

**Adverse and adaptive childhood experiences are associated with parental reflective functioning in mothers with Substance Use Disorder**

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**Competing interests**

The authors declare they have no competing interests.

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## **Abstract**

Mothers with a substance use disorder (SUD) are at risk for maladaptive parenting practices, and have heightened likelihood of having experienced childhood adversity themselves. In addition, parental reflective functioning (PRF), a capacity underlying sensitive caregiving, is often low in mothers with SUD. This study examines the relationship between PRF and aversive (emotional, physical, sexual abuse and neglect) and adaptive (safety and competence) experiences, in different developmental phases (early childhood, latency, and adolescence) in mothers with a SUD. A sample of 43 mothers with small children were interviewed with the Parental Developmental Interview to assess PRF, and they completed the Traumatic Antecedents Questionnaire regarding aversive and adaptive experiences. In addition, we used the Hopkins Symptoms Checklist-10 to control for mental health status and a battery of neuropsychological tests to control for executive functions. Results indicated that adaptive experiences in early childhood were positively related to PRF, and that experience of emotional abuse was negatively related to PRF. When separating the group of mothers in two sub-groups based on PRF level, results showed that mothers with negative to low PRF had significantly more experiences of adversities in early childhood and latency, and significantly less adaptive experiences in early childhood, latency and adolescence, compared to mothers with moderate to high PRF. In addition, mothers with adequate to high PRF reported experiencing significantly more types of adaptive experiences, and significantly less adversities compared to mothers with negative to low PRF. Results are discussed in relation to developmental trauma, resilience, epistemic trust and mistrust.

*Key words:* Parental reflective functioning, aversive experiences, adaptive experiences, substance use disorder, executive functioning, mental health, emotional abuse

## **Introduction**

Adverse interpersonal traumatic experiences in childhood and adolescence are shown to negatively affect somatic health as well as heighten the risk for adult psychopathology (Heleniak, Jenness, Vander Stoep, McCauley, & McLaughlin, 2016; Shonkoff et al., 2012; Teicher & Samson, 2016). Although experiences of early adversity might lead to post-traumatic stress disorder (PTSD) for some individuals, others might develop other forms of psychopathological symptoms such as depression, anxiety or a substance use disorder (SUD), and some individuals may not develop any symptoms (Dube et al., 2003; Dube et al., 2006; Ozer, Best, Lipsey, & Weiss, 2003; Strine et al., 2012). In numerous studies, results suggest that there is a high co-occurrence between SUD and the likelihood of having experienced childhood adversity (Felitti et al., 1998; Green et al., 2010; Jansson & Velez, 2011; Norman et al., 2012; Vachon, Krueger, Rogosch, & Cicchetti, 2015). Furthermore, it has been suggested that substance abuse might be conceptualized as a form of coping behaviour, where substances might function as a strategy to manage challenging emotions associated with previous traumatic exposure (Berking & Wupperman, 2012; Haller & Chassin, 2014; Leeies, Pagura, Sareen, & Bolton, 2010; Sheerin et al., 2016).

Trauma is defined as a response to an event that threatens a person's life, physical or psychological integrity whether experienced directly, witnessed or heard about (American Psychological Association, 2013; Rothschild, 2011). Early, recurrent and severe interpersonal trauma has been termed developmental trauma (Ford et al., 2013). Developmental trauma suggests that a primary caregiver is involved in the adversity, and therefore the experience could affect core developmental capacities in the child. Specifically early caregiving relationships are thought to provide the relational context in which children develop the earliest psychological representations of self, others, and self in relation to others (Fonagy, Gergely, & Jurist, 2004). These working models form a developmental foundation of a child's sense of safety, emotion

regulation capacity, distress tolerance and a sense of agency, and together these processes influence the experience of controlling one's own actions and having competence to handle events in the outside world (Haggard & Chambon, 2012; Sokol, Hammond, Kuebli, & Sweetman, 2015). When the child-caregiver relationship is the source of adversity, the attachment relationship may be severely compromised (Allen, 2012; Cook et al., 2005; Van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). For instance, when a caregiver is too preoccupied, distant, unpredictable, punitive or distressed to be reliably responsive, children can become distressed easily (Cook et al., 2017; Shonkoff et al., 2012). Different forms of adversity frequently co-occur, and exposure to a higher number of adversities predicts greater psychological and somatic symptom severity in childhood through to adulthood (Cecil, Viding, Fearon, Glaser, & McCrory, 2017, Finkelhor, Ormrod, & Turner, 2007, 2009). Furthermore, there is an increasing risk when victimization in childhood is followed by further traumatization in adolescence and in adulthood (Briere, Kaltman, & Green, 2008; Van der Kolk et al., 2005). Exposure to adversity during sensitive periods, such as early childhood and adolescence are particularly harmful for the developing child, and may compromise core self-regulatory capacities in childhood (Kolk & Fisler, 1994; Manly, Kim, Rogosch, & Cicchetti, 2001; Meaney & Ferguson-Smith, 2010). In addition, individuals exposed to adversity in childhood may be particularly sensitive to stressful experiences and prone for later psychological distress in adolescence and adulthood (Althoff, Verhulst, Rettew, Hudziak, & van der Ende, 2010; Dougherty, Klein, & Davila, 2004; Fonzo et al., 2016; McLaughlin, Sheridan, Alves, & Mendes, 2014).

Transition to parenthood is considered a period of reorganization of the self, that may trigger memories and experiences associated with childhood adversity (Fraiberg, Adelson, & Shapiro, 1975; Lieberman & Van Horn, 2011). Repeated adversities may disrupt the development of appropriate emotion regulation capacities and interpersonal skills needed for

parenting, making the cues and demands from the child potentially overwhelming for the parent (Burns, Jackson, & Harding, 2010; Cicchetti & Rogosch, 2009). Indeed, adults with developmental trauma are shown to be at risk for impaired parenting capacities (Belsky & Pluess, 2013; DiLillo & Damashek, 2003; Fuchs, Möhler, Resch, & Kaess, 2015; Gonzalez, 2015). Consequences of adverse childhood experiences may as such extend into the next generation.

Adaptive experiences in childhood and adolescence such as safe relationships, adequate coping mechanisms, and a sense of competence and agency may contribute to resilience in adulthood (Belsky & Pluess, 2009; Block & Block, 1980; Cook et al., 2017; McGloin & Widom, 2001). Resilience is defined as the ability to maintain equilibrium in the face of stressful life events (Bonanno, 2005), or a pattern of positive adaptation in the context of significant risk or adversity (Rutter, 2012). A good enough, safe attachment relationship with the caregiver, in addition to having effective coping capacities have been found to be protective factors when growing up with adversity (Luthar, 2003, 2006; Schofield, Conger, & Neppl, 2014). Adults with SUD exposed to developmental trauma often report low levels of such protective adult relationships in childhood (Brown & Shillington, 2017).

Early adversity is associated with disturbances in mentalizing abilities in individuals with SUD (Allen, Lemma, & Fonagy, 2012). Mentalizing is a developmentally acquired skill that enables an understanding of mental states (e.g. feelings, wishes, thoughts) in others and oneself as underlying behavioural expressions (Fonagy et al., 2004; Fonagy, Steele, Steele, Moran, & Higgitt, 1991). Development of adequate mentalizing capacities may be a protective factor against emergence of psychopathology in the face of childhood adversity by creating a coherent narrative around the adversity (Fonagy, Steele, Steele, Higgitt, & Target, 1994). Reflective functioning (RF) is the manifestation of mentalizing, and is suggested to first develop in an attachment relationship with a sensitive and responsive caregiver (Bouchard et al., 2008;

Fonagy & Target, 1997; Sharp & Fonagy, 2008, Fonagy & Target, 1997; Fonagy & Target, 2002). Parental RF (PRF) is the capacity to mentalize in the context of the caregiving relationship (Slade, 2005), and is considered a prerequisite of parental sensitivity (Pajulo et al., 2012). The level of PRF also influences the development of child RF, for instance moderate to high PRF has been associated with moderate child RF (Ensink & Mayes, 2010; Sharp & Fonagy, 2008; Slade, 2005). However, as the child develops, peers, teachers and the sociocultural context increasingly influence RF capacity (Luyten, Nijssens, Fonagy, & Mayes, 2017). Indeed, although RF is not directly associated with parenting, RF and PRF are separate but related capacities that capture different aspects of mentalizing (Luyten et al., 2012, 2017; Steele et al., 2008). Both RF and PRF are considered dynamic capacities as they are influenced by particular contexts (e.g. developmental trauma) and specific relationships (e.g. being a parent). Fonagy et al. (1991, 1995) suggested that PRF has a mediating effect between maternal childhood adversity and the development of attachment security in the child. As such, PRF has been considered an intergenerational resilience factor. Previous studies have identified negative associations between PRF and emotional abuse (Bottos & Nilsen, 2014; Burns et al., 2010; Hart, Binggeli, & Brassard, 1997) and between PRF and neglect (San Cristobal, Santelices, & Fuenzalida, 2017), indicating that different forms of adversity might affect PRF differently (Teicher, Samson, Polcari, & McGreenery, 2006). Furthermore, a good enough attachment relationship is theorized to lead to an interpersonally transmitted knowledge, called *epistemic trust*. Epistemic trust is a process whereby a child, and later an adult, experience enough trust in the authenticity and personal relevance of interpersonally transmitted knowledge to be able to make use of it for social and interpersonal learning (Fonagy & Campbell, 2017). Mistrust in this context can occur when there are no clear signals of authenticity, and individuals with experience of developmental trauma and profound trust-issues concerning attachment relationships are more prone to *epistemic vigilance* (Fonagy & Allison, 2014). The mistrust in

early attachment relationships can lead these individuals to be more vigilant and less likely to profit from later relational experiences (Fonagy & Campbell, 2017). The experience of epistemic mistrust in relational settings may be particularly high in vulnerable populations, which includes mothers with SUD. Indeed, mothers with SUD have been identified to have a low PRF (Håkansson, Söderström, Watten, Skårderud, & Øie, 2017; Levy & Truman, 2002; Pajulo et al., 2012; Suchman, DeCoste, Castiglioni, Legow, & Mayes, 2008). In a previous study, we separated SUD mothers according to their PRF level, which was either negative to low or adequate to high (Håkansson et al., 2017). Negative to low PRF indicates not fully developed reflective capacities and adequate to high represents developed reflective functioning (Kelly, Slade, & Grienenberger, 2005; Taubner et al., 2013). We found that mothers with negative to low PRF started using substances earlier, had a more chaotic substance use pattern and developed SUD significantly earlier compared to mothers with adequate to high PRF. Surprisingly, there were no significant differences between mothers with low and adequate PRF in regards of what type of substance they preferred. Furthermore, mothers with adequate PRF performed according to norms in diverse executive functions (EF), while mothers with negative to low PRF had multiple deficits in EF (Håkansson et al., 2017). This association between PRF and EF was also highlighted in a recent study on mothers from a normal population (Rutherford et al., 2017). EF refers to a set of cognitive processes that involves working memory, inhibition, cognitive flexibility and regulation of emotion and attention (Diamond, 2013; Zelazo, 2015). Studies have found that adverse childhood experiences have been associated with long lasting effects on cognitive development and functioning (Teicher, Samson, Anderson, & Ohashi, 2016), and reductions in EF (Hanson et al., 2015; Hostinar, Stellern, Schaefer, Carlson, & Gunnar, 2012; Viola, Tractenberg, Pezzi, Kristensen, & Grassi-Oliveira, 2013). It is suggested that impairments in the hippocampus, prefrontal cortex, and enhanced amygdala function after early life adversity may increase emotional responses to

threat detection and EF capabilities later in life (Kim et al., 2013; Loman et al., 2013; Teicher et al., 2016).

In spite of numerous studies that have highlighted the significance of adverse and adaptive experiences during childhood and adolescence for adult and parental functioning, to our knowledge, no studies have investigated associations between PRF and adaptive and adverse experiences in mothers with SUD. Considering the potential intergenerational transmission of risk and resilience in mothers with SUD, it is important to enhance our knowledge about possible associations, and individual differences, regarding PRF and different forms of adverse and adaptive experiences during childhood and adolescence.

### **The Current Study**

**Part 1.** In the first part of the study we aimed to examine associations between PRF and adaptive and adverse experiences during different developmental phases, as well as different forms of adaptive (safety and competence) experiences and adversities (emotional, physical sexual abuse, and neglect), controlling for EF and mental health status in mothers with SUD. We expected to find positive correlations between PRF and adaptive experiences, and negative correlations between PRF and adversities throughout early childhood, latency and adolescence. We hypothesized that adaptive and adverse experiences in early childhood, would be strongly associated with PRF. We expected to find significant negative associations between all forms of adversities and PRF, and anticipated that emotional abuse and neglect in particular would be strongly associated with PRF compared to other forms of adversities. Based on our previous study on the same population of mothers, we predicted EF capacities and the level of experienced psychological distress to affect the association between PRF and adverse and adaptive experiences.

**Part 2.** In the second part of the study, we separated the group of mothers in two, based on PRF level and controlled for EF and psychological distress. We expected to find between-group



differences depending on whether the mothers exhibited either a negative to low PRF or an adequate to high PRF. We hypothesized that mothers with negative to low PRF would report significantly more adverse and less adaptive experiences in different developmental phases compared to mothers with adequate to high PRF. Furthermore, we expected that mothers with adequate to high PRF would report less experience of emotional, physical, and sexual abuse and neglect as well and more experience of safety and competence compared to mothers with negative to low PRF.

## **Methods**

### **Participants**

The study cohort consisted of 43 mothers (mean age = 31.0 years; *SD* 6.4). We recruited the mothers during pregnancy or early during the postpartum period and referrals were received from municipality nurses, clinicians in outpatient clinics or from clinicians in institutions specialized in caring for pregnant women with SUD. To be eligible for inclusion, mothers had a child under the age of 18 months, and a SUD diagnosis, with or without comorbid mental health diagnosis. Exclusion criteria were: (a) estimated full IQ below 70. Factors considered as potential confounding stressors for the mothers as (b) multi-parity (i.e. giving birth to twins or triplets), (c) premature birth (<32 weeks and <1500 g), or (d) having a severely ill or multi-handicapped child were also exclusion criteria. Neonatal abstinence syndrome in the infant was not an exclusion criterion. Although the mothers had a recent and severe history of substance abuse, all the mothers were abstinent during the inclusion and assessment period that lasted for several months.

*Insert Table 1 about here*

### **Measures**

**Socio-demographic variables and use of psychoactive substances.** Substance use was registered with the *European Addiction Severity Index (Europ-ASI)* 5<sup>th</sup> edition (Kokkevi &

Hartgers, 1995; McLellan et al., 1992), Norwegian version (Lauritzen, 2010). The Europ-ASI is a well-validated semi-structured commonly used clinical interview. In addition to questions concerning substance use and addiction severity, questions relate to employment and support status, family and social relationship, as well as somatic and psychological issues. Reliability and validity for the Europ-ASI has been reported to be satisfactory (Kessler et al., 2012; Kokkevi & Hartgers, 1995; McLellan et al., 1992).

**Adaptive and Adverse Experiences.** The Traumatic Antecedent Questionnaire (TAQ) (Van der Kolk, Spinazzola, & Hopper, 1995) is a 41-item self-administered instrument that evaluates adverse and adaptive experiences in four different developmental phases; early childhood (0-6 years), latency (7-12 years), adolescence (13-18 years) and adulthood. Information about lifetime experiences is measured in ten domains: (1) competence, (2) safety, (3) neglect, (4) separations, (5) family secrets, (6) physical trauma, (7) sexual trauma, (8) witnessing trauma, (9) other traumas (i.e., natural disaster, serious accident), and (10) exposure to familial or personal alcohol or illicit drug use (Herman & Van der Kolk, 1990). The first two domains represent adaptive experiences, while the latter eight domains assess exposure to adverse experiences or trauma. For this particular study, we investigated four adverse experiences (emotional, physical, sexual abuse, and neglect), and two adaptive experiences (competence and safety). The TAQ allows calculation of summary scores for each of the ten individual domains, as well as across the four developmental periods. For each item of the TAQ, respondents are asked to rate the extent to which they had a particular experience during each developmental period on a scale from 0 to 3. Numerical markers represent both frequency and severity of experience. In general, higher scores on the two adaptive domains represent greater levels of adaptive functioning, while higher scores on the eight trauma/adverse event domains represent greater levels of accumulated risk. A composite score is then calculated for each area

and for each age range. The TAQ has shown preliminary incremental validity (Luxenberg, Spinazzola, & Van der Kolk, 2001).

**Parental Reflective Function (PRF).** We used the Parent Development Interview-Revised (PDI-R2) to assess PRF (Fonagy, Target, Steele, & Steele, 1998; Slade, Aber, Berger, Bresgi, Kaplan et al., 2003), Norwegian translation. The PDI-R2 is a 20-question semi-structured interview designed to assess how the parent makes sense of rewarding and challenging situations with the child, the relationship, or themselves as a parent. To assess for PRF, the PDIs-R2 were transcribed verbatim and were rated according to RF coding guidelines (Fonagy et al., 1998). For reliability purposes, a second independent rater coded 25% of the interviews. There was a strong correlation between the coders ( $r = .96$ ). The interviews were scored for PRF on an 11-point scale from  $-1$  to  $9$ , where higher scores reflected higher RF (Slade, Bernbach, Grienberger, Levy, & Locker, 2005). We made a distinction between negative to low PRF and average to high PRF at a score of  $4$  in this study. In a vulnerable population (as SUD mothers), a score of  $4$  indicates average RF capacity (Kelly et al., 2005; Levy et al., 2001; Taubner et al., 2013), while a score of  $5$  or above indicates average RF in a normal population. (Slade, 2005). PDI-RF has good validity in normal populations and in populations of parents with a SUD (Levy & Truman, 2002; Slade, 2005; Slade et al., 1999).

**Mental health status.** To measure psychological distress, we used the Hopkins Symptom Checklist (HSCL-10). The HSCL-10 is a self-administered questionnaire designed to measure daily subjective experiences of anxiety and depression symptoms. The HSCL-10 is a short version of the HSCL-90 (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974), and consists of 10 items, in which responses ranges from  $1 =$  not at all, to  $4 =$  very much. By dividing the total score with number of items answered, a total score is calculated. The cut-off score of  $1.85$  is an indication of psychological distress (Strand et al., 2003). The HSCL-10 has good

validity and reliability (Haavet, Sirpal, Haugen, & Christensen, 2010; Strand, Dalgard, Tambs, & Rognerud, 2003).

**Executive Functions (EF).** Neuropsychological measures of maternal EF included an assessment of several executive sub-functions. The raw scores were converted into t-scores. We assessed the following EF components:

***Working memory.*** In the Letter-Number Sequencing sub-test from the Wechsler Adult Intelligence Scale 4<sup>th</sup> Edition (Wechsler, 2014), the participants were presented with an increasingly longer series of mixed letters and numbers at one-second intervals. They were required to repeat back to the administrator in a manner in which the numbers were presented, first in order from the lowest to the highest, followed by the letters in alphabetical order. Higher raw t-scores and longer spans indicate a high capacity of auditory working memory. The Wechsler Adult Intelligence Scale has good validity and reliability (Canivez & Watkins, 2010).

***Verbal Fluency.*** Letter Fluency and Category Fluency from the Verbal Fluency test from the Delis-Kaplan Executive Function System (D-KEFS) (Delis, Kaplan, & Kramer, 2001) were used to assess verbal fluency. In the Letter Fluency condition, participants were required to say as many words as possible that started with either “F”, “A”, or “S” within in a 60-second time frame. In the Category Fluency condition, participants were required to first say as many animals as possible in a 60-second time frame, and then as many boys names as possible at the same time frame. Higher t-scores are indicative of high levels of verbal fluency.

***Cognitive inhibition.*** To assess cognitive inhibition, we used the Colour-Word Interference Test, Condition 3 from the D-KEFS (Delis et al., 2001). Participants had to inhibit themselves from reading a colour word, and instead as quickly as possible say the name of the colour in which the word was printed. A higher frequency of errors and a longer time to complete the task indicates difficulties with inhibition and provide a lower t-score.

***Cognitive flexibility.*** To assess cognitive flexibility, we used the inhibition-switching task in the Colour-Word Interference Test, Condition 4 from the D-KEFS (Delis et al., 2001). Participants were required to switch between reading the colour word and naming the colour in which the colour was printed. The time used and the numbers of errors committed during the task were measured. More errors, in addition to a longer time to complete the task, indicate difficulties with cognitive flexibility and provide lower t-scores. The D-KEFS has good reliability and validity (Delis, Kramer, Kaplan, & Holdnack, 2004; Shunk, Davis, & Dean, 2006).

***Planning.*** We used The Tower of Hanoi Test (Delis et al., 2001) to measure planning, rule learning and the ability to establish and maintain an instructional set. Participants were requested to place discs of varying sizes on a board with three vertical pegs in the same manner shown on a picture. They were requested to perform as fast as possible and with as few numbers of movements as possible. There is an increasing complexity of the test, starting with two discs and ending with five discs. Taking a long time to complete the task, as well as a high frequency of errors, indicate difficulties in planning and yielded a lower t-score.

## **Procedures**

The present study had a cross-sectional design. This study is part of a larger study with a broad battery of measures and only results relevant to the aims in the current study are presented in this paper. Assessments consisted of the PDI-R2, which we audio recorded and transcribed verbatim, the EuropASI, and the neuropsychological test battery, and a request of completing the HSCL-10 and the TAQ in between interview sessions. As some mothers found the TAQ challenging, mothers were offered an interview as an alternative, which 16 (37.2 %) of the mothers accepted. Estimated time for data collection using the larger test-battery was approximately seven hours per family, and each participant met with the researcher on three to six separate occasions to complete the assessment. Each session lasted between one and two

hours. Data collection for this particular part of the test battery lasted for approximately three hours per respondent. The mothers were assessed in the accommodation they were currently living.

### **Ethics**

The study was approved by The Norwegian Regional Committee for Medical Research Ethics in Eastern Norway (REK-Ost), and conducted in accordance with the Helsinki Declaration of the World Medical Association (2004).

### **Statistical analyses**

All cases ( $N = 43$ ) were included in the analyses, and there were no missing data. In part 1 of the study, we used descriptive statistics of socio-demographic variables, substance use, PRF, different forms of adverse and adaptive experiences in different developmental phases, mental health status and EF. We calculated Pearson product moment correlations between PRF, adverse and adaptive experiences in different developmental phases (early infancy, latency, and adolescence), the four types of adverse (emotional, physical, sexual abuse, and neglect) and the two types of adaptive experiences (safety and competence), mental health status, and EF. We conducted a principal component analysis on the EF measures and calculated the factor scores of the extracted dimensions. One major factor was extracted accounting for 56.9 % of the unrotated variance (eigenvalue = 3.4). The factor loadings of the six EF components were the following: Inhibition: .87; working memory: .86; cognitive flexibility: .80; planning: .79; category fluency: .57; and letter fluency: .57.

To further investigate the links between PRF and adverse and adaptive experiences, we carried out two multiple regression analyses. In the first analysis, we used PRF as the criterion variable, and adaptive and adverse experiences in different developmental phases (early infancy, latency, and adolescence) as predictor variables. We further entered mental health and EF (using the EF-factor) in two subsequent blocks as control variables. The analytic strategy

allowed us to determine how much additional variance in PRF adaptive and adverse experiences in different developmental phases accounted for before and after controlling for mental health and EF. In the second regression analysis, we used PRF as the criterion variable and different types of adversities (emotional, physical, sexual abuse, and neglect) as predictor variables. We controlled for mental health status and EF by entering the control variables in two blocks.

In part 2 of the study, three multiple analyses for variance (MANOVAs) were conducted to test differences between two groups of mothers differentiated by exhibiting an adequate to high PRF or a negative to low PRF. In the first and second analysis, we investigated if there were differences in adaptive (experience of safety and experience of competence) and adverse experiences (emotional, physical, sexual abuse, and neglect) in different developmental phases (early childhood, latency, and adolescence) depending on PRF level, controlling for mental health status and EF. In the third MANOVA, we tested whether there were differences in presence of specific types of adverse and adaptive experiences, for mothers with negative to low PRF compared to mothers with adequate to high PRF, controlling for mental health status and EF.

All statistical analyses we carried out using IBM Corp. Released 2016. IBM Statistical Package for Social Sciences (SPSS) version 24.0.

## **Results**

### **Part 1**

Pearson's correlations were calculated for the main variables of interest, and are presented in Table 2.

*Insert Table 2 about here*

PRF was negatively associated with adversity in early childhood,  $r = -.33$ ,  $p < .05$ , latency  $r = -.36$ ,  $p < .05$ . Furthermore, PRF was positively associated with adaptive experiences in early childhood,  $r = .61$ ,  $p < .01$ , latency,  $r = .33$ ,  $p < .05$ , adolescence,  $r = .36$ ,  $p < .05$ . The

results indicated that presence of adversities in different developmental phases were associated with lower PRF, while presence of adaptive experiences were associated with higher PRF.

Table 3 presents the results of the multiple regression analysis.

*Insert Table 3 about here*

Adverse and adaptive experiences in early childhood, latency, and adolescence explained 54 % of the variance in PRF ( $R^2=.54$ , adjusted  $R^2= .47$ ,  $F = 7.09$ ,  $df =6$ ,  $p < .001$ ). Adding mental health increased the explained variance in PRF to 65 % ( $R^2= .65$ , adjusted  $R^2= .58$ ,  $F = 9.44$ ,  $df =7$ ,  $p < .001$ ). Further, adding the EF-factor increased the variance in PRF to 67 % ( $R^2=.67$ , adjusted  $R^2= .59$ ,  $F = 8.44$ ,  $df =8$ ,  $p < .001$ ). After controlling for mental health and EF, adaptive experiences in early childhood showed a significant positive association with PRF, that is, we found that more adaptive experiences (safety and competence) in early childhood was positively associated with higher PRF. Mental health showed a significant negative association with PRF, indicating that less psychological distress was associated with higher PRF.

Different types of adversities (emotional, physical, sexual abuse, and neglect) explained 45 % of the variance in PRF ( $R^2=.45$ , adjusted  $R^2= .39$ ,  $F = 7.81$ ,  $df =4$ ,  $p < .001$ ). Adding mental health increased explained variance to 48 % ( $R^2=.48$ , adjusted  $R^2= .41$ ,  $F = 6.76$ ,  $df =5$ ,  $p < .001$ ). When the EF-factor was added, the model explained 53 % of the variance in PRF ( $R^2=.53$ , adjusted  $R^2= .45$ ,  $F = 6.79$ ,  $df =6$ ,  $p < .001$ ). After controlling for mental health and EF, emotional abuse showed a significant negative association with PRF. The results indicated that increased experiences of emotional abuse during early childhood, latency, and adolescence were associated with lower PRF. In addition, the EF-factor made a unique contribution to PRF, indicating that greater EF was associated with higher PRF, as we also reported in a previous study (Håkansson et.al., 2017).



Table 4 demonstrates the differences in adaptive and adverse experiences between mothers with a negative to low PRF and mothers with an adequate to high PRF.

*Insert Table 4 about here*

The MANOVA showed significant differences between the two groups of mothers (negative to low RF or adequate to high RF) regarding adverse and adaptive experiences also when we controlled for mental health status and EF. Mothers with a negative to low PRF reported significantly more adverse experiences in early childhood ( $F = 6.1, df = 1, p < .05$ ), and in latency ( $F = 4.2, df = 1, p < .05$ ), but not in adolescence. Furthermore, mothers with adequate to high PRF reported significantly more adaptive experiences, particularly in early childhood ( $F = 25.6, df = 1, p < .01$ ), but also in latency ( $F = 7.0, df = 1, p < .01$ ), and adolescence ( $F = 5.4, df = 1, p < .05$ ).

We also found significant differences between the groups in all the forms of adverse and adaptive experiences that we measured. In particular, mothers with negative to low PRF reported significantly more emotional abuse ( $F = 20.8, df = 1, p < .01$ ), and less experience of safety ( $F = 11.2, df = 1, p < .01$ ) compared to mothers with adequate to high PRF. In addition, mothers with negative to low PRF reported significantly more physical abuse ( $F = 5.7, df = 1, p < .05$ ), neglect ( $F = 6.6, df = 1, P < .01$ ), and sexual abuse ( $F = 7.7, df = 1, p < .01$ ), in addition to less experience of competence ( $F = 4.2, df = 1, p < .05$ ) compared to mothers with adequate to high PRF.

## **Discussion**

### **Part 1**

As expected, the mothers in this study reported a high degree of adversity associated with developmental trauma throughout childhood, latency, and adolescence. Particularly, the experiences of emotional abuse and neglect in childhood were prevalent in the group. In addition, these mothers reported relatively scarce presence of adaptive experiences, specifically

the experience of safety. Other studies have also documented that a large proportion of mothers with SUD have been exposed to developmental trauma in close relationships during childhood (Pajulo et al., 2012; Siqueland, Smith, & Moe, 2012). Furthermore, individuals with SUD often have few adaptive relationships (Brown & Shillington, 2017). As we have previously suggested, the mothers in our study demonstrated a low capacity in PRF (Håkansson et al., 2017) compared to what is expected in a normal population (Fonagy & Target, 1997; Slade, 2005), although comparable to other populations of mothers with SUD (Pajulo et al., 2012; Suchman, Decoste, Leigh, & Borelli, 2010).

Congruent with our first hypothesis, we found numerous positive correlations between PRF and adaptive experiences, and negative correlations between PRF and adverse experiences in different developmental phases. In addition, there were moderate to strong negative associations between different forms of adverse experiences (physical, emotional, sexual abuse and neglect) and PRF, as well as positive correlations between adaptive experiences (safety and competence) and PRF. Although we did not find any studies examining possible associations between adversities, adaptive experiences and PRF in SUD mothers, previous studies have found significant relationships between deficits in RF and having experienced developmental trauma in individuals with SUD (Allen et al., 2012) and in pregnant women (Ensink, Berthelot, Bernazzani, Normandin, & Fonagy, 2014). Although one study highlights the association between the capacity to mentalize around the trauma to significantly influence parental capacities, and not RF per se (Ensink, Normandin, Plamondon, Berthelot, & Fonagy, 2016), our results indicate a possible association between adaptive and adverse experiences and PRF.

As a group, the mothers in our study reported a particularly high presence of adversity during adolescence; however, we found no significant correlations with PRF. As RF and PRF are suggested to be somewhat different although related capacities (Luyten et al., 2017; Steele et al., 2008), it is possible that influence from peers and the wider sociocultural context in

adolescence might have been more influential for development of general RF, hence not directly targeting PRF capacities. While RF may represent a more generalized process, the capacity of a parent to think about their child's mental states is suggested to represent a qualitatively different function (Luyten, Fonagy, Lowyck, & Vermote, 2012), that become more refined through the emerging parent-child relationship (Slade, 2005). It is possible that adversities and adaptive experiences during childhood and latency could be predominately influenced by the experiences of being parented, and therefore important for the development of PRF in the group of mothers, while experiences during adolescence might not have had such a significant influence on PRF.

Our results supported our expectations that adversities, as well as adaptive experiences in different developmental phases, strongly correlated with each other. The findings indicated that some mothers in our study had prolonged cumulative adverse exposure throughout childhood and adolescence, which could have led them to be particularly vulnerable for mental health issues (Briere et al., 2008; Van der Kolk et al., 2005). In contrast, another group of mothers had prolonged experience of adaptive experiences, possibly allowing them to develop resilience factors based on having safety and a sense of agency and competence during childhood (Fonagy & Campbell, 2017; Holmes, 2017; Luthar, 2006), leading to greater levels of wellbeing.

Congruent with other studies, we found that different forms of maltreatment strongly correlated with each other (Cecil et al., 2017). Our results indicated that a sub-group of mothers experienced multiple adversities simultaneously. Multiple adversities are suggested to be detrimental for the developing child and the becoming adult (Anda, Felitti, & Corwin, 2014) as they pose a risk for child emotional, cognitive and social development (Gunnar, 2016; Shonkoff, Boyce, & McEwen, 2009). Further, exposure to a higher number of maltreatment types predicts greater severity in mental health and somatic symptoms in adulthood (Finkelhor

et al., 2007, 2009). Our results indicated that mothers raised in adversity, are those least likely to encompass resilience-enhancing resources, such as access to safety from their own parents or experience of competence during childhood, or an adequate PRF in adulthood. Conversely, children raised in conditions that foster resilience might have had a buffer against adversity by having access to safety and a sense of agency/competence. Our results are congruent with a recent study demonstrating that greater the experience of adversity, is associated with less resilience (Holmes, 2017).

Adaptive experiences in early childhood uniquely predicted variance in PRF. The results suggested that compared to experiences of adversities, the presence, or absence of adaptive experiences were more closely related to PRF level. Supporting our results, adaptive experiences, including safe positive relationships and a sense of agency and competence in childhood have been found to be protective for children growing up during adverse circumstances (Luthar, 2003, 2006; Shonkoff et al., 2012). Indeed, in our study we found that mothers with a high degree of adaptive experiences in early childhood reported less adversity, as well as exhibiting a higher PRF. In contrast, mothers with less adaptive experiences reported more adversities as well as exhibiting a lower PRF. The results indicated that the presence or absence of adaptive experiences might be a mediator between developmental trauma and PRF in mothers with SUD. It is suggested that resilience and the experience of early secure attachment are highly related and built into an individual's biology (Holmes, 2017). Indeed, our results indicated that early childhood and relational adaptive experiences were particularly related to adult PRF. In early childhood, the parent's capacity to regulate the infant's emotions is vital for development of resilience, and of stress inoculation (Tronick, 2007). Stress and threat activates the limbic system. The left prefrontal cortex that regulates and modulates these affective responses is underdeveloped in early childhood, and the child draws upon the caregiver to help co-regulate emotions (Tronick, 2007). Affect co-regulation within a safe

attachment relationship, thereby builds the capacity to recognize and regulate affect in the developing child, and is suggested freeing energy to lessen adverse consequences of unregulated emotions (Friston, 2010; Holmes, 2017; Schore & Schore, 2008). In addition, it may allow a child to endure some adverse or painful experiences without it targeting self-development or expectations of others (Stein, 2006). Well-developed or under-developed capacity for affect co-regulation may continue throughout life (Fonagy et al., 2004; Schore, 2005, 2015). As such, adaptive experiences in early childhood may function as a resilience factor when an individual faces adversities later in life, either by drawing on own pre-existing regulation capacities, or having the capacity to relate to others for safety and support. According to our results, we found that a sense of safety and competence in early childhood were associated with moderate to high PRF, and therefore adaptive experiences in early childhood could be considered an intergenerational resilience factor. Furthermore, it is important to note that experiences in early childhood, including those of safety, agency and coping, is predominately stored as a part of the procedural memory, that is implicit, without conscious awareness, and not necessarily in the episodic memory where conscious recollection is more accessible and hence possible to reflect upon (Fonagy, Campbell, & Bateman, 2017). Previous studies have suggested that the potential emotional charge related to the presence or lack of safety and agency in early childhood could become embodied (Shai & Belsky, 2011; Shai, Dollberg, & Szepeswol, 2017). Therefore, early adaptive experiences could be transferred to the next generation through the implicit ways the caregiver relates and interacts with their child, as have previously been suggested in relation to the experience of developmental trauma (Ensink et al., 2014; Fraiberg et al., 1975).

Mental health status also made a unique contribution to variance in PRF, and had a positive association with adaptive experiences in early childhood. The results indicated that mothers with adaptive experiences also had higher mental health status. Supporting our results,

previous studies have reported that mental health problems in adulthood may decrease reflective capacities including PRF (Borelli, West, Decoste, & Suchman, 2012; Camoirano, 2017; Heim, Shugart, Craighead, & Nemeroff, 2010; Luyten, van Houdenhove, Lemma, Target, & Fonagy, 2012), and that presence and lack of adaptive experiences in early childhood is related to adult mental health (Cecil et al., 2017).

Congruent with our hypothesis, emotional abuse significantly explained variance in PRF, when we controlled for EF and mental health status. Our results are supported by previous studies that have highlighted that the impact of emotional abuse in childhood is harmful for development (Burns et al., 2010; Hart et al., 1997), and affecting mentalizing capacities (Bottos & Nilsen, 2014). Although neglect did not make a unique contribution in the regression, it was strongly correlated with PRF, an association supported by a previous study highlighting the negative correlation between childhood neglect and PRF (San Cristobal et al., 2017). Emotional abuse is one of the most common, yet often underreported forms of adversity (Trickett, Mennen, Kim, & Sang, 2009). Furthermore, emotional abuse is suggested to often underlie other forms of abuse (Bottos & Nilsen, 2014). Although physical and sexual abuse are without doubt harmful for the developing child (Norman et al., 2012), emotional abuse may target fundamental aspects of self-development. By psychologically depriving the child of safe and secure caregiving experiences, emotional abuse might hinder the creation of a coherent narrative of own experiences. Children who experience emotional abuse may have a heightened experience of fear and emotional dysregulation, which could represent a substantial risk for developing inadequate reflective capacities in childhood and adulthood (Fonagy, Gergely, & Target, 2007; Fonagy & Target, 2002; Ensink et al., 2016), and according to our results, also transmitted to PRF.

Finally, EF made a unique contribution in variance of PRF and had a negative association with emotional abuse. The results indicated that mothers with increased emotional

abuse had a less functioning EF system in addition to a lower PRF. Supporting our results, previous studies have highlighted the association between adversities in childhood and impairments in adult EF (Hanson et al., 2015; Hostinar et al., 2012; Viola et al., 2013). In addition, we have previously found a positive association between EF and PRF (Håkansson et al., 2017), which is in accordance with a recent study in a normal population of mothers (Rutherford et al., 2017). Based on results in the current study, the association between PRF and EF may be particularly affected by experience of emotional abuse in childhood and adolescence.

## **Part 2**

In the second part of the study, our aim was to investigate whether differences within the group of mothers with SUD existed based on PRF. As hypothesized, the results showed that adverse (emotional, physical, sexual abuse and neglect) experiences throughout the developmental phases (early childhood, latency, and adolescence) were significantly more common in mothers with negative to low PRF, while adaptive (safety and competence), experiences in early childhood, and latency were more common in mothers with adequate to high PRF. In addition, mothers with negative to low PRF reported experiencing significantly more of all forms of adversities, as well as less adaptive experiences compared to mothers with adequate to high PRF. The experience of safe relationships serves an important function beyond securing the physical and psychological development of a child. The good enough attachment relationship is also the foundation of epistemic trust, which is an authenticity in the interpersonal transmitted knowledge, (Sperber et al., 2010; Fonagy & Allison, 2014). Learning that takes place in a developmental context, where caregivers are trusted, gives the child an opportunity for acquiring social learning that is associated with resilience, and benefiting from positive influences from others (Antonovsky & Sagy, 1986; P. Fonagy & Campbell, 2017; Luyten et al., 2017). Epistemic trust promotes structured and manageable cognitions and the capacity to

navigate in a social and physical environment, as well as learning from new relational experiences later in life (Fonagy & Allison, 2014; Fonagy et al., 2017; Luyten et al., 2017). Drawing on these theoretical considerations, it is likely that the mothers in our study with negative to low PRF, with increased presence of adversity and less adaptive experiences, did not have the opportunity to develop epistemic trust. We suggest that the differentiation between mothers with negative to low PRF and mothers with adequate to high PRF might reflect differences between epistemic trust and epistemic vigilance in the mothers. The lack of epistemic trust might have prevented interpersonal learning in relating to self and the child, and hence inhibited the development of an adequate PRF (Fonagy & Campbell, 2017). Research indicates that absence of epistemic trust creates a rigidity that makes capacity for change challenging (Fonagy & Allison, 2014). Our findings demonstrated that mothers with a moderate to high PRF had significantly less experiences of adversity, as well as significantly more adaptive experiences. This sub-group of mothers could have grown up in an environment that fostered the development of epistemic trust and inter- and intrapersonal curiosity, which could have facilitated them to develop moderate to high PRF capacity when becoming a mother. It is possible that this sub-group of mothers with adequate PRF capacities developed SUD for reasons like genetic vulnerability (Palmer et al., 2015), specific personality traits (Belcher, Volkow, Moeller, & Ferré, 2014), tendency for sensation seeking (Holmes, Hollinshead, Roffman, Smoller, & Buckner, 2016), or traumatic experiences in adulthood (Roberts, Roberts, Jones, & Bisson, 2015), that did not target PRF capacities.

### **Strength and limitations**

This study has several advantages. First, it increases our understanding of how adaptive and adverse experiences in different developmental phases could affect PRF in SUD mothers. This group of mothers are considered a difficult population to offer appropriate and individually customized interventions. Indeed, the clinical challenges of working with this group are



exacerbated by the risk of intergenerational transmission of adversity, Therefore, we suggest clinicians should endeavour to offer a more targeted focus depending on previous adaptive and adverse experiences. Second, our assessment tools strengthened our findings as all the mothers completed a comprehensive test-battery that consisted of well-validated and reliable instruments. Finally, we included EF and mental health status as control variables, as these have previously been found to be associated with PRF. Including these control variables in the current study enabled us to investigate the contribution of adverse and adaptive experiences in early childhood, latency, and adolescence.

Despite these strengths, the study has some limitations. First, this was a cross-sectional study and therefore no casual or temporal inferences could be concluded. However, we compared two groups of mothers (mothers with adequate to high PRF and mothers with negative to low PRF) in the MANOVAs to provide an opportunity to develop inferences about causation. Second, as the focus was on five constructs (i.e. PRF, adaptive and adverse experiences, EF and mental health status), results may have been influenced by unmeasured confounding variables that were associated with the variables of interest. For instance, the current study did not include specifics of the SUD. In our previous study on the same group of mothers, we found that onset age, and using multiple substances had negative associations with PRF, but not preference of a specific type of substance (Håkansson et al., 2017). Third, we administered self-reports questionnaires to measure mental health, adaptive and adverse experience. Although self-reports are susceptible to recall bias or deficits, longitudinal follow-up of adults have demonstrated that reports of childhood abuse often are underestimated, which might attenuate the association between adversities and PRF (Hardt & Rutter, 2004). Finally, the sample size, although well within the norm for this type of study, is relatively small, and replication with a larger sample should be considered in future studies.

## **Clinical Implications**

Mentalization-based interventions are gaining popularity as effective for parents with SUD (Neger & Prinz, 2015). These specialist interventions focus on improving parental mentalizing skills in order to improve parent-infant interactions (Kalland, Fagerlund, von Koskull, & Pajulo, 2016). Since mothers with SUD show different levels of PRF, clinicians should be able to assess the level of PRF in the mothers and adapt the intervention accordingly. Findings from the current study particularly highlight the importance of investigating adaptive as well as adverse childhood experiences before initiating the intervention. Specifically, parents with negative to low PRF might require interventions focusing on developmental trauma, establishment of emotion regulation capacities and epistemic trust in addition to improving PRF, while mothers with adequate PRF might profit on a more limited intervention. For the majority of SUD mothers it would be relevant to develop interventions that have a multiple focus, where change in one function may promote change in others in reciprocal fashion. A multimodal intervention strategy using both verbal and non-verbal, embodied methodology might be particularly regulating for mothers with low PRF. We suggest that it is important to have an overall targeted and specific focus on developing a sense of safety and competence in the mothers, as these experiences seem to influence PRF especially. A focus on enhancing epistemic trust in the therapeutic relationship and in the dyadic relationship in parents with negative to low PRF might offer new experiences of relational learning as a foundation for training PRF.

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## Tables

Table 1

*Descriptive statistics of Demographics, Substance Preference, Parental Reflective Functioning, Amount of experienced adversity in different developmental phases, and amount of adverse and adaptive experiences in a lifetime perspective*

Variable	M	SD	Range	N	%
Demographics					
Mother's age <sup>a)</sup>	31.1	6.4	19-44		
Child's age (months) <sup>a)</sup>	8.6	3.8	4-18		
Educated (highest completed) <sup>a)</sup>					
Not completed primary school				2	4.7
Primary School				23	53.5
High School				12	27.9
University				6	4.7
Preferred Substance <sup>a)</sup>					
Central Stimulant				16	37.2
Opioids				14	32.6
Alcohol				7	16.3
Cannabis				6	14.0
Parental Reflective Functioning <sup>b)</sup>					
General RF	2.91	1.71	0-6		
Adverse Experiences <sup>c)</sup>					
Early Childhood	11.3	6.9	0-21		
Latency	13.1	6.0	0-21		
Adolescence	14.7	5.0	0-21		
Adaptive Experiences					
Early Childhood	1.9	1.6	0-6		
Latency	2.2	1.8	0-6		
Adolescence	2.2	1.9	0-6		
Adverse and Adaptive Experiences <sup>c)</sup>					
Emotional Abuse	9.3	2.4	2-12		
Physical Abuse	6.2	3.6	0-12		
Neglect	8.4	3.2	0-12		
Sexual Abuse	5.6	3.4	0-12		
Competence	6.0	2.9	2-12		
Safety	3.9	2.8	0-11		
Mental health <sup>d)</sup>					
HSCL-10	2.5	1.6	1.3-3.5		
Performance on Cognitive Tests					
Working memory, Letter-Number <sup>e)</sup>	41.2	8.8	25-65		
Inhibition <sup>f)</sup>	39.8	11.3	20-65		
Cognitive Flexibility <sup>f)</sup>	35.2	11.4	20-63		
Letter Fluency <sup>e)</sup>	48.4	11.4	21-70		
Category Fluency <sup>e)</sup>	59.0	11.4	30-80		
Planning, Tower <sup>f)</sup>	45.1	6.5	30-59		

a) European Addiction Severity Index (Europ-ASI), 5<sup>th</sup> edition.

b) Parental Development Interview – Revised, Reflective Functioning Scale.

c) Traumatic Antecedents Questionnaire (TAQ).

d) Hopkins Symptom Checklist (HSCL-10).

e) Letter-Number Sequencing sub-test in the Wechler Adult Intelligence Scale, 4<sup>th</sup> edition.

f) Colour-Word Interference Test, Conditions 3 and 4 from Delis-Kaplan Executive Function System (D-KEFS)

g) Verbal Fluency test from Delis-Kaplan Executive Function System (D-KEFS).

h) Tower Test from Delis-Kaplan Executive Function System (D-KEFS).

Table 2

Correlation coefficients between Parental Reflective Functioning (item 1), adverse experiences based on developmental phase (items 2-4), adaptive experiences based on developmental phase (items 5-7), type of adversity and adaptive experience (items 8-13), mental health status (item 14), and EF factor (working memory, inhibition, cognitive flexibility, planning, letter fluency, and category fluency), (item 15).

	1	2	3	4	5	6	7	8	9	10
1 Reflective Functioning <sup>a)</sup>										
2 Early Childhood, Adversity <sup>b)</sup>	-.33*									
3 Latency, Adversity <sup>b)</sup>	-.36*	.88**								
4 Adolescence, Adversity <sup>b)</sup>	-.22	.63**	.80**							
5 Early Childhood, Adaptive <sup>b)</sup>	.70**	-.61**	-.59**	-.41**						
6 Latency, Adaptive <sup>b)</sup>	.46**	-.73**	-.72**	-.59**	.66**					
7 Adolescence, Adaptive <sup>b)</sup>	.35*	-.73**	-.70**	-.62**	.59**	.94**				
8 Emotional Abuse <sup>b)</sup>	-.65**	.63**	.71**	.55**	-.70**	-.62**	-.55**			
9 Physical Abuse <sup>b)</sup>	-.31*	.86**	.89**	.76**	-.53**	-.67**	-.68**	.61**		
10 Neglect <sup>b)</sup>	-.38*	.77**	.79**	.79**	-.59**	-.74**	-.73**	.66**	.74**	
11 Sexual Abuse <sup>b)</sup>	-.30*	.77**	.79**	.69**	-.47**	-.57**	-.56**	.64**	.87**	.60**
12 Competence <sup>b)</sup>	.38*	-.81**	-.76**	-.69**	.63**	.79**	.80**	-.64**	-.70**	-.77**
13 Safety <sup>b)</sup>	.47**	-.72**	-.72**	-.65**	.64**	.72**	.74**	-.80**	-.70**	-.77**
14 HSCL <sup>c)</sup>	-.56**	.54**	.67**	.73**	-.56**	-.58**	-.59**	.73**	.58**	.62**
15 EF factor <sup>d, e, f)</sup>	.58**	-.50**	-.56**	-.49**	.59**	.57**	.46**	-.61**	-.45**	-.50**

N=43, \*\* =  $p < .01$ , \* =  $p < .05$

i) Parental Development Interview – Revised, Reflective Functioning Scale

j) Traumatic Antecedents Questionnaire (TAQ)

k) Hopkins Symptom Checklist (HSCL-10)

l) Letter-Number Sequencing sub-test from the Wechsler Adult Intelligence Scale, 4<sup>th</sup> edition

m) Colour-Word Interference Test, Condition 3 and 4 from the Delis-Kaplan Executive Functioning System (D-KEFS)

n) Tower Test from the Delis-Kaplan Executive Functioning System (D-KEFS)

Table 3

*Multiple regression Analyses for adverse and adaptive experiences (in early childhood, latency, and adolescence), controlled for mental health (HSCL-10), and executive functioning (EF) predicting parental reflective functioning (PRF). Different types of adversities (emotional, physical and sexual abuse, and neglect), controlled for mental health (HSCL-10) and executive functioning (EF), predicting parental reflective functioning (PRF)*

Variable	B	SE B	B	T	Sig.
PRF, adverse experiences					
Early childhood	.02	.04	.12	.48	NS
Latency	-.001	.06	-.01	-.03	NS
Adolescence	.08	.05	.35	1.72	NS
PRF, adaptive experiences					
Early Childhood	.35	.11	.49	3.16	**
Latency	.36	.24	.56	1.50	NS
Adolescence	-.34	.23	-.54	-1.48	NS
Mental Health	-.95	.33	-.50	-2.91	**
EF-factor	.18	.17	.16	1.08	NS
PRF, type of adverse experience					
Emotional Abuse	-.28	.10	-.58	.3.77	**
Physical Abuse	-.03	.09	-.10	-.41	NS
Neglect	-.05	.07	.14	-.01	NS
Sexual Abuse	.11	.09	.31	1.22	NS
Mental Health	-.31	.34	-.16	-.90	NS
EF-factor	.36	.18	.30	2.03	*

\*p < .05. \*\*p < .01. NS = No significant results

o) N=43

Table 4

*Differences in presence of adverse and adaptive experiences in different developmental phases, and in different types of experiences between mothers with a negative to low Parental Reflective Functioning and mothers with an adequate to high Parental Reflective Functioning, controlling for mental health status (HSCL-10) and Executive Functions (EF-variable). Multiple Analysis of Variance (MANOVA)*

	Negative to Low RF <sup>a)</sup>		Adequate to High RF <sup>a)</sup>		F	Sig.
	N:32		N:11			
	M	SD	M	SD		
Adverse experiences <sup>b)</sup>						
Early childhood	12.8	6.7	7.1	5.9	6.1	*
Latency	14.1	6.1	10.0	4.8	4.2	*
Adolescence	15.2	4.9	13.4	5.1	1.0	NS
Adaptive experiences <sup>b)</sup>						
Early Childhood	1.3	1.2	3.5	1.4	25.6	**
Latency	1.8	1.6	3.4	1.9	7.0	**
Adolescence	1.8	1.8	3.3	1.9	5.4	*
Type of Experience <sup>b)</sup>						
Emotional Abuse	10.1	1.9	6.9	2.3	20.8	**
Physical Abuse	6.9	3.6	4.1	2.9	5.7	*
Neglect	9.1	2.9	6.5	3.2	6.6	**
Sexual Abuse	6.4	3.0	3.3	3.6	7.7	**
Competence	5.5	2.8	7.5	2.9	4.2	*
Safety	3.2	2.4	6.1	2.7	11.2	**

N=43, \*\* = p<.01, \* = < .05

a) Parental Development Interview – Revised, Reflective Functioning Scale

b) Traumatic Antecedents Questionnaire (TAQ)