Maternal reflective functioning: influence on parenting practices and the early development of externalizing behavior

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Chapter 7

General Discussion and Summary

High levels of physical aggression during early childhood increase the chances of following persistent high disruptive behavioral trajectories throughout later childhood, adolescence and even adulthood (Côté, Vaillancourt, LeBlanc, Nagin, & Tremblay, 2006; Moffitt, Caspi, Harrington, & Milne, 2002). Therefore, timely intervention and prevention efforts are vital. To be able to confront the problem of aggression, it is crucial to study potentially malleable factors that may account for the initial manifestation and continuation of such behavior. This thesis focused on one such factor, parental reflective functioning, which has been associated with children's externalizing behavior (Benbassat & Priel, 2012; Ha et al., 2011; Meins, Centifanti, Fernyhough, & Fishburn, 2013) and can be considered a trainable ability (Katznelson, 2014).

The role of parental mentalizing or reflective functioning (RF) in children's socio-behavioral development has received increased attention in recent years. Parental RF can be regarded as the parents' capacity to make sense of their own and their child's mental states (i.e., feelings, emotions, intentions, needs) and to use this understanding to guide their responses to the child (Slade, 2005; Slade, Sadler, & Mayes, 2005). Maternal RF starts to develop during pregnancy and is predictive of postnatal maternal RF (Arnott & Meins, 2007, 2008; Steele & Steele, 2008). Parental RF has been related to various aspects of children's socio-behavioral development, for example behavioral regulation skills (Heron-Delaney et al., 2016; Suchman, DeCoste, Castiglioni, Legow, & Mayes, 2008; Suchman, DeCoste, & Mayes, 2009), and mentalization- or RF-abilities in children (Ensink, Bégin, Normandin, & Fonagy, 2016; Laranjo, Bernier, Meins, & Carlson, 2010; Meins & Fernyhough, 1999; Meins et al., 2003) and adolescents (Benbassat & Priel, 2012). Inadequate or lack of parental RF has been associated with children's behavioral problems (Benbassat & Priel, 2012; Ensink et al., 2016; Ha, Sharp, & Goodyer, 2011; Meins, Centifanti, Fernyhough, & Fishburn, 2013; Sharp, Fonagy, & Goodyer, 2006). So far, most studies linking parental RF to children's socio-behavioral development have focused on postnatal maternal RF. The first main contribution of the studies presented in this thesis is the focus on prenatal maternal RF, as well as postnatal maternal RF. For this thesis, potential associations between pre- and postnatal maternal RF and children's externalizing behavior were (re-)examined focusing on very young children from diverse socio-economic backgrounds.

Children growing up in families struggling with multiple complex problems have an increased risk of developing behavioral problems (Cabaj, McDonald, & Tough, 2014; Côté et al., 2006; Hay et al., 2011; Huijbregts, Séguin, Zoccolillo, Boivin, & Tremblay, 2008). The

fact that parental RF is often compromised in high-risk parents (Pajulo et al., 2012; Schechter et al., 2005; Suchman, DeCoste, Castiglioni, et al., 2010) in combination with the association between parental RF and children's externalizing behavioral problems, make parental RF a potentially interesting target for interventions aiming to prevent or reduce children's externalizing behavioral problems, like aggression. The second main contribution of the studies presented in this thesis is the in-depth investigation of multiple risk factors (combined and individually) in relation to maternal RF.

Violent or aggressive behavior not only raises major public health concerns and increased costs to society (Krug, Mercy, Dahlberg, & Zwi, 2002), it also has detrimental effects on the child, its development, and its family (Côté et al., 2006; Campbell, Spieker, Burchinal, Poe, & NICHD Early Child Care Research Network, 2006; NICHD Early Child Care Research Network, 2004). In toddlerhood, a subgroup of aggressive 'early-starter' children can already be identified. These children continue to show the most persistent and serious forms of aggression later in life (Aguilar, Sroufe, Egeland, & Carlson, 2000; Moffitt et al., 2002). With interventions aiming to reduce aggression being more effective when offered at a younger age (Hermanns, Ory, & Schrijvers, 2005), the importance of understanding how aggression unfolds at the earliest possible stages is further underlined. With its associations to children's socio-behavioral problems (Ha et al., 2011; Walker, Wheatcroft, & Camic, 2011), parental RF might be valuable in managing childhood aggression. Therefore, it seems important to investigate the role of maternal RF in the development of child physical aggression. The fact the maternal prenatal RF was examined in relation to child physical aggression and that child physical aggression was investigated from 6 months postpartum and onwards may be considered another important contribution of the studies presented in this thesis.

The mechanisms by which parental RF impact children's socio-behavioral development are still largely unknown. It was hypothesized that the (potential) link between parental RF and children's socio-behavioral development (particularly physical aggression) would be mediated and/or moderated by parenting behavior. Parental RF has been linked to more sensitive and adequate parenting behavior (Grienenberger, Kelly, & Slade, 2005; Huth-Bocks, Muzik, Beeghly, Earls, & Stacks, 2014; Slade, Belsky, Aber, & Phelps, 1999; Stacks et al., 2014). Inadequate parenting behavior and inadequate parental RF have both been associated with children's behavioral problems (Edwards & Hans, 2015; Feng, Shaw, & Silk, 2008; Healy, Murray, Cooper, Hughes, & Halligan, 2013; Hughes & Ensor, 2006; Keren & Tyano, 2012). Hence, parental RF may (partially) influence children's behavioral problems

through parenting behavior. The effects of parental RF may also be more pronounced when it is adequately translated into behavior and interactions with the child. As there were no studies available that investigated the potential moderator and/or mediator effects of parenting in the link between parental RF and children's behavioral problems, this may therefore be considered another distinctive contribution of the studies presented in this thesis.

To summarize, the main aims of this thesis were to investigate the effects of maternal RF on the development of (precursors of) behavioral problems – in particular aggression - from infancy onwards, and to examine whether potential effects of maternal RF on child aggression could be explained by parenting behavior. **Chapter 1** provides a more elaborate description of the background and aims of this thesis.

Main findings

The studies in this thesis are part of the Mother-Infant Neurodevelopment Study (*MINDS*) – Leiden. *MINDS* – Leiden aims to determine (1) which neurobiological, neurocognitive and social-environmental factors predict (directly, indirectly or in interaction) emotional and behavioral problems – specifically aggression – in early infancy, (2) the effects of an intensive RF-based home-visiting program for high-risk mothers on neurobiological, neurocognitive, emotional and behavioral development in children, and (3) which factors predict variation in effects of the home-visiting program on child emotional and behavioral outcomes. *MINDS* – Leiden was designed as a longitudinal randomized control trial. All participating families were being followed over a period of approximately four years, consisting of six assessment waves (the first assessment took place in the third trimester of pregnancy and the last assessment took place when the children were 3.5 - 4 years of age). A total of 128 low-risk and 147 high-risk families were included in the study. Based on elaborate screening for the presence of the following eight predefined risk factors during the first prenatal home visit, classification into high- and low-risk groups was achieved (World Health Organization, 2005, 2016): 1) positive screening on current psychiatric disorder(s) or substance use (alcohol, tobacco and/or drugs) during pregnancy; or 2) presence of two or more of the following risk factors: single status (biological father not involved), unemployment, financial problems, no secondary education, limited social support network (<4 individuals listed in network), and young maternal age (<20 years). In case only one risk factor was present - other than an indication for current psychiatric disorder(s) or substance use - women were discussed in a clinical expert meeting to determine whether

placement in the high-risk group was appropriate (n = 6). High-risk families were randomly assigned to the intervention (n = 65) or high-risk control group (n = 82). Demographic and mental health characteristics of the low-risk and high-risk groups were presented in **Chapter 2**. This chapter also described the design of *MINDS* – Leiden, the measures used, and the intervention program. Furthermore, this study may yield insights into effective, targeted, and tailor-made components of prevention programs, ultimately reducing the psychological and economic costs of mental health problems to society.

Chapter 3 describes the results of a comparison between first-time high-risk (HR) and low-risk (LR) mothers-to-be on prenatal RF and which psychosocial and environmental risk factors for the HR-women were specifically linked to prenatal RF. The sample consisted of 162 women (83 classified as HR). During the third trimester of pregnancy, maternal prenatal RF was assessed using the Pregnancy Interview – Revised (PI-R; Slade, 2007a), while risk factors were measured using a semi-structured psychiatric interview and various questionnaires. HR-women demonstrated lower prenatal RF-skills compared to LR-women. This finding was later replicated with a larger sample when the data collection for the first assessment wave of *MINDS* – Leiden was completed (see **Chapter 2**). Maternal education, size of social support network, and substance use during pregnancy were most strongly associated with maternal prenatal RF. HR-women appear to have a limited RF-capacity: the way they perceive and respond to information related to the upcoming motherhood and their future baby may have negative consequences for mother and child. Enhancing maternal prenatal RF may be an effective way to improve the mother's representations of her unborn child and their developing relationship, thereby easing the transition to motherhood.

The goals of the study described in **Chapter 4** were to examine whether maternal prenatal RF was related to postnatal maternal behavior in first-time mothers and their six-month-old infants during challenging (two teaching tasks and reengagement after stressor) and non-challenging tasks (a free play task with toys and a free play task without toys), and to what extent quality of maternal prenatal RF accounted for the negative impact of accumulated risk (defined as a sum-score of risk factors assessed prenatally) on maternal behavior. Mother-infant dyads (N = 133) were observed during free play, two teaching tasks, and the 'play' and 'reunion' or 'reengagement' episodes of the Still-Face Paradigm (SFP; Tronick, Als, Adamson, Wise, & Brazelton, 1978). Higher maternal prenatal RF was associated with more sensitivity and positive engagement during all tasks, and less

intrusiveness and internalizing-helplessness behavior during the teaching tasks and SFP-reengagement. Accumulated risk and maternal prenatal RF predicted shared variance in maternal behavior, although a few unique predictive effects were also observed for prenatal RF and for accumulated risk (depending on the task). Accumulated risk had an indirect effect on sensitivity during the teaching tasks and SFP-play through prenatal RF. These findings suggest not only that RF may be targeted prenatally in order to improve mother-infant interactions, but also that enhancing RF-skills may ameliorate some of the negative consequences from some more stable perinatal risk factors that influence parent-child interactions.

The study described in **Chapter 5** examined whether maternal prenatal RF predicted the development of infant physical aggression and whether maternal sensitivity and/or intrusiveness mediated or moderated this association. A total of 96 mother-infant dyads were included in the study. Maternal prenatal RF was measured with the PI-R (Slade, 2007a) around 27 gestational weeks, maternal behavior was observed during free play at 6 months postpartum, and infant physical aggression was assessed at 6, 12, and 20 months using maternal reports. In general, poor maternal prenatal RF was related to relatively high levels of reported infant physical aggression. Moderating effects were observed for maternal behavior: higher prenatal RF was particularly associated with lower levels of reported infant physical aggression among mothers who showed no or low signs of intrusiveness. However, for mothers who showed some intrusiveness in interaction with their infant, prenatal RF-level seemed to have little effect on reported infant physical aggression. Generally, mothers reported an increase in infant physical aggression between 6 and 12 months, except when they had both low maternal RF-skills and were relatively less sensitive. The results indicated that maternal prenatal RF is associated with (development of) infant physical aggression, and therefore it may be targeted in intervention programs aimed at reducing early physical aggression. Furthermore, the findings suggested that associations between maternal RF and children's socio-behavioral development should not be studied in isolation, as factors such as parenting behavior (but probably other factors as well) may have moderating effects.

In **Chapter 6**, the results of a study are described which investigated whether both maternal prenatal and postnatal RF can be regarded as a multidimensional construct, and if so, whether these RF-dimensions were differentially associated with children's temperament and externalizing behavior at 20 months postpartum. Prenatal and postnatal RF were assessed using the PI-R (Slade, 2007a) and Parent Development Interview Revised - short version (PDI-R2; Slade et al., 2003), while children's temperament and externalizing

behavior were measured with questionnaires filled out by the mother. The sample consisted of 123 first-time mothers and their 20-month-olds. Two dimensions were found for maternal prenatal RF, termed self-focused (maternal ability to mentalize about her own emotions and behaviors) and child-focused mentalization (maternal capacity to mentalize about her child's mental states and behavior). Three dimensions were observed for maternal postnatal RF, which were named relation-focused (mentalization about how dynamics in mental processes influence interpersonal interaction and behavior), self-focused, and child-focused mentalization. Prenatal total RF was negatively related to reported child physical aggression. Postnatal self-focused RF was positively associated with children's externalizing behavior and negative emotionality, while relation-focused RF was negatively associated with child physical aggression. The results indicated that it is important to look at specific RF-dimensions when examining the effects of maternal RF on children's behavioral development. Suggestions were made to further improve the measurement of maternal RF as a multidimensional construct.

Clinical implications

The results of our studies may have implications for clinical and more specific preventive practices. First of all, maternal RF seems an interesting candidate for incorporation in prevention and intervention programs aimed at reducing children's externalizing behavioral problems. Improvement of parental RF may stimulate adequate parenting behaviors and (subsequently) could reduce the chances of children developing behavioral problems. Improving parental prenatal RF may be especially interesting as this could ameliorate some of the negative consequences of more stable and/or less changeable perinatal risk factors.

RF-based parenting programs have been shown to generate positive effects on parental RF and parenting behavior in high-risk samples (Katznelson, 2014; Miller, 2008; Pajulo et al., 2012; Sadler et al., 2013; Sleed, Baradon, & Fonagy, 2013; Suchman, DeCoste, Castiglioni, et al., 2010). The primary aim of any RF-based program must be the development of a reflective stance in parents (Slade, 2007b). This would enable them to become more sensitive, regulating, and autonomy-promoting parents, ultimately resulting in positive effects on a range of developmental outcomes in the child (Ordway, Sadler, Dixon, Close, et al., 2014; Sadler et al., 2013; Sadler, Slade, & Mayes, 2006; Slade et al., 2005). There are various strategies to improve parental RF to help high-risk parents obtain more reflective and cognitively mature ways of thinking about themselves, their relationships,

and their new roles as parents (Markin, 2013; Sadler, Novick, & Meadows-Oliver, in press; Sadler et al., 2013; Sadler et al., 2006). For example, clinical care and counseling may include the clinician modeling a reflective stance, naming feelings in the mother and the infant, reviewing recorded mother-infant interactions, and put the mother's or infant's emotions that might underlie behaviors into words (Sadler et al., in press; Slade, 2007b).

Second, clinicians or therapists working with pregnant high-risk women may find it useful to assess their reflective capacities. This knowledge may enable them to help the mother-to-be gain reflective abilities as she matures as a mother and to ease the transition into motherhood (Sadler et al., in press). Furthermore, adequate parental RF-skills also provide parents with a framework to help them deal with child-rearing issues (Ordway, Sadler, Dixon, & Slade, 2014; Ordway, Webb, Sadler, & Slade, 2015). We recommend that RF-based interventions should start targeting parental RF prenatally in order to improve postnatal parent-infant interactions and reduce the chances of the child developing behavioral problems.

Given the emerging evidence of the importance of parental RF in early development, innovative ideas for promoting RF in high-risk families using low-cost methods ought to be further developed. At the same time, the current instruments for assessing parental RF could be refined further and less time-intensive measures should be developed with special attention for the multidimensionality of parental RF. This will enable future intervention research to track the development of (dimensions of) parental RF over the course of the interventions and to determine the optimal timing of different components of the intervention.

Limitations, scientific implications, and directions for future research

Some of the strengths of the studies presented here include the longitudinal design starting in pregnancy, the multi-method approach (interviews, observations, and maternal reports/ questionnaires), and the use of a heterogeneous sample consisting of both low-risk and high-risk mother-child dyads. Some critical notes should also be made when interpreting the results presented in this thesis. One limitation is that we made use of questionnaires filled out by the mother to assess (precursors of) physical aggression. The use of multiple informants would have been preferable (Kerr, Lunkenheimer, & Olson, 2007), particularly considering our finding presented in **Chapter 5**, which suggested that low reflective and low sensitive mothers may be less observant of their child's behavior (i.e., they did not report the commonly observed increase in physical aggression between 6 and 12 months). Direct

observation of infant physical aggression would further strengthen the findings presented here. The scope on socio-behavioral problems should also be widened and include different types of socio-behavioral problems. It is well-known that there is high comorbidity between different types of behavioral problems and this may be particularly evident among very young children. Internalizing problems may predispose towards externalizing problems later in life (and vice versa) (August, Realmuto, MacDonald, Nugent, & Crosby, 1996; Cummings, Caporino, & Kendall, 2014; Merikangas, Nakamura, & Kessler, 2009). Greater attention is also needed regarding the impact of paternal RF on children's socio-behavioral development, especially given the increased involvement of fathers in the upbringing of children. Even more so as there is evidence that the RF-abilities and parenting skills of fathers and mothers may have differential effects on children's socio-behavioral development (Benbassat & Priel, 2012, 2015; Esbjørn et al., 2013; Stover & Kiselica, 2014).

Although the studies included in this dissertation have brought us a step closer to a better understanding of how maternal RF impacts the development of (precursors of) behavioral problems, particularly physical aggression, they have also raised various questions that may give direction to future research. For example, more knowledge is necessary about the mechanisms through which maternal RF influences the development of early behavioral problems. In this thesis the focus has been primarily on parenting behavior in this respect. Yet, the potential role of child-related and other mother-related factors, such as emotional and behavioral regulation skills (physiological and behavioral), socio-cognitive abilities, or temperament, still remains largely unknown. Bidirectional effects must also be considered more explicitly, since children also play an active role in influencing their social environments (Lengua & Kovacs, 2005; Pardini, 2008).

Studies investigating the effects of parental RF on children's outcomes are broadening their scope from child attachment security to other aspects of children's socio-behavioral development, but this research area is still in its infancy. However, interesting theories have been opted regarding various mechanisms that may also play a role in the processes by which parental RF affects child adjustment and the development of behavioral problems. For example, it has been suggested that maternal RF stimulates in the child a better understanding of its own mind and the minds of others, thereby supporting its own developing RF-ability (Sharp & Fonagy, 2008; Sharp et al., 2006). Therefore, it may be possible that poor parental RF has an indirect impact on the development of behavioral problems through a reduced mentalization ability (Theory of Mind) in the children themselves. Other aspects of cognition (e.g., executive functioning, language) and emotion

regulation skills may also be affected by poor parental RF. Future research must therefore explore potential mediators and moderators in order to better understand mechanisms and conditions under which parental RF is associated with healthy child adjustment in order to be able to optimize the socio-behavioral development of children at risk for adverse developmental outcomes. Furthermore, it is recommended that future studies examine parental RF as a multidimensional construct with potentially differential links to parenting behavior and child socio-behavioral development (Borelli, St John, Cho, & Suchman, 2016; Suchman, DeCoste, Leigh, & Borelli, 2010).

Finally, more and especially even larger longitudinal studies, preferably starting in the prenatal period, to capture factors that influence trajectories of parental RF in association with the developmental trajectories of children's cognitive, social and behavioral abilities. Such studies would also be able to identify the mutual or reciprocal influences of parental RF and child factors across time.

Conclusions

The findings of this thesis contribute to our understanding of the effect of maternal RF on children's socio-behavioral development, specifically early physical aggression. From the findings presented in the studies, we may conclude the following:

First, maternal RF plays an important role in the development of early behavioral problems, especially physical aggression. Generally, better maternal RF seems to reduce the chances of developing physical aggression in early infancy. This includes not only postnatal RF, but also maternal RF-skills during pregnancy.

Second, pregnant women struggling with multiple, complex problems have limited maternal prenatal RF-abilities. This may potentially place them at risk for showing less adequate parenting skills and postnatal parental RF. As a result, this may possibly increase the risk of their child developing externalizing behavioral problems.

Third, it is important to recognize that parental RF is a multidimensional construct, with differential associations between the RF-dimensions and children's temperament and externalizing behavior. Future studies must determine whether and how RF-dimensions are related to different aspects of children's socio-behavioral development.

Overall, our findings strongly suggest that maternal RF plays a vital role in the likelihood of developing externalizing behavioral problems, especially physical aggression, in early childhood. They also support the notion that parental RF may offer an opportunity in managing childhood aggression.

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