

Exploring maternal reflective functioning as a predictor of mother-child dyadic behaviour over time in a clinical context

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ABSTRACT

The current study examined 20 participants from group attachment based intervention (GABI), who completed the adult attachment interviews (AAI; George, *et al.*, 1985) as part of a RCT to test the efficacy of GABI compared with treatment as usual, in order to explore the possible benefits higher RF for treatment outcome in terms of interactive mother and child behaviour. Mothers' AAIs were analyzed using the reflective functioning (RF) rating scale (Fonagy, *et al.*, 1998), yielding overall RF scores, prompted/demand RF scores, and spontaneous RF scores, and parent-child dyadic interactive behaviour was coded utilizing the coding interactive behaviour (CIB: Feldman, 1998) manual. Children's age ranged from 2-25 months, mean=14 months. 86.7% of the sample identified English as their primary language, with 13.3% identified speaking both Spanish and English. RF in AAIs obtained at intake from some GABI mothers was expected to be linked to the quality of the parent-child interaction (observed with the CIB), at intake (T1), at end-of treatment T2), and at sixmonth follow-up (T3). Results confirmed this impression insofar as lower overall RF was linked to T1 levels of higher intrusiveness from mothers. At end of treatment (T2), mothers' higher spontaneous RF scores were significantly linked to maternal praising (of the

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child), child positive affect, child alertness. At 6-month follow up (T3), mother's spontaneous RF scores correlated significantly and positively with maternal elaborating with child positive affect. Discussion focuses on the importance of assessing RF in parents entering therapy with their children as it may provide insight into what parent or child behaviours may be targeted. And the RF scores will highlight which mothers need special attention to stimulate their interest and attention to attachment-related processes in themselves, and in their children.

Key words: Reflective functioning; group attachment based intervention; coding interactive behaviour; adult attachment interview.

Introduction

Reflective functioning (RF) informs many early attachment-based interventions (Murphy et al., 2015; Slade et al., 2020; Suchman et al., 2010; Zayde et al., 2021). This is not suprising as RF has been shown to be a marker of resilience following past adversity (RF; Fonagy et al., 1994; Steele & Steele, 2008). RF is a vital cognitive-emotional capacity that can be reliably observed in adult attachment interviews (AAIs) and has important predictive value in terms of favorable child development outcomes (Fonagy et al., 1991; Steele et al., 1996; Steele & Steele, 2008). RF is a measure of an adult's capacity for showing with language an understanding of mental states (beliefs and desires) in the self and others, with attention to how mental states are at once both causal and consequential influences of interactive behaviour. The term 'mental states' applies to a wide range of cognitive, emotional, and volitional processes, including thoughts, feelings, desires, intentions, preferences, beliefs, needs, and dreams (Allen, 2006; Fonagy et al., 1991). Since RF was developed (Steele & Steele, 2008), mentalization has entered





the literature and it is useful to think of mentalization as an inherent human capacity, and RF as the measurable expression of that capacity at work.

Parental mentalization starts at the level of an implicit propensity or explicit willingness to identify these mental states in one's self and one's offspring (Sharp et al., 2008). An optimally attuned parent attends, labels, and adaptively communicates positive and negative affective, cognitive, perceptual, and physiological mental states to the child, without avoidance or undue overidentification with those states (Beebe et al., 2012). Importantly, for the infant, mentalizing interactions with the mother are, over time, generalized, utilized, and solidified in social relationships, creating a functional template for later emotion understanding, self-regulation, and interpersonal connectedness. Fonagy et al. (1994) demonstrated that the capacity to discuss attachment relationships utilizing mental state constructs illustrated individual differences in parental sensitivity. The sensitive caregiver can bridge the focus on physical reality and internally directed attention sufficiently for the child to identify contingencies between internal and external experience (Fonagy & Target, 1997). Importantly, RF is linked to mental health (Fonagy et al., 1996) and has been shown to improve following therapy (Diamond et al., 2014; Suchman et al., 2010, Toth et al., 2008). Lo & Wong (2020) conducted a meta-analytic report on the wide range of parenting interventions that have been shown to improve RF, showing that RF is an extremely fitting target for therapeutic intervention.

One iteration of an intervention focused on promoting the development of reflective functioning is The group attachment-based intervention (GABI) which is delivered in a multifamily intervention aimed at supporting parents (Steele *et al.*, 2010; Murphy *et al.*, 2015; Steele *et al.*, 2019). GABI is a trauma-informed intervention for families with children aged 0-3 years. Each GABI session comprises of three parts: i) parents and children are engaged in dyadic interactions facilitated by a clinician; ii) a 'parent only' group context for parents to discuss salient issues and challenges that arise for them and a separate and simultaneous 'child only' context in which a clinicians interact with a child, following their leads in play and facilitating peer interactions; and iii) a reunion between parents and children.

The GABI model is informed by core attachment-based and trauma-informed principles (Murphy *et al.*, 2015), aimed at validating and supporting the parents so they become more effective sources of nurture and affection for their children. The GABI sessions provide a secure base for families who may have unpredictable schedules (Murphy *et al.*, 2015). In the published empirical results demonstrating the efficacy of GABI (Steele *et al.*, 2019), the outcome that was focused on was parent-toddler interaction behaviours, over 5-minutes of video-filmed interaction, rated with the coding interactive behaviour (CIB) manual developed by Ruth Feldman

(1999). The only other clinical study utilizing the CIB as the outcome measure, outside of Steele *et al.*, (2019) in an independent single-group test-retest design with mothers and toddlers, where significant improvements in maternal sensitivity and child engagements were observed (Dollberg *et al.*, 2013) found that maternal intrusiveness did not lessen over time. Maternal intrusiveness was a composite variable, in Dollberg *et al.* (2013), including the scales 'maternal forcing' and 'maternal overriding', which are investigated in the current exploratory research.

The CIB is a global scheme including 42 codes each rated from 1 (low) to 5 (high) and has good psychometric properties that have been validated internationally in many studies with infants, toddlers, preschoolers, adolescents, and adults in both normative and high-risk samples (Feldman, 2012; Feldman, 2015). Feldman and colleagues have published widely on the relevance over time of the CIB coding categories that reflect adaptive healthy parent-child communication patterns (Feldman, 2015, 2017). Six CIB dimensions are included in this report: two dimensions of the CIB that reflect possible history and risk of maltreatment, i) maternal forcing and ii) maternal overriding; and four dimensions that reflect probably history of sensitive care and probable health and security in the parent-child relationship: i) maternal praising; ii) child alert; iii) child positive affect; and iv) maternal elaborating. The current report seeks to investigate links between ratings derived from CIB (Feldman, 1999) ratings at intake, and end of treatment (6 months later) and their mothers' RF in their pre-treatment AAI responses (6 months later), and at six-month follow-up. Specifically, the question to be explored is whether higher RF correlates positively with maternal sensitivity behaviours and negatively with maternally intrusive behaviours? We also seek to examine the effects of maternal RF on child behaviours, specifically asking if maternal sensitivity correlates positively with child alertness and child positive affect? It is anticipated that those CIB ratings reflecting maternal sensitivity are expected to correlate with higher RF scores.

Materials and methods

Participants

Participants were recruited from families participating in treatment at Montefiore Medical Center in the Bronx, New York. Families were referred by paediatricians, word-of-mouth, and Child Welfare. Data was collected as a part of the randomized control trial (RCT) investigating the efficacy of the GABI as reported on in Steele *et al.* (2019). The data from 20 families for which there was an AAI available, scoreable for RF, as well as CIB-scored observations at Time 1 (intake), Time 2 (end-of-treatment six months later), and Time 3 (six-month follow up) are the focus of this report. Demographic information about these 20 families appears below in Tables 1 and 2.





Table 1 shows that for the 20 participants, 87% of the sample identified English as their primary language and an additional 13% identified speaking both Spanish and English. Table 1 also indicates that 7% of the sample identified as White, while the remainder were split between those identifying as Black or Hispanic. Table 1 also shows that 65% of the participants had some high school experience, or a high school diploma in terms of schooling, with the majority of participants being unemployed. Participants were recruited at Montefiore Medical Center and agreed to come to the New School for Social Research (NSSR) for assessments. They were given \$65 and metro cards for participating each time. Families agreed at the beginning of treatment to participate in the research study and provided consent at the beginning of each assessment.

Procedure

IRB approval was obtained for the hospital where the clinical intervention occurred as well as at the university where data was collected. Families began each assessment by signing informed consent and reviewing assessment protocol. The families with children of at least 12 months of age were filmed in 5-minute free play sessions later coded with Ruth Feldman's Coding Interactive Behaviour guidelines. Upon successful completion of all measures (beyond the AAI and CIB which are the focus of this report), families signed receipts to indicate they received the stipend and the metro card.

Measures relevant to the current report

Coding interactive behaviour (CIB): Developed by Ruth Feldman (1998), the CIB is a global rating scheme for coding adult-infant interactions for children ages 2 to 36 months. There are 43 scales; 22 adult, 16 child, and 5 dvadic. These scales address the nature and flow of the interaction, the interactive involvement, and style of each partner. Codes range from 1 to 5, with 1 generally implying a minimal level of the specific behaviour or attitude and 5 the maximum. The CIB was coded by graduate students and post-doctoral visitors to The New School, who were kept blind to whether the observation was baseline, end-of-treatment or six-month follow-up. Leaders of coding groups were trained by Ruth Feldman, and consensual coding was achieved that was reliable with the group (trained/reliable) leader), ICC average scores in the range of 0.72-0.96, mean=0.84.

The reflective functioning manual for application to adult attachment interview (RF scale): The RF scale (Fonagy, Steele, Steele, & Target, 1998) was used to code mother's AAIs by the first author who was trained to reliability by the second author. Three reliable training raters independently rated all 20 interviews with high agreement among the three raters (Chronbach's alpha=0.92). Averaged ratings of the three reliable codes were relied on in this report.

Adult attachment interview (AAI): The AAI is an interview used to assess internal working models of attachment relationships (George, Kaplan, & Main, 1985). Participants are asked to describe their early childhood experiences concerning illness, injuries, separations, rejections, and evaluate the effects of these experiences on their development as well as their current functioning including parenting.

Within the AAI there are questions that directly demand reflection. These questions are considered 'demand' questions, which refer to: i) which parent the participant was closest to and why; ii) whether the participant has ever felt rejection from their parents; iii) how their overall experience with their parent has affected them; iv) if there were any setbacks; v) why they think their parents behaved as they did; vi) if they experienced any loss of a parent or close one; vii) how the relationship with their parents has changed from childhood to adulthood; and viii) what their current relationship with their parents and/or partner.

The RF scale is an 11-point scale that evaluates the quality of mentalization in the context of attachment relationships. The scale ranges from –1 (negative RF, in which interviews are overly concrete, totally lack mentalization, or grossly distorting of the mental states of others) to 9 (exceptional RF, in which interviews show complex, elaborate, or original reasoning about mental states). Lower ratings indicate a lack of mental-state accounts while higher ratings indicate increasingly sophisticated and full mental-state accounts of interactions and reactions (Fonagy *et al.*, 1998). RF is scored based on all AAI questions, with the demand questions holding more

Table 1. Participant demographic information.

Measures	N (%)
Child gender	
Male	6 (40.0)
Female	9 (60.0)
Mother's level of education	
No High School	1 (6.7)
Some High School	7 (46.7)
High School Diploma/GED	2 (13.3)
Some College	4 (26.7)
Some Junior High School	1(6.7)
Mother's employment	
Not employed/parent	10 (66.7)
Employed	3 (20.0)
Student	2 (13.3)
Language spoken at home	
English	13 (86.7)
English and Spanish	2 (13.3)
Mother's ethnicity	
White	1 (6.7)
Black or African-American/Afro-Caribbean	5 (33.3)
Hispanic/Latino	7 (46.7)
Bi-Racial or Multi-Racial	2 (13.3)

Completed information available for 15 families only.





weight than the permit questions. An overall RF score, representing the participants characteristic level of RF, is derived from individual scores which consider the respondents most frequent level of RF responses as well as the frequency of responses characterized by high and low RF (Fonagy *et al.*, 1998). Both spontaneous (permit) RF scores and prompted (demand) RF scores are reported on in this paper.

Descriptive overview of the CIB and RF results are shown below in Table 2.

Table 2 shows that mothers' RF scores ranged from 1.00-5.00, mother's spontaneous RF scores ranged from 1.50-5.00, and mother's demand RF scores ranged from 1.00-5.00, out of an 11-point scale of -1-9, M=2.90, SD=1.02. Overall RF and spontaneous RF is shown as for some results the overall score yielded most interesting correlates, *e.g.* T1 results, while spontaneous RF was most relevant for T2 and T3 results. Notably, scores for overall RF, spontaneous RF, and demand RF are highly intercorrelated. The current study drew its sample from a clinical population, which can explain the low to moderate RF scores (circa 3) whereas community norms are circa 4/4.5. Table 2 also shows CIB descriptive results for all the CIB scales relied on in the results. These are in the moderate range with mean scores 2-3 for these 5-point scales.

Results

Results comprise two portions and are organized into three sections: i) intake results; ii) end-of-treatment results and six-month follow-up results; and iii) qualitative illustrations of lower *versus* higher RF.

Intake results

Initial analyses examined the relationship between maternal forcing (M=2.24, SD=1.14) and maternal overriding scores (M=2.65, SD=1.06) at intake. Mothers' overall RF scores were expected to be significantly and negatively correlate with mothers' forcing scores and they were r(38) = -0.40, P<0.05. We anticipated that at intake that mothers' overall RF score and mother overriding scores would be significantly and negatively correlated and this anticipation was demonstrated, r(38) = -0.39, P<0.05, as seen in Table 3 below.

End-of-treatment and six-month follow-up results

Mothers' RF from intake was correlated with end-of-treatment (T2) and six-month follow-up (T3) CIB scores. These are shown below in Table 4.

Consistent with prediction, Table 4 shows that mothers' spontaneous RF scores correlated significantly and positively with end-of-treatment maternal praising (of the child), r=0.47, P<0.05, two-tailed, n=20. To further examine the impact of mothers' RF on parent-child interaction, CIB child behaviour scores were considered. Table 4 shows that child positive affect correlated with maternal RF (r=0.41, P<0.05, one-tailed, n=20) and child alertness (r=0.57, P<0.01, two-tailed, n=20).

Once recognizing the link between child's alertness,

Table 2. Basic descriptive statistics for key variables.

Variable	N	Range	M	SD
Maternal RF	38	1.00-5.00	2.90	1.02
Maternal spontaneous RF	38	2.00-4.50	2.80	0.83
CIB maternal forcing (T1)	38	1.00-5.00	2.24	1.14
CIB maternal overriding (T1)	38	1.00-5.00	2.63	1.05
CIB maternal praising (T2)	20	1.00-4.00	1.68	0.88
CIB child alert (T2)	20	1.50-5.00	3.13	1.01
CIB child positive affect (T2)	20	1.00-4.00	2.20	0.92
CIB maternal elaborating (T3)	20	1.00-2.50	1.46	0.49
CIB child positive affect (T3)	20	1.00-5.00	2.21	1.05

Table 3. Correlation matrix for key measures at intake or T1 (N=38).

Measure	1	2	3	
1. Mother AAI RF	_	0.57**	0.37	
2. CIB Parent Overriding (T1)	-0.40*	_	0.77***	
3. CIB Parent Forcing (T1)	-0.39*	0.78***	_	

AAI, adult attachment interview; RF, reflective functioning; CIB, coding interactive behaviour. *P<0.05; **P<0.01; ***P<0.001.





child's positive affect and maternal RF at T2, end of treatment, the link between mothers' spontaneous RF and CIB scores at T3, 6 month follow up were considered. As seen on Table 4, mother' spontaneous RF scores correlated significantly with T3 maternal elaborating (r=0.50, P<0.05, two-tailed) as well as positively and significantly correlated with child's positive affect (r=0.51, P<0.05 two-tailed).

Qualitative results: illustrations of lower *versus* higher reflective functioning

Though the majority of the interviews had at least one, if not multiple instances of limited RF, there were a handful that displayed exceptional RF. A rating of -1 indicates a refusal of RF. One subject after stating their sister had passed away as an infant was asked if they thought that this death had an effect on their family or what affect it may have had responded; 'That's a dumb question, I can't answer that, only my mother can answer that' (-1). The response is notable as is the inability to engage in or with mental state language.

A rating of 0 indicates inappropriate, or unintegrated RF. When asked which parent they felt closer to, one participant responded, 'My grandmother.' Your grandmother? 'My grandmother end of the mom. My great-grandfather died; it was like my father was taken away. But my mother and him, they made the best juice, and he was always telling me stories' (0). Here, the participants response to the question with a reference to concrete support provided by her father that is appreciated, but not complete ('it's not over). Invited to reflect upon how her relationship with her parents has changed since childhood through adulthood, the speaker is limited to a focus on a material object (the car) which is not integrated with the issue of change. A score of 1 indicates a lack or absence of RF, also referred to as disavowal; Interviewer: What would you generally say it was like for you as a small child? Subject: I mean, I was small, little so I wouldn't know (1). Here, the subject responds with disavowal, pleading ignorance to the question.

A rating of 3 indicates a limited capacity to acknowledge mental states, often one dimensional, predictable,

naïve and/or simplistic. One participant, when asked why they thought their aunt and uncle behaved as they did, replied: 'I think my uncle acted like that cause he was raised that way. He's the oldest of eight kids so he had most of the responsibilities to take care of them. And then my aunt... I guess she had no choice, I don't know' (3). In this response the subject uses family structure as a way to explain behaviour. Though we can understand this as being the reality or truthful, it does not expand on the uncle's mental states, illustrating a simplistic response. A rating of 5 indicates a basic, normative capacity of RF, Interviewer: Why do you think your mom did those things? Subject: I don't think my mom understood me as a child. I think that um, I think I like, I don't think my mom really liked having children altogether and I think that she just, I think my behaviours may have made her feel insecure herself or like not sure what to do as a parent. The reader does not have to make assumptions or try to understand where the subject is going with this response. It is distinct and coherent, with the subject clearly trying to tease apart mental states and their impact on behaviour. Further examples of low and high RF can be seen on Table 5.

Discussion

The goal of the current study was to explore the link between maternal RF and parent-child interactive behaviour, specifically the intricate nature and effect of CIBbased ratings of maternal overriding, forcing, praising, and elaborating with child's alertness and positive affect before and after intervention. This exploration was guided by an intent to consider which aspects of parent-child interaction, relied on as the outcome measure of choice in our empirical report (Steele et al., 2019) demonstrating the efficacy of GABI, may be associated with maternal RF. In line with previous research, we found that RF is associated with parenting and child behaviour. Fonagy & Target's (1997) account of reflective functioning states that RF organizes the experiences of one's own and others' behaviours in terms of mental state constructs. There is general agreement that self-organization initially entails

Table 4. Correlation matrix for key measures (N=20) at end-of treatment (T2) and 6-month follow-up (T3).

Measure	1	2	3	4	5	6	
1. Mother AAI RF	_	_					
2. Mother Spontaneous RF	0.86***	_		_			
3. CIB Maternal Praising (T2)	0.14	0.47*	_		_		
4. CIB Child Positive Affect (T2)	0.36	0.41	0.22				
5. CIB Alert (T2)	0.51**	0.57**	0.13	0.57***			
6. CIB Maternal Elaborating (T3)	0.33	0.50*	0.33*	0.15	0.03		
7. CIB Child Positive Affect (T3)	0.29	0.51*	0.22	0.11	0.10	0.52***	

^{*}P<0.05; **P<0.01; ***P<0.001.





the integration of body related experiences, defining the physical boundaries of self and world (Brownell & Kopp, 1991). The caregiver's recognition of the child's intentional stance is communicated nonverbally from birth, and this communication is a key component to the infant's development of self-regulation. Here, we highlight the interplay between mother's RF and mother's behaviour.

Parental sensitivity is highlighted within Bowlby's (1969, 1973, 1980) attachment theory, where the caregiver provides their infant with a sense of security (a 'secure base') from which the infant learns to explore their surroundings with confidence and trust that their needs, both emotional and physical, will be met. It comes as no surprise then that the CIB derived ratings of the child's alertness is linked to maternal elaborating, however, the correlation between these scores increased during T2 end of treatment and T3 6-month follow up, indicating the positive influence of the GABI therapeutic intervention. The findings of this study are in line with previous research. Specifically, Steele et al. (2019) stated that their strongest result was the significant changes in motherchild interaction patterns when compared to intake observations and end of treatment. It was observed that there was significantly less 'constriction' and significantly more 'reciprocity' in the observed mother-child interactions. Overall, this makes sense as GABI provides both therapist-supported and peer-supported interactions a 'secure base' for both parent and child.

The social processes which accelerate the mentalizing quality of self-organization are the very same as those which ensure security of attachment so that the understanding of how mental states affect our social behaviours is of key importance (Fonagy & Target, 1997). As the mothers from this sample experienced a range of adverse experiences in childhood and concurrently, one would hypothesize that their RF scores would be low to moderate, which they are. However, upon comparing mother's RF scores to her elaborating her child's play, as well as child's positive affect and alertness scores we found a significant, positive correlation demonstrating that mother's ability to mentalize about her past and current relationships does have an effect on maternal sensitivity.

And with respect to maternal forcing and overriding behaviours, the aspects of maternal behaviour that Dollberg *et al.* (2013) found resistant to change, the current results suggest that they may be amenable to change, particularly when maternal RF is functional, or can be helped to improve, in an RF-Based intervention.

Interestingly, the overall RF score was found to be the most significant RF correlate of T1 (intake) CIB results, while the spontaneous (unprompted) RF score was found to the most significant correlate of T2 and T3 CIB scores. Spontaneous RF may be regarded as providing an index of the extent to which the respondent engaged in RF as a habit of mind and speech. This may suggest how GABI is promoting reliance on RF to help parents explain their

Table 5. Examples of lower versus higher reflective functioning.

Description of RF	Example question and response I: Okay, and do you think, like what was the effect on your family, on your parents, having lost— S: That's a dumb question, I can't answer that, only my mother can answer that'			
-1 Negative RF Anti-reflective or bizarre/inappropriate. May express hostility or active evasion in response to opportunity for reflection				
1 Absent but not repudiated RF Subject does not mention mental states, in spite of clear opportunity to do so. May be sociological, excessively generalized, concrete or overwhelmingly egocentric.	I: What would you generally say it was like for you as a small child? S: I mean, I was small, little so I wouldn't know			
3 Questionable or low RF RF may be there by suggestion, but it is unclear and is as likely to be a cliché as a proper reflective statement	I: And why do you think your aunt and uncle behaved as they did during your childhood? S: I think my uncle acted like that cause he was raised that way. He's the oldest of eight kids so he had most of the responsibilities to take care of them. And then my aunt I guess she had no choice, I don't know			
5 Ordinary RF Makes reflection explicit. Even if mental state is fairly simple it is described clearly and briefly reflected on in a way which does not suggest resentment of what might be socially expected	I: Why do you think your mom did those things? S: I don't think my mom understood me as a child. I think that um, I think I like, I don't think my mom really liked having children altogether and I think that she just, I think my behaviours may have made her feel			
5 Ordinary RF Makes reflection explicit. Even if mental state is fairly simple it is described clearly and briefly reflected on in a way which does not suggest resentment of what might be socially expected.	I: And your grandparents, why do you think they behaved as they did? S: They didn't behave bad, they just tried to shield me from everything. And I wish, I wish they didn't at times because, I got so used to that and I didn't believe them that my parents were the way they were. Until I, you know, I went out for myself to, to figure it out. And it got worse because I had one, basically one picture of them how they, in my head how I thought they were, and one picture of how they really are			

I, Interviewer; S, Subject.





own and their children's behaviour, such that spontaneous RF emerged as the strongest RF correlate of CIB results at end-of-treatment and six-month follow-up.

Among the limitations of the current study, one is the small sample size. Given the transient nature of the families recruited for the study, the length of the study, and the amount of commitment required, the number of families retained from T1 to completion of treatment was a fraction of the initial group of families approached and recruited. Preliminary consideration of factors that may distinguish families were retained, as compared to those were not retained, suggests the latter group moved away, found paid work or had other competing household stressors, and/or became involved in full-time studies. In any case, the current report provides evidence for the CIB serving as a useful index of change in attachment-based interventions, and utility of reflective functioning in highlighting aspects of parent-child interactions most amenable to change.

The current work underscores the value of measuring reflective functioning in AAI responses or other narrative material in order to gain an early picture of strengths and difficulties in parents of infants *before* they enter a treatment program. The information gained may help clinicians target parents' and children's psychosocial needs most effectively.

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