Childhood experiences of maltreatment, reflective functioning and attachment in adolescent and young adult mothers: effects on mother-infant interaction and emotion regulation

ABSTRACT

Background: Maternal childhood experiences of maltreatment affect parenting and have consequences for a child's social-emotional development. Adolescent mothers have a higher frequency of a history of maltreatment than adult mothers. However few studies have analyzed the interactions between adolescent mothers with a history of childhood maltreatment and their infants. **Objective**: The aim of the study was to examine the effect of maternal childhood experiences of maltreatment on mother-infant emotion regulation at infant 3 months, considering both infant and mother individual emotion regulation and their mutual regulation. **Participants**: Participants were 63 adolescent and young adult mother-infant dyads recruited at a hospital. **Methods**: The mothers were administered the *Adult Attachment Interview* to evaluate reflective functioning and attachment and the *Childhood Experiences of Care and Abuse* was used to evaluate maternal childhood experiences of maltreatment. Mother-infant interactions were coded with a modified version of the *Infant Caregiver Engagement Phases*. **Results:** Dyads with mothers with childhood maltreatment (vs dyads with mothers with no maltreatment) spent more time in negative emotional mutual regulation (p=.009) and less time in positive and neutral mutual emotion regulation (p=.019). Cumulative maternal childhood experiences of maltreatment were associated positively with mother and infant negative states at individual and dyadic level and with the AAI scales of Passivity and Unresolved Trauma (p<.05). The effect of cumulative maternal childhood experiences of maltreatment on mother-infant emotion regulation was direct and not mediated by maternal attachment and reflective function. **Conclusions:** Maternal childhood experiences of maltreatment increase the risk connected to early motherhood, affecting mother-infant emotion regulation.

Keywords: adolescent and young adult mother, mother-infant interaction and emotion regulation, maternal attachment, maternal childhood experiences of maltreatment, maternal reflective functioning

1. Background

As is well-known, childhood experiences of maltreatment (physical, sexual and emotional abuse and neglect) have short and long term psychological consequences for a child's social-emotional development and for child and adult mental health, involving, *inter alia*, symptoms of depression and anxiety, substance abuse, dissociation processes and complex post-traumatic disorders, and affecting interpersonal relationships and emotion regulation (Bradley et al., 2008; Norman, Byambaa, Butchart, Scott, & Vos, 2012; Keyes et al., 2012; Pears & Capaldi, 2001; Vaillancourt, Pawlby & Fearon, 2017). Numerous studies have also shown that those with childhood experiences of maltreatment have a higher risk of abusing their own children upon becoming parents, maltreating and being violent towards them, (Dixon, Browne, & Hamilton-Giachritsis, 2005; Egeland, Bosquet, & Chung, 2002).

However, the hypothesis of intergenerational transmission of abuse, known as circle of violence and put forward to explain the cited research data, has not completely explained how such

transmission occurs (Thornberry & Kerry, 2012) or why in a significant percentage of cases abuse is not transmitted from one generation to the next (Ertem, Leventhal, & Dobbs, 2000; Widom, Czaja, & DuMont, 2015).Various studies have hypothesized that one of the possible factors underlying intergenerational transmission of abuse is the parenting behavior adopted by the parent during the childhood of the child.

Another important point which has emerged from the research is that a history of childhood maltreatment is often correlated with high risk conditions for parenthood, including poverty, mental illness and young motherhood. Various studies have addressed adolescent motherhood in particular, showing that adolescent mothers have a higher frequency of abuse than adult mothers (Boyer & Fine, 1992; Madigan, Vaillancourt, & Mckibbon, 2012; Young, Deardorff, Ozer, & Lahiff, 2011) and adolescent non-mothers (Boden, Fergusson, & Horwood, 2008). The various studies have also defined a range between 47% and 62% of experiences of childhood abuse of adolescent mothers (Bailey, Moran, & Pederson, 2007; Noll, Shenk, & Putnam, 2009; Putnam-Hornstein, Cederbaum, King, Cleveland, & Needell, 2013). In this regard a meta-analysis (Noll et al., 2009) highlighted how suffering sexual abuse in childhood is one of the predictive factors for early pregnancy. At the same time other studies (Valentino, Nuttall, Comas, Borkowski, & Akai, 2012; Zuravin & Di Blasio, 1996) have shown that a history of abuse or neglect is a risk factor for perpetration of abuse by young mothers (Stevens-Simon, Nelligan, & Kelly, 2001). Dixon (Dixon et al., 2005) has identified becoming a parent before the age of 21 as a mediation factor of intergenerational transmission of trauma, in addition to parental mental illness, parental depression and living with a violent adult.

It must be noted in this regard that early motherhood, per se, is a risk factor for quality of parent-child interaction. In their relationship with their infant adolescent mothers are less responsive and more punitive (Berlin, Brady-Smith, & Brooks-Gunn, 2002), have less appropriate responses to their children’s emotions (Dukewich, Borkowski, & Whitman, 1996) and are more detached or hostile and intrusive (Lee & Guterman, 2010), considering as intrusive behavior, behavior overstimulating or

interfering the child's activities (Biringen et al., 2000). Adolescent mothers also present low mind-mindedness (Demers, Bernier, Tarabulsy, & Provost, 2005), considering mind-mindedness as the capacity of the parent to attributing putative mental states; this ability is measurable by analyzing the verbal comments which the caregiver makes to the infant in the first year of life (Meins, 1997). Compared to adult mother-infant interaction, adolescent and young mother-infant interaction is also characterized by more negative emotional states (Anonymous 2014). It is, therefore, of particular interest to study whether childhood experiences of maltreatment in adolescent mothers – very frequent in such mothers as research demonstrates – are a further risk factor with respect to early motherhood, making adolescent mothers more vulnerable in their interaction with the child.

In general, with regard to adult mothers a direct association has been shown between maternal history of childhood abuse and maternal parenting behavior in the first two years (Vaillancourt et al., 2017). Lyons-Ruth and Block (1996) showed that mothers who had been sexually abused in childhood exhibited low levels of involvement with the child at 18 months, while mothers who had been physically abused in childhood were more hostile and intrusive. Pereira et al. (2012) also reported a significant association between maternal experience of physical abuse and low levels of maternal sensitivity at infant 16 months. The Fuchs longitudinal study (Fuchs, Möhler, Resch, & Kaess, 2015), which examined emotional availability in the interactions of mothers who had suffered physical and sexual abuse and their children, showed that, at 12 months but not at 5 months, mothers who had suffered abuse were less emotionally than mothers who had not had such experiences, just as their infants were less responsive and socially involved in the same period. However, other studies have only found indirect effects, (Martinez-Torteya et al., 2014) or no effect of maternal history of child abuse on caregiving behaviors (Lesser & Koniak-Griffin, 2000; Stacks et al., 2014).

Moreover few studies have examined mother-infant interaction in the first months of the infant's life. Dixon et al. (2005) found that, at both 4-6 weeks and 3-5 months, mothers with a history of abuse (vs mothers without a history of abuse) had poor parenting with less positive attributions towards the

infant, provided less support and were less emotionally available. On the contrary Lesser and Koniak-Griffin (2000) found that a history of abuse of the mother was not related with caregiving behavior during the first 12 months.

For what specifically concerns adolescent and young adult mothers some studies have analyzed interaction between abused adolescent and young mothers and their children. Driscoll and Easterbrooks (2007) have shown that adolescent mothers aged under 21 years with a history of childhood physical abuse adopt intrusive and directive styles of interaction characterized by unpredictable changes more frequently than non-abused mothers. On the contrary in the study of Lesser and Koniak-Griffin (2000) a history of childhood maltreatment alone did not increase a young mother's risk for problems of mother-infant interaction. Lastly, the work of Madigan (Madigan, Moran, & Pederson, 2006) has shown that adolescent mothers with unresolved attachment with respect to trauma, constituted by physical, sexual and emotional abuse, adopt interaction with their children which is characterized by errors in emotion communication and frightened/disoriented and intrusive-negative behavior.

An interesting line of research into the role played by parental sensitivity in the transmission of abuse concerns emotion regulation, which is generally compromised both in childhood and adulthood in those who have suffered abuse (Briere & Jordan, 2009; Maughan & Cicchetti, 2002; Oshri, Sutton, Clay-Warner & Miller, 2015). Difficulty in emotion regulation may, therefore, also be found in mothers who have suffered abuse, such mothers adopting non-adaptive strategies in caring for their child, such as aggressive conduct or affective withdrawal (Ehrensaft, Knous-Westfall, Cohen, & Chen, 2015). In this regard a recent study has shown that the potential of mothers who have suffered childhood abuse to perpetrate abuse themselves is mediated by maternal emotion dysregulation and negative emotions evaluated by means of self-reports (Smith, Cross, Winkler, Jovanovic, & Bradley, 2014). However, the study did not examine by direct observation mother-infant emotion regulation but only maternal regulatory capacity.

It should be noted that the emotion regulation which characterizes mother-infant interaction is of particular importance in the first year of the infant. During this period the infant interacts with his mother by facial expression, gaze (at partner and at object), vocalization, and gesturing, communicating positive and negative emotions. The mother, with her communication, tunes into and helps to modulate her infant's emotions. Thus, a system of mutual regulation is created which can be distinguished by mutual interactive regulatory processes involving coordination of mother-infant emotion states (matches) alternating with non-coordination of emotion states (mismatches) (Tronick et al., 2005; Tronick & Beeghly, 2011). These methods of mutual or dyadic regulation form the basis of future attachment patterns and of an infant's subsequent ability to regulate emotions. They have a long-term impact on an infant's socio-emotional skills and psychopathological risk (Sroufe, Egeland, Carlson, & Collins, 2005). In conditions of risk for motherhood, such as depression and perinatal anxiety, such styles are less adequate (Reck et al., 2011; Anonymous, 2016).

To sum up, the results pertaining to the relationship between maternal childhood experiences of maltreatment and early mother-infant interaction have not been concordant for what concerns mothers in general and adolescent and young adult mothers in particular, although the latter have often had adverse experiences in childhood. Moreover, almost all the studies focused on maternal behavior without considering the child's style of interaction with the mother. What is more, to our knowledge no study has directly examined mother-infant emotion regulation in adolescent mothers with a history of maltreatment.

Furthermore, no study has examined whether the role of adverse experiences in adolescent and young mothers can be influenced by some variables which the theory of attachment considers to be particularly influential with respect to mother-infant emotion regulation, such as the mother's capacity for mentalization and her attachment model (Fonagy, Gergely, Jurist, & Target, 2002). Attachment models, secure and insecure, understood as cognitive-affective schematization of their

infant attachment relations by the adult (Main, 2000), are considered to function as expectation and guide with respect to the current relations of the subject him/herself. These models, concerning the representation of self in relationships with others, appear to influence in particular in parents their interactions with children. In this regard the quality of maternal attachment has been found to be significantly correlated to the early styles of interaction adopted by the mother with her infant for what concerns her responsiveness (Pederson, Gleason, Moran, & Bento, 1998), synchronization capacity (Feldman, 2003), emotional regulation (Anonymous, 2013) and emotional availability (Biringen et al. 2000). The capacity for mentalizing, operationalized as reflective functioning (RF), has been defined (Fonagy et al., 2002) as the capacity to consider close relationships and the self in terms of mental states, understanding one's own behavior and that of others in the light of these states, such as feelings, thoughts, desires, intentions, or beliefs. Reflective functioning can be measured by Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985), a semi-structured interview used to evaluate the attachment models (Secure (F), Insecure-Dismissing (Ds), Insecure-Preoccupied (E) and Insecure-Unresolved /Disorganized (U)) of the adult to their parenting figures; RF coding system consists in an evaluation of a subject's capacity to mentalize about his/her own early attachment experiences. Reflective function assessed thus has been found to be associated with the mother's attachment model (Fonagy, Steele, Steele, Moran, & Higgitt, 1991) and to her sensitivity towards the child (Anonymous, 2018) and to the attachment pattern of the child (Ensink, Normandin, Plamondon, Berthelot, & Fonagy, 2016).

1. Approach of our study

In brief, few studies have evaluated the association between childhood experiences of maltreatment of adolescent and young mothers and quality of mother-infant interaction in the first months, despite the high frequency of such experiences in these mothers, and only one study has analyzed the style of interaction of the infants with regard to adolescent mothers with childhood experiences of maltreatment (Dixon et al., 2005). Furthermore no study has examined the relationship between

emotion regulation between adolescent and young mothers with experiences of maltreatment and their infants and their capacity for mentalization, or examined other important variables which could moderate this relationship, such as maternal attachment (apart from the work of Madigan et al. 2006). In this regard, since it has been shown that emotion regulation is often compromised in people who have suffered childhood abuse, we hypothesize that adolescent and young mothers who have suffered maltreatment are likely to have difficulty in emotion regulation and this will affect their capacity to recognize and act on the emotions of their child. Since it has been shown that mother-infant emotion regulation is associated with maternal attachment models and reflective functioning (Heron-Delaney et al., 2016; Anonymous, 2018), assessing whether these variables are associated with maternal childhood experiences of maltreatment and whether they may have a mediating effect on the relationship between such experiences and mother-infant emotion regulation is also of particular interest.

On the basis of these considerations the principal aim of our study, therefore, is to examine whether having childhood experiences of maltreatment–defined as antipathy, neglect, physical, sexual and psychological abuse by Bifulco (Bifulco, Brown, & Harris, 1994) – (vs not having these experiences) in a high-risk sample such as that of adolescent and young mothers has a negative effect on the quality of mother-infant emotion regulation in the first months. This regulation will be studied microanalytically, considering mother-infant interaction second by second, in a natural setting consisting in a play-room provided with objects and toys suitable for children's ages. We hypothesize that adolescent and young mothers with childhood experiences of maltreatment display more negative behavior towards their infants than do adolescent and young mothers without these experiences just as their infants display more negative behavior. We also hypothesize that, at the level of mutual emotion regulation, mother-infant dyads with adolescent and young mothers with histories of childhood maltreatment (vs adolescent and young mothers without histories of childhood maltreatment) spend more time in states of negative matches and of total (neutral and positive)

mismatches and less time in total matches. According to Tronick (Tronick et al., 2005), a "match" corresponds with moments in which mother and infant share the same emotional states at the same time, whether they be positive, negative or neutral; a "mismatch" corresponds to moments in which mother and infant are in a different state at the same time (for example, mother negative/infant positive, infant neutral/mother negative, etc.,). The second aim is to examine whether having suffered more than one experience of childhood maltreatment results in greater difficulty in mother-infant emotion regulation. The study is exploratory since there is no research which has examined the effect of the cumulative adverse experiences of adolescent and young mothers on their interaction or emotion regulation with the child. The third aim is to examine whether having experiences of childhood maltreatment is associated with maternal attachment and reflective functioning and whether these variables have a mediating effect on the relationship between these experiences and mother-infant emotion regulation. In this case too the analysis is exploratory since, although a few studies have found an association between maternal attachment and a history of abuse in adolescent mothers (Madigan et al., 2012) and reflective function and history of abuse (Ensink, Bégin, Normandin, & Fonagy, 2016), no study has considered the possible effect of mediation played by maternal attachment and reflective function with respect to maternal adverse experiences and mother-infant emotion regulation.

2. Method

2.1 Participants

Participants in the present study were adolescent and young adult mothers and their infants who were recruited from the "Accompagnamento alla genitorialità in adolescenza" [Accompanying Parenting in Adolescence] Service at the San Paolo Hospital of Milan, a Service that follows adolescent and young mothers aged 14 to 21 years, offering them an attachment based intervention program consisting of psychological support and videofeedback (Anonymous 2016). The mothers

who regularly access the Service are considered a group at risk because they have a low socio-economic level (85%) and a low level of education (85%) (Anonymous 2016, 2017). Inclusion criteria for participation in the study included: ability to speak and understand the Italian language; age range between 14 and 21; absence of maternal psychopathology, uneventful delivery, infants born at full term with no medical complications and physically healthy; primipara mothers. Exclusion criteria included: prematurity and twin birth.

Mothers (and their infants) who met the criteria were initially approached during the post-partum. Those who had expressed an interest in participating in the study were contacted again when the infant was 2 months of age. The assessment was conducted when the infants were 3 months of age before starting the intervention program.

Of the 86 mothers contacted, 8 (9%) declined to participate, 15 (18%) repeatedly cancelled appointments; the remaining 63 (73%) mother–infant dyads were involved in the study. The present analyses included the 63 mother–infant dyads (Male infants = 29) for whom complete data were available on all relevant measures. The recruited group of the mothers had similar characteristics to the non-recruited one (N = 23), but related to the Service during the recruitment period for both socio-economic level (85% had a low socio-economic level) and a level of education (85% had a low level of education); also the percentage of adverse experiences did not differ with respect to the recruited group.

Mothers had a mean age of 18.63 (SD =1.87). We chose this age range in accordance with other studies which show that early motherhood under 21 years is an at-risk period in the development of the mother–infant relationship. See the research of Easterbrooks (Easterbrooks, Chaudhuri, Bartlett, & Copeman, 2011; Easterbrooks, Chaudhuri, & Gestsdottir, 2005) which used EA scales in a sample of young mothers aged under 21. See also the study of Dixon (Dixon et al., 2005) who identified young motherhood before the age of 21 as a risk factor for transmission of trauma.

Mothers had an average 9.91 years of education with a range of between 8 and 14 years. 73% of the mothers had a partner while the remaining mothers were single. 85% were of a low socio-economic level, 15% a medium socio-economic level. 23.8% of the mothers had jobs. Socio-economic status (SES) was calculated with a modified Italian version of the Index of Social Position (Hollingshead, 1975; Rossi, 1994) which considers level of education and occupation. The sample may be considered at risk, given the low socio-economic level and education and the fact that 20% of the sample had mothers who had been single mothers. 78% of the adolescent mothers were Italian. The remaining mothers were European or Latin American who knew the Italian language and were integrated into the Italian cultural context. The study protocol was approved by the institutional review board of the San Paolo Hospital of Milan. All subjects gave written informed consent.

2.2 Procedure and program implementation

At infant 3 months, the Adult Attachment Interview (George et al., 1985) was administered to the mothers to evaluate maternal attachment representations and reflective functioning (Fonagy, Target, Steele, & Steele, 1998). The interview was also evaluated using the Childhood Experience of Care and Abuse system (CECA; Bifulco et al., 1994) to codify the childhood experiences of maltreatment of the mothers. At 3 months mother-infant couples were video-recorded for around 5 minutes (M = 5.02; SD = .40) in a laboratory of the hospital consisting of a suitably furnished play room. The video camera was positioned inside the room in front of the dyad in order to frame mother and infant, who were sitting on a cushion, sideways. The behavior and the expressions on the faces of both members of the dyad were thus visible and could be coded. The mothers were instructed to interact with the infant as they would normally do at home. Mother-infant interactions were coded with a modified version of Infant and Caregiver Engagement Phases (Anonymous, 2013; Weinberg & Tronick, 1999) to evaluate emotion regulation of the mother and infant.

2.3 Measures

Adult Attachment Interview (AAI). The AAI is a semi-structured interview which explores the interviewees' relations with their parents as children, including early separation and means of comfort-seeking. According to the Main coding system (Main, Goldwyn, & Hesse, 2002), based on 9-point scales, each interview was assessed for the following categories: Secure/Autonomous (F), Dismissing (Ds), Preoccupied (E), Unresolved/Disorganized (U). The interviews assigned to the U category received a secondary score of Secure/Autonomous, Dismissing or Preoccupied. According to this system, autonomous secure attachment involves consistent and objective narration of attachment experiences and their assessment; dismissing attachment involves inconsistent narration of attachment experiences with idealization of attachment figures, distinguished by generally positive descriptions of the latter which are not supported and/or are contradicted by specific episodes, difficulty in remembering and underestimation of these experiences; preoccupied attachment involves inconsistent narration characterized by vagueness and prolixity together with worry and/or anger being expressed towards attachment figures; unresolved/disorganized attachment involves failure to process traumatic episodes (maltreatment, abuse, etc.) and mourning; lastly unclassifiable attachment involves the co-presence of contradictory mental states with regard to attachment. The interviews were scored by the first author. The second judge (the second author) rated 20% of the interviews. Concordance between the two coders for the four way classifications was 85% (k =.70) and for the two way classifications (secure versus insecure) 100% (k = 1.00) (Cohen, 1960). Both coders were trained for the AAI scales.

Reflective Functioning Scales. The reflective functioning scale (*Reflective Functioning*, *RF*; Fonagy et al., 1998) applied to the Adult Attachment Interview allows assessment of the mentalization of the interviewee, understood as the capacity to give meaning to one's own and other's experiences in terms of mental states and emotions. Reflective function is assessed by means of a scale from -1 to 9. The category *Negative RF (-1)*covers interviewees who are confused or hostile and refuse all attempts on the part of the interviewer to get them to begin any reflection;

the category *Lacking in RF (1)* covers interviewees in whom the reflective function is totally or almost totally absent. They may mention mental states occasionally with respect to themselves or others, but such mentioning is not connected to feelings underlying the behavior of the interviewee; the category *Questionable or Low RF (3)* covers interviewees who display some evidence of awareness of mental states, albeit at a fairly rudimentary level. The category *Ordinary RF (5)*covers interviewees who possess some type of model of the mind of attachment figures and of their own mind which is relatively consistent if simple; the category *Marked RF (7)* covers interviewees who demonstrate awareness of the nature of mental states for the entire interview and express efforts to reflect on the mental states underlying behavior; the category *Exceptional RF (9)* covers interviewees who are exceptionally sophisticated, adopting causal reasoning in which mental states are used. Reliability between coders was calculated on 20% of the interviewees through the intraclass correlation coefficient and was ICC = .82. Both coders (the first and second authors) were trained for the RF scales.

Childhood Experience of Care and Abuse (CECA). The scales of the CECA coding system (Bifulco et al., 1994) were used to evaluate childhood experiences of maltreatment before age 17 resulting from the AAI interviews of the study participants. The main scales include assessment of neglect, antipathy, physical and psychological abuse from different parent figures as well as sexual abuse from any perpetrator. Parental antipathy assesses hostility, coldness or rejection shown to the child; antipathy is taken by Bifulco to equate with parental emotional neglect that is considered a type of psychological maltreatment as described in the literature (Claussen & Crittenden, 1991; LoCascio et al., 2018). Parental neglect indicates lack of material care, lack of interest in the school activities and friendships of the child. Physical abuse includes any type of physical violence towards the child. Psychological abuse includes humiliation, instilling terror, depriving the child of his/her primary needs, extremely rejecting. Sexual abuse involves physical contact or approach of a sexual nature by any adult to the child. Each variable was rated on a 4-point severity scale

(1=marked, 2=moderate, 3=some, 4=little or none) by raters, according to predetermined criteria and manualized threshold examples. Moreover, these scales were dichotomized into severe (marked/moderate) and non-severe (little or none) as in previous studies using the CECA (Bifulco, Moran, Ball, & Bernazzani, 2002). A summary index of childhood adversity involving the peak experience of 'marked' or 'moderate' neglect, antipathy and abuse in childhood was used (Bifulco et al., 2002). Following the CECA coding system, we also evaluated scales other than the main ones mentioned above, such as loss of parents, parental control, level of discord between parents, violence between parents, role reversal, and parent mental health. CECA has demonstrated strong psychometric properties (Bifulco et al., 1994). In our study, the index of childhood adversity scale showed moderate internal consistency ($\alpha = 0.65$).

Infant and Caregiver Engagement Phases (ICEP). Interactions were coded by the Infant Caregiver and Engagement Phases (ICEP; Weinberg & Tronick, 1999), which has been modified to analyze the interaction between mother and infant concerning objects (Anonymous, 2013). This is a system which evaluates the behavior of mother and infant during face-to-face play on the basis of emotions expressed, gaze direction, vocalization, and verbalization. Since the original coding system was created to evaluate mother and infant interaction in the Still Face paradigm, which does not involve the use of objects, we introduced new categories with the aim of exploring the way in which infants and their mothers direct attention to objects during play. These categories differentiate between (1) the infant's attention to objects offered by his/her mother, or chosen by him/herself and (2) the mother's involvement with an object chosen by the infant, or an object chosen by the mother, as shown in Table 1. Maternal and infant behaviors were analyzed second by second, using the Noldus Observer XT system. Coding was continuous and occurred for every instance of a behavior. The codes were mutually exclusive. Infant and maternal behavior was coded separately, and at different times, by the same researcher. It was decided to use the same coder given the interactive characteristic of many codes (e.g. those concerning play with objects). It was therefore important that in coding one

member of the dyad the researcher also bore in mind the behavior of the other. A second coder, operating independently, of the first also coded the behavior of the mothers and infants of 20% of the dyads. Inter-rater agreement in the second-by-second codes calculated by Cohen's Kappa coefficient (Cohen, 1960) was 0.89 for the observation of maternal behavior and 0.88 for the observation of infant behavior. The two coders were blind to the classification of maternal attachment and the scores of reflective function.

Assessment of matched and mismatched states

According to Tronick (Tronick et al., 2005), a "match" corresponds with moments in which mother and infant share the same states at the same time, whether they be positive, negative or neutral; a "mismatch" corresponds to moments in which mother and infant are in a different state at the same time. Firstly, in order to evaluate these matched and mismatched emotion states, we combined the second-by-second maternal and infant behavioral codes (see Table 1), such as child positive and negative engagement, mother negative and positive engagement, etc., according to the ''Global States'' they represented, using three categories: neutral, positive, and negative, via the GSEQ program (Bakeman & Quera, 1995) as presented in Table 2. GSEQ is a computer program for analyzing sequential observational data. It computes a variety of simple and contingency table statistics. Simple statistics include frequencies, rates, durations, and proportions (percentages). The Sleeps, Observes Stranger and Uncodable categories of the infant and the Uncodable category of the mother were not included in the behavior analysis or in the grouping of emotion states since they were low frequency.

Regarding the mother and infant behavioral codes used, we assigned "*Social Positive Engagement"* and "*Orientation of the Infant to Objects Offered" and "not Offered by the Mother"* to **Infant Positive**. We reasoned that such orientation was activated in the former case by positive engagement toward the mother and by interest in and curiosity about the objects, and in the latter case by interest in and curiosity about the objects. We assigned "*Social Monitor"* to **Infant Neutral**, in

that it presupposes (Weinberg &Tronick, 1999) that the infant is oriented toward the mother's face without expressing positive emotions (see Table 1). For the same reason we assigned "*Allows caregiving"* and "*Allows comforting*" to **Infant Neutral**. In the same way, we assigned "*Orientation to Environment"* to **Infant Neutral**, in that such behavior entails visual exploration of the environment without attention to or interest in a particular object (Weinberg & Tronick, 1999) (see Table 1). For the mother, we assigned "*Social Positive Engagement"* and behavior relating to the "*Offer of Objects and Involvement in Play"* to **Mother Positive**, considering them to be ways of positive engagement with the infant mediated by objects. We assigned "*Social Monitor"* (Weinberg & Tronick, 1999) and "*Call for Infant's Attention"* to **Mother Neutral**, as these entail neutral attention toward the infant. We also assigned "*Caretaking"* to **Mother Neutral** because such behavior involves physical caretaking of the infant such as positioning him/her, blowing his nose. We assigned "*Comfort"* behavior to **Mother Neutral** because the behavior included in this category involves the mother consoling the infant (for example, cradling him displaying a neutral expression. The Unscorable category was not included in the global states.

We then calculated the relative duration of different mutual emotion states (positive, negative, neutral match) and of non-mutual emotion states (mismatch) (e.g. infant positive/mother negative, etc.) of mother-infant dyads. Matched states were: Mother Positive/Infant Positive, Mother Negative/Infant Negative, Mother Neutral/Infant Neutral. Mismatched states were: Infant Positive/Mother Negative, Infant Positive/Mother Neutral, Infant Negative/Mother Positive, Infant Negative/Mother Neutral, Infant Neutral/Mother Positive and Infant Neutral/Mother Negative. In calculating total matches we considered the sum of the duration of the positive and the neutral matches. Negative matches were not included because they could not be considered an adequate state of affective coordination (Tronick et al., 2005). Total mismatches correspond to the sum of all six different states of mismatch.

Finally, we studied the capacity of the dyad to carry out repairs following mismatches, leading to the emergence of new matched states. For this purpose the mean frequency by minute of the transitions from mismatched to matched states (Tronick et al., 2005) was calculated as a measure of repair. (Insert Table 1 and 2)

3.Statistical Analysis

The SPSS Statistic 24 package was used for all analyses. Descriptive statistics were calculated with respect to demographic characteristics: t-tests and Chi-square test (or Fisher's exact test) were applied. Preliminary analyses with correlations did not show significant relations between maternal education, socio-economic level and emotion regulation. Moreover, no significant differences emerged from the t-test with respect to marital status, employment or infant gender in relation to emotion regulation. Preliminary analyses with respect to socio-demographic variables did not show significant differences between the two groups. We therefore did not consider these variables in the subsequent analyses. Furthermore, in order to carry out the subsequent analyses, the sample of adolescent mothers was divided into two groups, according to the presence or absence of a high score (moderate or marked) on at least one CECA scale relating to antipathy, neglect, sexual, physical and psychological abuse. The differences between two dyadic groups - one with mothers with childhood experiences of maltreatment and one with mothers without such experiences - were evaluated with the chi-square (or Fisher's exact test) with respect to attachment model and with the t-test with respect to reflective function and emotional regulation in dyadic interactions. Through analysis of variance the possible effects of interaction between attachment and childhood experiences of maltreatment on emotional regulation were evaluated. Pearson correlation was used to examine associations between cumulative maternal childhood experiences of maltreatment (calculated as the sum of severe antipathy, abuse and neglect experiences) and AAI scales and ICEP categories. We also performed correlation analyses between AAI scales and ICEP categories to test the possible mediation effects of AAI and reflective function scales on the relationship between

maternal childhood experiences of maltreatment and emotion regulation. In the case of significant results effect size was computed; in the case of MANOVA revealing no effects, post-hoc power analysis was conducted using G*Power 3.1.5 (Faul, Erdfelder, Lang, & Buchner 2007).

4. Results

4.1 Maternal childhood experiences of maltreatment

Table 3 shows the percentages of adolescent and young mother childhood experiences of maltreatment which emerged from the analysis carried out with the CECA scales applied to the AAI. Half of the adolescent and young mothers had a serious experience of neglect, antipathy or abuse (see Table 3). The most frequent experience of maltreatment was father neglect, followed by parental discord, mother neglect, parental mental health, violence between parents and mother antipathy. Furthermore, the sum of the childhood experiences of maltreatment reported in the main neglect, antipathy and abuse (physical, sexual, and psychological) scales in the group that had experiences of maltreatment was calculated: 43.8% of mothers had one experience of maltreatment, 28.1% two experiences of maltreatment, 12.5% three experiences of maltreatment; 9.4% four and 6.3% five experiences of maltreatment.

(Insert Table 3)

4.2 Maternal representation of attachment and reflective functioning

In all the sample, 23 adolescent and young mothers had secure attachment and 40 mothers insecure attachment of whom 12 Dismissing, 12 Preoccupied, 13 Unresolved/Disorganized and 3 Cannot Classify. 63.5% of adolescent and young mothers had an insecure attachment model, with a distribution similar to that of clinical and at risk samples (Bakermans-Kranenburg & van IJzendoorn, 2009). Adolescent and young mothers also had low scores in reflective functioning, averaging 2.84 (sd = 1.6).

In the comparison between the two groups of mothers with and without experiences of maltreatment, no significant differences emerged regarding the dichotomized attachment model (χ^2 = 1.29; p = .25) (no zero cells size), the four attachment styles (Fisher's Exact Test = 9.33; p = .05) and the reflective function scores (t = .81; p = .42). Furthermore, no significant associations were found between childhood experiences of maltreatment and attachment disorganization (χ^2 = 2.22; p = .21). Analyses carried out with the t-test to identify differences between mothers with childhood experiences of maltreatment and mothers without such experiences compared to the AAI scales show significant results. Mothers with childhood experiences of maltreatment had higher scores on the AAI Father Anger, Passivity and Unresolved Trauma scale, and lower scores on the Coherence of Transcript and Coherence of Mind scales (see Table 4).

(Insert Table 4)

4.3 Maternal childhood experiences of maltreatment and individual and mutual mother-infant emotion regulation

We analyzed the individual behaviors of mother and infant in relation to play with objects and emotion regulation and repair assessed with ICEP at 3 months in order to identify differences between the group of mothers with childhood experiences of maltreatment and the group of mothers without such experiences. Analysis conducted with the t-test indicated significant differences between the two groups at 3 months. With respect to individual behaviors (see Table 1) of mother and child, the differences that emerged for the child concern their negative behavior. Infants of mothers who had childhood experiences of maltreatment spent more time in "Infant Withdrawn" (t = -2.34; p = .022; d = .59) and "Infant Anger" (t = -2.34; p = .022; d = .59) than infants of mothers who had no childhood experiences of maltreatment. Mothers with childhood experiences of maltreatment spent less time in "Mother Positive Engagement" (t = 2.46; p = .017; d = .62) and "Social Monitoring" (t = 2.17; p = .034; d = .55) and more time in "Mother Intrusive" (t = -2.76; p = .008; d = .70) than mothers with no childhood experiences of maltreatment.

Compared to global emotional states (see Table 2), infants of mothers who had a history of maltreatment spent more time in “Infant Negative” than infants of mothers who had no history of maltreatment. Mothers with histories of maltreatment spent more time in “Mother Negative” than mothers with no history of maltreatment. Dyads which had mothers with histories of maltreatment spent more time in Negative Match “Infant Negative-Mother Negative” and in mismatch “Infant Neutral-Mother Negative” than dyads which had mothers with no history of maltreatment. Moreover, dyads which had mothers with histories of maltreatment (vs. dyads which had mothers with no history of maltreatment) spent less time in “Total Matches” (positive and neutral matches) and more time in “Total Mismatches” (see Table 5).

(Insert Table 5)

Multivariate analysis of variance (MANOVA) was performed to examine the possible moderating effects of maternal attachment between maternal childhood experiences of maltreatment (presence/absence) and emotional regulation at 3 months. Maternal attachment (secure/insecure) and maternal childhood experiences of maltreatment (presence/absence) were entered as between-subject variables to identify interaction effect and ICEP categories were entered as dependent variables. The results of MANOVA did not show significant effects of interaction between maternal attachment and childhood experiences of maltreatment in the ICEP categories ($F(17, 53) = .64$; $p = .83$). A MANOVA post-hoc power analysis was conducted. The model was sufficiently powered (power = .78; d = .25).

4.4 Maternal cumulative childhood experiences of maltreatment and individual and mutual mother-infant emotion regulation

The associations between CECA cumulative childhood experiences of maltreatment and AAI scales and ICEP categories were examined. Cumulative childhood experiences of maltreatment were positively correlated with Passivity and Unresolved Trauma AAI scales and negatively correlated with Coherence of Transcript and Coherence of Mind scales (see Table 6). Cumulative

childhood experiences of maltreatment were positively correlated with “Infant Negative” and “Mother Negative”, and with “Negative Match” and Mismatch “Infant Positive-Mother Negative”, “Infant Neutral-Mother negative” and “Total Mismatches”. Cumulative childhood experiences of maltreatment were also negatively correlated with “Total Matches” and Repair (see Table 7). Reflective function, on the other hand, was not correlated with cumulative childhood experiences of maltreatment.

Finally, associations between the AAI scales, reflective function and emotional regulation were assessed to identify possible mediation effects of the AAI scales and reflective function on the relationship between cumulative childhood experiences of maltreatment and maternal and infant emotional states. Regression results do not show any significant effects of the AAI scales and the RF scale on ICEP categories (see Table 8). For this reason it was not possible to test the mediation effects, as the AAI scales and the RF scale cannot be considered as possible mediators of the effect of cumulative childhood experiences of maltreatment on emotion regulation.

(Insert Tables 6, 7 and 8)

5. Discussion and conclusion

The results show, firstly, the high frequency (50 %) of at least one experience of childhood maltreatment in the adolescent and young mothers participating in the study. This result is in line with the research which indicates a high percentage of experiences of childhood maltreatment in young mothers (Noll et al., 2009). Another important finding is that 30% of the adolescent and young mothers with a history of maltreatment had more than one childhood experience of maltreatment. It is also interesting to note that the most frequent experience of maltreatment for adolescent mothers was “Father Neglect”, involving absence and emotional detachment of the father, followed by “Mother Neglect” and “Mother Antipathy”, i.e. derogating mothers. The most frequent experiences of maltreatment therefore concern the methods of caregiving, neglectful and/or derogating, of parents, rather than traumatic events such as sexual and physical abuse.

Secondly, analysis of the impact of a maternal history of childhood maltreatment on adolescent and young mother-infant emotion regulation at 3 months confirms the first hypothesis of our study, i.e. that maternal experiences of childhood maltreatment affect the negative behavior of mothers and children and mutual emotion regulation. Adolescent and young mothers who have had childhood experiences of maltreatment (vs adolescent and young mothers who have not had such experiences) spend more time in negative emotion states characterized by greater intrusiveness towards infants in interaction at 3 months and also display less positive involvement. At the same time, the infants of adolescent and young mothers who have a history of maltreatment spend more time in negative states, characterized by anger and protest and by emotional withdrawal, than mothers without childhood experiences of maltreatment. This is particularly interesting since our study is the first to examine the interaction style of not only adolescent and young mothers with childhood experiences of maltreatment but also their infants.

A maternal history of childhood maltreatment impacts not only at individual level but also at dyadic level. Dyads with adolescent and young mothers with childhood experiences of maltreatment (vs dyads with mothers without experiences of childhood maltreatment) spend more time in negative matches in which both mothers and infants express negative emotions at the same time and in the mismatch “Infant Neutral-Mother Negative”. Dyads with mothers with experiences of childhood maltreatment also spend more time in “Total Mismatches “and less time in “Total Matches”, experiencing difficulty in matching the emotions of the partner. The greater presence of the mismatch “Infant Neutral-Mother Negative” shows that when an infant gives neutral signals, adolescent mothers tend to adopt negative engagement, demonstrating that they interpret such signals negatively. Various studies show, in this regard, that in conditions of risk for parenthood (Anonymous, 2014, 2016), including maternal perinatal depression (Reck et al., 2011), dyadic emotion regulation is less adequate and is, for example, characterized by more time spent in mismatches and negative matches than is the case with dyads without conditions of risk.

Analysis of the correlations between maternal cumulative experiences of maternal childhood maltreatment and emotion regulation supported the results relating to the impact of an adolescent and young mother's experiences of childhood maltreatment on mother-infant emotion regulation. Cumulative childhood experiences of maltreatment were shown to affect the negativeness of the emotions expressed by mother and child at both individual and dyadic level. A higher number of maternal childhood experiences of maltreatment was associated with more time spent by mothers and infants in negative states and more time spent in negative matches and in mismatches and in the mismatch "Infant Positive-Mother Negative". Cumulative maternal childhood experiences of maltreatment were also associated with less emotion coordination, with less time spent in matches and less capacity to repair, i.e. move from states of mismatch to states of match.

For what concerns the last aim of our study, maternal attachment was not associated with adolescent and young mothers' childhood experiences of maltreatment if evaluated dichotomically as secure/insecure. However, considering the AAI scales regarding state of mind as to the relationship with the mother and with the father and overall states of mind, it was shown that mothers who had had at least one experience of childhood maltreatment (vs mothers without childhood experiences of maltreatment) had higher scores on the Father Anger and Passivity scales, which are considerable indicators of an insecure-preoccupied attachment style (Main et al., 2002), and on the Unresolved Trauma scale and lower scores on the Coherence of Mind and Coherence of Transcript scale. It is also interesting to observe that the results are similar for associations between the AAI scales and cumulative childhood experiences of maltreatment. Therefore, the narration of experiences of attachment by adolescent and young mothers with experiences of maltreatment – assessed with AAI - is characterized by passivity, unresolved trauma and low coherence. While the finding relating to unresolved trauma has been seen in other studies (Madigan et al., 2012), our study is the first to show correlations between a mother's childhood experiences of maltreatment and the AAI coherence and passivity scales.

Our study did not find that the AAI scales had a mediation effect on the relationship between maternal cumulative childhood experiences of maltreatment and emotion regulation of mother and infant. Likewise no effect of interaction between maternal attachment (considered dichotomically) and maternal childhood experiences of maltreatment on individual and dyadic emotion regulation was found. Therefore, if a mother has had childhood experiences of maltreatment (single and multiple) this has a simple and direct effect on mother-infant emotion regulation at 3 months, above all in terms of greater expression of negative states and difficulty in regulating such states.

To sum up, early motherhood is a condition of risk for parenthood and the quality of mother-infant interaction (Anonymous, 2018; Anonymous, 2014). Our study is the first, to our knowledge, to show that this risk is greater when mothers have had childhood experiences of maltreatment and that it affects mother-infant emotion regulation - both at individual and dyadic level - directly and not mediated by maternal attachment and reflective function. This risk increased if mothers had had multiple childhood experiences of maltreatment.

The results are significant considering their possible effects with regard to the subsequent development of the child. Greater expression of negative emotions and difficulty in regulating emotions, in particular negative emotions, on the part of the child, may have short and long term effects on the child's capacity for emotion regulation and on the quality of his/her attachment models, increasing the risk of insecurity and disorganization and the emergence of psychopathological problems in adolescence and adulthood (Beebe et al., 2010; Lyons-Ruth, Pechtel, Yoon, Anderson, & Teacher, 2016). At the same time the difficulty found in adolescent and young mothers with traumatic experiences in regulating their childrens' emotions can increase the probability of them maltreating the child at the level of both abuse and neglect in early infancy. From this perspective we may hypothesize that the difficulties in emotion regulation seen in couples of adolescent and young mothers with a history of abuse and their children may be one of the factors underlying transmission of such experiences from parent to child. This hypothesis could be

ascertained in a longitudinal study aimed at analyzing the relationship between difficulty in emotion regulation in dyads of adolescent and young mothers with traumatic experiences and their children and maternal maltreating behavior towards them.

For what concerns clinical implications, the results of this study may provide important pointers in relation to planning prevention programmes for adolescent and young mothers, considering the high frequency in these mothers of childhood experiences of maltreatment and the effect of such experiences on emotion regulation and on the consequent greater probability of the mothers committing abuse. In light of the results, intervention programmes should focus on the impact of maternal childhood experiences of maltreatment on the mental functioning of young mothers by means of intervention aimed at trauma processing, at increasing their capacity for mentalization, and at increasing their sensitivity in order to prevent the possible transmission of abusive experiences to the child (Anonymous, 2016, 2017). The results indicate the importance of implementing such intervention in the first months, given that inadequacy of emotion regulation is already present at 3 months, as shown in this study.

There are a number of limits to our study. The number of participants is small; a larger sample would have eliminated possible Type II errors. If there were more participants a distinction could also be made between different types of maltreatment (antipathy, neglect, physical, sexual and psychological abuse) and their possible differential effects assessed. Another limit is that the research participants were recruited on their first access to a Service aimed at offering support to adolescent and young adult mothers; this does not allow the generalizability of the results to a more general population of adolescent and young adults mothers who have not sought services or who have not been contacted by this type of service as needing help. Furthermore, the study did not consider some risk factors which could increase the difficulties in emotion regulation of adolescent mothers with childhood experiences of maltreatment, such as maternal depression, parental stress, and quality of the relationship with the partner. Lastly, the study examined mother-infant regulation

at 3 months. It would, however, be interesting to examine whether the effects of maternal childhood experiences of maltreatment last over time and evaluate their possible repercussions on the social-emotional and psychopathological development of the child.

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Table 1. Infant and mother behavioral codes.

Infant Codes	*Negative Engagement*	Infant is negative, protesting with facial expressions of anger, annoyance, often with crying or withdrawn/passive and minimally engaged with the mother and the environment.
	Social Positive Engagement	Infant is displaying facial expressions of joy, astonishment and smiles. SPE is considered play with or without objects, but social play.
	*Orientation to Objects Offered by the Mother**	Infant is looking, touching, playing with objects offered by the mother.
	*Orientation to Objects Not Offered by the Mother**	Infant is looking, touching, playing with objects not offered by the mother.
	Orientation to Environment	Infant is visually exploring the setting without focalizing attention on any specific object.
	Social Monitor	Infant's attention is directed toward mother's face. He/she is looking at her.
	*Allows comforting**	Infant lets the mother comfort him/her when he/she is upset (e.g. she the rocks the
	*Allows caretaking**	Infant lets the mother provide caregiving (position him, blow his/her nose).
	Unscorable	Infant's face is obscured (e.g. his/her face is covered by the mother's body or is outside the view of the camera) or the infant is asleep.
Mother codes	*Negative Engagement*	Mother is negative, intrusive toward the infant's physical space, activities and objects, hostile or withdrawn (minimally engaged with the infant's activities).
	Social Positive Engagement	Mother is interacting with the infant through facial expressions of joy and interest, with positive vocalizations, motherese and social play.
	*Involvement in Play**	Mother joins in the game with the object chosen by the infant.
	*Offer of Object**	Mother is offering a new object chosen by her to the infant.
	Social Monitor	Mother is looking at the infant and his/her activities.
	*Comforting**	Mother is comforting the infant when he/she is upset (e.g. he/she cries).
	*Caretaking**	Mother is caregiving the infant, positioning him, blowing his/her nose.
	Non-Infant Focused	Mother is not attending to the infant or to the infant's activities.
	*Call for Infant's Attention**	Mother is trying to draw the infant's attention to her or to an object (e.g. calling the infant, shaking the object, making noises).
	Unscorable	Mother's face is obscured (e.g. her face is covered).

Note: This coding system is an elaboration of ICEP (Weinberg and Tronick, 1999). Categories with an asterisk were not provided in the ICEP, being introduced for the purposes of our studies (Anonymous, 2013).

Table 2. Definition of emotional states: positive, neutral, negative

EMOTIONAL STATES	*CODES*
Infant Positive	Social Positive Engagement, Orientation to Objects Not Offered by the Mother, Orientation to Objects Offered by the Mother
Infant Neutral	Social Monitoring, Orientation to the Environment, Allows caretaking, Allows comforting
Infant Negative	Negative Engagement
Mother Positive	Social Positive Engagement, Offer of Object, Involvement in Play
Mother Neutral	Social Monitoring, Call for Infant's Attention, Non-infant Focused, Caretaking
Mother Negative	Negative Engagement

Table 3. Adolescent mothers' childhood experiences of maltreatment according to CECA

Childhood experiences<17	%
Mother antipathy	14.3
Father antipathy	8.1
Mother neglect	27
Father neglect	40.3
Sexual abuse	6.3
Psychical abuse	11.3
Psychological abuse	4.8
Mother role reversing	7.9
Father role reversing	1.6
Parent mental health	19
Parental loss	9.2
Parental discord	30.2
Violence between parents	14.3
Parental control	4.8
Any severe neglect, or antipathy or abuse	50.8

Table 4. Differences between the two groups on maternal AAI scales and RF

	Dyads with mothers with childhood experience of maltreatment (N=32)		Dyads with mothers without childhood experience of maltreatment (N=31)				
	M	SD	M	SD	*t*	*p*	d
Mother Idealizing	2.42	1.59	2.56	1.83	-.33	.74	
Father Idealizing	2.32	1.54	2.63	1.75	-.72	.46	
Mother Anger	1.57	1.12	1.21	.66	1.52	.13	
Father Anger	2.37	2.04	1.11	.40	3.30	.002**	.85
Mother Derogation	1.31	.82	1.31	1.05	-.01	.98	
Father Derogation	1.06	.24	1.23	.97	-.96	.33	
Overall Derogation	1.28	.77	1.37	1.18	-1.33	.73	
Metacognitive	1.03	1.17	1.10	.40	-.82	.38	
Lack of memory	1.96	1.23	2.03	1.29	-.20	.84	
Passivity	3.21	1.66	2.33	1.47	2.21	.031*	.57
Fear of Loss	1.15	1.62	1.15	.43	.04	.96	
U Loss	1.91	1.80	1.93	1.70	-.61	.95	
U Trauma	2.24	1.95	1.03	.18	3.31	.002**	.87
Coherence of Transcript	3.81	1.44	4.70	1.62	-2.27	.026*	-.59
Coherence of Mind	3.73	1.51	4.67	1.64	-2.31	.024*	-.59
RF	2.68	1.41	3.02	1.78	-.81	.42	

Note. (M) medium, (sd) standard deviation, (t) t-student, level of significance (p), and effect size (d). *<.05, **<.01

Table 5. Differences between the two groups on ICEP categories at the level of individual and dyadic global emotional states.

	Dyads with mothers with childhood experiences of maltreatment (N=32)		Dyads with mothers without childhood experiences of maltreatment (N=31)				
	M	SD	M	SD	*t*	*p*	d
Infant positive	.24	.20	.25	.22	-.19	.84	
Infant Negative	.20	.18	.09	.12	2.58	.012*	.71
Infant Neutral	.28	.26	.70	.64	-.87	.38	
Mother Positive	.16	.16	.35	.35	-.11	.91	
Mother Negative	.12	.15	.04	.06	2.61	.011*	.70
Mother Neutral	.56	.14	.62	.16	-1.56	.12	
Infant Positive-Mother Positive	.14	.12	.15	.14	-.38	.70	
Infant Negative-Mother Negative	.04	.07	.00	.01	2.71	.009**	.80
Infant Neutral-Mother Neutral	.38	.17	.46	.20	-1.72	.09	
Infant Positive-Mother Negative	.01	.04	.00	.01	.91	.36	
Infant Positive-Mother Neutral	.08	.10	.08	.10	-.15	.88	
Infant Negative-Mother Positive	.03	.05	.01	.02	1.96	.05	
Infant Negative-Mother Neutral	.09	.08	.07	.09	1.04	.30	
Infant Neutral-Mother Positive	.16	.12	.16	.12	.00	.99	
Infant Neutral-Mother Negative	.06	.09	.03	.04	2.08	.042*	.43
Total Matches	.52	.16	.61	.14	-2.41	.019*	-.59
Total Mismatches	.46	.14	.37	.14	2.18	.033*	.64
Repair	4.69	1.73	4.75	1.40	-.16	.86	

Note. (M) medium, (sd) standard deviation, (t) t-student, level of significance (p), and effect size (d). *<.05, **<.01

Table 6. Correlations between maternal AAI scales and RF and cumulative childhood experiences of maltreatment

	Cumulative Maternal childhood experiences of maltreatment
Mother Idealizing	-.02
Father Idealizing	.03
Mother Anger	.19
Father Anger	.19
Mother Derogation	.00
Father Derogation	-.11
Overall Derogation	-.10
Metacognitive	-.08

Lack of memory	.02
Passivity	.50***
Fear of Loss	-.04
U Loss	-.02
U Trauma	.30*
Coherence of Transcript	-.29*
Coherence of Mind	-.28*
RF	-.09

*<.05, ***<.00

Table 7. Correlations between ICEP category and cumulative maternal childhood experiences of maltreatment

	Cumulative maternal childhood experiences of maltreatment
Infant positive	.01
Infant Negative	.31*
Infant neutral	-.15
Mother Positive	-.16
Mother Negative	.32*
Mother Neutral	-.11
Infant Positive-Mother Positive	-.11
Infant Negative-Mother Negative	.33**
Infant Neutral-Mother Neutral	-.16
Infant Positive-Mother Negative	.35**
Infant Positive-Mother Neutral	.05
Infant Negative-Mother Positive	.17
Infant Negative-Mother Neutral	.21
Infant Neutral-Mother Positive	-.11
Infant Neutral-Mother Negative	.26*
Total Matches	-.28*
Total Mismatches	.26*
Repair	-.27*

*<.05, **<.01

Table 8. Linear regression of RF and AAI scales on Icep categories

	B	**SE**	***p***
RF			
Infant Negative	.00	.01	.95
Mother Negative	-.02	.01	.05
Infant Negative-Mother Negative	-.00	.00	.46
Total Matches	.01	.01	.25
Total Mismatches	-.02	.02	1.00
Passivity			

Infant Negative	.00	.01	.70
Mother Negative	.03	.03	.29
Infant Negative-Mother Negative	.00	.00	.11
Total Matches	-.01	.01	.10
Total Mismatches	.02	.01	.06
Coherence of Mind			
Infant Negative	.00	.01	.56
Mother Negative	-.01	.01	.32
Infant Negative-Mother Negative	-.00	.02	.69
Total Matches	.00	.01	.59
Total Mismatches	-.01	.01	.33
U/not U Trauma			
Infant Negative	.02	.05	.63
Mother Negative	.06	.03	.07
Infant Negative-Mother Negative	.01	.01	.52
Total Matches	-.01	.05	.71
Total Mismatches	.02	.04	.55