibra, 2011), 8-month-old infants first had to watch five unfamiliar animated objects on a display. In the interactive condition, one of the objects, in the center of the display, "responded" to the infant by moving whenever the infant looked at the object. In the other (non-interactive) condition, the same object moved comparably but unrelated to the infant's gaze. In the test phase, the central object "turned" to the left or the right, toward one of the other four objects on the display. The 8-month-olds looked for significantly longer in the direction to which the test object turned—that is, they tended to follow the object's "gaze"—but this was the case only in the infants who had been randomized to the interactive condition. Hence, the contingent reactivity of the test object appeared to be sufficient to trigger the child's interest in the object's activity and "gaze".

Studies suggest that differences in attachment style have a crucial influence on these processes (Corriveau et al., 2009; Mikulincer, 1997). Secure attachment experiences entail feelings of being recognized by someone who genuinely cares, and thus are likely to increase epistemic trust. This is particularly the case when the source of communication is reasonably credible. Indeed, individuals with secure attachment also seem to have confidence in their own capacity to distinguish between credible and less credible sources of communication. By contrast, those with a history of anxious-preoccupied and (particularly) disorganized attachment appear to lack this capacity, and as result tend to be either overly trusting or overly distrusting. A history of attachment avoidance is typically associated with epistemic mistrust and epistemic hypervigilance, that is, a tendency to distrust knowledge conveyed by others. Further research in this domain is needed, but studies so far suggest that PRF may be part of a broader, inbuilt evolutionary mechanism that is involved in the intergenerational

transmission of the culturally and personally relevant knowledge needed for humans to understand themselves and others in their intrinsically social and interpersonal world.

## Clinical Applications

Given the potential importance of PRF in the developmental path of both parents and children, several intervention programs based around mentalization have been developed. Although the different interventions have been developed for different populations, the common aim of these programs is to enhance the parent's capacity for PRF, to improve the parent–infant relationship, and to decrease the risk for the intergenerational transmission of psychopathology. More specifically, these programs focus on increasing the parent's interest and curiosity in their own and their infant's mental state rather than focusing solely on expressed behaviors, to help them recognize the opacity of mental states and to decrease their use of prementalizing modes by helping them to maintain mentalizing under heightened arousal.

The Parents First program (Goyette-Ewing et al., 2003; Kalland, Fagerlund, von Koskull, & Pajulo, 2016; Slade, 2007), for example, is a preventive group intervention program for parents of infants, toddlers, and preschoolers. The program aims to support parents and enhance the parent–infant relationship by promoting parental capacities for RF. Currently, data are being collected to evaluate the intervention in a matched control-group design (Kalland et al., 2016).

The Minding the Baby (MTB) program (Sadler et al., 2013; Sadler et al., 2006; Slade, 2007; Slade et al., 2005b) is an interdisciplinary, relationship-based home-visiting program that uses a mentalization-based approach to promote the reflective capacities of young mothers considered to be at high risk. The efficacy of this program has been investigated in several randomized controlled trials. Preliminary results showed that mothers who followed

the MTB program significantly improved in terms of their levels of PRF (measured as by the PDI) and were more likely to have securely attached infants (as measured by the SSP) (Ordway et al., 2014; Sadler et al., 2013). Further, compared with mothers who were assigned to a "treatment as usual" parental mental health intervention, mothers in the MTB program reported fewer externalizing problems in their children (Ordway et al., 2014), and mother–infant interactions were coded as less disruptive (Sadler et al., 2013).

In part inspired by the Parents First and MTB programs, Nijssens, Luyten, and Bales (2012) developed MBT-P, an add-on module tailored to an evidence-based mentalization-based treatment for adults with borderline personality disorder (BPD) (Bateman & Fonagy, 2010), and specifically aiming to enhance PRF in mothers with BPD and their infants aged 0–4 years. Similarly, Baradon and colleagues (Baradon, Fonagy, Bland, Lénárd, & Sleed, 2008; Sleed, Baradon, & Fonagy, 2013) developed New Beginnings, a mentalization-based intervention for mothers and babies in prison. Results from a cluster randomized trial of this intervention showed that mothers in the intervention group significantly improved in terms of their level of PRF (as measured by the PDI) compared with mothers in the control group (Sleed et al., 2013).

Finally, Suchman and colleagues developed the Mothers and Toddlers Program for substance-abusing mothers (Borelli, West, Decoste, & Suchman, 2012; Pajulo et al., 2012; Suchman et al., 2011; Suchman, Decoste, Rosenberger, & McMahon, 2012). A randomized control trial of this program showed improvements in PRF (as measured by the PDI and the WMCI) and caregiving behavior in the intervention group compared with the control group (Suchman et al., 2011; Suchman et al., 2012).

## Conclusions and Future Developments

This paper reviews recent theorizing as well as research and clinical applications of the capacity for PRF, that is, the capacity of parents/caregivers to understand their own behavior and that of their child as being driven by changing internal mental states. The literature reviewed here clearly demonstrates that interest in this concept is increasing from a theoretical and research perspective, and also from a clinical perspective. However, more efforts are needed in all of these domains. Indeed, theoretical and conceptual work is needed to further delineate the concept of PRF and investigate its relationship to other related concepts such as MMM, mindfulness, ToM, empathy, and perspective-taking. In addition, much more research is needed to investigate the reliability and validity of the current measurement strategies used to assess PRF. There is a particular need for broader, and preferably population-based, studies in this context, to investigate the potential role of PRF in child (and parent) development with greater precision. In the absence of such studies clearly demonstrating longitudinal associations between PRF and child development in the population, formulations concerning the potential role of PRF in child development remain at best speculative. At the same time, there is also a need for more ecologically valid, and thus preferably "online" (real-time) measures of PRF, instead of the current largely retrospective and "offline" measures of this capacity. Neurobiological research could play an important role here in delineating brain areas that are involved in specific aspects of PRF. Likewise, behavioral studies are needed to enable more theory-driven neurobiological studies.

Perhaps the greatest challenges in relation to the concept lie in its clinical applications. Is it indeed possible to foster the development of parents' PRF by means of psychosocial intervention, as preliminary studies suggest, and, if so, how is this best achieved? How can such programs be made more effective? What are their effective ingredients? Are changes in PRF as a result of intervention really associated with long-term effects on the development of children and parents? Do such interventions really have an impact on the broader

environment of the child—that is, do they lead to an environment where there is greater attention to “mental state talk”, fostering epistemic trust and social communication? And are these interventions more effective than other interventions in achieving these aims? Clearly, there is a great need for comparative trials, with long-term follow-up focused not only on changes in children’s behavioral and emotional problems, but also in their capacity to resume normal development and to benefit from the social world around them. These are perhaps daunting challenges for the field, but they are much needed if we really want to convince scientific colleagues, clinicians and the public of the relevance of this concept.

## References

Abidin, R. R. (1995). *Parenting Stress Index* (3rd ed.). Odessa, FL: Psychological Assessment Resources.

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the Strange Situation*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Allen, J. G., Fonagy, P., & Bateman, A. W. (2008). *Mentalizing in clinical practice*. Washington, DC: American Psychiatric Press.

Antonovsky, H., & Sagy, S. (1986). The development of a sense of coherence and its impact on responses to stress situations. *Journal of Social Psychology, 126*, 213-225.

Arnott, B., & Meins, E. (2007). Links among antenatal attachment representations, postnatal mind-mindedness, and infant attachment security: A preliminary study of mothers and fathers. *Bulletin of the Menninger Clinic, 71*, 132-149. doi: 10.1521/bumc.2007.71.2.132

Arnsten, A. F., Mathew, R., Ubriani, R., Taylor, J. R., & Li, B. M. (1999). α-1 noradrenergic receptor stimulation impairs prefrontal cortical cognitive function. *Biological Psychiatry, 45*, 26-31. doi: 10.1016/S0006-3223(98)00296-0

Arnsten, A. F. T. (1998). The biology of being frazzled. *Science, 280*, 1711-1712. doi: 10.1126/science.280.5370.1711

Baillargeon, R., Scott, R. M., & He, Z. (2010). False-belief understanding in infants. *Trends in Cognitive Sciences, 14*, 110-118. doi: 10.1016/j.tics.2009.12.006

Baradon, T., Fonagy, P., Bland, K., Lénárd, K., & Sleed, M. (2008). New Beginnings – an experience-based programme addressing the attachment relationship between mothers and their babies in prisons. *Journal of Child Psychotherapy, 34*, 240-258. doi: 10.1080/00754170802208065

Bartz, J., Simeon, D., Hamilton, H., Kim, S., Crystal, S., Braun, A., . . . Hollander, E. (2011a). Oxytocin can hinder trust and cooperation in borderline personality disorder. *Social Cognitive and Affective Neuroscience, 6*, 556-563. doi: 10.1093/scan/nsq085

Bartz, J. A., Zaki, J., Bolger, N., & Ochsner, K. N. (2011b). Social effects of oxytocin in humans: Context and person matter. *Trends in Cognitive Sciences, 15*, 301-309. doi: 10.1016/j.tics.2011.05.002

Bateman, A., & Fonagy, P. (2004). *Psychotherapy for borderline personality disorder: Mentalization-based treatment*. Oxford, UK: Oxford University Press.

Bateman, A., & Fonagy, P. (2008). Comorbid antisocial and borderline personality disorders: Mentalization-based treatment. *Journal of Clinical Psychology, 64*, 181-194. doi: 10.1002/jclp.20451

Bateman, A., & Fonagy, P. (2010). Mentalization based treatment for borderline personality disorder. *World Psychiatry, 9*, 11-15.

Beebe, B., Badalamenti, A., Jaffe, J., Feldstein, S., Marquette, L., Helbraun, E., . . . Ellman, L. (2008). Distressed mothers and their infants use a less efficient timing mechanism in creating expectancies of each other's looking patterns. *Journal of Psycholinguistic Research, 37*, 293-307.

Beebe, B., Jaffe, J., Buck, K., Chen, H., Cohen, P., Blatt, S., . . . Andrews, H. (2007). Six-week postpartum maternal self-criticism and dependency and 4-month mother-infant self- and interactive contingencies. *Developmental Psychology, 43*, 1360-1376.

Beeghly, M., & Cicchetti, D. (1994). Child maltreatment, attachment, and the self system: Emergence of an internal state lexicon in toddlers at high social risk. *Development and Psychopathology, 6*, 5-30.

Bernhardt, B. C., & Singer, T. (2012). The neural basis of empathy. *Annual Review of Neuroscience, 35*, 1-23. doi: 10.1146/annurev-neuro-062111-150536

Bernier, A., Carlson, S. M., & Whipple, N. (2010). From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. *Child Development, 81*, 326-339. doi: 10.1111/j.1467-8624.2009.01397.x

Bernier, A., & Dozier, M. (2003). Bridging the attachment transmission gap: The role of maternal mind-mindedness. *International Journal of Behavioral Development, 27*, 355-365. doi: 10.1080/01650250244000399

Berthelot, N., Ensink, K., Bernazzani, O., Normandin, L., Luyten, P., & Fonagy, P. (2015). Intergenerational transmission of attachment in abused and neglected mothers: The role of trauma-specific reflective functioning. *Infant Mental Health Journal, 36*, 200-212. doi: 10.1002/imhj.21499

Bertsch, K., Schmidinger, I., Neumann, I. D., & Herpertz, S. C. (2013). Reduced plasma oxytocin levels in female patients with borderline personality disorder. *Hormones and Behavior, 63*, 424-429. doi: 10.1016/j.yhbeh.2012.11.013

Blatt, S. J. (2008). *Polarities of experience: Relatedness and self definition in personality development, psychopathology, and the therapeutic process.* Washington, DC: American Psychological Association.

Borelli, J. L., West, J. L., Decoste, C., & Suchman, N. E. (2012). Emotionally avoidant language in the parenting interviews of substance-dependent mothers: associations with reflective functioning, recent substance use, and parenting behavior. *Infant Mental Health Journal, 33*, 506-519. doi: 10.1002/imhj.21340

Brent, B. K., Holt, D. J., Keshavan, M. S., Seidman, L. J., & Fonagy, P. (2014). Mentalization-based treatment for psychosis: Linking an attachment-based model to the psychotherapy for impaired mental state understanding in people with psychotic disorders. *Israel Journal of Psychiatry and Related Sciences, 51*, 17-24.

Bricker, D., & Squires, J. (1999). *Ages & Stages Questionnaires: A parent-completed, child-monitoring system* (2nd ed.). Baltimore, MD: Paul H. Brookes.

Briggs-Gowan, M. J., & Carter, A. S. (2002). *Brief Infant-Toddler Social and Emotional Assessment (BITSEA). Manual, version 2.0.* . Yale University. New Haven, CT.

Carpendale, J., & Lewis, C. (2006). *How children develop social understanding*. Malden, MA and Oxford, UK: Blackwell.

Choi-Kain, L. W., & Gunderson, J. G. (2008). Mentalization: Ontogeny, assessment, and application in the treatment of borderline personality disorder. *American Journal of Psychiatry, 165*, 1127-1135. doi: 10.1176/appi.ajp.2008.07081360

Cicchetti, D., & Toth, S. L. (2005). Child maltreatment. *Annual Review of Clinical Psychology, 1*, 409-438. doi: 10.1146/annurev.clinpsy.1.102803.144029

Cooper, A., & Redfern, S. (2016). *Reflective parenting: A guide to understanding what's going on in your child's mind*. Abingdon, UK: Routledge.

Corriveau, K. H., Harris, P. L., Meins, E., Fernyhough, C., Arnott, B., Elliott, L., . . . de Rosnay, M. (2009). Young children's trust in their mother's claims: Longitudinal links with attachment security in infancy. *Child Development, 80*, 750-761. doi: 10.1111/j.1467-8624.2009.01295.x

Csibra, G., & Gergely, G. (2009). Natural pedagogy. *Trends in Cognitive Sciences, 13*, 148-153. doi: 10.1016/j.tics.2009.01.005

Cyranowski, J. M., Hofkens, T. L., Frank, E., Seltman, H., Cai, H. M., & Amico, J. A. (2008). Evidence of dysregulated peripheral oxytocin release among depressed women. *Psychosomatic Medicine, 70*, 967-975. doi: 10.1097/Psy.0b013e318188ade4

De Bellis, M. D. (2005). The psychobiology of neglect. *Child Maltreatment, 10*, 150-172. doi: 10.1177/1077559505275116

Deligianni, F., Senju, A., Gergely, G., & Csibra, G. (2011). Automated gaze-contingent objects elicit orientation following in 8-month-old infants. *Developmental Psychology, 47*, 1499-1503. doi: 10.1037/a0025659

Edwards, A., Shipman, K., & Brown, A. (2005). The socialization of emotional understanding: A comparison of neglectful and nonneglectful mothers and their children. *Child Maltreatment, 10*, 293-304. doi: 10.1177/1077559505278452

Ensink, K., Berthelot, N., Bernazzani, O., Normandin, L., & Fonagy, P. (2014). Another step closer to measuring the ghosts in the nursery: Preliminary validation of the Trauma Reflective Functioning Scale. *Frontiers in Psychology, 5*, 1471. doi: 10.3389/fpsyg.2014.01471

Ensink, K., & Mayes, L. C. (2010). The development of mentalisation in children from a theory of mind perspective. *Psychoanalytic Inquiry, 30*, 301-337. doi: 10.1080/07351690903206504

Ensink, K., Normandin, L., Target, M., Fonagy, P., Sabourin, S., & Berthelot, N. (2015). Mentalization in children and mothers in the context of trauma: An initial study of the validity of the Child Reflective Functioning Scale. *British Journal of Developmental Psychology, 33*, 203-217. doi: 10.1111/bjdp.12074

Feldman, R., Weller, A., Zagoory-Sharon, O., & Levine, A. (2007). Evidence for a neuroendocrinological foundation of human affiliation: Plasma oxytocin levels across pregnancy and the postpartum period predict mother-infant bonding. *Psychological Science, 18*, 965-970. doi: 10.1111/j.1467-9280.2007.02010.x

Fonagy, P. (1993). Psychoanalytic and empirical approaches to developmental psychopathology: Can they be usefully integrated? *Journal of the Royal Society of Medicine, 86*, 577-581.

Fonagy, P., Gergely, G., Jurist, E., & Target, M. (2002). *Affect regulation, mentalization, and the development of the self*. New York, NY: Other Press.

Fonagy, P., Gergely, G., & Target, M. (2007). The parent–infant dyad and the construction of the subjective self. *Journal of Child Psychology and Psychiatry, 48*, 288-328. doi: 10.1111/j.1469-7610.2007.01727.x

Fonagy, P., & Luyten, P. (2009). A developmental, mentalization-based approach to the understanding and treatment of borderline personality disorder. *Development and Psychopathology, 21*, 1355-1381. doi: 10.1017/S0954579409990198

Fonagy, P., Luyten, P., & Allison, E. (2015). Epistemic petrification and the restoration of epistemic trust: A new conceptualization of borderline personality disorder and its psychosocial treatment. *Journal of Personality Disorders, 29*, 575-609. doi: 10.1521/pedi.2015.29.5.575

Fonagy, P., Luyten, P., Bateman, A., Gergely, G., Strathearn, L., Target, M., & Allison, E. (2010). Attachment and personality pathology. In J. F. Clarkin, P. Fonagy & G. O. Gabbard (Eds.), *Psychodynamic psychotherapy for personality disorders: A clinical handbook* (1st ed., pp. 37-88). Washington, DC: American Psychiatric Publishing.

Fonagy, P., Luyten, P., & Strathearn, L. (2011). Borderline personality disorder, mentalization, and the neurobiology of attachment. *Infant Mental Health Journal, 32*, 47-69. doi: 10.1002/Imhj.20283

Fonagy, P., Steele, M., Steele, H., Higgitt, A., & Target, M. (1994). The Emanuel Miller Memorial Lecture 1992. The theory and practice of resilience. *Journal of Child Psychology and Psychiatry, 35*, 231-257.

Fonagy, P., Steele, M., Steele, H., Moran, G. S., & Higgitt, A. C. (1991). The capacity for understanding mental states: The reflective self in parent and child and its significance

for security of attachment. *Infant Mental Health Journal, 12*, 201-218. doi: 10.1002/1097-0355(199123)12:3<201::Aid-Imhj2280120307>3.0.Co;2-7

Fonagy, P., & Target, M. (2005). Bridging the transmission gap: An end to an important mystery of attachment research? *Attachment and Human Development, 7*, 333-343. doi: 10.1080/14616730500269278

Fonagy, P., Target, M., Steele, H., & Steele, M. (1998). *Reflective-functioning manual, Version 5, for application to Adult Attachment Interviews*. Unpublished manuscript. University College London. London, UK.

Fraiberg, S., Adelson, E., & Shapiro, V. (1975). Ghosts in the nursery. A psychoanalytic approach to the problems of impaired infant-mother relationships. *Journal of the American Academy of Child Psychiatry, 14*, 387-421.

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology, 78*, 350-365.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions. *American Psychologist, 56*, 218-226. doi: 10.1037/0003-066X.56.3.218

Frith, C. D., & Frith, U. (2006). The neural basis of mentalizing. *Neuron, 50*, 531-534. doi: 10.1016/j.neuron.2006.05.001

George, C., Kaplan, N., & Main, M. (1985). The Adult Attachment Interview. Unpublished manuscript, Department of Psychology, University of California at Berkeley.

Gordon, I., Zagoory-Sharon, O., Leckman, J. F., & Feldman, R. (2010). Oxytocin and the development of parenting in humans. *Biological Psychiatry, 68*, 377-382. doi: 10.1016/j.biopsych.2010.02.005

Goyette-Ewing, M., Slade, A., Knoebber, K., Gilliam, W., Truman, S., & Mayes, L. (2003). *Parents First: A developmental parenting program*. Unpublished manuscript. Yale Child Study Center. New Haven, CT.

Grienenberger, J. F., Kelly, K., & Slade, A. (2005). Maternal reflective functioning, mother-infant affective communication, and infant attachment: Exploring the link between mental states and observed caregiving behavior in the intergenerational transmission of attachment. *Attachment and Human Development, 7*, 299-311. doi: 10.1080/14616730500245963

Gunnar, M., & Quevedo, K. (2007). The neurobiology of stress and development. *Annual Review of Psychology, 58*, 145-173. doi: 10.1146/annurev.psych.58.110405.085605

Gweon, H., Dodell-Feder, D., Bedny, M., & Saxe, R. (2012). Theory of mind performance in children correlates with functional specialization of a brain region for thinking about thoughts. *Child Development, 83*, 1853-1868. doi: 10.1111/j.1467-8624.2012.01829.x

Huth-Bocks, A. C., Muzik, M., Beeghly, M., Earls, L., & Stacks, A. M. (2014). Secure base scripts are associated with maternal parenting behavior across contexts and reflective functioning among trauma-exposed mothers. *Attachment and Human Development, 16*, 535-556. doi: 10.1080/14616734.2014.967787

Insel, T. R., & Young, L. J. (2001). The neurobiology of attachment. *Nature Reviews. Neuroscience, 2*, 129-136. doi: 10.1038/35053579

Kalland, M., Fagerlund, A., von Koskull, M., & Pajulo, M. (2016). Families First: The development of a new mentalization-based group intervention for first-time parents to promote child development and family health. *Primary Health Care Research & Development, 17*, 3-17. doi: 10.1017/S146342361500016X

Katznelson, H. (2014). Reflective functioning: A review *Clinical Psychology Review, 34*, 107–117. doi: 10.1016/j.cpr.2013.12.003

Klein, M. (1975). *Envy and Gratitude and Other Works, 1946-1963*. New York, NY: Delta.

Kovacs, A. M., Teglas, E., & Endress, A. D. (2010). The social sense: Susceptibility to others' beliefs in human infants and adults. *Science, 330*, 1830-1834. doi: 10.1126/science.1190792

Leckman, J. F., Feldman, R., Swain, J. E., & Mayes, L. C. (2007). Primary parental preoccupation revisited. In L. C. Mayes, P. Fonagy & M. Target (Eds.), *Developmental science and psychoanalysis: Integration and innovation* (pp. 89-108). London, UK: Karnac Books.

Leckman, J. F., Mayes, L. C., Feldman, R., Evans, D. W., King, R. A., & Cohen, D. J. (1999). Early parental preoccupations and behaviors and their possible relationship to the symptoms of obsessive-compulsive disorder. *Acta Psychiatrica Scandinavica. Supplementum, 396*, 1-26.

Lejuez, C. W., Kahler, C. W., & Brown, R. A. (2003). A modified computer version of the paced auditory serial addition task (PASAT) as a laboratory-based stressor *The Behavior Therapist, 26*, 290-293.

Lemma, A., Target, M., & Fonagy, P. (2011). The development of a brief psychodynamic intervention (dynamic interpersonal therapy) and its application to depression: A pilot study. *Psychiatry (Edgmont), 74*, 41-48. doi: 10.1521/psyc.2011.74.1.41

Lieberman, M. D. (2007). Social cognitive neuroscience: A review of core processes. *Annual Review of Psychology, 58*, 259-289. doi: 10.1146/annurev.psych.58.110405.085654

Lombardo, M. V., Chakrabarti, B., Bullmore, E. T., Consortium, M. A., & Baron-Cohen, S. (2011). Specialization of right temporo-parietal junction for mentalizing and its relation to social impairments in autism. *Neuroimage, 56*, 1832-1838. doi: 10.1016/j.neuroimage.2011.02.067

Lombardo, M. V., Chakrabarti, B., Bullmore, E. T., Wheelwright, S. J., Sadek, S. A., Suckling, J., . . . Baron-Cohen, S. (2010). Shared neural circuits for mentalizing about the self and others. *Journal of Cognitive Neuroscience, 22*, 1623-1635. doi: 10.1162/jocn.2009.21287

Luyten, P. (2015). Unholy questions about five central tenets of psychoanalysis that need to be empirically verified. *Psychoanalytic Inquiry, 35*, 5-23. doi: 10.1080/07351690.2015.987590

Luyten, P., & Blatt, S. J. (2013). Interpersonal relatedness and self-definition in normal and disrupted personality development: Retrospect and prospect. *American Psychologist, 68*, 172-183. doi: 10.1037/a0032243

Luyten, P., & Fonagy, P. (2015). The neurobiology of mentalizing. *Personality Disorders: Theory, Research, and Treatment, 6*, 366-379. doi: 10.1037/per0000117

Luyten, P., Fonagy, P., Lemma, A., & Target, M. (2012a). Depression. In A. Bateman & P. Fonagy (Eds.), *Handbook of mentalizing in mental health practice* (pp. 385-417). Washington, DC: American Psychiatric Association.

Luyten, P., Fonagy, P., Lowyck, B., & Vermote, R. (2012b). Assessment of mentalization. In A. W. Bateman & P. Fonagy (Eds.), *Handbook of mentalizing in mental health practice* (pp. 43-65). Washington, DC: American Psychiatric Publishing.

Luyten, P., Mayes, L. C., Nijssens, L., & Fonagy, P. (2016). *The Parental Reflective Functioning Questionnaire: Development and preliminary validation*. Manuscript submtited for publication.

Luyten, P., Mayes, L. C., Sadler, L., Fonagy, P., Nicholls, S., Crowley, M., . . . Slade, A. (2009). *The Parental Reflective Functioning Questionnaire-1 (PRFQ-1)*. University of Leuven. Leuven, Belgium.

Madigan, S., Bakermans-Kranenburg, M. J., Van Ijzendoorn, M. H., Moran, G., Pederson, D. R., & Benoit, D. (2006). Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment and Human Development, 8*, 89-111. doi: 10.1080/14616730600774458

Mayes, L. C. (2000). A developmental perspective on the regulation of arousal states. *Seminars in Perinatology, 24*, 267-279. doi: 10.1053/sper.2000.9121

Mayes, L. C. (2006). Arousal regulation, emotional flexibility, medial amygdala function, and the impact of early experience: Comments on the paper of Lewis et al. *Annals of the New York Academy of Sciences, 1094*, 178-192. doi: 10.1196/annals.1376.018

Meins, E. (2013). Sensitive attunement to infants' internal states: operationalizing the construct of mind-mindedness. *Attachment and Human Development, 15*, 524-544. doi: 10.1080/14616734.2013.830388

Meins, E., & Fernyhough, C. (2006). *Mind-Mindedness Coding Manual*. Durham University. Durham, UK.

Meins, E., Fernyhough, C., de Rosnay, M., Arnott, B., Leekam, S. R., & Turner, M. (2012). Mind-mindedness as a multidimensional construct: appropriate and nonattuned mind-related comments independently predict infant-mother attachment in a socially diverse sample. *Infancy, 17*, 393-415. doi: 10.1111/j.1532-7078.2011.00087.x

Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal sensitivity: Mothers' comments on infants' mental processes predict security of attachment at 12 months. *Journal of Child Psychology and Psychiatry, 42*, 637-648. doi: 10.1017/S0021963001007302

Meins, E., Fernyhough, C., Wainwright, R., Clark-Carter, D., Das Gupta, M., Fradley, E., & Tuckey, M. (2003). Pathways to understanding mind: Construct validity and

predictive validity of maternal mind-mindedness. *Child Development Perspectives, 74*, 1194-1211. doi: 10.1111/1467-8624.00601

Meins, E., Fernyhough, C., Wainwright, R., Das Gupta, M., Fradley, E., & Tuckey, M. (2002). Maternal mind-mindedness and attachment security as predictors of theory of mind understanding. *Child Development, 73*, 1715-1726. doi: 10.1111/1467-8624.00501

Mikulincer, M. (1997). Adult attachment style and information processing: Individual differences in curiosity and cognitive closure. *Journal of Personality and Social Psychology, 72*, 1217-1230.

Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change*. New York, NY: Guilford Press.

Montague, P. R., & Lohrenz, T. (2007). To detect and correct: Norm violations and their enforcement. *Neuron, 56*, 14-18. doi: 10.1016/j.neuron.2007.09.020

Neumann, I. D. (2008). Brain oxytocin: A key regulator of emotional and social behaviours in both females and males. *Journal of Neuroendocrinology, 20*, 858-865. doi: 10.1111/j.1365-2826.2008.01726.x

Nijssens, L., Bleys, D., Casalin, S., Vliegen, N., & Luyten, P. (2016a). *The origins of parenting stress: A one-year prospective study of the role of parental reflective functioning*. Manuscript submitted for publication.

Nijssens, L., Luyten, P., & Bales, D. L. (2012). Mentalization-based treatment for parents (MBT-P) with borderline personality disorder and their infants. In N. Midgley & I. Vrouva (Eds.), *Keeping children in mind: Mentalization-based interventions with children, young people and their families* (pp. 79-97). New York, NY: Routledge.

Nijssens, L., Vliegen, N., & Luyten, P. (2016b). *Parental attachment dimensions and child social-emotional development: A one-year prospective study of the mediating and*

*moderating role of parental reflective functioning*. Manuscript submitted for publication.

Northoff, G., Heinzel, A., de Greck, M., Bermpohl, F., Dobrowolny, H., & Panksepp, J. (2006). Self-referential processing in our brain – a meta-analysis of imaging studies on the self. *NeuroImage, 31*, 440-457. doi: 10.1016/j.neuroimage.2005.12.002

Ordway, M. R., Sadler, L. S., Dixon, J., Close, N., Mayes, L., & Slade, A. (2014). Lasting effects of an interdisciplinary home visiting program on child behavior: Preliminary follow-up results of a randomized trial. *Journal of Pediatric Nursing, 29*, 3-13. doi: 10.1016/j.pedn.2013.04.006

Pajulo, M., Pyykkonen, N., Kalland, M., Sinkkonen, J., Helenius, H., Punamaki, R. L., & Suchman, N. (2012). Substance-abusing mothers in residential treatment with their babies: Importance of pre- and postnatal maternal reflective functioning. *Infant Mental Health Journal, 33*, 70-81. doi: 10.1002/imhj.20342

Pajulo, M., Tolvanen, M., Karlsson, L., Halme-Chowdhury, E., Ost, C., Luyten, P., . . . Karlsson, H. (2015). The Prental Parental Reflective Functioning Questionnaire: Exploring factor structure and construct validity of a new measure in the Finn Brain Birth Cohort pilot study. *Infant Mental Health Journal, 36*, 399-414. doi: 10.1002/imhj.21523

Panksepp, J., & Watt, D. (2011). Why does depression hurt? Ancestral primary-process separation-distress (PANIC/GRIEF) and diminished brain reward (SEEKING) processes in the genesis of depressive affect. *Psychiatry (Edgmont), 74*, 5-13. doi: 10.1521/psyc.2011.74.1.5

Ripoll, L. H., Snyder, R., Steele, H., & Siever, L. J. (2013). The neurobiology of empathy in borderline personality disorder. *Current Psychiatry Reports, 15*, 344. doi: 10.1007/s11920-012-0344-1

Rochat, P., & Striano, T. (1999). Social-cognitive development in the first year. In P. Rochat (Ed.), *Early social cognition* (pp. 3-34). Mahwah, NJ: Lawrence Erlbaum Associates.

Rutherford, H. J., Booth, C. R., Luyten, P., Bridgett, D. J., & Mayes, L. C. (2015). Investigating the association between parental reflective functioning and distress tolerance in motherhood. *Infant Behavior and Development, 40*, 54-63. doi: 10.1016/j.infbeh.2015.04.005

Rutherford, H. J., Goldberg, B., Luyten, P., Bridgett, D. J., & Mayes, L. C. (2013). Parental reflective functioning is associated with tolerance of infant distress but not general distress: Evidence for a specific relationship using a simulated baby paradigm. *Infant Behavior and Development, 36*, 635-641. doi: 10.1016/j.infbeh.2013.06.008

Rutherford, H. J., Williams, S. K., Moy, S., Mayes, L. C., & Johns, J. M. (2011). Disruption of maternal parenting circuitry by addictive process: Rewiring of reward and stress systems. *Frontiers in Psychiatry, 2*, 37. doi: 10.3389/fpsyt.2011.00037

Sadler, L. S., Slade, A., Close, N., Webb, D. L., Simpson, T., Fennie, K., & Mayes, L. C. (2013). Minding the Baby: Enhancing reflectiveness to improve early health and relationship outcomes in an interdisciplinary home visiting program. *Infant Mental Health Journal, 34*, 391-405. doi: 10.1002/imhj.21406

Sadler, L. S., Slade, A., & Mayes, L. C. (2006). Minding the Baby: A mentalization-based parenting program. In J. G. Allen & P. Fonagy (Eds.), *Handbook of mentalization-based treatment* (pp. 271-288). Chichester, UK: John Wiley & Sons.

Satpute, A. B., & Lieberman, M. D. (2006). Integrating automatic and controlled processes into neurocognitive models of social cognition. *Brain Research, 1079*, 86-97. doi: 10.1016/j.brainres.2006.01.005

Schechter, D. S., Coots, T., Zeanah, C. H., Davies, M., Coates, S. W., Trabka, K. A., . . . Myers, M. M. (2005). Maternal mental representations of the child in an inner-city

clinical sample: Violence-related posttraumatic stress and reflective functioning. *Attachment and Human Development, 7*, 313-331. doi: 10.1080/14616730500246011

Schechter, D. S., Myers, M. M., Brunelli, S. A., Coates, S. W., Zeanah, C. H., Davies, M., . . . Liebowitz, M. R. (2006). Traumatized mothers can change their minds about their toddlers: Understanding how a novel use of videofeedback supports positive change of maternal attributions. *Infant Mental Health Journal, 27*, 429-447. doi: 10.1002/imhj.20101

Senju, A., & Csibra, G. (2008). Gaze following in human infants depends on communicative signals. *Current Biology, 18*, 668-671. doi: 10.1016/j.cub.2008.03.059

Sharp, C., & Fonagy, P. (2008). The parent's capacity to treat the child as a psychological agent: Constructs, measures and implications for developmental psychopathology. *Social Development, 17*, 737-754. doi: 10.1111/j.1467-9507.2007.00457.x

Sharp, C., Fonagy, P., & Goodyer, I. M. (2006). Imagining your child's mind: Psychosocial adjustment and mothers' ability to predict their children's attributional response styles. *British Journal of Developmental Psychology, 24*, 197-214. doi: Doi 10.1348/026151005x8269

Shipman, K. L., & Zeman, J. (2001). Socialization of children's emotion regulation in mother-child dyads: A developmental psychopathology perspective. *Development and Psychopathology, 13*, 317-336. doi: 10.1017/s0954579401002073

Simons, J. S., & Gaher, R. M. (2005). The Distress Tolerance Scale: Development and validation of a self-report measure. *Motivation and Emotion, 29*, 83-102. doi: 10.1007/s11031-005-7955-3

Skårderud, F. (2007a). Eating one's words, part II: The embodied mind and reflective function in anorexia nervosa--theory. *European Eating Disorders Review, 15*, 243-252. doi: 10.1002/erv.778

Skårderud, F. (2007b). Eating one's words: Part III. Mentalisation-based psychotherapy for anorexia nervosa--an outline for a treatment and training manual. *European Eating Disorders Review, 15,* 323-339. doi: 10.1002/erv.817

Slade, A. (2005). Parental reflective functioning: An introduction. *Attachment and Human Development, 7*, 269-281. doi: 10.1080/14616730500245906

Slade, A. (2007). Reflective parenting programs: Theory and development. *Psychoanalytic Inquiry, 26*, 640-657. doi: 10.1080/07351690701310698

Slade, A., Aber, J. L., Berger, B., Bresgi, I., & Kaplan, M. (2004). *The Parent Development Interview – Revised*. The City University of New York, New York, NY.

Slade, A., Grienenberger, J., Bernbach, E., Levy, D., & Locker, A. (2005a). Maternal reflective functioning, attachment, and the transmission gap: A preliminary study. *Attachment and Human Development, 7*, 283-298. doi: 10.1080/14616730500245880

Slade, A., Patterson, M., & Miller, M. (2007). *Addendum to Reflective Functioning Scoring Manual (Fonagy, Steele, Steele, & Target, 1998) for use with the Pregnancy Interview (Slade, Grunebaum, Huganir & Reeves, 1987; Slade, 2004)*. City College of New York. New York, NY.

Slade, A., Sadler, L., De Dios-Kenn, C., Webb, D., Currier-Ezepchick, J., & Mayes, L. (2005b). Minding the Baby: A reflective parenting program. *Psychoanalytic Study of the Child, 60*, 74-100.

Sleed, M., Baradon, T., & Fonagy, P. (2013). New Beginnings for mothers and babies in prison: A cluster randomized controlled trial. *Attachment and Human Development, 15*, 349-367. doi: 10.1080/14616734.2013.782651

Sperber, D., Clement, F., Heintz, C., Mascaro, O., Mercier, H., Origgi, G., & Wilson, D. (2010). Epistemic vigilance. *Mind & Language, 25*, 359-393. doi: 10.1111/j.1468-0017.2010.01394.x

Stacks, A. M., Muzik, M., Wong, K., Beeghly, M., Huth-Bocks, A., Irwin, J. L., & Rosenblum, K. L. (2014). Maternal reflective functioning among mothers with childhood maltreatment histories: Links to sensitive parenting and infant attachment security. *Attachment and Human Development, 16*, 515-533. doi: 10.1080/14616734.2014.935452

Stanley, B., & Siever, L. J. (2010). The interpersonal dimension of borderline personality disorder: Toward a neuropeptide model. *American Journal of Psychiatry, 167*, 24-39. doi: 10.1176/appi.ajp.2009.09050744

Steele, M., Kaniuk, J., Hodges, J., Asquith, K., Hillman, S., & Steele, H. (2008). Measuring mentalization across contexts: Links between representations of childhood and representations of parenting in an adoption sample. In E. Jurist, A. Slade & S. Bergner (Eds.), *Mind to Mind: Infant research, neuroscience, and psychoanalysis* (pp. 115-138). New York, NY: Other Press.

Stovall-McClough, K. C., Cloitre, M., & McClough, J. F. (2008). Adult attachment and posttraumatic stress disorder in women with histories of childhood abuse. In H. Steele & M. Steele (Eds.), *Clinical application of the Adult Attachment Interview* (pp. 320-340). New York, NY: Guilford Press.

Strathearn, L., Fonagy, P., Amico, J., & Montague, P. R. (2009). Adult attachment predicts maternal brain and oxytocin response to infant cues. *Neuropsychopharmacology, 34*, 2655-2666. doi: 10.1038/npp.2009.103

Strathearn, L., Li, J., Fonagy, P., & Montague, P. R. (2008). What's in a smile? Maternal brain responses to infant facial cues. *Pediatrics, 122,* 40-51. doi: 10.1542/peds.2007-1566

Suchman, N. E., Decoste, C., McMahon, T. J., Rounsaville, B., & Mayes, L. (2011). The Mothers and Toddlers Program, an attachment-based parenting intervention for

substance-using women: Results at 6-week follow-up in a randomized clinical pilot. *Infant Mental Health Journal, 32*, 427-449. doi: 10.1002/imhj.20303

Suchman, N. E., Decoste, C., Rosenberger, P., & McMahon, T. J. (2012). Attachment-based intervention for substance-using mothers: A preliminary test of the proposed mechanisms of change. *Infant Mental Health Journal, 33*, 360-371. doi: 10.1002/imhj.21311

Swain, J. E., Lorberbaum, J. P., Kose, S., & Strathearn, L. (2007). Brain basis of early parent-infant interactions: Psychology, physiology, and in vivo functional neuroimaging studies. *Journal of Child Psychology and Psychiatry, 48*, 262-287.

Target, M., Fonagy, P., Shmueli-Goetz, Y., Datta, A., & Schneider, T. (1998). *The Child Attachment Interview (CAI) protocol, Revised Edition VI*. University College London. London, UK.

Target, M., Oandasan, C., & Ensink, K. (2001). *Child Reflective Functioning Scale scoring manual: For application to the Child attachment Interview*. Anna Freud Centre/University College London. London, UK.

Taubner, S., Horz, S., Fischer-Kern, M., Doering, S., Buchheim, A., & Zimmermann, J. (2013). Internal structure of the Reflective Functioning Scale. *Psychological Assessment, 25*, 127-135. doi: 10.1037/a0029138

Uddin, L. Q., Iacoboni, M., Lange, C., & Keenan, J. P. (2007). The self and social cognition: The role of cortical midline structures and mirror neurons. *Trends in Cognitive Sciences, 11*, 153-157. doi: 10.1016/j.tics.2007.01.001

van Ijzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology, 11*, 225-249.

Van Overwalle, F. (2009). Social cognition and the brain: A meta-analysis. *Human Brain Mapping, 30,* 829-858. doi: 10.1002/hbm.20547

Van Overwalle, F., & Baetens, K. (2009). Understanding others' actions and goals by mirror and mentalizing systems: A meta-analysis. *NeuroImage, 48,* 564-584. doi: 10.1016/j.neuroimage.2009.06.009

Waters, H., & Rodrigues-Doolabh, L. (2004). *Manual for decoding secure base narratives*. State University of New York. Stony Brook, NY.

Wilson, D., & Sperber, D. (2012). *Meaning and relevance*. Cambridge, UK: Cambridge University Press.

Winnicott, D. W. (1956). Primary maternal preoccupation. In D. W. Winnicott (Ed.), *Collected papers: Through paediatrics to psycho-analysis* (pp. 300-305). London, UK: Tavistock, 1958.

Zeanah, C. H., Benoit, D., Barton, M., Regan, C., Hirshberg, L. M., & Lipsitt, L. P. (1993). Representations of attachment in mothers and their one-year-old infants. *Journal of the American Academy of Child and Adolescent Psychiatry, 32*, 278-286. doi: 10.1097/00004583-199303000-00007