Tampere University

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Transition to Motherhood in High-Risk Families: Re-organization or Disorganization?

The role of maternal trauma, mental representations, and mental health in transgenerational transmission of vulnerability

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ACADEMIC DISSERTATION
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Armille ja Okolle

Minä suojelen sinua kaikelta
mitä ikinä keksitkin pelätä
ei ole sellaista pimeää
jota minun hento käteni ei torjuisi

(*Ultra Bra: Minä suojelen sinua kaikelta*)

Aina on olemassa virheen mahdollisuus.
Ja se on pahinta.
Rotat kelluvat joessa kuin vettyneet leivänkannikat,
tuuli pöllyttää hiekkalaatikon hiekkaa,
myrsky autiomaassa,
siellä Jeesuskin näki Saatanan
(tai näki mitä näki)
kukaan ei anna meille anteeksi,
emmekä me anna

(*Silene Lehto: Hameln)*

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ABSTRACT

Maternal complex trauma, and related disruptions in mental representations and mental health, can severely compromise mothers' and infants' pre- and postnatal wellbeing. Combining quantitative and qualitative approaches, this dissertation investigates diverse mothers' early-onset and later complex trauma experiences, attachment and caregiving representations, and pre- and postnatal mental health symptoms. We test the hypothesis that, among the studied mothers, mental representations and mental health (stress, depressive and posttraumatic stress disorder [PTSD]) symptoms transmit the harmful effects of maternal trauma onto mother–infant interaction and infant stress regulation. Participants were 43 Finnish substance-abusing mother–infant pairs and 48 comparison dyads (Article I); 501 war-exposed Palestinian mothers and their infants (Article II) and a subsample of 50 Palestinian participants (Article III); and a Finnish psychotherapy-enrolled mother with her infant (Article IV). Trauma experiences and mental representations were studied among all mothers, while mental health was only assessed among the Palestinian mothers. Key findings are, first, that early caregiving-inflicted trauma had a wider harmful effect on the Palestinian mothers' prenatal mental health than war exposure, suggesting that early-onset relational trauma is specifically harmful for women in transition to motherhood in diverse socio-cultural contexts. Second, concurring with previous studies, we found that the risks in the mothers' mental representations, such as Hostility, Helplessness, Enmeshment/Merger, and Emotional Dysregulation, are distinct from those of lower-risk mothers. Third, regarding the transmitting role of mental representations and mental health, results only substantiated the harmful role of Palestinian mothers' postnatal PTSD symptoms on mother–infant interaction, while the hypothesized associations between mothers' mental health symptoms and infant stress regulation (Article II) and between mental representations and mother–infant interaction quality (Articles I & III) were not found. The null findings may be explained by use of self-report measures and assessment tools developed among non-traumatized Euro-American

mothers. The relevance of the results for assessment of and interventions with traumatized mothers and their infants is discussed.

Key words: Transition to Motherhood, Pre- and Postnatal, Complex Trauma, Mental Representations, Depression, PTSD, Infant Stress Regulation, Mother – Infant Interaction

TIIVISTELMÄ

Äidin kompleksiset traumakokemukset ja niistä aiheutuva mielikuvien ja mielenterveyden häiriintyminen voi vaarantaa hoivaajana toimimista vauvalle. Väitöskirjassa tutkitaan määrällistä ja laadullista tutkimustapaa yhdistäen äitien lapsuudenaikaisten ja myöhempien traumakokemusten, kiintymys- ja hoivamielikuvien sekä raskaus- ja vauva-aikaisten mielenterveysoireiden (stressi, masennus- ja posttraumaattisen stressin [PTSD] oireet) esiintyvyyttä, laatua ja yhteyksiä erilaisissa riskiperheissä. Testaamme oletusta, että äitien traumakokemusten haittavaikutukset vauvan stressinsäätelylle sekä äiti–vauva -vuorovaikutukselle välittyvät mielikuvien ja mielenterveysoireiden kautta. Tutkimukseen osallistuivat 43 suomalaista päihdetaustaista äiti-vauvaparia ja heidän 48 verrokkiaan (Artikkeli I), 501 sota-altistunutta palestiinalaista äitiä vauvoineen (Artikkeli II), 50 palestiinalaisäidin alaotos (Artikkeli III) sekä varhaisen vuorovaikutuksen psykoterapiassa oleva suomalainen äiti (Artikkeli IV). Traumakokemuksia ja mielikuvia kartoitettiin kaikilta äideiltä ja mielenterveysoireita vain palestiinalaisäideiltä. Ensimmäinen keskeinen tutkimustulos on, että lapsuudenaikainen kaltoinkohtelu haittasi palestiinalaisäitien raskausaikaista mielenterveyttä laaja-alaisemmin kuin sota-altistus. Tulos viittaa siihen, että varhaisten lähisuhdetraumojen erityinen haittavaikutus siirtymässä vanhemmuuteen pätee äiteihin sosio-kulttuurisesta ympäristöstä toiseen. Toiseksi, tulokset vahvistavat näkemystä siitä, että kompleksisesti traumatisoituneiden äitien mielikuvien riskipiirteet (kuten vihamielisyys, avuttomuus, eriytymättömyys ja hallitsematon tunteiden valtaan joutuminen) ovat laadullisesti erilaisia kuin matalan riskin äideillä. Kolmanneksi, tulokset todensivat vain palestiinalaisäitien vauva-aikaisten PTSD-oireiden haittavaikutuksen äidin ja vauvan vuorovaikutukselle, kun taas oletukset mielenterveysoireiden haitallisuudesta vauvan stressinsäätelylle (Artikkeli II) ja mielikuvien riskipiirteiden yhteydestä heikompaan vuorovaikutuksen laatuun (Artikkelit I ja III) eivät saaneet tukea. Yhteyksien puuttumista selittänevät osittain käytetyt menetelmät: itsearviot ja normatiivisille länsimaisille äideille kehitetyt arviointiulottuvuudet. Tulosten merkitystä pohditaan

traumatisoituneiden naisten raskaus- ja vauva-ajan arvioinnin ja hoidon näkökulmasta.

Avainsanat: siirtymä vanhemmuuteen, raskaus- ja vauva-aika, kompleksinen trauma, mielikuvat, masennusoireet, PTSD-oireet, vauvan stressinsäätely, äiti–vauva -vuorovaikutus

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ORIGINAL PUBLICATIONS

The thesis is based on the following publications, referred to in the text as Articles I – IV.

I Isosävi, S., Flykt, M., Belt, R., Posa, T., Kuittinen, S., Puura, K. & Punamäki, R-L. (2016). Attachment representations among substance-abusing women in transition to motherhood: Implications for prenatal emotions and mother-infant interaction. *Attachment and Human Development 18* (3), 1-27. doi: 10.1080/14616734.2016.1151904

II Isosävi, S., Diab, S.Y., Kangaslampi, S., Qouta, S., Kuittinen, S., Puura, K. & Punamäki, R-L. (2017). Maternal trauma affects prenatal mental health and infant stress regulation among Palestinian dyads. *Infant Mental Health Journal 38* (5), 617-633. doi: 10.1002/imhj.21658

III Isosävi, S. Diab, S.Y., Kangaslampi, S., Qouta, S., Kankaanpää, S., Sleed, M. Puura, K., & Punamäki, R-L. (manuscript under review). Caregiving representations in war conditions: Associations with maternal trauma, mental health, and mother-infant interaction. *Infant Mental Health Journal.*

IV Isosävi, S., Wahlström, J., Flykt, M., Heiskanen, L., Finger, B., Puura, K. & Punamäki, R-L. (2019). Dysregulated motherhood: Exploring the risk features in a mother's caregiving representations. *Journal of Infant, Child, and Adolescent Psychotherapy*, 18 (1), 29-57. doi: 10.1080/15289168.2019.1568032

1 INTRODUCTION

The pre-and postnatal period, termed *transition to motherhood*, demands great re-organization of a woman's emotionality, roles, and mental representations of her close relationships (Nelson, 2003; Stern, 1985, 1995). The success of this re-organization determines whether a mother can relate to her infant and promote his/her development in a 'good-enough' manner (George & Solomon, 2008; Winnicott, 1958). Mothers with histories of severe, prolonged, and/or early-originating trauma (i.e., complex trauma; Herman, 1992; van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005) are at specific risk of disruptions to their mental health and mental representations during the transition, posing a threat to infant and relational development (Fraiberg, Adelson, & Shapiro, 1975; Muzik et al., 2013; Schechter et al., 2008). Accordingly, treating maternal trauma-related psychological disturbances in the pre- and postnatal periods is central to preventing transgenerational transmission of risks in vulnerable families (Pearlman & Courtois, 2005; Schechter & Serpa, 2014; Seng, D'Andrea, & Ford, 2014). This thesis examines diverse high-risk mothers' complex trauma experiences, mental representations, and mental health symptoms; their interconnections; and their importance for infant development and mother–infant interaction quality.

1.1 Transition to motherhood: re-organization in support of self–other regulation

On becoming a mother, a woman faces a great demand for re-organization of her identity, roles, and priorities (Slade, Cohen, Sadler, Miller, 2009; Stern, 1995). In contrast to the idealized picture of motherhood, this period is often characterized by emotional turmoil and ambivalence. During pregnancy, profound psycho-physiological, hormonal, and relational changes can dispose women to distress, mood changes, and an unclear sense of self (Raphael-Leff, 1991, 2010). After the infant is born, the enormous

responsibility of keeping him/her alive, and the demand of interpreting the communications of the pre-verbal infant, provokes normative stress, anxiety, and uncertainty in a mother (Johns & Belsky, 2007; Rallis, Skouteris, McCabe, & Milgrom, 2014). However, a mother's sensitization to her emotions, as well as to those of the infant, is understood as serving her psychological reorganization and motivating her to promptly respond to her infant's needs (Brodén, 2006; Raphael-Leff, 1991).

Paradoxically, the central demand for parenting during this turbulent period is that of self- and other-regulation. A mother's ability to regulate her own stress and emotions – in other words, her mental health – plays a key role in this task (Atkinson et al., 2000). In the prenatal period, the infant needs protection from harmful levels of maternal stress, as *in utero* exposure can disturb his/her adaptive development (Barker, Jaffee, Uher & Maughan, 2011; Davis, Glynn, Waffarn, & Sandman, 2011; Kingston, Tough, & Whitfield, 2012). After birth, the mother is needed as a self-regulating other who protects the infant from excess internal and external stimuli. This regulatory help allows the immature infant, who cannot yet recover from stress independently, to maintain a tolerable arousal state in which development can proceed (Calkins & Hill, 2007; Schore, 2015; Sroufe, 1995, 2000).

Gradually, by coordinating their affective expressions and repairing normative ruptures in interactions, the caregiver and the infant form a dyadic regulatory system (Beebe & Lachmann, 1998; Tronick, 1989). Infant characteristics, such as temperament, contribute to the formation of dyadic regulation (Fuertes, Santos, Beeghly, & Tronick, 2006; Provenzi et al., 2015; Volling, McElwain, Notaro, & Herrera, 2002). Still, a mother's ability to regulate her individually reactive infant is key to successful child development (Feldman, Greenbaum & Yirmiya, 1999; Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990). The infant internalizes the regulated interactions as a sense of safety and ability to cope with stress and affect (Bernier, Carlson, & Whipple, 2010; Rosenblum, Dayton, & Muzik, 2009; Schore, 2000), which are at the core of mental health and the ability to form fulfilling relationships (Bateman & Fonagy, 2012; Fonagy, Gergely, Jurist, & Target, 2002; Siegel, 1999).

Although becoming a mother is a major life transition common to all cultures, existing studies have mainly focused on pre- and postnatal middle-class women from urban European and American societies. This reflects a general bias in psychology research, where generalizations are made from

this selected group while disregarding families in so-called 'developing countries'; in other words, the Majority World (Arnett, 2008; Henrich, Heine, & Norenzayan, 2010; Jensen, 2011). However, socio-culturally constructed meanings and practices, as well as the resources available for prenatal preparation and postnatal infant care, shape caregiving and infant development to a great extent (Johns & Belsky, 2007; Keller, 2013, 2017). Accordingly, studies are needed that explore women in transition to motherhood in diverse contexts where different obligations, beliefs, norms, and family constellations shape the experience of early motherhood.

That said, the infant need for a caregiver's regulatory help is universal (Bhavnagri & Gonzalez-Mena, 1997; Trevathan & McKenna, 1994) and normative mothers respond to their infants' signals with an equal level of contingency, despite variation in their means of response (Bornstein, Putnick, Cote, Haynes, & Suwalsky, 2015; Murray, 2014, p. 16). Euro-American mothers' and infants' well-regulated interactions are characterized by maternal mirroring of the infant's affective expressions in face-to-face interactions (Gergely & Watson, 1996). This specifically fosters the development of the child's individuality and self-expression, which are desired characteristics in these individualistic societies (Kagitcibasi, 2005; Keller, 2003). In contrast, keeping the infant close, and touching and in other ways motorically stimulating him/her, is emphasized in interactions among less-educated mothers living in rural 'Non-Western' societies where social harmony and conforming to one's group's and elders' needs are desired socialization goals (Kärtner, Keller, & Yovsi, 2010).

A further note is that, although maternal regulatory help is central to infant development, in reality infants attach to multiple caregivers (such as fathers, older siblings, extended family members, and alloparents) and all of these relationships together shape their development (Cowan, 1997; Hrdy, 2011; Keller, 2017). Thus, the reader should note that, by concentrating on mothers and the mother–infant relationship, the thesis provides a partial and simplified view of caregiver impact on infant development in the pre- and postnatal periods.

1.1.1 The role of mental representations

According to attachment theory, a mother's internal working models of close relationships are central determinants of her ability to regulate herself and

her infant (Hesse, 2008; Main, Kaplan, & Cassidy, 1985). However, the quality and importance of these *mental representations* remains understudied among mothers outside the Euro-American cultural context. Consequently, caution is warranted in generalizing the presented theory and research findings to mothers worldwide.

The transition to motherhood is presumed to specifically activate a mother's internal working models of early relational experiences with her caregivers; that is, *attachment representations* (Bretherton & Munholland, 2008). When the attachment representations are *Autonomous/Secure* (that is, coherent and balanced), they promote maternal ability to openly explore her emotional experiences without being overwhelmed by them (Cassidy, 1994; Shaver & Mikulincer, 2012) and to sensitively respond to her infant (van IJzendoorn, 1995; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999).

Such open and balanced stance is also central to maternal *mentalizing*; that is, a mother's ability to unknowingly reflect upon her own and her infant's mental states underlying behavior and interactions. A mother's mentalizing stance allows her to notice the effect of her own stress and emotions on the interactions with her infant, as well as to respond to infant intentions (such as frustration, anger, disappointment) rather than just to his/her behavior or presumed bodily needs (Slade, 2005; Zeegers, Colonnesi, Stams, & Meins, 2017). Parental reflective functioning is a specifically challenging task, as the mother has to hold two minds in mind simultaneously, and not only to think about the child's mental states, but also to use this information for promptly helping him/her in regulation (Slade, 2005; Slade, Aber, Bresgi, Berger, & Kaplan, 2004).

The attachment representations serve as a platform for emerging *caregiving representations* that the mother constructs pre- and postnally of herself-as-caregiver, the infant, and their relationship (Slade et al., 2009; Stern, 1995). However, the formation of caregiving representations is also distinct from the mother's attachment experiences. Caregiving representations are primarily organized around the role of protecting one's offspring, thus differing from the attachment motivation of seeking safety (Bowlby, 1969/82; George & Solomon, 1996, 2008). In addition, caregiving representations are constructed in the present and thus influenced by the family's current risk and resilience factors, such as maternal mental health and social support and infant characteristics (Huth-Bocks, Levendosky, Bogat,

& von Eye, 2004; van Bakel & Riksen-Walraven, 2002). Research shows that caregiving representations are key in determining how a mother interprets her infant's signals and responds to them, and that balanced and mostly positive caregiving representations allow for appropriate maternal responses to the infant (Biringen, Matheny, Bretherton, Renouf, & Sherman, 2000; Korja et al., 2010; Vreeswijk, Maas, & van Bakel, 2012).

In sum, successful reorganization of maternal emotionality and representations allows for the emergence of a specific psychological organization, termed *primary maternal preoccupation* (Winnicott, 1958) or *the motherhood constellation* (Stern, 1995), in which caregiving towards the infant takes precedence over all else in a mother's mind. In motivation systems theory, the reorganization is conceptualized as a shift from the dominance of the attachment system to that of the caregiving system (George & Solomon, 2008; Solomon & George, 1996). A well-organized caregiving system allows a mother to promptly attend to her infant especially at times of heightened stress or danger. This is central to the survival of the individual child as well as that of the human species (George & Solomon, 2008; Solomon & George, 1996).

1.2 Maternal trauma inflicts disorganization and self–other dysregulation

Psychological trauma is defined as an overwhelmingly stressful experience which, at its occurrence, surpasses an individual's ability to mentally represent what has happened, and consequently disturbs the regulation of arousal, affect, and cognitions, manifesting as intrusive (re-experiencing, hypervigilance) and constricted (numbing, avoidance) responses (Herman, 1992; Horowitz, 2011; Selye, 1956). After a single, potentially traumatic event, the complex interplay of individual risks and resiliences determines whether such normative stress reactions decline or whether they become chronic hindrances to an individual's wellbeing (Bonanno & Mancini, 2012).

However, complex traumas that are long-lasting, originate in childhood, and/or involve other humans as perpetrators, inflict prolonged and intolerable distress, helplessness, and terror that are likely to exceed most individuals' psychological resources. In addition, early-originating complex traumas interfere with the development of stress and emotion regulation, increasing an individual's vulnerability to later challenges (Herman, 1992; van

der Kolk et al., 2005). Consequently, complex traumas are likely to disturb survivors' mental health, representation formation, and interpersonal relationships (Courtois, 2008; Ehring & Quack, 2010; Janoff-Bulman, 2010), and dispose them to accumulation of stressors (Hughes et al., 2017).

Complexly-traumatized women are especially vulnerable in their transition to motherhood. The psycho-physiological changes, demands of caregiving, and infant attachment signals (such as crying and approaching the parent) can specifically re-activate maternal traumatic experiences (Fraiberg et al., 1975; Levy, 2006; Schechter, Kaminer, Grienenberger, & Amat, 2003). Instead of organizing a traumatized mother to promptly respond to her infant, the infant's cries are likely to elicit aggressive (fight), hyper-aroused, (flight), or paralyzed (freeze) responses in the mother, in other words, disorganize her (Lyons-Ruth, 2003;; Scheeringa & Zeanah, 2001; Solomon & George, 2011) .

Maternal inability to regulate her stress responses and emotions, and distorted interpretations of infant intentions, characteristics, and needs, are hallmarks of a disorganized caregiving system (George & Solomon, 2008; Solomon & George, 2011). Indeed, as illustrated in Figure 1, and described in detail in section 1.4.2, research has identified maternal pre- and postnatal mental health symptoms and excess stress, and distorted attachment and caregiving representations, as central routes through which maternal trauma can dysregulate infant development and mother–infant interaction (Muzik et al., 2013; van Ee, Kleber, & Mooren, 2012; van IJzendoorn, 1995).

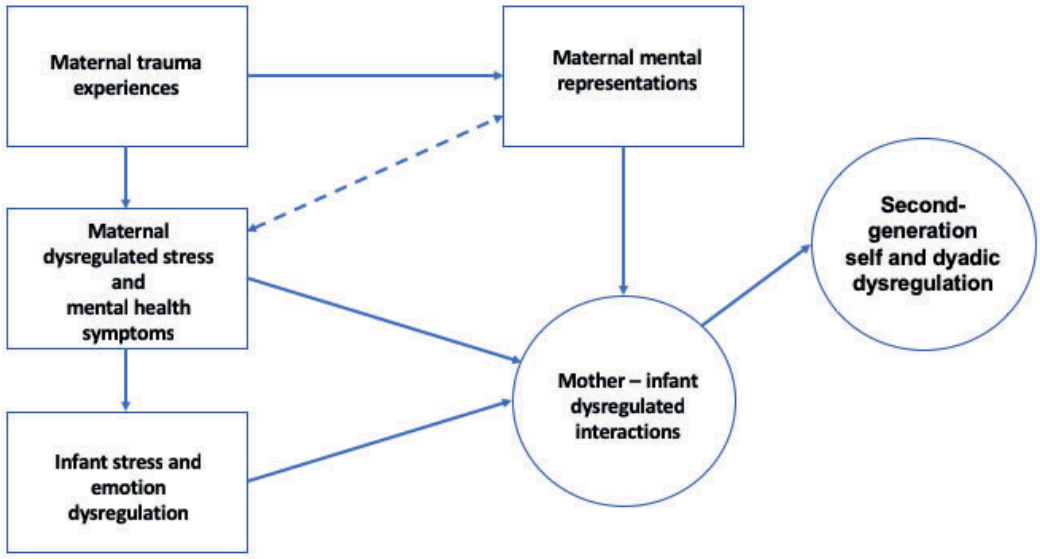

Figure 1. Transgenerational transmitters of maternal trauma-related dysregulation.

Disturbances in traumatized mothers' stress responses, mental health, and mental representations impact the infant both pre- and postnatally, through *in utero* stress exposure (Bosquet Enlow et al., 2009; Seng et al., 2014) and dysregulated interactions; that is, maternal noncontingent/affectively erroneous responses to the infant's attachment signals (described in detail in section 1.3.1; Lyons-Ruth, 2003; Lyons-Ruth & Block, 1996; Lyons-Ruth, Bronfman, & Parsons, 1999; Seng et al., 2013). In her case illustration, Arietta Slade describes the dysregulation between a traumatized mother and her infant as follows:

> "…AnaRosa [the mother] intruded upon Sophia's [the four-month-old infant] physical and visual space in an extremely aggressive way for nearly twenty minutes. She poked, she loomed, she slapped in a playful but very rough way, and she mocked Sophia's distress. The baby looked stunned, and attempted in a variety of ways to regulate her mother's insistent and overwhelming approach. At moments she looked away and seemed almost dissociated, at others she looked actively frightened and blinked her eyes as if trying to blot her mother out, at others she fussed mildly, and at others she struggled to placate with a dazed half-smile. […] AnaRosa missed many of her baby's cues, notably her fear, her dysregulation, and her intentions." (Slade, 2007, p.230).

The excerpt above describes how maternal failure in dyadic regulation, and/or behavior that further increases distress, prevents the infant from forming a functional regulatory strategy. Such interactions are consolidated into infant insecure, and specifically disorganized, attachment style by the end of the first year (Feldman & Vengrober, 2011; Lyons-Ruth Yellin, Melnick, & Atwood, 2005; Madigan et al., 2006). Reflecting the inability to resort to their caregiver, disorganized infants show conflicting, disoriented, and fearful behaviors, or collapse in posture at times of heightened stress (Granqvist et al., 2017; Hesse & Main, 2000). The child's internalization of the dysregulated interactions, then, extends their harmful effects throughout the lifespan and onto the next generation, manifesting as affective and behavioral problems in childhood; mood, personality, and dissociative disorders in adulthood; and disturbances in next-generation parenting (Lyons-Ruth & Jacobvitz, 2008; Lyons-Ruth, Melnick, Patrick, & Hobson, 2007; Madigan, Moran, Schuengel, Otten, & Pederson, 2007; van IJzendoorn et al., 1999).

To a large but not complete extent (see, e.g., Feldman & Vengrober, 2011; Levy, 2006; van Ee et al., 2012), the studies cited here have investigated Euro-American women traumatized in their early and later intimate relationships. As with reorganization in transition to motherhood, research is limited on trauma-inflicted dysregulation among women in their pre- and postnatal period in the Majority World. We address this matter in the next section in relation to the participants of the present work.

1.3 The present work: high-risk mothers with traumatic histories

Two types of complex traumas are examined in this dissertation: childhood caregiver-inflicted traumas, and exposure to traumatic war events prior to pregnancy and in the postnatal periods. Specifically, the study investigates how these traumas, as well as maternal mental representations and mental health symptoms, contribute to maternal, infant, and dyadic dysregulation among different high-risk mothers and their infants in the pre- and postnatal periods: groups of Finnish substance-abusing (Article I) and war-exposed Palestinian mothers (Articles II & III), and in the case of a Finnish mother enrolled in parent-infant psychotherapy (Article IV).

This section first describes the complex traumas under study and their dysregulating impact. Second, it summarizes existing evidence of maternal

mental health symptoms and stress, as well as mental representations, as transmitters of dysregulation.

1.3.1 Caregiver-inflicted traumas in childhood

In this dissertation, caregiver-inflicted early traumas are conceptualized as attachment trauma (Articles I & IV) and childhood emotional or physical abuse by mother or father (Article II). Attachment trauma refers to developmental trauma arising from overwhelming and dysregulating experiences with one's caregivers, including but not restricted to abuse (see Schore, 2010, 2013).

In considering what constitutes a traumatic experience, a developmental understanding is crucial. For small children, a parent's failure in dyadic regulation leaves them in a state of intolerable arousal (Lieberman, 2004; Scheeringa & Zeanah, 2001). The harmful effects of parents' emotional and physical abuse are widely recognized (Bailey, DeOliveira, Wolfe, Evans, & Hartwick, 2012; Norman et al., 2012). In addition, attachment research has identified more specific manifestations of dysregulating (also referred to as 'atypical' or 'anomalous') caregiving, such as affectively contradictory, fearful, helpless, dissociative, role-reversed, hostile, and withdrawn behaviors, as sources of disorganization to child development (Hesse & Main, 2000; Lyons-Ruth et al., 1999b; Madigan et al., 2006). Fearful/Helpless behaviors can be subtle and have been underrecognized or confused with maternal sensitivity in the past. Better awareness and identification of such caregiving profile is needed, as they may be linked to infant disorganized attachment in low-risk samples where child abuse is rare (Bureau, Martin, & Lyons-Ruth, 2010; Lyons-Ruth & Spielman, 2004).

Early caregiver-inflicted traumas are specifically harmful because they disturb individuals' regulatory development and social learning. First, the experiences of overwhelming stress, or 'states', are consolidated into permanent vulnerability to stress, or 'traits', via the experience-expecting central nervous system (Perry, Pollard, Blakley, Baker, & Vigilante, 1995). Second, dysregulating caregivers fail to act as 'natural pedagogists' who teach the child culturally salient ways of self-expression and relating to others (Fonagy & Allison, 2014; Fonagy, Gergely, & Target, 2007; Gergely, 2007). Research on Euro-American mothers shows that, as a consequence,

survivors develop affective (Anda et al., 2006) and personality disorders (Ball & Links, 2009; Herman, Perry, & van der Kolk, 1989).

Importantly, later close relationships, including interacting with one's infant, re-evoke similar unmodulated arousal, stress, and emotions that a mother has experienced in relation to her caregiver(s), which in turn block maternal ability to mentalize her own or her infant's experiences (George & Solomon, 2011; Mayes, 2000; Schechter et al., 2005). As a result, mothers with a history of caregiver-inflicted trauma are at risk of transmitting traumatic dysregulation (Lyons-Ruth, 2003; Lyons-Ruth, Melnick, Bronfman, Sherry, & Llanas, 2004) and psychopathology (Plant, Jones, Pariante, & Pawlby, 2017; Plant, Pawlby, Pariante, & Jones, 2018; Rijlaarsdam et al., 2014) from one generation to another.

1.3.1.1 Substance-abusing women and childhood caregiver-inflicted trauma

Article I studies treatment-enrolled substance-abusing mothers. Prior research shows that childhood caregiver-inflicted traumas characterize the histories of substance-abusing pregnant and postpartum women (Grella, Stein, & Greenwell, 2005; Hans, 1999; Kaltenbach, 2013). In fact, some scholars understand substance abuse as a maladaptive self-regulation attempt in the absence of internalized regulating relationships (Cihan, Winstead, Laulis, & Feit, 2014; Padykula & Conklin, 2010).

Perinatal substance abuse is not an isolated problem, but instead typically an indicator of accumulated psychosocial risks such as mental health problems, lack of social support, unplanned pregnancies, single parenting or unstable partner relationships, low educational and socioeconomic status, and overall chaotic life situation (Belt, Punamäki, Pajulo, Posa, & Tamminen, 2009; Hans, Bernstein, & Henson, 1999; Suchman, McMahon, Slade, & Luthar, 2005), all of which contribute to compromising caregiving.

Consequently, substance-abusing women display both self- and other-dysregulation in their transition to motherhood. In addition to history of trauma and accumulated risks, the substance misuse in itself negatively affects these mothers' abilities to regulate their emotions and reflect on their behavior and dyadic interactions (Baler & Volkow, 2006; Flykt, 2014; Goldstein et al., 1999). Further, when ceasing or attempting to cease substance abuse, the women lose the self-regulatory strategy they have previously relied upon (Mayes & Truman, 2002). In interactions with their infants, substance-abusing mothers typically display lack of attunement and

structuring, as well as harshness, flatness, and hostility (Belt et al., 2012; Flykt et al., 2012; Pajulo, Savonlahti, Sourander, Piha, & Helenius, 2001; Salo et al., 2010). The infants' exposure to maternal mental health symptoms and substance abuse *in utero* contributes to the dyadic dysregulation by making them less involved and harder to soothe (Beeghly, Frank, Rose-Jacobs, Cabral, & Tronick, 2003; Tronick et al., 2005).

Despite the importance of attachment representations for self- and dyadic regulation, research on their importance among substance-abusing women in transition to motherhood is scarce. Accordingly, **in Article I, we investigate how substance-abusing mothers' attachment representations are associated with their prenatal emotion processing and the quality of interaction with their four-month-old infants.**

1.3.1.2 The role of childhood abuse among war-exposed mothers

There is a lack of prior research on the impact of caregiver-inflicted early traumas on transition to motherhood in war conditions. We address this gap in Article II by examining childhood emotional and physical abuse in Palestinian mothers (who are described in more detail below). Study of the dysregulating impacts of childhood abuse among mothers living in dangerous environments is needed for several reasons. First, childhood abuse experiences might be specifically prevalent among mothers living in war zones, as the burdening of prolonged military conflict can have specifically provoked abusive parenting in their own caregivers (Catani, Schauer, & Neuner, 2008; Saile, Ertl, Neuner, & Catani, 2014). Second, the high-stress context can specifically activate such earlier traumas (Bowlby, 1973; de Kloet, Sibug, Helmerhorst, & Schmidt, 2005; Mikulincer & Shaver, 2012). Third, the mothers with early traumas can be specifically vulnerable to the adverse effects later traumatic events such as war exposure (de Kloet et al., 2005; Roth, Newman, Pelcowitz, van der Kolk, & Mandel, 1997). **Accordingly, in Article II, we study the effects of Palestinian mothers' childhood abuse, alone and when accumulated with current war exposure, on their prenatal mental health and their infants' stress regulation.**

1.3.1.3 A mother with a dysregulating attachment history: the case stydy

Article IV investigates the attachment and caregiving representations of a mother enrolled in a parent-infant psychotherapy process together with her firstborn son. The mother's descriptions of her own parents' behavior were a textbook example of dysregulating (helpless, fearful and hostile) responses to her attachment needs (see Lyons-Ruth et al., 1999b, 2005). The mother often talked about the experiences as causes for her lifetime emotion and stress dysregulation, previously diagnosed as borderline personality disorder. Her fear that the mental health problems would inevitably transmit onto the relationship with her son was a central reason for seeking treatment. In line with prior research on attachment-traumatized mothers (Lyons-Ruth, Dutra, Schuder, & Bianchi, 2006; Lyons-Ruth & Spielman, 2004; Slade, 2007), activation of the dysregulating attachment experiences in transition to motherhood were key in complicating the case study mother's ability to reflect on her own and her infant's experiences, and to build coherent and realistic representations of her child and of herself as a caregiver.

Even though transmission of risks from a mother's attachment representations to her caregiving representations is a central premise in research with traumatized mothers, there are no prior studies that have investigated the presumed transmission in a detailed way. **Accordingly, in Article IV, we study risk features in the case study mother's attachment and caregiving representations.**

1.3.2 Exposure to traumatic war events

Exposure to traumatic war events prior to pregnancy and in the postnatal period is the caregiving context for the Palestinian mothers investigated in Articles II and III. Living in a military conflict zone gravely contradicts the core caregiving task of keeping one's infant alive and safe (Stern, 1995). In addition to creating direct threat to life, armed conflicts that often persist over multiple generations damage the societal structures and traditions that support caregiving (Igreja, 2003).

The studied mothers live in the Gaza Strip, where the unstable socio-political situation creates constant fear of a new armed conflict. The international siege since 2007 has generated unemployment, related poverty, and shortage of basic infant care and medical necessities, adding to the mothers' stress and complicating caregiving on daily basis (Punamäki,

Diab, Isosävi, Kuittinen, & Qouta, 2018; UN-Human Rights Council, 2015). Mothers are overburdened by taking care of the extended family in crowded living conditions, and further take on the responsibility of income provider when male members of the family are killed or missing (Rahim, 2009).

Despite the high stress and danger, war exposure does not inevitably hamper mother–infant interaction and child development, but instead its harmful effects are transmitted through impaired caregiving (Feldman & Vengrober, 2011; Punamäki et al., 2018; van Ee et al., 2012). As with mothers who have experienced caregiver-inflicted early traumas, war-traumatization is found to disturb exposed mothers' mental health, and according to some qualiative studies, also their mental representations (Almqvist & Broberg, 2003; Kaitz, Levy, Ebstein, Faraone, & Mankuta, 2009; Levy, 2006). Consequently, mothers may either withdraw or become emotionally dysregulated by their infants' signals, and children learn not to resort to their mothers for regulation. This strategy continues to pose risks to child development even after mothers no longer show posttraumatic symptoms (Almqvist & Broberg, 2003; Feldman & Vengrober, 2011; Kaitz et al., 2009).

Thus far, there is little research on how war exposure impacts on caregiving in the prenatal period. Further, although adaptive caregiving is especially important to infant development in high-stress and dangerous conditions (Lieberman, Chu, van Horn, & Harris, 2011; Masten & Narayan, 2012; Scheeringa & Zeanah, 2001), quantitative research is scarce on war-exposed mothers' caregiving representations as transgenerational transmitters of trauma. **In Article III, we assess the risk features in Palestinian mothers' representations, as well as their associations with war exposure, pre- and postnatal mental health symptoms, and mother–infant interaction quality.**

1.4 Mechanisms of transmission

The following section outlines in detail the theoretical and empirical justification for examining maternal mental health, stress, and mental representations as central transmitters of mothers' trauma-related dysregulation in the pre- and postnatal periods. These are explained in the context of the specific trauma types and high-risk groups under study.

1.4.1 Maternal stress and mental health symptoms

Maternal pre- and postnatal mental health and stress are studied among Palestinan mothers in Articles II and III. Research among Euro-American women has shown that caregiver-inflicted early traumas hamper mothers' prenatal stress regulation (Juul, Hendrix, Robinson, Stowe, Newport, Brennan, & Johnson, 2016; Lang et al., 2010). Some studies suggest that war traumatization has similar effects (Ramo-Fernández, Schneider, Wilker, & Kolassa, 2015). Consequently, and with the contribution of the psycho-hormonal changes of the pre- and postpartum period, traumatized women are especially susceptible to developing mental health problems, most notably depressive and posttraumatic stress disorder (PTSD) symptoms.

This is well-established among Western mothers with childhood caregiver-inflicted trauma histories (Banyard, Williams, & Siegel, 2003; McDonnell & Valentino, 2016; Seng et al, 2014; Sexton, Hamilton, McGinnis, Rosenblum, & Muzik, 2015). There is also some limited evidence that war and terror inflict prenatal mental health symptoms on exposed women (Brand, Engel, Canfield, & Yehuda, 2006; Punamäki et al., 2018; Yehyda et al., 2005). Some research suggests that childhood interpersonal traumas are more harmful to prenatal mental health than later traumas (Huth-Bocks, Krause, Ahlfs-Dunn, Gallagher, & Scott, 2013; Schwerdtfeger & Goff, 2007).

Mothers' dysregulated stress and prenatal mental health symptoms expose the *in utero* infant to dysregulated secretion of the maternal stress hormone cortisol (Davis et al., 2011). Since the stress and emotion regulation structures of the infant's prenatally-developing central nervous system – namely, the Hypothalamic-Pituitary-Adrenal (HPA) axis – are programmed by the prenatal hormonal environment (Bridgett, Burt, Edwards, & Deater-Deckard, 2015; Glover, O'Connor, & O'Donnell, 2010), exposure to altered levels of maternal cortisol disposes the infant to postnatal difficulties in being soothed and recovering from stress (Brand et al., 2006; Korja et al., 2017; Yehuda et al., 2005). Maternal trauma history and related psychopathology also dispose the infant to prematurity and low birth weight, which likely increase his/her postnatal regulatory difficulties (Koen et al., 2016; Seng, Low, Sperlich, Ronis, & Liberzon, 2011).

Research on Euro-American mothers suggests that maternal early-life traumas impact infant prenatal regulatory development both directly, via hampered maternal stress regulation, and indirectly, through mental health symptoms (Brand et al., 2010), and that diverse maternal childhood abuse

experiences might contribute differently to infants' regulation (Jovanovic et al., 2011; Lang et al., 2010). Later trauma exposure is shown to disturb infant regulation only when mothers develop PTSD (Brand et al., 2006; Yehuda et al., 2005). However, there are no prior studies exploring the harmful effects of diverse childhood abuse experiences on maternal mental health and infant stress regulation among war-exposed dyads. Further, to our knowledge, the effects of these two types of trauma on maternal prenatal mental health and infant stress regulation has not yet been compared. We address this gap in Article II.

In addition to compromising dyadic regulation through the programming of infant's HPA-axis, maternal prenatal mental health and stress complicate psychological preparation for motherhood and representation formation (Ahlqvist-Björkrooth et al., 2016; Lindgren, 2001). However, research is scarce on the impact of pre- and postnatal mental health symptoms on complexly-traumatized mothers' caregiving representations (but see Lyons-Ruth et al. 2007; Schechter et al., 2008), and nonexistent on war-exposed mothers. In Article III, we address this research gap by investigating the links between mothers' war exposure, pre- and postnatal mental health, and caregiving representations.

In the postnatal period, dyads with traumatized mothers face two concurrent issues, as both maternal mental health problems and infant regulatory difficulties can contribute to dyadic dysregulation. Infant stress expressions have been shown to catalyze posttraumatic symptoms in both childhood- and war-traumatized mothers (Almqvist & Broberg, 2003; Feldman & Vengrober, 2011; Schechter & Willheim, 2009). Maternal postnatal mental health symptoms, in turn, are particularly associated with dysregulating caregiving behavior and transgenerational transmission of psychopathology (Bosquet Enlow, Egeland, Carlson, Blood, & Wright, 2014; Feldman & Vengrober, 2011; Martinez-Torteya et al., 2014; van Ee et al., 2012).

The substance-abusing and case study mothers' prenatal- and postnatal mental health and stress are not under examination. However, Article I investigates the substance-abusing mothers' pregnancy-related *emotion processing* (EP). Processing of cognitive, feeling state, and behavioral levels of emotions, as well as the ability to evaluate emotions at meta-level, is central to self-regulation and adaptation to new circumstances (Gross & John, 2003; Punamäki, Belt, & Posa, 2013). In tandem with the Palestinian

mothers' pre- and postnatal mental health symptoms, we consider the substance-abusing mothers' imbalanced emotion processing as reflective of maternal emotional dysregulation. In the discussion, we widen the consideration to include the case study mother's expressions of dysregulated stress, arousal, and emotions, as evident in her representations.

1.4.2 Mental representations

As described above, traumatized mothers' attachment and caregiving representations have received extended attention in research. However, their quality and role as transgenerational transmitters of trauma among the subjects in this dissertation still remain understudied. Accordingly, in the present work, the following questions are addressed:

1) Do attachment representations play a similar role among high-risk, substance-abusing mothers and non-using comparisons in transition to motherhood (Article I)?
2) Are the risks in war-exposed Palestinian mothers' caregiving representations similar to those identified among interpersonally-traumatized Euro-American mothers (Article III)?
3) Do the case study mother's attachment and caregiving representations show similar or different risk features? And further, do the most potent representational theories identify the same or different risks from the mother's caregiving representations (Article IV)?

In short, the focus is on possible different dynamics of representations in high- and low-risk groups, different risk groups, and attachment and caregiving, as well as on the clinical relevance of the main representational theories.

In describing mental representations that underlie maternal disorganized caregiving, George and Solomon (2008; Solomon & George, 2011) have postulated that traumatized mothers' representational processes resemble the dialectic of constriction and intrusion of posttraumatic stress (see also Scheeringa & Zeanah, 2001; Schechter et al., 2006; Schechter & Willheim, 2009). To preserve a tolerable state of mind, mothers defensively attempt to *segregate* the representations from awareness (described also as a dissociative process of *splitting*; see Lyons-Ruth et al., 2005). This manifests as mothers' absent or unrealistically positive or 'glorified' working models in

which the infant has no attachment needs or is the regulating other for the mother, and caregiving is thus not needed. However, as the relationship with the infant inevitably activates the caregiving system, the rigid and fragile defense breaks down and *'flooded'* representations take over, characterized by maternal experiences of overwhelming emotional distress and a very negative view of caregiving and the infant (Almqvist & Broberg, 2003; George & Solomon, 2008; Sleed, 2013).

There are several theories that somewhat differently identify specific representational features that may account for dysregulated mother–infant relationships and infant disorganized attachment. They all recognize the constriction/flooding, unrealistic positivity/negativity, and lack of reflection/affect regulation described above, but they emphasize and conceptualize these differently. The following section first describes the theories that are used in this dissertation to assess the mothers' representational risks, and second, relates them to the focus of each study. Table 1 summarizes the theories' premises and their relationships with dyadic dysregulation.

Table 1. Representational risk phenomena assessed in the dissertation.

Conceptualization	Central characteristics	Relation to dyadic dysregulation[1]	Use in the current study[3]
INSECURE[1] **Dismissing (Ds)** **Preoccupied (E)** **Unresolved/** **Disorganized (U/d)**	Lack of coherence, imbalance or break-down in attentional-emotional strategies. Ds: idealizing, lack of memory, or derogating E: vagueness, role confusion, preoccupation with affect and relationships U/d: collapse of reasoning, discourse, or behavior in relation to trauma/loss.	Ds: Low maternal involvement, sensitivity, and responsiveness, linked to infant insecure attachment. E: Maternal unpredictability, linked to infant insecure and disorganized attachment. U/d: Specifically linked to maternal frightened, frightening, and atypical[2] behaviors and to infant disorganization.	**Article I**: classification of attachment representations **Article III**: Idealization, Incoherence, and Enmeshment/Role Reversal in caregiving representations **Article IV**: classification of attachment representations and identifying the Insecure features in caregiving representations
HOSTILE/HELPLESS **Hostile** **Helpless** **Fearful**	Pervasive un-integration of representations that is not restricted to discussing trauma/loss, evident as inability to reflect on representations, emotional dysregulation, contradictions, identification with hostile/helpless caregivers, and sense of badness/unworthiness.	Linked to maternal atypical behaviors, including "subtle" indicators of dysregulation such as parental hesitant/helpless behaviors. Explaining infant disorganization beyond U/d representations.	**Article III**: Hostile, Helpless, Fearful, and Emotionally Distressed features in caregiving representations **Article IV**: classification of attachment representations and identifying the Hostile/Helpless features in caregiving representations
PRE-MENTALIZING **Psychic Equivalence** **Teleological** **Pretend**	Failures in mentalizing self and other: (Psychic equivalence: experiencing world as isomorphic to mental states. Teleological: focus on behavior and appearance. Pretend: apparent/pseudo-mentalizing detached from experience.	Maternal low level of mentalizing associated with poor interaction quality and infant disorganized attachment. No studies on the relationship between lapses to specific pre-mentalizing modes and dyadic dysregulation.	**Article IV**: Assessing the level of mentalizing ability regarding attachment and Identifying Pre-mentalizing features in attachment and caregiving representations

[1]Research on caregiving representations has categories corresponding to Insecure attachment representations (Vreeswijk, Maas, & van Bakel, 2002; Zeanah, Benoit, Barton & Hirshberg, 1996; Crawford & Benoit, 2009). Although these are named differently, for simplicity and clarity we use the "Insecure" term for both.

[2]Covering affective communication errors, role confusion, fearfulness/disorientation, intrusive/negative and withdrawn behaviors, as conceptualized in the Atypical Maternal Behavior Instrument for Assessment and Classification [AMBIANCE]; Bronfman, Madigan, & Lyons-Ruth, 2009-2014).

[3]Attachment representations were assessed with the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) in articles I and IV. Caregiving representations were assessed with the Parent Development Interview (PDI, short version; Slade, Aber, Bresgi, Berger, & Kaplan, 2004) in article III and with content analysis of psychotherapy notes in article IV.

1.4.2.1 Insecure representations

The vast majority of prior research has focused on *Non-autonomous/Insecure* (hereafter Insecure) attachment representations among Euro-American mothers (see Hesse, 2008, for a detailed description of the phenomena and their assessment in the Adult Attachment Interview [AAI; George et al., 1985]). In contrast to Autonomous/Secure (hereafter Secure) representations, Insecure attachment representations are characterized by low coherence and imbalanced emotional-attentional strategies, or breakdown thereof. Two organized representational categories, *Dismissing* and *Preoccupied*, and one specific, *Unresolved/Disorganized in relation to loss or trauma***,** have been identified. In addition, an interview that displays global incoherence, contradictory strategies, and does not fit to any of the above criteria, is deemed non-classifiable to the categories, and receives a '*Cannot Classify*' rating (Hesse, 2008; Hesse & Main, 2000; Main, Goldwyn, & Hesse, 2003).

Dismissing representations are characterized by overregulation of, or attempts to turn attention away from, attachment-activating experiences (such as being hurt, upset, or separated from caregivers) by means of idealization, claiming not to remember, or derogating attachment figures or attachment needs overall. In contrast, Preoccupied representations demonstrate under-regulation, as mothers become emotionally entangled with their past and present experiences with caregivers while discussing them, and display an enmeshed sense of self and caregiver. The breakdown of attentional-emotional strategy in Unresolved/Disorganized representations comes across as lapses in reasoning (such as speaking of a deceased person as s/he were still alive, unwarranted beliefs of causing death/abuse, descriptions of dissociation), speech (sudden shifts in speech pattern, prolonged silences, unusual attention to sensory detail), and behavior (such as self-harm), specifically when discussing loss or trauma (Main et al., 2003). Such lapses are thought to represent the interference of normally dissociated memories/beliefs into consciousness (Hesse, 2008). Understanding (and category development) of the Cannot Classify representations is very incomplete, but it is suggested that they reflect a global disorganization, or "Unorganized" states of mind related to attachment (Hesse, 2008, p. 571).

Traditionally, the organized Insecure attachment representations have been understood as reflecting sub-optimal, yet not necessarily pathological,

representational strategies. They have been shown to link to non-sensitive, yet not necessarily extremely dysregulating, mother–infant interactions (Adam, Gunnar, & Tanaka 2004; Cohn, Cowan, Cowan, & Pearson, 1992; Crowell & Feldman, 1988; Riva Crugnola et al., 2013). Instead, the Unresolved/Disorganized attachment representations have been considered as specific predecessors of dyadic dysregulation (Goldberg, Benoit, Blockland, & Madigan, 2003; Main & Hesse, 1990).

However, research shows that Preoccupied as well as Unresolved/Disorganized attachment representations are associated with infant disorganized attachment (Hesse & Main, 2000; Madigan et al., 2006; van IJzendoorn, 1995). In fact, there is evidence that the Preoccupied and Unresolved categories reflect similar, rather than qualitatively distinct, maternal states of mind (Haltigan, Roisman, & Haydon, 2014). For example, some Preoccupied representations are characterized by trauma-related fear (Main et al., 2003). In addition, they are both prevalent among mothers with borderline personality disorder, a common sequence of early complex trauma (Barone, 2003; Macfie, Swan, Fitzpatrick Watkins, & Rivas, 2014).

After over three decades of research on Insecure attachment representations, a 'transition gap' still remains in which the Insecure (and particularly Unresolved/Disorganized) maternal representations only predict a small proportion of variance in maternal dysregulating behavior and infant disorganized attachment (Madigan, 2006; van IJzendoorn, 1995; van IJzendoorn et al., 1999; Verhage et al., 2016). Accordingly, identification of other features of maternal representations is needed that are linked to transgenerational transmission of trauma.

Insecure features of caregiving representations have also been identified that underlie problematic mother–infant interactions. Dismissing representations (named *Disengaged* in the Working Model of the Child Interview [WMCI; Zeanah et al., 1996], a widely used semi-structured interview for assessing caregiving representations) are associated with low maternal sensitivity and involvement (Vreesvijk et al., 2012; Zeanah et al., 1996). Preoccupied (named *Distorted* in the WMCI) features specifically characterize the caregiving representations of interpersonally-traumatized mothers, and link with more dysregulating behaviors such as hostility (Korja et al., 2010; Schechter et al., 2008; Sokolowski, Hans, Bernstein, & Cox, 2007). However, the WMCI was developed before the infant disorganized attachment classification (Vreesvijk et al., 2012), and it is thus unclear how

the interview's classifications relate to most severe relational risks. In modification of the original coding, Crawford and Benoit (2009) found links between 'disrupted' maternal prenatal caregiving representations (i.e., those which were affectively contradictory, withdrawn, fearful, disoriented, hostile, or role reversed) and mothers' similar dysregulating behaviors and infant disorganized attachment (see also Niccols, Smith, & Benoit, 2015). However, it is unclear how such risks in the caregiving representations correspond with risks in mothers' attachment representations.

1.4.2.2 Hostile/Helpless representations

Research investigating complexly-traumatized mothers and their infants has questioned whether Insecure attachment representations, originating in research with normative dyads, are central in predicting their dyadic dysregulation. Karlen Lyons-Ruth and her colleagues (2003, 2005) have widened the concept of 'unresolved' states of mind regarding single losses and traumas to more holistic Hostile and Helpless-Fearful (HH) states of mind regarding attachment. Such representations are characterized by a black-and-white view of self in relation to other as victim and/or perpetrator, and show a global lack of integration rather than local lapses in thinking about (specific) trauma. Aligning with the idea of segregated/flooding states of mind, the lack of integration manifests as inability to reflect upon mental representations (e.g., speech about representations as realities, unnoticed contradictions such as glorified/devalued accounts of parents) and breakdown of representational strategy (e.g., activation of overwhelmingly painful emotions when discussing relationships with caregivers).

The HH theory describes discrete qualities of traumatized mothers' attachment representations previously classified (erroneously) as Insecure. For example, extreme glorification (rather than moderate idealization) displayed in such mothers' narratives easily breaks down, alternating with hostile devaluation (rather than emotionally detached derogation). This is deemed to reflect the rigid and immature defense of splitting rather than a stable and organized Dismissing strategy. Further, activation of 'flooding' or overwhelming stress and emotions is considered as collapse in representational strategy rather than (seemingly) organized Preoccupied states of mind (Lyons-Ruth et al., 2005).

Two profiles of Hostile/Helpless attachment representations have been identified that differ considerably from each other. A predominantly Hostile

or defended constellation is characterized by a globally devaluating stance towards caregivers. The strategy does not hold, however, as speakers simultaneously display preoccupation with attachment experiences (such as identifying with a hostile caregiver). Individuals with a Hostile representational strategy commonly constrict thinking and speaking of attachment experiences, and fail to reflect on their own or others' experiences. The other, more fragile profile is characterized by Fearful/Helpless states of mind. Such individuals display apparent ability to reflect upon their own or caregivers' intentions. However, such ability has often developed in the service of trying to "read the mind" of one's emotionally unstable caregivers and regulate them in order to receive care for oneself. Hence, the individual's under-developed self-regulation easily breaks down and intolerable emotions are activated when thinking or talking about attachment experiences. Helpless/Fearful attachment representations typically entail identification with a helpless/victim parent and internalization of dysregulation as experiences of badness/worthlesness (Lyons-Ruth, Bronfman, & Atwood, 1999; Lyons-Ruth & Jacobvitz, 2008; Lyons-Ruth & Melnick, 2004; Lyons-Ruth et al., 2005).

The HH attachment representations appear as prominent transmitters of maternal trauma. They are commonly found among individuals with childhood abuse history and current personality disorder (Finger, Byun, Melnick, & Lyons-Ruth, 2015; Lyons-Ruth et al., 2007), and link to maternal anomalous/dysregulating caregiving behavior, neglect and maltreatment of their children, and infant disorganization unaccounted for by maternal Unresolved/Disorganized attachment representations (Finger, 2006; Frigerio, Constantino, Ceppi, & Barone, 2013; Lyons-Ruth et al., 1999b, 2005; Milot et al., 2014). Research on Hostile/Helpless caregiving representations is scarce, but there are preliminary results of links with maternal psychopathology and relational risks (Sleed, 2013; Terry, 2018; Terry, Finger, Lyons-Ruth, Sadler, & Slade, 2019).

1.4.2.3 Pre-mentalizing modes

The interruptions to mentalizing that early caregiving specifically induces among attachment-traumatized individuals manifest as frequent lapses into *Pre-mentalizing*, namely, to *Psychic Equivalence*, *Teleological*, and *Pretend* modes (Allen, Fonagy, & Bateman, 2008; Fonagy, Gergely, Jurist, & Target, 2002). According to mentalization theory and contemporary mentalization-

based treatment approaches, identification of these lapses is central in interventions with traumatized mothers, as psychological change can only occur after one's mentalization ability is restored (Allen et al., 2008; Bateman & Fonagy, 2012; Nijssens, Luyten, & Bales, 2012).

In the Psychic Equivalence mode, the representational nature of mental states[1] is lost and the world is experienced as isomorphic to one's distressed experiences. For example, in depressive rumination of one's experienced worthlessness, an individual might express that everyone else is for sure perceiving him/her in such a way. In the Teleological mode, intentions are understood solely according to behaviors and appearance. For example, a mother could state that her infant is bad and not obeying because he is crying and showing dissatisfaction. Finally, in the Pretend mode, subjects show apparent mentalizing but the attempt is detached from their experience, taking theoretical, pre-fixed, intrusive, and even dissociative forms (Allen et al., 2008; Fonagy et al., 2002). For example, a psychotherapy client could talk at length about her mother's presumed psychological complexes, but the account would nonetheless not help the therapist in trying to empathize with the speaker's or her mother's experience.

Prior research has mostly focused on assessing mothers' general ability to mentalize attachment and caregiving representations, operationalized as reflective functioning (RF). The results show that mothers' low attachment-specific RF is associated with insecure infant attachment (Fonagy, Steele, Steele, Moran, & Higgitt, 1991), and low caregiving-specific RF creates a predisposition for problematic mother–infant interactions and infant insecure as well as disorganized attachment (Grieneberger et al., 2005; Rosenblum, McDonough, Sameroff, & Muzik, 2008; Slade, Grienenberger, Bernbach, Levy, & Locker, 2005). Focus on general RF level has been criticized, however, because it is not specific enough to tease out clinically relevant high-risk maternal states of mind (Fonagy, Sleed, & Baradon, 2016; Luyten, Mayes, Nijssens, & Fonagy, 2017; Sleed, 2013).

[1] "Mental states" is an established concept in mentalization literature, and it is accordingly used in relation to maternal mentalizing and the Pre-mentalizing modes in this dissertation. Instead, attachment and caregiving representation literature most commonly uses the concept "states of mind", and it is accordingly applied in relation to them.

1.4.2.4 Mental representations and mother – infant interaction quality in the the current disseration

Article I explores the role of Secure and Insecure attachment representations in substance-abusing mothers' transition to motherhood. Previous research shows that Insecure attachment representations are highly prevalent among substance-abusing mothers (Bakermans-Kranenburg & van IJzendoorn, 2009; Borelli, Goshin, Joestl, Clark, & Byrne, 2010; Finger, 2006; Riggs & Jacobvitz, 2002), but understanding of their importance in the pre- and postnatal period is lacking. The process of becoming a mother can differ greatly between normative and substance-abusing women, based on their relational histories and discontinuity in using drugs as means of self-regulation (Brudenell, 1997). We investigate whether Secure attachment representations similarly promote, and Insecure attachment representations compromise, prenatal emotionality and mother–infant interaction among substance-abusing women and their non-substance-abusing comparisons. There is preliminary evidence that Hostile-Helpless features of substance-abusing mothers' attachment representations explain infant disorganization to a greater degree than Unresolved/Disorganized attachment representations (Finger, 2006). Investigating these specifically among substance-abusing women in transition to motherhood is a task for further study.

Mother–infant interaction is assessed among the substance-abusing and Palestinian mothers, with focus on *Emotional Availability*. This construct taps into mothers' successful regulation (sensitivity and structuring) and dysregulation (intrusiveness and hostility) as well as infants' initiatives and responsiveness in the interactions (Biringen, 2000). Prior research shows that Security/Insecurity of attachment representations determines how sensitive, structuring, intrusive, and hostile mothers are in interactions (Adam et al., 2004; Biringen et al., 2000; Crandell, Fitzgerald, & Whipple, 1997; Riva Crugnola et al., 2013) and that substance-abusing mothers and their infants show dysregulated interactions (Beeghly, Frank, Rose-Jacobs, Carbal, & Tronick, 2003; Flykt et al., 2012; Salo et al., 2010). We combine these two lines of study by investigating how the security of substance-abusing and comparison mothers' attachment representations is associated with dyadic Emotional Availability. Regarding the Palestinian mothers, to our knowledge, there are no prior studies where the relationship between war-exposed

mothers' caregiving representations and dyadic interaction quality would be explored.

Article III examines the risk features in the Palestinian mothers' caregiving representations. In addition to cultural differences, high stress and threat in a family's living environment is suggested to pose specific demands to caregiving (Belsky, 2008; Crittenden, 2006). Currently, however, it remains unclear whether diversity in mothers' contexts and trauma histories manifests as different risks in their caregiving representations. Some qualitative studies suggest that war-exposed mothers' caregiving representations show similar risks to those of Euro-American interpersonally-traumatized mothers: namely, views of self and infant as bad/damaged; perceiving the infant as overtly difficult and a cause of one's distress; fearfulness; and glorified accounts of the infant as restorer of life and normalcy (Almqvist & Broberg, 2003; Kaitz et al., 2009; Levy, 2006). However, quantitative research is missing. Accordingly, we investigate the structure and content of previously indicated risks (hostility, fearfulness, helplessness, emotional distress, idealization, enmeshment/role reversal, and incoherence) in the Palestinian mothers' caregiving representations, and if war exposure and pre- and postnatal mental health symptoms induce such risks. Further, we examine whether high-risk caregiving representations mediate the effect of war exposure and mental health on mother–infant Emotional Availability.

Article IV examines the Insecure, Hostile/Helpless, and Pre-mentalizing features in the case study mother's attachment and caregiving representations. Thus far, no studies have addressed whether these risks show continuity from a mother's attachment to her caregiving representations, or whether the caregiving role elicits specific risks. Further, it remains unclear whether the Insecure, HH, and Pre-mentalization conceptualizations point to the same or different clinical phenomena. We strive to fill this gap by examining the independence and overlapping of the three theories in detecting risks in the case study mother's caregiving representations.

1.5 Addressing the gaps in prior research

Based on the preceding Introduction, this dissertation aims to fill three identified gaps in prior research:

1. **Universality of the specifically harmful effects of caregiver-inflicted early trauma:** Do different complex traumas pose similar risks to the pre- and postnatal period, or is early caregiver-inflicted trauma specifically harmful across contexts, as substantiated by the Palestinian dyads?
2. **Common and specific risk features in the studied mothers' mental representations and their clinical utility:** Are there common representational risk features that characterize all the studied mothers? Are there group- or caregiving-specific risk features in representations? Do different theoretical conceptualizations identify the same or different risks in caregiving representations?
3. **Substantiation of mental representations and mental health as transmitters of maternal complex trauma:** Is support found for the the premise of maternal mental representations and mental health symptoms as transmitters of dysregulation onto infant development and mother–infant interaction among the studied mothers?

2 AIMS OF THE STUDY

This dissertation focuses on maternal trauma experiences, mental representations, and mental health symptoms among diverse high-risk mothers and their infants during the transition to motherhood. This involves Finnish treatment-enrolled substance-abusing mothers and their comparisons (Article I); Palestinian mothers living in conditions of war and military violence (Articles II and III); and a case study of a Finnish mother enrolled in parent–infant psychotherapy (Article IV). We further study the role that accumulated stressors play in disposing dysregulation onto the studied mothers and infants.

By studying diverse mothers, we strive to identify possible group-specific and general risks. The four studies have different foci and provide distinct knowledge of the phenomena, which is illustrated in Figure 2.

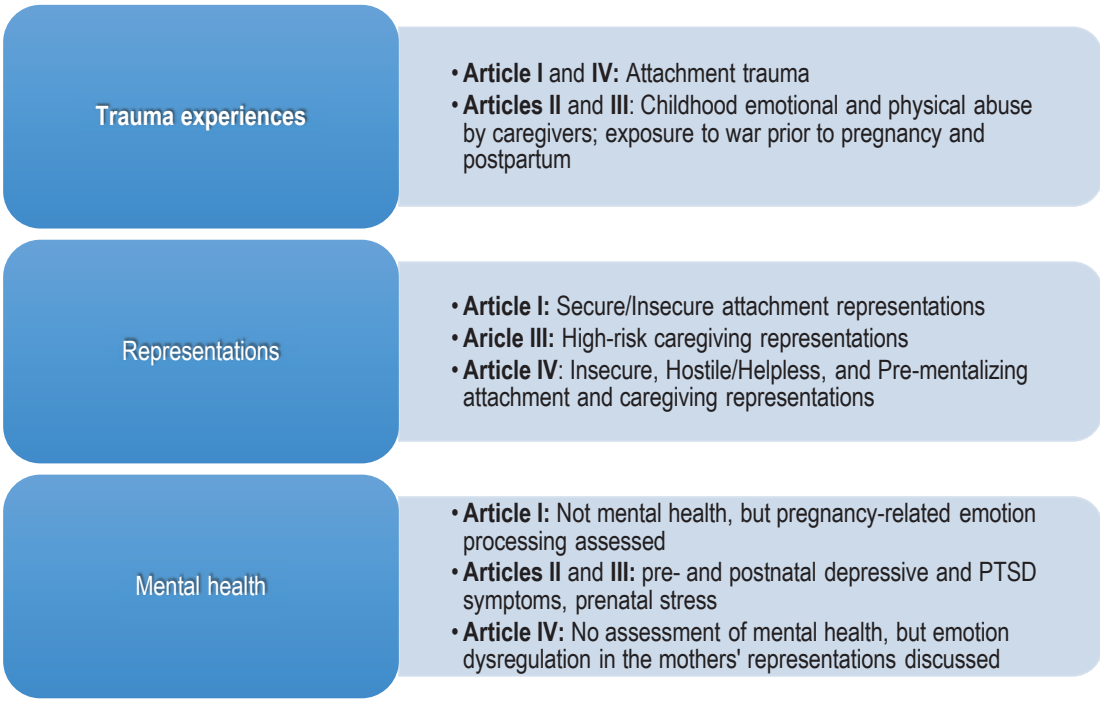

Figure 2. Foci on maternal trauma, mental representations, and mental health in the substudies.

The dissertation also focuses on four more specific tasks, as follows:

1. **We investigate the prevalence of trauma experiences, mental health symptoms, and additional stressors for caregiving among the participating mothers**; that is:
   a) attachment trauma experiences among the substance-abusing mothers, their non-using comparisons, and the case study mother; and childhood emotional (CEA) and physical (CPA) abuse by parents as well as exposure to traumatic war events (TWE) prior to pregnancy and postnatally among the Palestinian mothers;
   b) pre-and postnatal mental health (depressive and posttraumatic stress disorder [PTSD]) symptoms as well as prenatal stress among the Palestinian mothers; and
   c) sociodemographic and infant-related risks among all the mothers.

2. **We identify the risk features in mothers' mental representations**, by:
   a) analyzing the prevalence of Secure vs. Insecure (Dismissing, Preoccupied, or Unresolved/Disorganized) attachment representations among the substance-abusing mothers and their comparisons. We hypothesize that substance-abusing mothers display Insecure attachment representations more often than the comparison mothers. Further, we analyze whether the groups differ in specific determinants of the Secure and Insecure attachment representations. Lastly, we examine whether the Security/Insecurity of substance-abusing mothers' representations is related to the severity of their substance abuse;
   b) exploring the structure and possible group-specific content of high-risk (Hostile, Fearful, Helpless, Emotionally Distressed, Idealized, Role-reversed and Incoherent) features in Palestinian mothers' caregiving representations (Article III); and
   c) identifying which theory-predefined risk features (Insecure, Hostile/Helpless, and Pre-mentalizing) occur in the case study mother's attachment as well as in her caregiving representations; which risks are specific to her caregiving representations; and how the theoretical conceptualizations overlap in identifying risks in the mother's caregiving representations.

3. **We study interconnections between the mothers' trauma experiences, mental representations, and emotion dysregulation (mental health symptoms and imbalanced emotion processing)**; that is:
   a) whether the substance-abusing and case study mothers' mental representations display trauma-related features;
   b) associations between substance-abusing and comparison mothers' attachment representations and pregnancy-related emotion processing (EP). We hypothesize that Insecure, and especially Preoccupied and Unresolved/Disorganized, attachment representations are associated with imbalanced (high-intensity negative) EP; and that Secure attachment representations are associated with high meta-evaluation of representations, in both groups; and
   c) associations between the Palestinian mothers' childhood emotional (CEA) and physical abuse (CPA) and exposure to traumatic war events (TWE), pre-and postnatal mental health symptoms, and representations. First, we hypothesize that all trauma types are associated with elevated levels of pre- and postnatal symptoms (Articles II & III), and that accumulation of trauma is associated with the highest levels of prenatal symptoms (Article II). Second, we hypothesize that high levels of pre- and postnatal TWE and mental health symptoms are associated with the identified high-risk representations (Article III).

4. **We investigate how mothers' trauma experiences, mental representations, and mental health symptoms are associated with infant and dyadic regulation**; that is:
   a) we test associations between the substance-abusing and comparison mothers' attachment representations and mother–infant Emotional Availability (EA). We hypothesize that dyads with maternal Secure representation show higher EA regardless of mothers' substance abuse status;
   b) we test whether prenatal mental health (depressive and PTSD symptoms as well as stress) mediates the association between the Palestinian mothers' experiences of childhood emotional (CEA) and physical abuse (CPA) and traumatic war events (TWE), and their four-month-old infants' stress regulation. We hypothesize that CEA and CPA are associated with poor infant stress regulation directly and indirectly, and that TWE affects infant stress regulation indirectly via prenatal mental health (Article II); and
   c) we identify how the Palestinian mothers' pre- and postnatal TWE, mental health (depressive and PTSD symptoms), and high-risk caregiving representations are associated with mother-reported EA. We hypothesize that the harmful effects of TWE and mental health symptoms on interaction quality are mediated via the high-risk representations (Article III).

3 MATERIALS AND METHODS

3.1 Participants and procedure

Table 2 summarizes key research questions and information about participants, procedure, measures, and data analyses in the studies. The substance-abusing and Palestinian mothers (Articles I, II and III) participated in prospective longitudinal studies from the second trimester of pregnancy (T1) to their infant's age of four months (T2) and 12 months (T3). In Articles I and II, data is used from T1 and T2 but not from T3. Article IV is a single case study of maternal attachment and caregiving representations in the context of a parent–infant psychotherapy process. In striving to produce generalizable as well as clinically salient knowledge, we combine quantitative and qualitative research approaches in studying the high-risk mothers.

Table 2. Participants, procedure, measures, and data analysis in Articles I – IV.

Article	I	II	III	IV
Main research questions	1) Distributions of attachment representations among substance-abusing and comparison women 2) Attachment representations' associations with prenatal EP and postnatal EA	1) Association between Palestinian mothers' trauma (childhood abuse and TWE) and prenatal mental health and stress 2) Direct and indirect effects (via prenatal mental health) of maternal trauma on infant stress regulation	1) Structure and content of the risks in Palestinian mothers' caregiving representations 2) Associations between Pre- and postnatal TWE, mental health symptoms, and risks in caregiving representations 3) Mediating role of high-risk caregiving representations on links between TWE/mental health symptoms and EA	1) Similarity in risk features between the case study mother's attachment and her caregiving representations 2) Distinct risks in the caregiving representations 3) Overlap between theoretical concepts in detecting the caregiving risks
PARTICIPANTS & PROCEDURE				
Participants	43 Substance-abusing and 48 comparison mothers and their infants	501 war-exposed Palestinian mother–infant pairs	A subsample of 50 war-exposed Palestinian mother–infant pairs	Parent-infant psychotherapy-enrolled mother
Setting: Prospective (P), Comparative (Co), Case Study (CS)	P, Co	P	P	CS
Assessment points	T1: 2/3 of pregnancy, T2: infant four months	T1: 2/3 of pregnancy, T2: infant four months	T1: 2/3 of pregnancy, T2: infant four months, T3: infant 12 months	Data consists of material recorded throughout psychotherapy process
MEASUREMENTS				
Trauma experiences	T1: Attachment trauma (AAI)	T1: Childhood emotional and physical abuse; TWE prior to pregnancy	T1: TWE prior to pregnancy T3: Postnatal TWE	Attachment trauma (AAI)
Mental representations	T1: Attachment representations (AAI)	-	T3: Caregiving representations (PDI)	Attachment representations (AAI) Assessment of caregiving representations from psychotherapy notes
Pre- and postnatal mental health and stress	No mental health measures, but evaluation of pregnancy-related multilevel EP	Prenatal depressive (EPDS) and PTSD symptoms (HTQ); Prenatal perceived stress (PSS)	Pre- and postnatal depressive (EPDS) and PTSD symptoms (HTQ)	-
Socio-demographic risks	Substance abuse, obstetric risks, SES, age, marital status, education, job status	SES (maternal education and financial difficulties)	Economic difficulties Large family sizes	Evaluated according to maternal reporting in psychotherapy
Infant characteristics	-	Infant stress regulation: (IBQ-R): Negative Affectivity and Soothability Gender Prematurity Need for hospital treatment	Gender Prematurity Need for hospital treatment	Evaluated according to maternal reporting in psychotherapy
Mother-infant interaction	Video-recorded EA at T2	-	Self-reported EA at T3	-
DATA ANALYSIS	Quantitative	Quantitative	Quantitative & Qualitative	Qualitative

Note. AAI= Adult Attachment Interview; EA = Emotional Availability; EP = Emotion Processing; EPDS = Edinburgh Postnatal Depression Scale; HTQ = Harvard Trauma Questionnaire; IBQ-R = Infant Behavior Questionnaire – Revised; TWE = traumatic war events; PDI = Parent Development Interview; PSS = Perceived Stress Scale; SES = Socio-economic status

3.1.1 Substance-abusing and comparison mothers

The participants in Article I were 51 substance-abusing mothers enrolled in a longitudinal study conducted from 2003 to 2008. The substance-abusing mothers and their infants were clients in a child protection family center specified for substance-abusing families in the pre- and postnatal periods. The original purpose of data collection was to examine an intensive and holistic intervention that 26 of the dyads were enrolled in: psychodynamic mother–infant psychotherapy which comprised 20-24 weekly sessions, as compared with individually-tailored psychosocial support that 25 dyads received, which lasted on average 12 months (for further information of the interventions and their effectiveness, see Belt, 2013; Belt et al., 2012; Flykt et al., 2012). Comparisons were 50 non-substance-abusing mothers with prenatal obstetric risks. Inclusion criterion for the substance-abusing mothers was a substance use disorder diagnosis. Of the participating mothers, 43 substance-abusing and 48 comparison mothers (total n = 91) were administered the Adult Attachment Interview (AAI; George et al., 1985) and they comprise the participants for Article I.

The substance-abusing mothers were characterized by a history of intravenous and polydrug use as well as common high consumption of alcohol. For the comparisons, lifetime use of illicit drugs was an exclusion criterion. In both groups, about half of the mothers were primiparous and half had between one and three children. A little over half (56.6%) of all infants were boys and 43.4% were girls.

The study protocol was identical for both the substance-abusing and the comparison mothers. At T1, the mothers were met at the program residence, informed about the study purpose, its voluntary nature, and the study procedure. Mothers willing to participate signed an informed consent form and received a baseline questionnaire to be completed and returned at a second visit when they were interviewed. At T2, families were met at their homes or at the program residence, where mother–infant interaction was videotaped. Dropout rates from T1 to T2 were 7.8% (n = 4) in the substance-abusing group and 14.0% (n = 7) in the comparison group. The dropout was related to low education and single marital status.

3.1.2 War-exposed Palestinian mothers

The participants in Article II were 511 Palestinian women and their infants residing in military conflict conditions in the Gaza Strip. They were recruited for the 'Gaza Infant Study' (Punamäki et al., 2018), conducted from 2013 to 2015. Prior to T1, the mothers had been exposed to the 2008 and 2012 wars/military offensives. Another war began in 2014 between T2 and T3. The purpose of the study was to examine how maternal pre- and postnatal exposure to war, mental health, mental representations, and sociocultural parenting beliefs contribute to the early development of children and mother–infant relationships in military conflict conditions. A minority of the mothers were expecting their first child (18.1%) and the rest already had between one and 11 children. A little over half (54.3%) of the infants were boys and 45.7% were girls.

To obtain a geographically representative sample of the Gaza Strip, the mothers were recruited from 10 maternity clinics in the five Gaza Strip Governorates. To be included, mothers had to be in their second trimester of pregnancy. Trained fieldworkers conducted the research visits, which were identical for all participants. At T1, the mothers were met at maternity clinics. They were informed about the study purpose, protocol, and its voluntary nature, and mothers willing to participate signed an informed consent form. Postnatally, the research visits were conducted in the families' homes. As some of the mothers were illiterate and unaccustomed to research practices, information was collected by interviewing the mothers and writing down their answers, instead of completing questionnaires. Maternal interviews conducted at T3 were audiotaped and transcribed verbatim. Total dropout from T1 to T3 was 10.6% (n = 54), and it was not related to maternal war exposure, mental health, or background variables.

In Article III, a subsample of 50 mothers that retained the geographical representativeness was randomly selected for an in-depth investigation of caregiving representations. Mothers in the total sample reported more financial difficulties and postnatal PTSD symptoms than mothers in the subsample. There was no dropout from T1 to T3 in the subsample, but data from T2 was missing for two mothers (4%).

3.1.3 Case study mother

The participant in Article IV was a forty-year-old mother (referred to here by the pseudonym 'Kati') who was enrolled in a parent–infant psychotherapy in a communal clinic, together with her seven-month-old firstborn son 'Paavo'.[2]. The author of this dissertation was also the psychotherapist in the process. Kati's reason for treatment referral, and major themes in the psychotherapy, were her difficult attachment experiences and her fears and worries about how she would inevitably 'spoil' Paavo. Further, Kati often experienced Paavo as not liking or rejecting her.

The data consisted of the notes of the psychotherapy sessions, written into a client information system after each session (61 pages), and of Kati's Adult Attachment Interview (AAI) which was audiotaped at the end of the psychotherapy and transcribed verbatim. It should be noted, first, that the psychotherapy notes were not Kati's verbatim expressions, but instead the psychotherapist's formulations of what had happened and been discussed during the sessions. Second, the AAI was also conducted by the psychotherapist, and it is possible that her knowledge of Kati's background information and the therapeutic relationship itself may have influenced the interview. However, every attempt was made to adhere to the interview protocol.

3.2 Measures

3.2.1 Demographic and infant characteristics

The substance-abusing and Palestinian mothers answered questions at T1 about age, education, employment status, civic status, length of current relationship, number of children, financial difficulties, and pregnancy-related risks. The Palestinian mothers reported infant gender, height and weight, gestational age, possible health problems, and need for hospitalization at T2. In Article II, maternal education and financial difficulties were used as indicators of socioeconomic status (SES).

[2] Participant identification is masked in order to ensure anonymity.

3.2.2 Infant stress regulation

In Article II, Palestinian infants' **stress regulation** was assessed at T2 with the Infant Behavior Questionnaire-Revised, short version (IBQ-R; Gartstein & Rothbart, 2003; Putnam, Helbig, Gartstein, Rothbart, & Leerkes, 2014). Mothers evaluated their infant's typical behavior during the last seven days in 91 vignettes (e.g., "How often did your baby cry or fuss before going for a nap?", "When being held, how often did the baby seem to enjoy him/herself?"). Piloting the IBQ-R among the Palestinian mothers revealed difficulties in using the original seven-point scale in the interview setting, so the assessment range was modified to a three-point scale (0 = *never or rarely*, 1 = *sometimes*, 2 = *often/always*).

Two infant temperamental qualities were used as indicators of stress regulation: first, the broader dimension of *Negative Affectivity* (comprising subscales of sadness, distress to limitations, fear, falling reactivity), which depicts the core elements of infant innate negative temperament (Rothbart, Ahadi, & Hershey, 1994). Second, the specific scale of *Soothability* was used to indicate infant ability to recover from distress when soothed by the caregiver (Paulussen-Hoogeboom, Stams, Hermanns, & Peetsma, 2007). The IBQ-R has shown acceptable reliability and validity (Putnam et al., 2014).

3.2.3 Maternal substance abuse

In article I, the substance-abusing mothers' **use of illegal substances** was assessed at T1 and T2 using a semi-structured questionnaire. They reported whether they had used any of eight different substances (1 = *no,* 2 = *yes*: cannabis, amphetamine, ecstasy, heroin, sniffing solvents, LSD, medicines, and other [e.g. buprenorphine]) and the use of substitute medication. Further, the mothers answered open questions about how often they had used the substance, and specified whether there had been changes in usage during the pregnancy or after delivery (1 = *no change*, 2 = *decreased,* 3 = *stopped*, 4 = *increased*). In the AAI analysis, the **severity of drug use** was assessed based on reportings of intravenous drug use, self-estimated psychological and physical dependency (binary variable, 0 = *no or little dependency*, 1 = *moderately to totally dependent*), and relapses to use in the postnatal period.

Alcohol use was evaluated at T1 and T2 using the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De la Fuente, & Grant,

1993), where the substance-abusing mothers answered 10 questions about the frequency, amount, and consequences of their use, using a five-point scale. Comparison mothers were interviewed about their alcohol consumption by a maternity clinic nurse.

3.2.4 Maternal trauma experiences

The substance-abusing and comparison mothers (at T1) and the case study mother (at the end of the psychotherapy process) answered questions about **attachment trauma** in the Adult Attachment Interview (AAI; George et al., 1985). The AAI probes loss and abuse experiences in relation to the primary caregiver(s) and other (close) persons.

In Article II, the Palestinian mothers' **childhood abuse** experiences were assessed with a 13-item questionnaire developed by the Transcultural Psychosocial Organization (Punamäki, Komproe, Qouta, & Elmasri, 2005) at T1. The scale includes seven items on **emotional abuse** (CEA) (such as verbal threats, humiliation, and ridiculing) and four items on **physical abuse** (CPA)**.** Two positive items in the scale were omitted from analysis. The mothers reported how often they had experienced each type of abuse in relation to mother and father separately on a five-point scale (0 = *never*, 4 = *always*). Cronbach's alpha (α) was .83 for the CEA and .86 for the CPA subscale.

In Articles II and III, Palestinian mothers' exposure to **traumatic war events** (TWE) was assessed with questionnaires depicting typical events in the wars/conflicts that the mothers were exposed to. Exposure to TWE prior to pregnancy was assessed at T1 with a 25-item questionnaire probing typical events during the 2008 war and 2012 military offensive. The scale comprised six items on human losses, four items on material losses, four items on injury to self or close others, and 11 items on witnessing/exposure to warfare. Mothers reported whether they had been subject to such experiences (0 = *no*; 1 = *yes*), and a summed composite score on total prenatal TWE was constructed.

As a new war began during the data collection, mothers were probed about postnatal TWE at T3. A 28-item questionnaire was used, comprising questions on human losses (3 items), injuries (4 items), witnessing/exposure to warfare (10 items), forced displacement (5 items) and exposure to serious health threats (6 items).

3.2.5 Maternal mental health and emotion processing

The Palestinian mothers were probed about pre- and postnatal depressive and posttraumatic stress disorder (PTSD) symptoms as well as prenatal stress.

Depressive symptoms were assessed at T1 and at T3 with the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987). Mothers answered 10 four-point (0–3) items about depressive thoughts, feelings, and behaviors during the last seven days. In Article II, a composite score of the prenatal symptoms was constructed, and in Article III, sum scores of pre- and postnatal symptoms were used. A cut-off score of ≥ 12 was used to indicate major depression (Adouard, Glangeaud-Freudenthal, & Golse, 2005; Deave, Heron, Evans, & Emond, 2008; Su et al., 2007). The EPDS has been validated among prenatal women (Bergink et al., 2011) and with postnatal Arabic women (Ghubash, Abou-Saleh, & Daradkeh, 1997). Cronbach's α for the whole sample in Article II at T1 was .78. For the subsample in Article III, it was .80 at T1 and .77 at T3.

PTSD symptoms were assessed at T1 and at T3 using the 16 questions from the 31-item Harvard Trauma Questionnaire (HTQ; Mollica & Caspi-Yavin, 1991) that depict symptoms according to the Diagnostic and Statistical Manual for Mental Disorder, Third Edition-Revised (DSM-IIIR; APA, 1987). The mothers evaluated to what extent they had experienced the symptoms during the last 30 days on a four-point scale (0 = *not at all*, 3 = *severely*).

In Article II, symptom dimensions of avoidance, intrusion, and hypervigilance were used as parcel indicators in the analysis (further reported under Data analysis, section 3.3). In Article III, a sum score was used for both T1 and T3 PTSD symptoms. In both Articles II and III, a mean sum score of 2.5 was used to indicate a diagnostic cut-off point, as suggested by a previous study (Ichikawa, Nakahara, & Wakai, 2006). The instrument has been validated among Palestinians (Salo, Qouta, & Punamäki, 2005). In this sample, Cronbach's α for the specific symptom clusters at T1 was .77 for intrusive, .75 for avoidance, and .83 for hypervigilance. For the sum score Cronbach's α was .90 at T1 and .83 at T3.

Prenatal stress was assessed with the 10-item Perceived Stress Scale (*PSS*; Cohen, 1994) in Article II. Mothers reported coping with everyday hassles and the extent of being stressed, angry and overwhelmed using a five-point scale (0 = *never*, 4 = *often*). The measure has been found reliable among Arab women (Chaaya, Osman, Naassan, & Mahfould, 2010). In this sample, a nine-

item version was used, omitting one non-correlating item, Cronbach's α =.74.

The substance-abusing and comparison mothers' **Pregnancy-related Emotion Processing (EP)** was assessed at T1 with an interview depicting the valence and intensity of multifocal emotional experience. It comprised 19 items on *Cognitive Appraisals* (according to Frijda, Kuipers, & Ter Schure, 1989; Smith & Pope, 1992; e.g., "The pregnancy is bothering me a lot," and "I hoped for the pregnancy"), 17 items on *Behavioral Urges* (according to Fridja et al., 1989; e.g., "I feel like I am boiling/paralyzed/laughing all the time"), 45 items on *Feeling States* (according to Larsen & Diener, 1992; Russell, 1980; e.g., sad/happy/angry/excited/calm), and three items on *Meta-evaluation* (according to Mayer & Stevens, 1994; clarity, familiarity, and acceptability).

Mothers estimated the intensity of the emotions using the Category Ratio-10 (CR10; Borg, 1982) scale, varying from 0 (*nothing at all*) to 10 (*extremely strong*). Averaged sum scores were used in analysis for negative and positive emotional valence at each of the processing levels (Cognitive Appraisals, Behavioral Urges, and Feeling States) and a factor score was used as a sum score for the Meta-evaluation. The measure has shown good reliability and validity among employees with burn-out risk (Salmela-Aro, Näätänen, Tolvanen, & Nurmi, 2011) and male war trauma survivors (Näätänen, Kanninen, Punamäki, & Qouta, 2002). In the current sample, Cronbach's α values varied from .71 to .81.

3.2.6 Maternal mental representations

The dissertation examines attachment representations among the substance-abusing (Article I) and case study mothers (Article IV) and caregiving representations among the case study and Palestinian mothers (Article III).

3.2.6.1 Attachment representations

The substance-abusing (at T1) and case study mothers' (at the end of the psychotherapy process) attachment representations were assessed with the Adult Attachment Interview (AAI; George et al., 1985). The semi-structured interview comprises questions about attachment-activating experiences in relation to primary caregiver(s), as well as loss of close persons through death

and threatening/abusive experiences in relation to caregivers or other persons. The respondents are asked to evaluate what effect the experiences have had on their development and current personality. The interviews were analyzed by trained and reliable coders using standardized coding systems. The raters were blind to the mothers' background information, and in Article IV, to each other's codings.

Secure/Insecure features were assessed from both the substance-abusing (Article I) and case study mothers' (Article IV) attachment representations with the Adult Attachment Scoring and Classification System (version 7.2; Main et al., 2003). Based on scores on nine-point Experience and State of Mind scales (experiences: Loving, Rejecting, Involving/Reversing, Pressured to Achieve, Neglecting; states of mind: Idealizing, Lack of Recall, Derogating, Fear of Loss, Involving Anger, Passivity of Thought Processes, Metacognitive Processes, Unresolved Loss/Trauma, Coherence of Transcript, Coherence of Mind), narratives were classified into one of five categories, where coherence of mind and transcript were central in determining the Secure/Insecure differentiation. In addition to the main classifications, the subscales were used in analyzing substance-abusing and comparison mothers' attachment representations.

A *Secure* classification is given to a coherent narrative where the respondent can freely explore attachment experiences, their importance for personal development, and reasons for caregiver behavior in a balanced way. When narratives show limited coherence, limited freedom to explore attachment experiences, and the use of unbalanced attentional-emotional strategies, one of two Insecure but organized classifications is given. *Insecure/Dismissing* narratives are characterized by idealization, insisting upon inability to recall, or by derogation of caregivers or attachment overall. An *Insecure/Preoccupied* classification is given to confused/enmeshed narratives that convey a sense of weak personal identity with passive and indecisive speech, psychological/theoretical rather than subjective descriptions, oscillating between points of view, linguistic confusion between self and parent, unbalanced blaming of self or parent, and preoccupying affects of anger, or more rarely, fear (Hesse, 2008; Main et al., 2003).

An *Insecure-Unresolved/Disorganized* classification is ascribed to narratives that are characterized by a breakdown of attentional-emotional strategies, or intrusion of traumatic memories specifically when discussing loss or trauma experiences, evident as lapses in reasoning (e.g., using the

present tense in relation to a deceased person, unrealistic feelings of being causal to a death or to one's traumatic experiences), speech (sudden changes in speech pattern, anomalous attention to detail, prolonged silences, inability to finish sentences), and behavior (e.g., self-destructive or suicidal behavior). Finally, when a narrative exhibits multiple/contradictory mental models with regard to attachment and/or a more global breakdown of strategy, and does not fit into any of the above categories, an *Insecure/Cannot Classify* categorization is given.

The author of this dissertation analyzed the AAIs in Article I. The second author of Article I (M. Flykt) analyzed 20% of the substance-abusing and comparison mothers' interviews for interrater reliability (Cohen's kappa = .82). The second coder also checked 24 transcripts where the primary coder had questions about the classification and all the Unresolved/Disorganized and Cannot Classify cases. The Secure/Insecure status of the case study mother's AAI was rated by the third author of Article IV (M. Flykt).

In Article IV, the case study mother's attachment representations were further assessed using two other standardized coding systems. **Hostile/Helpless (HH)** features were examined by utilizing the Pervasively Unintegrated, Hostile and Fearful/Helpless States of Mind Regarding Attachment coding system (version 4; Lyons-Ruth & Melnick, 2004). In the coding system, Hostile, Helpless and Fearful states of mind are identified in the whole of the individual's narrative, rather than in relation to specific loss or trauma. The unintegrated/dissociative nature of the HH representations manifests as unnoticed contradictions (e.g., as alternations between holistic glorification/devaluation of caregiver(s)) and inability to reflect upon the representations, which prohibits their integration. More specific markers of HH attachment representations are unconscious identification with hostile/helpless caregiver(s) (e.g., laughter at one's own pain, descriptions of oneself as hostile or fearful/anxious, pervasive sense of oneself as bad/unworthy); discussing relational experiences in a constricted manner or description of possibly traumatic experiences in an emotionally detached way; and activation of unprocessed, painful emotions when discussing attachment experiences (Lyons-Ruth & Melnick, 2004; Lyons-Ruth et al., 2005).

A narrative is given frequency codes on 19 scales identifying HH states of mind. An overall rating is assigned on a nine-point scale, where a narrative is classified as HH based on a rating of five or higher, and one of three

subcategorizations is further ascribed: 1) *Predominantly Hostile/Defended*, evidenced by attempts to restrict the activation of the attachment representations, low reflection, and signs of global devaluation of their caregiver(s) despite continuing identification with them and preoccupation with attachment experiences; 2) *Mixed Hostile/Helpless*, where the narrative is characterized by alternation between Hostile and Helpless states of mind; and 3) *Helpless/Fearful*, dominated by expressions of fearfulness, identification with a caregiver's victimhood/anxiousness/helplessess, inability to regulate emotions despite sometimes apparent reflective ability, and sense of being bad/unworthy. The fifth author of Article IV (B. Finger), who is one of the co-developers of the HH coding system, rated the interview.

The third assessment of the case study mother's attachment representations concerned her **Mentalizing ability and Mentalizing failures**, operationalized as 'reflective functioning' (RF). These were assessed with the Reflective-Functioning Manual for Application to Adult Attachment Interview (AAI-RF, version 5.0; Fonagy, Target, Steele, & Steele, 1998). The rating system depicts the level to which an individual is able to consider his/her own and his/her parents' intentional mental states (such as thoughts and feelings). More specifically, this relates to incidents of 1) awareness of the nature of mental states (e.g., that they are opaque, can be disguised, and that subjective insight is limited); 2) effort to tease out mental states underlying behavior and interactions (e.g., accurate attributions of mental states to self or other, acknowledging that emotions are affected by factors beyond the observable aspects of a situation, ability to take perspectives); 3) recognition of developmental aspects of mentalization (e.g., revisiting childhood experiences from an adult point of view, making intergenerational links, understanding developmental underpinnings to affect regulation); and 4) mental states in relation to the interviewer (e.g., not assuming knowledge, emotional attunement).

Specific demand questions (e.g., "Why do you think your parents behaved the way they did during your childhood?" and "Did you ever feel rejected as a child?") are rated and an overall score is given on a scale ranging from -1 (*negative or missing RF*, such as refusal to mentalize, hostile stance towards mentalizing, or bizarre answers) to 9 (*exceptional RF*, such as mentalizing complex, painful or contradictory experiences). The scale midpoint (5)

represents *definite or ordinary RF*, where referrals to mental states are explicit and they are connected to behavior and interactions.

In addition to the overall rating of the case study mother's RF regarding attachment, the author of this dissertation and the coder of the HH in the AAI, the fourth author of Article IV (L. Heiskanen), met several times for discussions on the qualitative aspects of and fluctuation in the mother's mentalization ability, and specific parts of the interview that displayed lapses into pre-mentalizing modes (described under section 3.2.6.2).

3.2.6.2 Caregiving representations

In Article III, the Palestinian mothers' **high-risk caregiving representations** were assessed using the Parent Development Interview-revised, short version (PDI-R S; Slade et al., 2004) with the Assessment of Representational Risk (ARR, version 3; Sleed, Isosävi, & Wain, 2017) tool. The PDI probes the caregiver's view of herself as a parent, of the specific child, and of their relationship, as well as the emotional experience of parenting. In the current study, the interview was modified to include two questions on how the 2014 war had affected the Palestinian mothers as caregivers and their infants.

The ARR spots specific representational features that underlie problematic caregiving behavior and are linked with infant disorganized attachment (Sleed, 2013, pp. 183-247). It has 10 subscales, eight of which depict representational risk features: *Hostile Experience, Hostile Behavior, Fearful Affect, Helplessness, Emotional Distress, Idealization, Enmeshment/Role Reversal,* and *Incoherence;* and two subscales that tap on positive or protective representational qualities: *Supportive Presence* and *Mutual Enjoyment.* Classification criteria are described in Table 3.

Table 3. Classification criteria of the Assessment of Representational Risk (ARR) system in Article III.

Classification	Description of the criteria
1.Hostile Experience	Overt or covert description of the child or parenting in negative or derogatory terms; experiencing the child as purposefully difficult or as the cause of their distress, and parenting as a hindrance to what they are able to do.
2.Hostile Behavior	Expressed verbal or physical threatening, frightening and punitive behaviors towards the child. Ranging from teasing, mocking, and refusal to help the child at times of heightened arousal, to physical abuse.
3.Fearful Affect	Fears and worries about the child's or parent's own wellbeing, safety, or life. At high levels the fearfulness is unconnected to a source and unrealistic, and occupies the parent's mind.
4.Helplessness	Descriptions of reduced sense of power and lack of means in relation to their child, often accompanied by a view of the child in power and of oneself as a victim.
5.Emotional Distress	Expressions of overwhelming painful or negative emotions, such as guilt, anxiety, or depression, that the parent is unable to regulate and contain when with their infant.
6. Idealization	Descriptions that lack or deny the negative or challenging experiences of caregiving or the child, which are often general and fail to give a detailed view of the relationship. Some idealized answers show unrealistic glorification of parenting, the child, or the relationship.
7.Enmeshment/ Role Reversal	Statements where caregiving and child roles or boundaries are confused, e.g., difficulty in separating from infant, descriptions of self and child as similar or the same, perceptions of the child as more powerful than self, or demanding care from the child.
8. Incoherence	Confusing, off-the-point, hard-to-follow or bizarre descriptions; getting lost in thought, wandering off topic, not collaborating, and (unnoticed) contradictions. Dysfluencies or grammatical errors are not coded as Incoherence.
9.Supportive Presence	Parent's ability to recognize infant needs and to respond to them appropriately with regulatory help, care, and support (sensitivity), as well as capability to allow the infant to explore. Lack of supportive presence is evident from descriptions of harsh, withdrawn, distant, enmeshed, emotionally overwhelmed, or otherwise insensitive/dysregulating interactions.
10.Mutual Enjoyment	Parental descriptions where it is clear that parent and child are both enjoying interactions with each other; shows parental "falling in love" with their child and serves as motivation to endure difficulties in parenting. Lack of mutual enjoyment is coded from descriptions of flat, negative, operational, or distant interactions where the infant is left without a positive connection to the parent.

Based on the intensity and frequency of each phenomenon in the parent's narrative, a rating from 1 (*no evidence of the state of mind*) to 5 (*high intensity and/or frequency of the state of mind*) is given on each scale, with high scores (4 and 5) indicating risks that disrupt caregiving behavior and infant development (Sleed, 2013). The ARR has shown moderate to good internal consistency, good criterion validity in screening high-risk samples, and predictive validity of maternal psychopathology and poor mother–infant interaction quality among normative, clinical, and prison mothers in the United Kingdom (Sleed, 2013), as well as clinical validity in an RCT of the effects of parent–infant psychotherapy (Fonagy et al., 2016).

The author of this dissertation, who co-developed the ARR scale, rated the interviews. The fifth author of Article III (M. Sleed), who is the primary developer of the ARR scale, coded 20% (n = 10) of the cases for interrater reliability. Intraclass correlations for the two factors and the single scale used in Article III varied from .67 to .94.

In Article IV, corresponding with the assessment of risks in the attachment representations, **Insecure, Hostile/Helpless (HH) and Mentalization failure** features were assessed from the case study mother's caregiving representations. The parts of the psychotherapy notes that depicted Kati's speech of herself-as-mother, her child, and their relationship were defined as units of analysis, and assessed with criteria adapted from the standardized AAI classification systems for Secure–Insecure (Main et al., 2003) and HH (Lyons-Ruth & Melnick, 2004) states of mind that are described in detail in section 3.2.6.1. Coding of caregiving instances as Unresolved/Disorganized was not restricted to speech of loss or trauma experiences.

Mentalization failures were indicated from the emergence of *Pre-mentalizing: Psychic equivalence, Teleological, and Pretend* modes. Criteria for classifying instances as Pre-Mentalizing were developed according to theoretical accounts as well as standardized assessment tools (Allen et al., 2008; Bateman & Fonagy, 2012; Fonagy et al., 1998; Luyten et al., 2017; Slade et al., 2004). For Psychic equivalence, criteria for classification were mind–reality equations and experiencing the world according to one's (distressed) mental states; for Teleological mode, criteria were focus on appearance or behavior only, and recognizing mental states as 'real' only when they were manifested as actions; and for Pretend mode, criteria were speech about mental states without connection to subjective experience (such as in clichéd, theoretical, or pre-fixed manners) or credible observations of other's behaviors. The data were analyzed by the author of this dissertation, who has training and expertise in the assessment tools and background theories.

3.2.7 Mother-infant interaction quality

The **Emotional Availability** (EA) of mother–infant interaction quality was assessed among the substance-abusing and comparison mother dyads, and among Palestinian dyads.

In Article I, the substance-abusing and comparison dyads' interactions were assessed with EA scales (4th ed.; Biringen, 2008) from videotaped free play interaction that lasted from seven to 10 minutes at T3. EA was evaluated in terms of maternal *Sensitivity, Structuring, Nonintrusiveness and Nonhostility,* as well as infant *Responsiveness and Involvement*, using 7-point scales (e.g., 1 = *highly Insensitive*; 4 = *inconsistently/apparently Sensitive*; 7 = *highly Sensitive*). Maternal and infant bids are assessed in relation to their

meaning for the other partner in the dyad. That is, a mother cannot be rated as highly sensitive without proof that the behavior is beneficial for the infant.

Sensitivity refers to the mother's positive and contingent responsiveness to infant cues, acceptance of the infant, and ability to repair ruptures and negotiate conflicts. Structuring refers to the mother's age-specific scaffolding skills. Nonintrusiveness depicts the mother's ability to be present but allow the infant autonomy and initiation. The mother's Nonhostility is evident as patience and lack of harsh or malevolent behaviors. Child Responsiveness assesses the infant's ability to respond to the mother's initiations, and Child Involvement relates to infant-initiated bids for interaction. Developmental stage is considered when assessing the infant scales.

The second author of Article I (M. Flykt), who is a reliable coder, analyzed the videotapes. Another reliable coder analyzed 10% of the tapes for interrater reliability; Pearson's *R* ranged from .82 to 97. The method developer Z. Biringen jointly coded five of the tapes. The coders were blind to the mothers' background information, including substance abuse status and attachment classification.

In Article III, the Palestinian mothers answered 28 questions in a self-assessment measure of EA (EA-SR Brief; Biringen, Vliegen, Bijttebier, & Cluckers, 2002) that correlates with the original EA dimensions (Vliegen, Luyten, & Biringen, 2009). The mothers evaluated how characteristic the statements were regarding their relationships with the infant on a 5-point scale (1 = *almost never*; 5 = *always*). Thirteen questions tap *Emotional Availability*, such as enjoyment of the relationship, accurate interpretation of the infant's signals, and scaffolding; and 15 items tap *Non-availability*, such as lack of positive interaction and not helping the infant at times of stressful arousal. In the current sample, the reliability of the Non-availability subscale was poor (Cronbach's α = .23), and thus only the Emotional Availability subscale (Cronbach's α = .78) was used as an indicator of interaction quality.

3.2.8 Translation of the measures

In Articles II and III, the childhood abuse, TWE, and PTSD questionnaires were available in Arabic. The EPDS, IBQ-R, PSS, PDI, and EA instruments were translated and back-translated from English to Arabic by bilingual members of the research team. The Palestinan mothers' PDI interviews were translated from Arabic to English for coding purposes by a bilingual research

group member. For coding purposes, the case study mother's transcribed AAI was translated from Finnish to English by a Bachelor's degree psychology student and the translation was inspected by the dissertation author.

3.3 Data analysis

3.3.1 Statistical analysis

In Article I, all analyses were performed by the first author, using SPSS version 23. Fisher's exact test, independent *t*-test, and $\chi 2$ tests were used in comparing the substance-abusing and comparison mothers' attachment distributions, differences in the AAI subscales, and in analyzing the associations between attachment classification and substance abuse severity.

Differences between substance-abusing and comparison mothers in terms of associations between attachment representations and emotion processing (EP) and emotional availability (EA) were analyzed using 2 (attachment: Secure vs. Insecure) x 2 (substance-abusing vs. comparison) analyses of covariance (ANCOVAs). Financial difficulties and maternal age were dummy-coded and used as covariates. Bonferroni *post-hoc* tests were conducted for pairwise comparisons when interaction effects were significant. Analysis of the associations between the four attachment categories (F, Ds, E, and a combined U/CC category) and EP and EA among the substance-abusing mothers was conducted using an additional ANCOVA and Bonferroni *post-hoc* tests. Several EP variables were transformed to meet standards of acceptable symmetry and kurtosis for the use of parametric tests.

In articles II and III, descriptive statistics were analyzed by the first author and the other analysis performed by the third author. In Article II, a structural equation modeling (SEM) approach was used to test direct effects of Palestinian mothers' single and cumulative trauma experiences (childhood emotional [CEA] and physical abuse [CPA] with traumatic war events [TWE]) on maternal prenatal variables (depressive and PTSD symptoms as well as perceived stress) and infant stress regulation (negative affectivity and soothability), as well as indirect effects of trauma experiences on infant stress regulation via the prenatal variables. The analyses were performed using Mplus 7.4 (Muthén & Muthén, 1998–2015). Trauma experiences were

included in the model as exogenous, continuous observed variables, and prenatal variables and infant stress regulation as latent variables. Figure 3 illustrates the measurement model for the latent constructs and their manifest indicators.

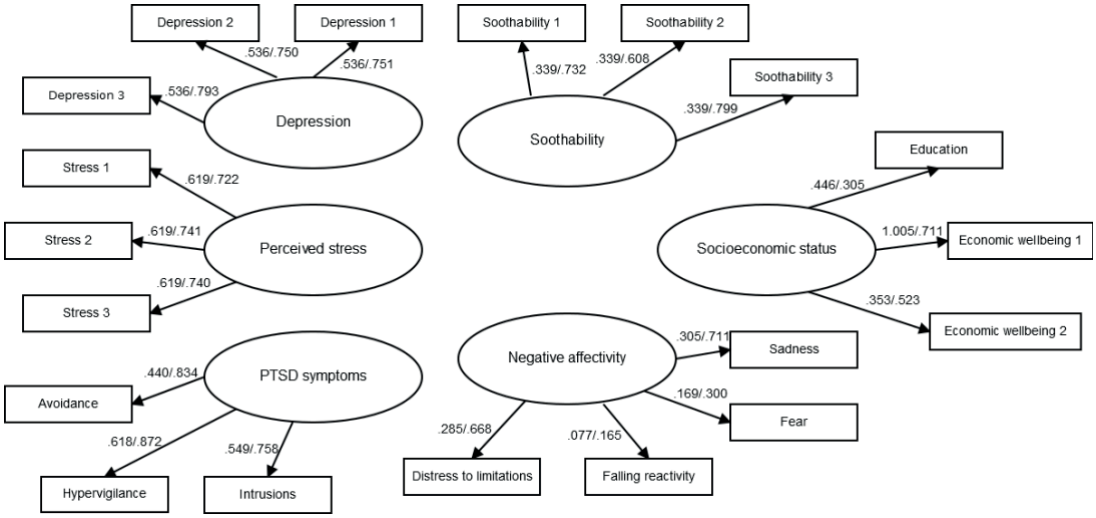

Figure 3. Measure model for latent variables included in Article II structural equation modeling.

Note. All latent variables allowed to covary freely – covariances not depicted for clarity. Non-standardized/fully standardized loadings. All loadings significant at the $p < 0.001$ level, except for falling reactivity, where for the standardized loading $p = 0.078$.

Parceling was used for the indicators of the constructs modeled as latent in order to improve reliability and communality, and to decrease the likelihood of distributional violations and levels of type II errors (Bagozzi & Heatherton, 1994; Little, Cunningham, Shahar, & Widaman, 2002; Little, Rhemtulla, Gibson, & Schoemann, 2013). Infant gender, prematurity, need for hospital treatment, the family's number of children, and SES were used as covariates.

Confirmatory factor analyses (CFA) were first performed to test the functioning and level of uni-dimensionality of the multi-item measures. Second, a measurement model where the latent constructs were allowed to covary freely was estimated and its fit was tested. Third, another measurement model where the latent variables' loadings were set to equality was estimated, and the reduction in fit was assessed. After these steps, an *a priori* specified structural model was imposed on the measurement model to reflect the research hypotheses. In this, the prenatal

variables were regressed on trauma experiences and on the interaction terms of CEA x TWE and CPA x TWE. Infant stress regulation was regressed on the maternal trauma and prenatal variables as well as on their interactions.

A final SEM was established when the fit and the parameters in the initial model were estimated, and nonsignificant interaction paths were removed. The direct and indirect effects were estimated from this model via the product of coefficients method, using a first- and second-order Taylor series approximation for the standard error of the product (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

In Article III, data processing was carried out with SPSS version 24 for descriptive statistics and R version 3.4.3 for all other analyses. The structure of Palestinian mothers' high-risk caregiving representations (ARR) was explored using ordinary least-squares (OLS) exploratory factor analysis (EFA) in the *EFAutilities 1.2.1* R package. Standard errors and confidence intervals were estimated with the sandwich method, which accepts non-normal distributions. As the ARR factors were assumed to correlate with each other, an oblique CF-varimax rotation was implemented. The statistical significance of estimated loadings (at $\alpha = .05$) and their magnitude ($\lambda > .40$) was considered in item retention and in determining optimal factor structure. Aggregate mean scores based on the EFA-suggested factor structure were used in further analysis.

Associations between pre- and postnatal TWE, mental health (depressive and PTSD symptoms), background variables (maternal age, education, financial difficulties, number of children, infant gender, prematurity, and need for hospital care), ARR, and mother-infant interaction quality (EA) were analyzed with bivariate correlations. In cases where several maternal (TWE or mental health) or background variables were associated with ARR or EA, ordinary least squares (OLS) multiple regression analysis was used. When correlations suggested possible mediation of WT and mental health on EA via ARR, OLS regression path analysis was performed

Missing values. In article I, missing values on the background variables were replaced using the expectation maximization (EM) method. Missing values on the dependent variables were deleted listwise. In Article II, weighted least squares means and variance adjusted estimation was used for confirmatory factor analyses with categorical items. Full-information maximum likelihood (FIML) estimation with robust standard errors was used

for all other analyses. In Article III, multiple imputation with chained equations in the *mice 2.46.0* R package was used in all analyses, apart from descriptive statistics.

3.3.2 Qualitative analysis

Regarding Article III, there are no prior studies using the ARR tool to assess Palestinian mothers' caregiving representations. As such, a detailed qualitative diary of the risks detected with the ARR was compiled in order to ensure a cross-culturally reliable assessment of representational risks. This also served the purpose of identifying possible context-specific features in the identified risks. After coding the interviews, the dissertation author re-read the diary several times and summarized recurring themes. Regular videocall meetings were held with the second (Palestinian) author of Article III (S. Diab) in order to discuss the possible context-specific meanings of the risks in the mothers' caregiving representations.

In Article IV, the dissertation author analyzed the psychotherapy data In search of Insecure, HH, and Pre-mentalizing instances via three separate rounds of theory-guided content analysis. The predefined theoretical concepts were criteria for formation of the main categories, whereas the formation of the subcategories was data-driven: thematically similar instances were placed into the same subcategory and they were named based on common features of the instances. Thus, the subcategories reflect case-specific manifestations of the theory-defined representational risks. The placement into main categories was not mutually exclusive (e.g., the same instance could receive an Insecure, HH, and Pre-mentalizing categorization). Within a main category, an instance could only be assigned to one subcategory.

A method of constant comparison was used in order to ensure coherent category formation; that is, an instance was compared to other instances in the subcategory, those in other candidate subcategories, and to the theoretical criteria for inclusion/exclusion (Boeije, 2002; Mayring, 2014). Regular meetings were held with the second author of Article IV (J. Wahlström) in order to discuss and revise the categorization. To enhance trustworthiness of the classification, saturation of the analysis was tested by initially categorizing the first 50% of the data, and using the established categorization in the analysis of the second half of the data. As all the

instances in the second half of the data fit the established categories in all three rounds of analysis, the testing showed that the analysis was saturated. Finally, the frequencies of the instances assigned to the main and subcategories as well as the coincidences of categorizations assigned to the same instances were summarized.

3.4 Ethical considerations

The study plan for data used in Article I was approved by the ethical boards of the city of Tampere, Finland, and Päijät-Häme Hospital District, Finland, in 2003. The study plan for data used in Articles II and III was approved by the ethical board of Helsinki and Uusimaa Hospital District, Finland, in 2011 and the research board of the Islamic University of Gaza, Palestine, in 2013. The family service unit of the city of Helsinki evaluated and approved the ethicality of the study plan for Article IV in 2016.

Research planning, recruitment of participants, data collection, and reporting of results were conducted according to American Psychological Association (APA, 2003/2016) ethical considerations and the declaration of Helsinki (General Assembly of the World Medical Association, 2013; World Medical Association, 2001). As the mothers in Articles I and IV were enrolled in psychological treatment, it was specifically emphasized that their decision about whether or not to participate would not affect their treatment. In studying vulnerable mothers and infants and probing about sensitive and possible stress-provoking matters (e.g., trauma experiences, mental health, and parenting) the mothers were provided with the option to contact either a researcher, research assistant, or their treating clinician with any thoughts they wanted to discuss after the research visits.

Efforts were made to limit the burden of research visits for all mothers (e.g., limiting visit length, not ending with questions about trauma), and to ensure that maternal and infant needs during the visits were attended to. Regarding the Palestinian mothers in Articles II & III, the fieldwork was planned together with local professionals to ensure context-appropriate research conduct. Regarding Article IV, the informed consent of the case study mother for participation in the research was requested at the end of the psychotherapy process, thus impacting the therapeutic relationship as little as possible. The mother read the description of her family and the

psychotherapy process prior to the publication of Article IV, to ensure anonymity.

4 RESULTS

In interpreting the results, it should be noted that they were arrived at by different means; that is, quantitative (Articles I, II, and III) and qualitative (Articles III and IV) analyses of the data. While the quantitative analyses allow for inferences regarding prevalence of the phenomena in the studied groups, and strives to generalize the results (while acknowledging the limitations of such generalizations), the qualitative results, and particularly those of the case study, do not communicate prevalence of the studied phenomena among other mothers. However, they are reported here partly alongside the quantitative results in order to compare the risk profiles of the studied mothers. In addition to producing knowledge of the quality and content of mental representations among the studied mothers, the qualitative results can serve as discovered patterns of risk, the fit of which among other individuals can be studied in subsequent research (Mayring, 2007).

4.1 Trauma experiences, mental health symptoms, and additional stressors

The first task was to explore the prevalence/occurrence of trauma experiences, mental health symptoms, and additional stressors among the substance-abusing (Article I), war-exposed Palestinian (Articles II and III), and case study (Article IV) mothers.

4.1.1 Trauma experiences

In their Adult Attachment Interview (AAI), the substance-abusing mothers reported significantly more childhood sexual or physical abuse experiences (19.0%) by their caregivers than the comparison mothers (0%). They further reported significantly more trauma experiences inflicted by other persons over their life course (39.5%) than the comparison mothers (2.0%).

The Palestinian mothers were probed about childhood abuse. Almost two thirds (65.6%) of the mothers reported experiences of emotional abuse by

either their mother or father. Experiences of physical abuse were even more common, as 77.6% of the mothers reported having experiences such as being slapped or beaten. Further, the mothers' exposure to traumatic war events prior to pregnancy and after having the infant was examined. Prior to pregnancy, almost all of the mothers (96.6%) reported exposure to warfare. Injury to self and others (81.5%) and losing a close person (69.3%) were also very common. Postnatally, practically all (98.0%) of the mothers in the subsample in Article III reported exposure to warfare with their infants. Displacement (88.0%) and exposure to serious health threats (72.0%) were also common.

The case study mother, Kati, did not report any experiences that would be classified as traumatic in the original Secure/Insecure coding system of the AAI, such as physical/sexual abuse by caregivers or loss of a primary caregiver. Instead, Kati's interview revealed her parents' hostile and fearful/helpless responses to her attachment needs.

4.1.2 Mental health symptoms

Pre- and postnatal mental health was assessed among the Palestinian mothers. Depressive symptoms in particular were highly prevalent during pregnancy and postpartum. Over half (51.5%) of the mothers in Article II reported clinical levels of prenatal depressive symptoms, 18.4% reported diagnostic levels of PTSD symptoms, and more than eight out of ten reported prenatal stress levels that exceeded previously reported female mean scores (Cohen, 1994).

Among the subsample of mothers in Article III, clinical levels of prenatal depressive and PTSD symptoms were relatively similar (54.0% and 14.6%, respectively) to those in the whole sample. There was a slight increase in the level of postnatal symptoms, with six out of ten mothers reporting diagnostic levels of depressive symptoms, and 16.0% reporting such levels of PTSD symptoms.

4.1.3 Additional stressors

The substance-abusing mothers were younger, more often single, and had lower education, more financial difficulties, and more unstable job statuses than their comparisons.

Concerning the Palestinian mothers, almost all (99.4%) reported the family as having moderate to high financial difficulties in the prolonged military conflict context (Article II). In the qualitative analysis of the mothers' caregiving representations in Article III, the mothers commonly described overburdening that stemmed from taking care of the often many children, extended family, and a home with insufficient resources. Concerning Palestinian infants, a little under a fifth (18.5%) needed extra hospital treatment for health problems in the neonatal period or later on, premature infants (of which there were 5.4%) more frequently than full-term ones.

In contrast to the substance-abusing and Palestinian mothers, Kati was not burdened by major socio-economic stressors during her early motherhood. The family had a steady income, Kati was highly educated, and she had a work position to return to after maternity leave. Her infant, Paavo, did not suffer from any objective health problems.

4.2 Mental representations

The second task was to identify the risk features in the studied mothers' representations.

4.2.1 Substance-abusing mothers' attachment representations

As hypothesized, the substance-abusing mothers' attachment representations were more often classified as Insecure than those of the comparison mothers. As Figure 4 illustrates, over two-thirds of the comparison mothers were classified as Secure, whereas only a fifth of the SA mothers received this classification.

There was also a difference in the Insecure classifications given to substance-abusing and comparison mothers: all the Insecure comparison mothers were classified as Dismissing, whereas a little over a fifth of the substance-abusing mothers received a Preoccupied classification. Almost a third of the substance-abusing mothers were classified as Unresolved/Disorganized and Cannot Classify. As these representations are both conceptualized to reflect breakdown of an organized attentional-emotional strategy, they were combined into one group (U/CC) for further analysis.

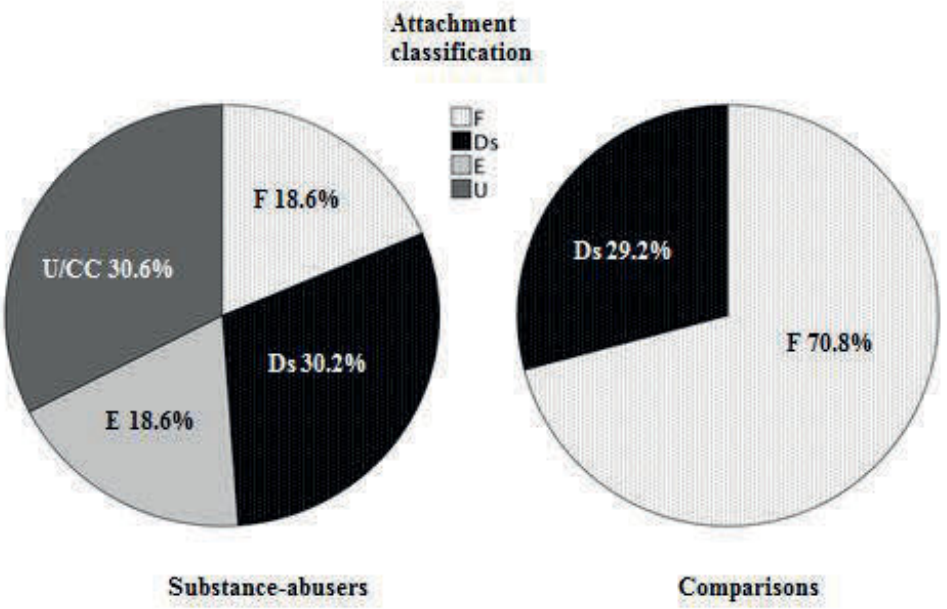

Figure 4. Attachment distributions among the substance-abusing and comparison mothers in article I. F = Secure, Ds = Insecure/Dismissing, E = Insecure/Preoccupied, U/CC = Insecure/Unresolved-Disorganized or Cannot Classify.

Investigation of the AAI subscales revealed further differences in the substance-abusing and comparison mothers' Secure and Insecure profiles. The majority of the Secure substance-abusing (62.5%, n = 5) mothers showed an 'earned secure' profile; that is, displaying Secure states of mind (such as coherence) despite harsh childhood experiences. Only a minority of the comparisons' Secure status was 'earned' (17.6%, n = 6). Further, the Insecure substance-abusing mothers were assessed as 'more' Insecure than the comparison mothers: they received lower Coherence of Mind and Transcript ratings than the Insecure comparison mothers. As compared to Dismissing comparison mothers, the Dismissing substance-abusing mothers were more often highly derogative (> 5) of their caregivers or attachment overall.

4.2.2 Palestinian mothers' high-risk caregiving representations

Exploration of the structure of risks in Palestinian mothers' caregiving representations revealed a two-factor model underlying the Assessment of Representational Risk (ARR) dimensions. As illustrated in Figure 5, Hostile Experience, Hostile Behavior, Helplessness, and Emotional Distress had strong (λ = .62 - .86) loadings on the first factor, named "Dysregulating", reflecting a mother's failure in both her self-regulation as well as in dyadic regulation. Idealization, Incoherence, and Mutual Enjoyment-Reversed had a strong loading on the second factor, named "Unavailable", reflecting maternal lack of realism and motivation in relation to the child and caregiving. Cronbach's α's for the Dysregulating and Unavailable factors were .84 and .69, respectively. Supportive Presence and Enmeshment did not load satisfactorily onto a single factor and were dropped from analysis. Despite low loadings on both factors, Fearfulness was retained as a single-item scale based on its theoretical importance.

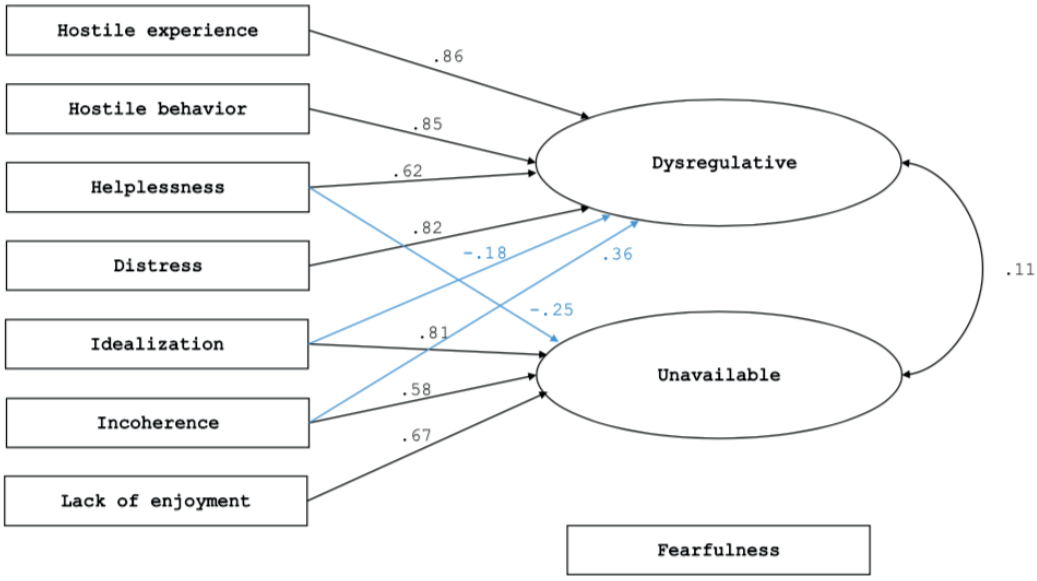

Figure 5. Results of the exploratory factor analysis for the Assessment of Representational Risk dimensions among the Palestinian mothers in Article III.

Qualitative analysis of the interviews revealed that, although probed about experiences in relation to the specific infant, the mothers represented themselves more broadly as caregivers to the extended family. Mothers

named their broad caregiving role in extremely challenging circumstances as a core reason for their Dysregulation: being nervous and/or uncontrollably angry in the presence of their infants. Although mothering was represented in a holistic way, the mothers' Dysregulating representations showed malevolent views of the specific infants, especially when they were needy or expressed distress. Further, mothers described not attending to their distressed infants and extreme infant stress reactions, such as pulling hair or hitting his/her head on the floor.

Regarding the Unavailable representations, mothers spoke of not having time or motivation to interact with their infants. Idealization was most notable in responses where the mothers first talked spontaneously about being distressed but denied having any negative emotions when specifically probed about them. This, together with irrelevant or behavioral/appearance-describing answers to questions about their own or infants' psychological experiences, also weighted on the Incoherence score. The answering pattern suggested that the mothers were unaccustomed to, or not comfortable with, answering such questions.

Mothers' expressions of Fearfulness were only scored highly if they reflected a constant state of worry/alarm in the post-war interviewing context. Some mothers were explicit about currently experiencing Fearfulness as a result of past war exposure. Reports of fear during past wars were not weighted on the scale, as they were not out-of-context or unreasonable.

4.2.3 Risk features in the case study mother's attachment and caregiving representations

Insecure, Hostile/Helpless (HH), and Pre-mentalizing instances were searched for in Kati's attachment and caregiving representations. Further, the overlapping (co-occurrence) of the three theoretical conceptualizations in detecting risks in caregiving representations was analyzed.

4.2.3.1 Similarities and differences in attachment and caregiving representations

Both the Insecure and Hostile/Helpless classification systems identified fearfulness as a central feature of Kati's attachment representations. However, in the Secure/Insecure system, she received an organized Preoccupied main classification, despite some Disorganized features in her

narrative. In contrast, the HH system identified the risks as reflecting 'pervasively unintegrated states of mind', more specifically, the Helpless-Fearful subtype.

Preoccupying features of fear, unbalanced blaming, weak sense of identity, and enmeshment of self/other characterized not only Kati's attachment, but also her caregiving representations. However, the caregiving representations were more clearly Disorganized, as Kati's fears were unconnected to a source and she frequently talked about unwarranted blaming of herself (i.e., being causal) for spoiling Paavo. Further, Kati presented a merged and role-confused view of herself and Paavo, in which she projected onto Paavo characteristics of badness similar to those she used in describing herself. Kati's Preoccupied and Disorganized caregiving instances seemed qualitatively alike rather than reflecting separate representational phenomena, forming a continuum from enmeshment (self and child as similar) to merger (self and child as the same).

Further HH features found in Kati's attachment and caregiving representations were Helplessness, Hostility, and sense of Badness/Unworthiness. Reflecting the unintegrated nature of the representations, Kati spoke of them as realities in the world, out of her control, and easily got over-aroused and overwhelmed by negative emotions when talking about them. In the caregiving representations, Kati's descriptions of Badness/Worthlessness were most common HH instances. While Kati only ascribed these to herself in her attachment representations, in the caregiving representations, she perceived both herself and Paavo as similarly Bad/Worthless.

Concerning Hostility, Kati represented Paavo as rejecting and judging of her in a similar way to her own father. More seldom, Kati expressed an internalization of her father's hostility in rejectment of Paavo. Specific to the caregiving representations was that Kati showed a fear of being hostile towards Paavo.

Fearfulness and Helplessness were found in both the attachment and caregiving representations, but in the former they took a form of diffuse hyper-arousal and anxiety, reflecting identification with her helpless mother and a history of *not being regulated* and a consequential lack of self-regulation. In contrast, the caregiving role inflicted specific fears and helplessness that were tied to everyday life and interactive situations with Paavo, communicating an *inability to act as a regulating other*.

Concerning Pre-Mentalizing, Pretend mode instances were found in both Kati's attachment and caregiving representations. However, whereas the caregiving representations showed more pronounced and variant lapses into all the Pre-mentalization modes, Kati showed predominantly high-level ability to mentalize her attachment experiences.

In both her attachment and caregiving representations, Kati's lapses into Pretend mode manifested, first, as pseudomentalizing: sophisticated, pre-fixed, general descriptions that were disconnected to subjective experience. For example, Kati described 'primary care' and 'symbiosis' with her mother, and spoke about how she 'should be' as a mother, instead of how motherhood was for her. Second, Kati made intrusive or 'mind-reading' statements of others' mental states (most importantly, her mother's, Paavo's, and other people as judging Paavo) without justification from observations. Third, distorted or bizarre instances were found where Kati's thinking was detached from reality testing. For example, in the attachment representations Kati talked about fear of growing up; in the caregiving representations Kati communicated worrying that Paavo's negative expressions could indicate psychopathology.

Teleological and Psychic Equivalence instances were found only in the caregiving representations. In the Teleological instances, Kati determined her own and Paavo's essence and worth based solely on appearance and behavior. For example, in describing Paavo according to his cranky behavior, Kati failed to consider the situational factors that led to such behavior or her responsibility to regulate Paavo. In the Psychic equivalence instances, Kati spoke about experiencing caregiving, Paavo, and her relationship with him according to her fearful, anxious, or otherwise emotionally overwhelmed mental states. For instance, Kati talked about how experiencing herself as bad was shared by Paavo and other people.

4.2.3.2 Co-occurrence of risks in the caregiving representations

Figure 6 illustrates co-occurrence in assigning Insecure, Hostile-Helpless (HH), and Pre-mentalizing categorizations to the same instances in Kati's caregiving representations.

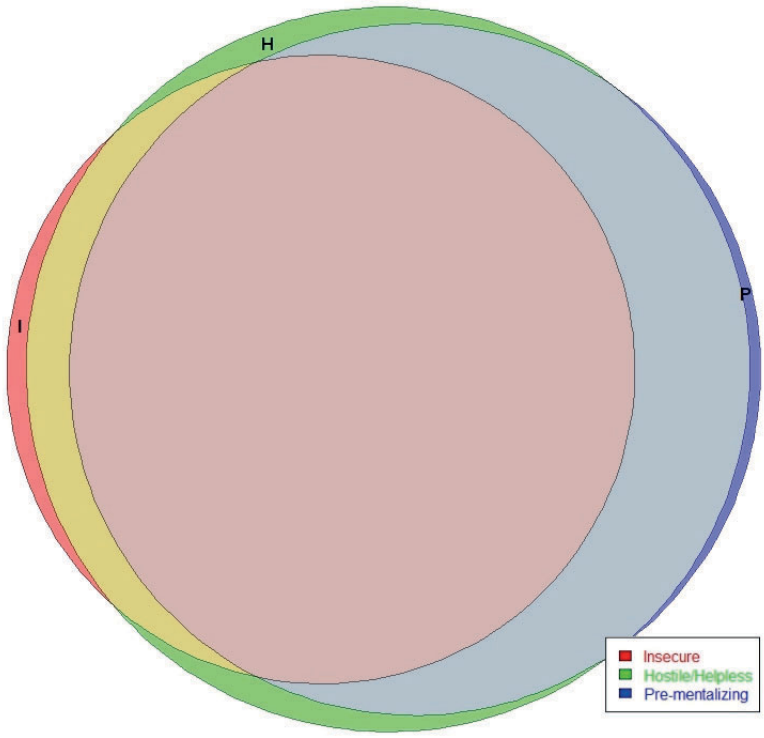

Figure 6. Co-occurrence of Insecure, Hostile-Helpless, and Pre-mentalizing categorization among instances of Caregiving representations in Article IV.

As the reader might have detected from the previous description of the found risks, the overlapping was great, varying from 49%–95%. The HH conceptualization was most comprehensive in covering the representational risks, as 80–95% of the Insecure and Pre-mentalizing instances were also co-categorized as HH. In comparison, an Insecure categorization was co-assigned from 49–70% of the HH and Pre-mentalizing instances, and a Pre-mentalizing co-categorization was assigned from 22%–95% of the Insecure and HH instances.

Figure 7 illustrates the distribution of the co-occurrences. Especially noteworthy is that two HH dimensions occurred somewhat independently; that is, they identified risks not spotted by the other two theories. First, the Fearful instances were classified as Insecure (most often Disorganized) in less than half of the cases. Second, only a fifth of the HH Helplessness instances met the criteria for a Pre-mentalizing (Pretend) categorization.

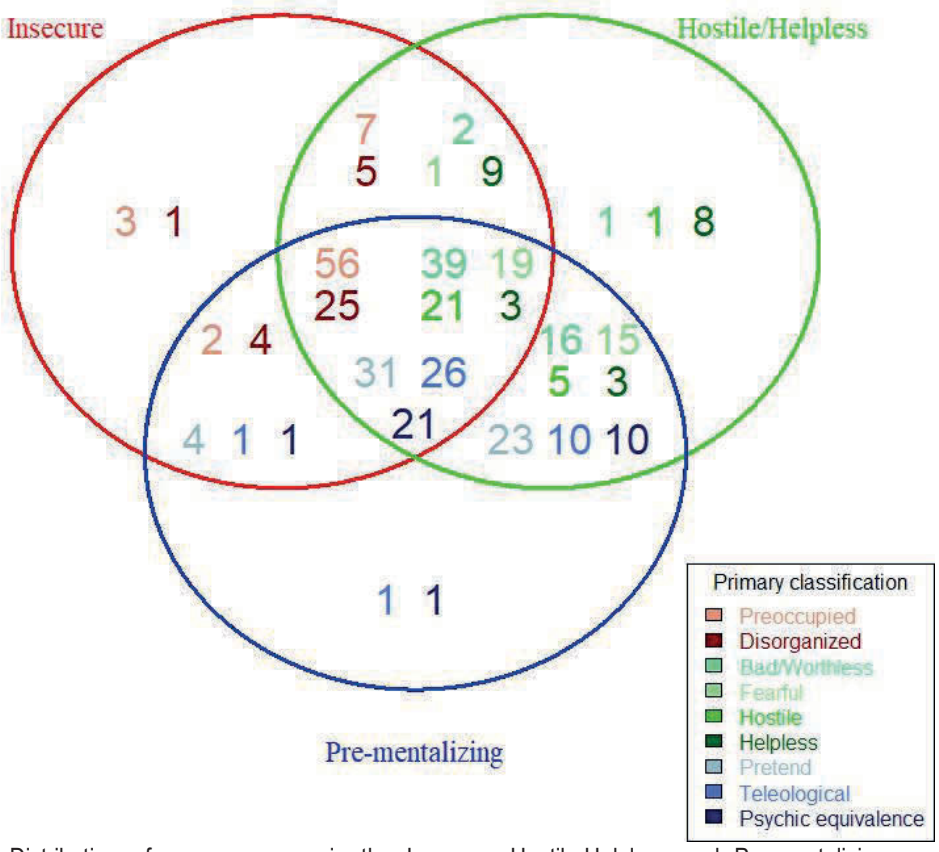

Figure 7. Distribution of co-occurrences in the Insecure, Hostile-Helpless and Pre-mentalizing instances in caregiving representations in Article IV.

4.3 Maternal trauma, emotional dysregulation, and mental representations

The third research task was to study interconnections between the mothers' trauma experiences, emotional dysregulation (mental health symptoms and imbalanced emotion processing), and mental representations.

4.3.1 Attachment trauma and representational features among substance-abusing mothers and the case study mother

As reported above, the substance-abusing mothers' attachment representations were frequently classified as Unresolved (Disorganized or Cannot Classify), which is in concordance with their high reporting of abuse and loss experiences. However, the case study mother Kati did not report such 'clear' traumas that are criteria for Unresolved/Disorganized category placement in the Secure/Insecure coding system. She did not receive a Disorganized categorization despite some Unresolved states of mind in her attachment representations.

Rather, Kati's attachment representations were classified as reflecting an organized, Preoccupied attentional-emotional strategy. However, the central preoccupying affect was fear, which is deemed even in the coding system to possibly stem from traumatic experiences (Main et al., 2003). The Hostile-Helpless (HH) system, instead, held the Fearful, in tandem with Bad/Worthless, Hostile, and Helpless representational features as indicators of unintegrated states of mind arising from traumatically dysregulated experiences with caregivers.

The un-integration continued to characterize Kati's caregiving representations. Further, Unresolved/Disorganized features were found to characterize the caregiving representations more frequently and clearly than the attachment representations. The Disorganization/breakdown in Kati's reasoning manifested as disorientation in the caregiving role (e.g. role-reversed expressions that Paavo is responsible for her emotion regulation) as well as fearful, magical, and dream-like ideation (e.g. anxiously waiting that 'something bad' or a 'cosmic punishment' would occur). Kati's ability to mentalize in the context of her caregiving was very fragile, a profile which has been previously reported to characterize interpersonally traumatized mothers (Berthelot et al., 2015; Fonagy et al., 2003; Schechter & Willheim, 2009).

4.3.2 Substance-abusing mothers' attachment representations and pregnancy-related emotion processing

As there were no comparison mothers classified as Preoccupied or Unresolved/Cannot Classify (U/CC), two sets of analyses were performed: first, comparing substance-abusing and comparison mothers at Secure vs. Insecure levels (including Dismissing, Preoccupied, and U/CC); and second, comparing only the Secure and Dismissing mothers across groups. Results showed that attachment representations associated differently with emotion processing (EP) among the Secure and Dismissing mothers in the substance-abusing and comparison groups. Further, substance abuse status, rather than security of attachment representations, was associated with multi-level negative pregnancy-related EP.

The first hypothesis that Secure mothers in both substance-abusing and comparison groups would show higher meta-evaluation of emotions was not substantiated. When analyzing only the Secure and Dismissing mothers, Secure comparisons showed, as expected, higher meta-evaluation whereas Secure substance-abusing mothers showed lower meta-evaluation than Dismissing mothers. Further, at the Secure/Insecure level of analysis, all substance-abusing mothers showed lower meta-evaluation of emotions than comparisons.

The second hypothesis, that Insecure mothers would show imbalanced (highly negative) EP regardless of substance abuse status, did not receive support. Secure comparisons showed lower levels of negative cognitive appraisals than the Dismissing comparison mothers, whereas Secure substance-abusing mothers showed higher levels of negative appraisals than Dismissing substance-abusing mothers. At the Secure/Insecure level of analysis, all the substance-abusing mothers reported higher negative feeling states and negative behavioral urges than the comparisons.

The more specific hypothesis that the Preoccupied and U/CC mothers especially would account for the imbalanced EP could only be tested among the substance-abusing mothers. Support for it was not found, as Preoccupied and U/CC substance-abusing mothers did not differ from the Secure substance-abusing mothers in negative EP. Instead, the Preoccupied substance-abusing mothers showed more negative cognitive appraisals than the Dismissing substance-abusing mothers.

4.3.3 Palestinian mothers' trauma experiences, mental health, and caregiving representations

Regarding the Palestinian mothers, the first hypothesis – that childhood emotional (CEA) and physical abuse (CPA) and exposure to traumatic war events (TWE) predispose mothers to problems in prenatal mental health (depressive and PTSD symptoms as well as stress), and postnatal mental health (depressive and PTSD) symptoms. In Article II, all the trauma types were associated with elevated prenatal symptoms. Only CEA predisposed mothers to all measured indicators of prenatal mental health and was uniquely associated with depressive symptoms. In the subsample of the mothers in Article III, postnatal TWE was associated with elevated postnatal depressive symptoms. The second hypothesis, that mothers with accumulated exposure to both childhood and war trauma would show the highest prenatal symptoms (Article II), was not substantiated.

The third hypothesis – that high levels of TWE and mental health symptoms are associated with the identified Disorganized, Unavailable, and Fearful representations (Article III) – was only partially substantiated. Prenatal depressive symptoms were associated with the Dysregulating and Fearful representations, and postnatal PTSD symptoms were associated with Fearful representations, but TWE was not associated with these representations. In addition, mothers with male infants had more Fearful representations. Financial difficulties, but none of the mental health variables, were associated with the Unavailable representations.

4.4 The impact of maternal trauma, mental representatins, and mental health on dyadic and infant regulation

Our final task was to investigate how the study variables are associated with infant stress regulation and with the quality of mother–infant interaction.

4.4.1 Substance-abusing mothers' attachment representations and mother-infant interaction quality

As in findings regarding prenatal emotion processing, substance abuse status, rather than mothers' attachment classification, was associated with poor mother–infant emotional availability (EA), and Secure attachment

status was differently associated with EA among the substance abuse and comparison mothers.

The hypothesis that mothers' Secure attachment representations are associated with higher EA in both the substance-abusing and comparison groups was not substantiated. Instead, regardless of their attachment classification, substance-abusing mothers were less Sensitive and Structuring and more Intrusive and Hostile than the comparisons. Their infants were also less Responsive and Involving than the infants in the comparison dyads. No differences in EA were found according to the four attachment classifications within the substance-abusing mothers. Unexpectedly, when comparing only the Secure and Dismissing mothers in the two groups, the Secure substance-abusing mothers showed more intrusiveness than the Dismissing substance-abusing mothers, whereas among the comparisons, the Secure mothers were, as expected, less intrusive than the Dismissing mothers.

4.4.2 Direct and indirect links between Palestinian mothers' trauma, prenatal mental health, and infant stress regulation

The hypothesis that maternal childhood abuse has direct harmful impact on infant stress regulation was not substantiated. Instead, we found that mothers' high level of childhood emotional abuse (CEA) impacted infants' Negative Emotionality differently according to the level of exposure to traumatic war events (TWE) prior to the pregnancy. The interaction effect is illustrated in Figure 8. When TWE was low, mothers with high CEA reported their infants expressing high levels of Negative Emotionality; in contrast, mothers exposed to high levels of both CEA and TWE reported lower levels of infant Negative Emotionality.

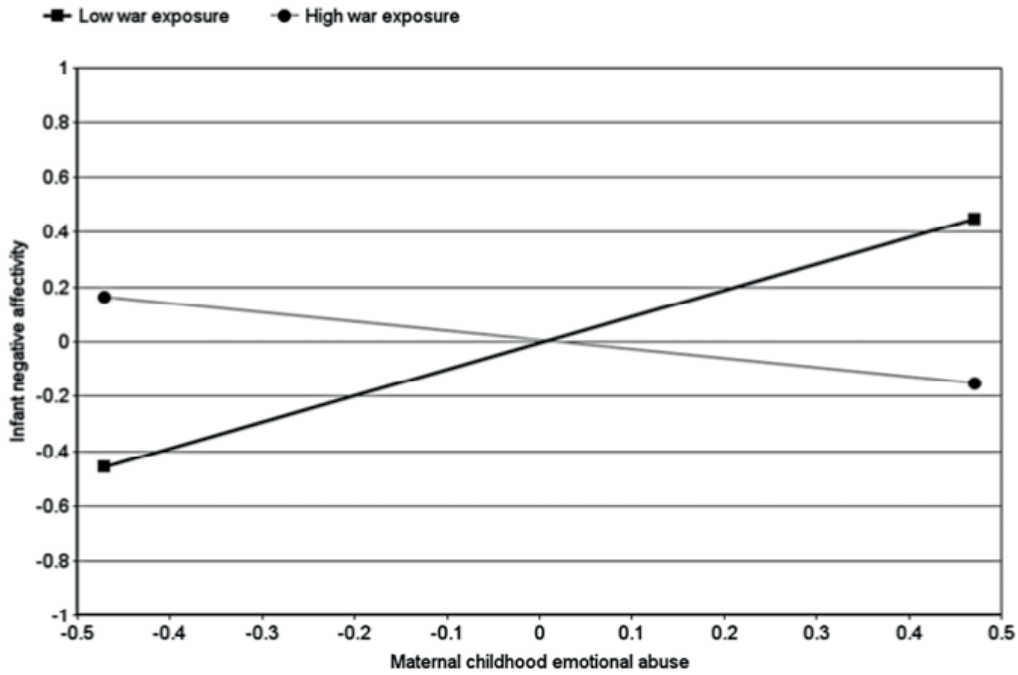

Figure 8. Interaction effect between Palestinian mothers' childhood emotional abuse and exposure to war events prior to pregnancy on infant Negative Emotionality in Article II.

The hypothesis that TWE and childhood abuse would transmit harmful effects on infant stress regulation via prenatal mental health symptoms was not substantiated either. Instead, unexpectedly, mothers' depressive symptoms were positively associated with reports of infant soothability. The results further showed that high family SES was associated with higher soothability, infant prematurity with lower soothability, and male gender with higher negative emotionality.

4.4.3 Impacts of Palestinian mothers' war exposure, mental health, and caregiving representations on mother–infant interaction quality

The hypothesis that harmful impact of traumatic war events prior to pregnancy and in the postnatal period (TWE) and pre- and postnatal mental health symptoms on emotional availability (EA) is mediated via high-risk caregiving representations did not receive support, as no associations were found between the Dysregulating, Unavailable, and Fearful representations

and mother-rated EA. Instead, postnatal PTSD symptoms and maternal age were associated with lower EA.

Contrary to the lack of association between the mothers' high-risk caregiving representations and EA, mothers' descriptions of problematic interactions were found in the qualitative analysis of the representation interviews. Mothers reported emotional dysregulation that heightened infant distress and using physical punishments (Dysregulating representations), leaving their infants' distress unattended (Unavailable representations), and displaying constant worrying/fearfulness in the company of their children (Fearful representations).

4.5 Summary of key findings

- All the studied high-risk mothers reported caregiver-inflicted distress in their childhood. However, defining the case study mother's attachment experiences as traumatic depended on the assessment method (Secure/Insecure vs. Hostile/Helpless).
- Accumulation of current stressors characterized the substance-abusing and Palestinian mothers, but not the case study mother.

Article I:

- The substance-abusing mothers' attachment representations were more often Insecure (particularly preoccupied and Unresolved/Disorganized) than the comparison mothers' attachment representations.
- substance-abusing mothers' Insecure attachment representations showed graver incoherence and derogation than those of comparisons.
- Insecurity of attachment representations was not central to maternal or dyadic dysregulation: all substance-abusing mothers showed greater imbalance in their pregnancy-related emotion processing and poorer emotional availability with their infants than the comparisons.
- Contrary to expectations and theory, the Secure substance-abusing mothers displayed poor ability to reflect on their pregnancy-related emotions and intrusivity in interactions with their infants.

Article II:

- The war-exposed Palestinian mothers' childhood emotional abuse had the most wide-reaching effects on prenatal mental health.
- Contrary to expectations, no clearly harmful effects were found of the mothers' early or later trauma or prenatal mental health symptoms on mother-rated infant stress regulation.

Article III:

- Dysregulating, Unavailable, and Fearful risk features were identified from the Palestinian mothers' caregiving representations. The mothers identified the pervasive stress posed by the war conditions as cause to Dysregulation and Unavailability. All of the mothers' fears were not unrealistic or unconnected to source.
- The Palestinian mothers perceived themselves primarily as caregivers to many (as opposed to the specific infant). They were inclined to give

concrete and behavioral, rather than psychological and subjective experience-exploring answers.

- Association between the mothers' high-risk caregiving representations and their evaluations of interaction quality with their infants were not found. This was in contrast to maternal descriptions of dysregulating caregiving, unattendance, fearfulness, and infant extreme stress responses in their representation interviews.

Article IV:

- The risks in the case study mother's attachment and caregiving representations were alike, but the caregiving risks were more severe, including merged view of self and child, disorganization, and frequent lapses into pre-mentalizing. The risks in caregiving representations were also more concrete and tied to daily interactions with the child. Of the three theoretical frameworks, Hostile-Helpless conceptualization captured the risks in the caregiving representations most comprehensively.

5 DISCUSSION

This dissertation examined how maternal complex trauma experiences, mental representations, and mental health symptoms contribute to maternal, infant, and dyadic dysregulation among diverse high-risk women in the pre- and postnatal periods; that is, substance-abusing Finnish mothers (Article I), war-exposed Palestinian mothers (Articles II & III), and a psychotherapy-enrolled Finnish mother (Article IV). Based on prior research, three gaps in knowledge were identified: first, whether early caregiver-inflicted traumas are particularly harmful for the pre- and postnatal period across socio-cultural contexts (as evidenced among the Palestinian dyads); second, whether the studied mothers' mental representations show common or group/caregiving-specific risks, and whether different theorizations point to same or different risks in caregiving representations (the latter particularly in the case study); and third, whether mental health symptoms and mental representations transmit the harmful effects of maternal trauma onto infant development and mother–infant interactions among the studied mothers.

First, the results support the proposal that maternal caregiver-inflicted early traumas are particularly harmful for maternal prenatal mental health across diverse contexts and cultures, even when accounting for later complex traumas. However, the harmful effect of Palestinian mothers' early traumas on infant stress regulation was not substantiated.

Second, investigation of the mothers' attachment and caregiving representations revealed that not only the type but also the degree of risk (ranging from lesser to more severe) differs between high-risk and low-risk mothers (substance-abusing and comparisons) and between attachment and caregiving representations (the case study). Further, results showed that the assessment method used determined whether or not risks in attachment representations were understood as originating from trauma (substance-abusing and case study mothers). Investigation of the previously unexamined Palestinian mothers' caregiving representations revealed both commonly recognized and group-specific risks. Finally, different theories mostly

detected the same risks in the case study mother's caregiving representations, but the Hostile/Helpless theory was most comprehensive in identifying them.

Third, the results only substantiated the hypothesized role of Palestinian mothers' postnatal PTSD symptoms as transmitting harmful effects of maternal trauma onto mother–infant interactions. Unexpectedly, no associations were found between the substance-abusing mothers' Insecure attachment representations or the Palestinian mothers' high-risk caregiving representations and the quality of mother–infant interaction, or Palestinian mothers' prenatal mental health and infant stress regulation.

Next, these results are discussed in detail in relation to their relevance for future research and clinical practice. We focus particularly on the validity of the assessment methods used among the traumatized high-risk mothers in general, and their role in explaining the null findings in particular.

5.1 Are childhood caregiver-inflicted traumas particularly harmful in transitioning to motherhood across contexts?

Article II found that childhood abuse was highly prevalent among the Palestinian mothers. Of the studied trauma types, childhood emotional abuse compromised their prenatal health most comprehensively, and specifically disposed the mothers to depression. The finding is important, as the mothers very commonly showed clinical levels of prenatal depression. The specific link between childhood emotional abuse and later life depression has been evidenced in other studies, with suggested mechanisms including alterations in the central nervous system's hormone segregation as well as low self-esteem (Carpenter et al., 2009; Mullen, Martín, Anderson, Romans, & Herbison, 1996; Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003). Among the Palestinian mothers, childhood abuse might specifically compromise mental health through its stigmatizing and isolating effect in the Palestinian society and consequential deterioration of mothers' social support (Punamäki et al., 2005).

Interestingly, and counter to expectations, the harmful impact of childhood emotional abuse was unique rather than accumulating with later war exposure. This finding is in agreement with the proposition that re-activation of early abusive experiences is a specific risk in transition to motherhood (Fraiberg et al., 1975; George & Solomon, 2008; Solomon &

George, 2011). It is plausible that the mothers' low mood, lack of pleasure, and disappointment in themselves reflects their re-evoked unsupportive, criticizing, or verbally hostile relational experiences.

The results indicate that early caregiver-inflicted traumas create vulnerability to prenatal mental health symptoms across contexts, and highlight the importance of identifying mothers' sometimes quite subtle emotional abuse experiences. Together with earlier studies (Guttman-Steinmetz, Shoshani, Farhan, Aliman, & Hirschberger, 2011; Punamäki et al., 2005; Qouta, Punamäki, & El Sarraj, 2008) the finding suggests that war-exposed mothers with early caregiver-inflicted trauma might be at specific risk for maladaptive and disorganizing, rather than adaptive and re-organizing, transitions to motherhood. Further research is needed on the impact of war-exposed mothers' childhood caregiver-inflicted trauma on their mental representations and caregiving behavior.

Support was not found for the presumed harmful effect of Palestinian mothers' early, or later trauma experiences, on infant stress regulation. The null finding is discussed under section 5.3.

Article I found that concordant to prior research (e.g., Hans, 1999; Harrington & Newman, 2007; Nair, Black, Schuler, & Kettinger, 2003), the substance-abusing mothers' histories were characterized by attachment trauma. The mothers' common reporting of later interpersonal trauma can perhaps be understood as a sequence of early traumatization and consequential lack of self-protective strategies (Ford, 2010; Lieberman & van Horn, 2011), posing additional risk to caregiving (Levendowsky, Huth-Bocks, & Bogat, 2011; Sokolowski, Bernstein, & Cox, 2007). Matching their traumatic histories, substance-abusing mothers' attachment representations were most often classified as Insecure and, unlike the comparison mothers, especially Preoccupied and Unresolved (Disorganized or Cannot Classify).

The case study mother Kati's attachment history was characterized by hostile and helpless relational experiences (Article IV). Albeit not recognized as traumatic in the AAI Secure/Insecure coding system, these disturbed the formation of Kati's internal working models of relationships and posed grave difficulties for her ability to form a balanced, 'good-enough' maternal identity as well as to interpret her infant Paavo's signals. The internalizations of such dysregulated relational experiences are described as the 'hidden trauma' of infancy (Bureau et al., 2010), as they induce developmental psychopathology such as disorganized attachment, dissociation, and

personality disorders (Dutra, Bureau, Holmes, Lyubchik, & Lyons-Ruth, 2009; Finger, Byun, Melnick, & Lyons-Ruth, 2015; Madigan et al., 2006). Accordingly, increasing clinicians' and researchers' awareness of the traumatizing nature of such early experiences is imperative.

Clearly, the assessment of early interpersonal trauma among the substance-abusing mothers and case study mother in this dissertation is very limited. Although a vast body of research exists on the prevalence and dysregulating impact of early caregiver-inflicted traumas among such mothers (Grella et al., 2005; Kuo, Khoury, Metcalfe, Fitzpatrick, & Goodwill, 2015; van Dijke et al., 2011), further research is needed where complex traumas are assessed with standardized tools (see, e.g., Courtois, 2008; van den Bosch, Verheul, Langeland, & van den Brink, 2003), the results are compared to maternal reports of trauma in the AAI, and the effects of both on caregiving is compared.

A globally poor socioeconomic situation was characteristic of the substance-abusing mothers. As earlier studies of the same mothers show that they commonly suffered from depressive symptoms (Belt et al., 2009; Flykt et al., 2012), their substance-abuse status communicates accumulation of grave risks. In this light, it is understandable why all the substance-abusing women, regardless of the security of their attachment representations, showed imbalanced pregnancy-related emotion processing and mother–infant interactions. Regarding the Palestinian mothers, practically all families suffered from pervasive financial difficulties. Further, the mothers communicated that accumulated stressors in their daily caregiving role catalyzed emotional dysregulation and lack of attendance to their infants' needs. Importantly, socioeconomic problems contributed to mothers' reporting of infants' regulatory difficulties and to mothers' Unavailable caregiving representations.

In contrast, Kati's transition to motherhood was not characterized by additional situational stressors. This further supports the view that Hostile/Helpless relational patterns can transmit trauma from one generation to another in a 'hidden' way, in the absence of accumulated risks (see, e.g., Lyons-Ruth, 2003).

In sum, the results of this dissertation preliminary suggest that early caregiver-inflicted traumas contribute to dysregulation in transition to motherhood across different socio-political contexts and among mothers with and without accumulated risks. Two distinct risk profiles need to be

recognized. The first is an explicit type, where families are burdened not only by maternal trauma but also by an accumulation of stressors. In such cases, multi-professional alleviation of everyday burdens is an intervention target in its own right (Appleyard, Egeland, van Dulmen, & Sroufe, 2005; Nair et al., 2003; Niccols et al., 2012), and a precondition for the families to benefit from psychological help. In the second, more hidden type, dysregulating early experiences in themselves severely threaten caregiving. Such families are likely to benefit from psychological and psychotherapeutic interventions more directly.

5.2 What were the key risks in mothers' mental representations?

As reported throughout the dissertation, different assessment tools were used in studying the substance-abusing, Palestinian, and case study mothers' attachment and caregiving representations. On one hand, this poses limitations for comparing risks across groups, but on the other hand, the diversity enables discussion about the role of background theory in identifying representational risks.

Concerning the substance-abusing mothers, the difference in Secure/Insecure attachment representations was not central to problems in pregnancy-related emotion processing and mother–infant interaction quality. The qualitative differences in substance-abusing and comparison mothers' Secure attachment representations might help in explaining the finding. Most of the substance-abusing mothers' representations were classified as 'earned Secure'; that is, displaying coherent and balanced features despite harsh or even traumatic attachment experiences. Among complexly-traumatized individuals, psychological functioning and coherence of mind can vary substantially from one context to another (Nijenhuis, van Der Hart, & Steele, 2010). Hence, the 'earned' Security that the mothers manifested in the structured interview situation with a familiar interviewer might not have a predictive value for their self-regulation and dyadic interactions in other contexts.

A further note is that classification systems developed among normative populations may under-recognize some of the risks in complexly-traumatized mothers' semi-structured representational interviews. Through detailed inspection of some substance-abusing mothers' narratives labeled as

'Secure' or, alternatively, 'highly mentalizing', risks such as descriptions of past dissociation, ability to mentalize one's substance abuse but not the infant, or very hostile representations of the infant, are nonetheless discovered, which leave the rater uneasy and unsatisfied with the classification (personal communication with M. Flykt and A. Slade, 2016).

The substance-abusing mothers' Insecure attachment representations also differed from those of the comparison mothers. The high Incoherence and Derogation found in these narratives resemble, in fact, the pervasively unintegrated nature of representations characteristic to complexly-traumatized mothers, as described by Lyons-Ruth et al. (2003, 2005) in the Hostile/Helpless theory. The fact that some substance-abusing mothers'attachment representations received the broader, yet somewhat vague, "Cannot Classify" categorization, further strengthens the view of a global, rather than local, break-down in representational strategy. In accordance with preliminary evidence from a previous study (Finger, 2006), we suggest that Hostile/Helpless mental representations are likely more central risk indicators among substance-abusing mothers than Insecure representations.

The study on Palestinian mothers' caregiving representations (Article III) identified Dysregulating, Unavailable, and Fearful features as core risks. The representations displayed both group-specific and general risk characteristics. Specific to the Palestinian context was that the mothers primarily perceived themselves as caregivers to many, as opposed to showing 'primary maternal preoccupation' in relation to the specific infant. Dysregulating and Unavailable representations stemmed from the overwhelming difficulties of taking care of the extended family in high-stress conditions, and the constant threat of a new war gave rise to Fearfulness.

Particular to the Palestinian mothers' narratives was also that they showed a lack of psychological-emotional orientation in describing themselves as caregivers and their children. This led to seemingly contradictory (such as describing their nervous behaviors and then denying having any negative feelings) and arbitrary (such as talking about appearance or behavior when probed about experiences) answers. The finding is in line with studies showing that self-reflection and self-expression might be discouraged, and instead compliance and thinking about others emphasized, in socialization practices outside the Euro-American context in general (Keller, 2013), and in the Palestinian society in particular (Dwairy, 2004;

Kuittinen et al., 2015). Awareness of these cultural differences is necessary, and caution is warranted in ascribing qualifications such as 'Idealization' or 'Incoherence' to mental representations that lack a mentalizing stance among mothers in the Majority World.

However, cultural sensitivity should not be, and in our study was not found to be, a hindrance to identifying risks in caregiving representations, and for the specific child, across contexts. The Palestinian mothers' caregiving representations entailed descriptions of maternal emotional and dyadic dysregulation; hostile/helpless views of their infants as malevolent and themselves as too exhausted to attend to them; and Fearful hyper-arousal. As similar Flooding, Hostile/Helpless, and Fearful features have been identified among Euro-American, interpersonally-traumatized mothers' mental representations (George Solomon, 2008; Hesse & Main, 2000; Lyons-Ruth et al., 2005; Sleed, 2013), the result tentatively suggests that they characterize diverse complexly-traumatized mothers' representations, and are thus globally useful risk indicators.

The case study is, to our knowledge, the first attempt to study continuity and particularity of risks in caregiving representations, and to test the clinical validity of and overlap between diverse theory-defined caregiving risks. Although remarkable similarities in risks were found between Kati's attachment and caregiving representations, they were more pronounced in her caregiving representations, evident as a merger view of self and Paavo, clear Disorganization, and frequent lapses into Pre-mentalizing. As suggested by prior studies, the Preoccupied and Unresolved/Disorganized representations seemed to reflect similar, rather than distinct, states of mind (Haltigan et al., 2014).

As with the substance-abusing mothers, the lesser risks in Kati's attachment representations may partly be a product of assessment protocol: they were coded from an interview conducted in a structured situation with a 'regulating other' (the psychotherapist), whereas the caregiving representations were derived from Kati's real-life, stress-eliciting psychotherapy sessions and interaction situations with Paavo. Further, whereas 'clear' trauma experiences (such as physical abuse or loss of primary caregiver) were criteria for Unresolved/Disorganized classification in the AAI, indicators of disorganization were searched for in the whole of the caregiving representations. Despite these differences in assessment, or even because of them, it is likely that the observed caregiving risks provide a more valid

assessment of the extent of problems in Kati's caregiving when alone with Paavo. In line with others (Lyons-Ruth, 2003; Lyons-Ruth et al., 1999b), we suggest that complexly-traumatized mothers' caregiving assessment should show cross-context validity from laboratory/interview situations to observations made in families' naturalistic settings, such as homes or parent–infant clinics.

Comparison of Insecure, Hostile/Helpless, and Pre-mentalizing conceptualizations showed that the criteria for unintegrated (Bad/Worthless, Fearful, Hostile, and Helpless) representations was most extensive in capturing Kati's caregiving representational risks. In addition, the Hostile/Helpless framework recognized a broader variety of Fearfulness than depicted with the Insecure criteria, and Helplessness that was not recognized as lapse to any of the Pre-mentalizing modes. Particular to the Fearfulness and Helplessness in Kati's caregiving representations was that they were concretely related to her everyday parenting. It seems likely that they reflect particular hyper- and hypo-arousal, or flight and freeze, responses elicited by the caregiving role.

The results of the case study suggest that it might be clinically relevant to screen and target interventions on attachment-traumatized mothers' Disorganized/Merged and Hostile/Helpless caregiving representations, which, in Kati's case, mostly also indicated a breakdown in her mentalizing. Naturally, further research that tests the fit of this risk profile to other mothers is needed.

In sum, Unintegrated Hostile/Fearful-Helpless features were found in all the studied mothers' mental representations, and emotionally dysregulated (Flooded) (Articles III and IV) **as well as Enmeshed/Merged features** (Articles I and IV) **were central risks in two out of three studies.** Further studies are needed to show whether Enmeshment, which characterized the substance-abusing and case study mothers' representations but not those of the Palestinian mothers, is a risk only among mothers living in 'Western' societies, where it interferes with the desired socialization goal of individuation and self/other differentiation (Keller, 2013). Also, specific focus on identifying Bad/Worthless features of mental representations, which were prevalent in Kati's working models, may help in detecting 'hidden' risks among diverse traumatized mothers. On a more global note, generalization of the current results demands confirmatory

research where the identified high-risk dimensions are assessed with the same criteria and tools across diverse groups of traumatized mothers.

5.3 Did mental representations and mental health symptoms transmit maternal trauma-related dysregulation?

The results of this dissertation offer only very limited support for the hypothesis that mental health symptoms and mental representations transmit the harmful effects of studied mothers' complex trauma onto the pre- and postnatal periods. Of all the presumed associations, only the Palestinian mothers' PTSD symptoms were found to compromise the quality of their interactions with their infants (Article III). However, we suggest that the use of assessment tools developed among normative Euro-American populations, measurement of general psychological processes rather than those specific to the pre-and postnatal periods, and the use of self-report measures may explain the lack of associations to a large extent.

In Article I it was found that, contrary to theory, Secure attachment representations disposed the substance-abusing mothers to imbalanced pregnancy-related emotion processing: low meta-evaluation and high negative cognitive appraisals. As with the Secure/Insecure criteria for attachment representations, the measure of emotion processing might show limitations in differentiating between high-risk mothers' adaptive and maladaptive prenatal emotional development. As the mothers were enrolled in treatment, the 'imbalanced' emotion processing might have reflected the Secure mothers' ability to openly deal with their confusion (evident as lack of meta-evaluation) and ambivalence arising from the discrepancy between their previous lifestyles and the demands of becoming a mother (evident as high negative cognitive appraisals of pregnancy). If this were so, the Dismissing substance-abusing mothers' lesser *expressions* of confusion/ambivalence would fit with the over-regulating profile of Dismissing individuals in general.

However, even if the Secure substance-abusing mothers' emotional processing was not interpreted as problematic, we found that they were still particularly intrusive with their infants. This can reflect the Secure mothers' greater attempts to engage with their infants, but from the point of view of the infant, the behaviors are still problematic and result in infants' need to withdraw (see also Beebe, 2000; Reck et al., 2004).

Neither the substance-abusing mothers' attachment representations nor the Palestinian mothers' caregiving representations (Article III) were associated with the emotional availability with their infants in hypothesized ways. These null findings might be partly due to the focus on maternal sensitivity in the Emotional Availability measures. As noted throughout this dissertation, maternal behaviors that dysregulate the infant, rather than maternal lack of sensitivity, characterize traumatized mothers' caregiving risks (Haltigan et al., 2017; Lyons-Ruth et al., 1999b; Madigan et al., 2006). Further studies are needed where 'atypical', or dysregulating, caregiving behaviors of war-traumatized and substance-abusing mothers are assessed.

Contrary to the hypothesis, the Palestinian infants' stress regulation did not seem to be impacted by maternal trauma exposure or prenatal mental health (Article II). Instead, we found that high levels of maternal childhood emotional abuse were predictive of infant negative emotionality, but only among women with low current war exposure, and that highly depressed mothers reported having infants that soothed easily. An important note is that Palestinian mothers' self-reports were used in assessing both infant stress regulation and dyadic interaction quality. In line with previous accounts, we suggest that war-traumatized mothers' tendency to avoid their infants' distress (Feldman & Vengrober, 2011; Kaitz et al., 2009) as well as unreliable reporting of infants' characteristics (van Ee et al., 2012) may contribute to the low reportings of infant negative emotionality and lack of dyadic problems. We further suggest that the Palestinian mothers might be culturally inclined to disregard their own and their infants' negative emotions, and perhaps in the same vein, avoid reporting of relational difficulties. Further research is needed where the impacts of maternal trauma, and the mediating role of pre- and postnatal mental health on infant stress regulation and mother–infant interactions, is studied using objective measures.

A further note is that very little is known about optimal individual stress regulation development, as well as demands of caregiving, in dangerous contexts. The level of maternal stress hormones that are transmitted to the infant *in utero* prepare him/her for the demands of the postnatal environment (Del Giudice, 2012; Sandman, Davis, Buss, & Glynn, 2011). Thus, the finding that mothers with higher prenatal depressive symptoms and higher war exposure prior to pregnancy reported having 'well-regulated' infants might reflect an adaptive programming effect of Palestinian infants'

exposure to prenatal stress on their postnatal development. However, prenatal programming, postnatal caregiving, and infant characteristics form a highly complex matrix that influences individuals' later adaptation and maladaptation to his/her environment (Feldman, Monakhov, Pratt, & Epstein, 2016; Nederhof & Schmidt, 2011; Pluess & Belsky, 2011), and its exploration is beyond the scope of the current dissertation. Concerning caregiving, it might be that with assessment tools developed among Euro-American mothers, the current examination disregarded some maternal behaviors (in addition to the suggested dysregulating ones) that are salient for war-affected Palestinian infants' development (e.g., Feldman, Masalha, & Alony, 2006; Feldman & Masalha, 2010).

Despite the limitations in assessment, this dissertation contributes to clarifying the previously understudied link between maternal pre- and postnatal mental health symptoms and representational risks. Palestinian mothers' prenatal depression and postnatal PTSD disposed their caregiving representations to Dysregulating and Fearful distortions, while war exposure alone did not have a similarly harmful effect. The result concurs with the idea that only when mothers' traumatic experiences lead to psychopathology is caregiving compromised (Feldman & Vengrober, 2011; Scheeringa & Zeanah, 2001), and contributes to prior knowledge in showing that mental health symptoms do not only jeopardize caregiving behavior but also representations. Further research needs to substantiate the finding among complexly-traumatized mothers more broadly.

The case study did not explore links between Kati's mental representations and her caregiving behavior, but the high-risk representations communicated severe self- and dyadic dysregulation. Kati's over-aroused fearfulness and paralyzing helplessness likely reflect the fragile stress and affect regulation that characterizes complex trauma survivors (Corrigan, Fisher, & Nutt, 2011; van der Kolk, 1996). The very negative views that Kati showed both of herself and of Paavo correspond to the core sense of shame of complexly-traumatized individuals (Courtois, 2008; Herman, 1992), but also to negative cognitions and rumination that characterize depressed and anxious mothers (Pajulo et al., 2001; Stein et al., 2012). Future research is needed where these links are investigated with validated mental health assessment.

Kati experienced her representations/mental states, such as views of Paavo's or her own hostility, or fearful anticipation that something bad could

happen, as realities (Psychical equivalence) and consequently became more distressed at their occurrence. In tandem, and as a result of her dysregulating early experiences, Kati was very sensitive to the normative stresses of early parenting, such as sleep deprivation or Paavo's undesired behavior. Especially when Kati felt over-stressed by motherhood, the problematic caregiving representations filled her mind (Isosävi & Wahlström, 2018). Thus, as suggested in prior research, also in Kati's case, the activation of unintegrated caregiving representations was key in compromising her self-regulation. The results of the case study highlight that the specific stresses of early motherhood contribute to the representational risks.

In sum, our results suggest that valid assessment of complexly-traumatized women's risks in transition to motherhood calls for focus on psychological processes specific to the developmental phase; consideration of cultural diversity in caregiving and infant development; and use of objective rather than subjective measures.

5.4 Strengths and limitations of the study

The strengths of this dissertation involve investigating several hard-to-reach high-risk groups; the longitudinal settings in Articles I, II, and III; combining quantitative and qualitative approaches; and avoiding predetermination of risks through use of an exploratory approach in Article III. In Article IV, specific strengths are that data from a natural clinical context were used, and that the results serve as 'practice-based evidence' (Green, 2008) of the utility of theories in identifying central clinical risks among traumatized mothers' caregiving representations.

Limitations related to the measures used include relying on traumatized mothers' self-reports (Articles II and III); assessing high-risk mothers' mental representations and mother–infant interaction with tools developed among normative Euro-American parents (Articles I and III); and retrospective reporting of childhood abuse (Article II). In addition, the reliability of IBQ-R in Article II was only moderate, and the revised scale limits comparison of the current results to other studies applying the same measure. As the analysis of Palestinian mothers' representation structure was exploratory and ignored some of the items' cross-loadings, further confirmatory analyses are needed.

Limitations in statistical analysis include the small sample sizes in Articles I and III, which restrain generalization of the results and may have contributed to the lack of observed associations between studied maternal characteristics and mother–infant interaction quality.

The diverse settings and tasks involved in the studies did not allow for comparison of the studied phenomena across the different participants, and this is a task for future studies. Effects of some important risk factors were not assessed, such as infant *in utero* substance exposure in Article I and infant direct exposure to warfare in Articles II and III. Lastly, this dissertation only concentrated on risks, and disregarded the importance of relationships with other caregivers (such as fathers, partners, and extended family members) on infant development. Future research should investigate maternal and wider familial protective and resiliency-enhancing characteristics.

5.5 Clinical implications and directions for further studies

5.5.1 Implications for assessing traumatized mothers' mental representations, mental health, and parent–infant interactions

Clinicians should be aware of the specific developmental tasks and challenges that the transition to motherhood poses to traumatized women. In evaluating maternal trauma-related dysregulation, considering how this affects a mother's ability to regulate her infant is pivotal. Clinicians should be aware and respectful of cultural and contextual variations in caregiving, but these should not stand in way of identifying dysregulating forms of caregiving.

Screening for mothers' caregiver-inflicted early trauma is important across diverse contexts. Assessing such experiences and related mental health symptoms already at the prenatal stage could help in early detection of women at the highest risk for dysregulating caregiving. In addition, as accumulated socio-economic difficulties pose severe risks to the pre- and postnatal periods, mothers' situational stressors should be evaluated prenatally and the most burdened families helped promptly.

We suggest that, in addition to complexly-traumatized mothers' pre- and postnatal mental health symptoms, a wider range of maternal dysregulation should be recognized as a relational risk. The 'flooded' unmodulated arousal

and affect displayed by traumatized mothers accompany diagnosable mental health symptoms and impact caregiving. Identification of subtle indicators of dysregulation, such as maternal fearfulness and helplessness, is needed to prevent transgenerational transmission of trauma among dyads without accumulated stressors.

In order to gain a valid understanding of how maternal dysregulation contributes to caregiving, traumatized mothers and their infants should be assessed not only in structured situations, but also in naturalistic environments. As complexly-traumatized mothers' functioning as a parent can fluctuate considerably, assessment of situational, rather than stable, self-regulation would be informative (see, e.g., Chow, Ram, Boker, Fujita, & Clore, 2005; Kashdan & Collins, 2010; Kuppens & Verdyun, 2017). Of particular interest is how mothers' self-regulation varies between caregiving and other situations. Using this information in interventions would serve to enhance maternal self-reflection.

In future studies, diverse high-risk mothers should be used as informants in identifying group-specific variation in organization and disorganization of caregiving. Such '*emic'* approach would ensure that pre-fixed assumptions based on research on other groups of mothers would not stand in way of finding the most salient risk and resilience factors in a given context (Yin, 2015).

Assessment of complexly-traumatized mothers' attachment and caregiving representations should concentrate on high-risk features such as Hostility, Helplessness, Fearfulness, Enmeshment, and Emotional Dysregulation. Tools such as the ARR (Sleed, 2013; Sleed et al., 2017) have been developed for this purpose. Assessing the degree of the risks (i.e., a dimensional approach) is likely more informative than a categorical approach in determining their likelihood of disturbing caregiving at a behavioral level (Fraley & Spieker, 2003; Roisman, Fraley, & Belsky, 2005, Sleed, 2013). Identification of specific risk phenomena, such as Pre-mentalizing modes, or more recently suggested *trauma-specific reflective functioning* (Berthelot et al., 2015; Ensink, Berthelot, Bernazzani, Normandin, & Fonagy, 2014), is likely to be more clinically useful than assessment of general level of parental mentalizing.

Relational dysregulation among traumatized mothers and their infants is likely best captured with tools that specifically depict such maternal behaviors, such as the Atypical Maternal Behavior Instrument for

Assessment and Classification (AMBIANCE; Bronfman, Parsons, & Lyons-Ruth, 1999). Future research is needed on the cross-cultural profiles of dysregulating caregiving behavior, as well as their change in caregiver–infant interventions.

5.5.2 Implications for relational interventions for complexly-traumatized mothers and their infants

Interventions for complexly-traumatized women should start during pregnancy. Mothers with multiple stressors need prompt and multidisciplinary help; this not only aids women in preparation for motherhood, but also protects the *in utero* infant from harmful effects of maternal stress and mental health symptoms (Dunkel, Schetter, & Tanner, 2012; Lahti et al., 2017; Madigan et al., 2018). High-risk representational features can also be identified during pregnancy (Crawford & Benoit, 2009; Terry, 2018). Intervening with them early on could prevent distorted working models from becoming established as a mother's permanent view of herself and of her child.

As complexly-traumatized mothers suffer from pervasive stress and emotional regulation difficulties, establishing a secure and regulating relationship with them should be the basis for any intervention (Belt & Punamäki, 2007; Lyons-Ruth & Spielman, 2004). Diverse approaches suggest that a secure relationship allows the mother to gain understanding about the origins and current catalysts of her dysregulation, and that this is a precondition to reflect on her caregiving and relationship with her infant (Ben-Porath, 2010; Nijssens et al., 2012). Clinicians should be aware of the dysregulating effect of activating mental representations and caregiver–infant interaction on maternal functioning, and help traumatized mothers in restoring self-regulation (Ruismäki et al., 2016) prior to attempts to induce change in mental representations or caregiving behavior. Use of video feedback can be particularly useful in creating less emotionally-charged situations for traumatized mothers to reflect on their own and their infants' experiences (Fukkink, Trienekers, & Kramer 2011; Schechter et al., 2006).

Based on the results of this dissertation, and prior formulations by psychotherapy pioneers (e.g., Lieberman & van Horn, 2011; Schechter & Sherpa, 2014), interventions could enhance adaptive and regulated

relationships between traumatized mothers and their infants by: reducing mothers' self-blame and sense of worthlessness; reducing mothers' fearfulness and over-arousal; helping mothers to make age-appropriate and benevolent interpretations of their infants' communications, and to accept their own aggressive emotions; enhancing mothers' assertiveness and limit-setting; and striving to differentiate self-as-caregiver from one's early traumatic experiences, and the infant's intentions from one's own. Triadic and whole-family interventions are needed to decrease maternal stress, enhance treatment efficacy and generalization to real life, support co-parenting, and promote infants' secure attachments to other caregivers (Feinberg & Kan, 2008; Panter-Brick et al., 2014; Punamäki, Qouta, & Peltonen, 2017). To maintain the ability to help parents and infants, clinicians should be mindful of the dysregulating impact of working with high-risk families on their own emotions and thinking.

The statements above are mainly derived from studies of Euro-American traumatized women. More research and clinical understanding are needed to meet the needs of war-exposed mothers and their children in their particular contexts and in refuge. The matter is urgent, as there are currently more war trauma survivors than ever before (UN Refugee Agency, 2018-19). Mothers living in, or originating from, collectivistic cultures might suffer from mental health problems specifically due to low social support, and the lack of social support further compromises their caregiving (Feldman & Masalha, 2007; Punamäki et al., 2005). Accordingly, war-affected mothers might especially benefit from strengthening of social support, such as mobilizing extended family members in conflict zones and/or enrollment in peer group interventions after migration or forced displacement. We further suggest that relieving war-exposed mothers' burdening, increasing their understanding of their infants' regulatory needs, and help in making less malevolent interpretations of the infants' signals could prevent the mothers from transmitting their early and later trauma experiences onto their children.

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PUBLICATIONS

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Attachment Representations Among Substance-Abusing Women in Transition to Motherhood: Implications for Prenatal Emotions and Mother-Infant Interaction

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Attachment representations among substance-abusing women in transition to motherhood: implications for prenatal emotions and mother–infant interaction

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ABSTRACT

We studied how attachment representations contribute to central components of transition to motherhood, prenatal emotion processing (EP) and emotional availability (EA) of mother–infant interaction, and whether there are group specific differences. Participants were 51 treatment-enrolled substance-abusing (SA) mothers and their infants and 50 non-using comparison dyads with obstetric risk. Mother's attachment representations (AAI) and EP were assessed prenatally and EA when infants were four months. Results showed that autonomous attachment only had a buffering effect on prenatal EP among comparisons. All SA mothers showed more dysfunctional EP than comparisons and, contrary to comparisons, autonomous SA mothers reported more negative cognitive appraisals and less meta-evaluation of emotions than dismissing SA mothers. Preoccupied SA mothers showed high negative cognitive appraisals, suggesting under-regulation of emotions. Attachment representations were not associated with EA in either group; rather, SA status contributed to global risk in the relationship. Surprisingly, autonomous SA mothers showed a tendency towards intrusiveness. We propose that obstetric risk among comparisons and adverse relational experiences among almost all SA mothers might override the protective role of mother's autonomous representations for dyadic interaction. We conclude that prenatal emotional turbulence and high interaction risk of all SA mothers calls for holistic treatment for the dyad.

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Substance-abusing (SA) women face cumulative risks in transition to parenthood. Pregnancy commonly reactivates representations of one's own childhood experiences, and the histories revisited by SA mothers are often insecure, violent, and colored with parental substance abuse (Nair, Schuler, Black, Kettinger, & Harrington, 2003). Accordingly, similar to other high-risk mothers, their representations of childhood caregivers are often incoherent, contradictory, and characterized by unresolved trauma

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experience (Finger, 2006; Lyons-Ruth, Yellin, Melnick, & Atwood, 2005). Furthermore, these women face an accumulation of social, legal, and economic stressors during the perinatal period (Belt, Punamäki, Pajulo, Posa, & Tamminen, 2009; Nair et al., 2003). Some research suggests that SA pregnant women experience dysfunctional and intensively negative emotions when preparing for motherhood (Mayes & Truman, 2002; Punamäki, Belt, & Posa, 2013). Also, there is ample evidence of problematic mother–infant relationship quality among SA dyads, involving hostile, flat, intrusive, and emotionally mismatched interactions (Flykt et al., 2012; Hans, 2002; Pajulo, Suchman, Kalland, & Mayes, 2006; Tronick et al., 2005). Attachment representations are considered to be central organizers of emotionality and interpersonal relationships, especially in life transitions (Bretherton & Munholland, 2008). Still, we lack knowledge of their possibly protective or predisposing role in transition to parenthood among high-risk, SA women. Here, we analyze how attachment representations contribute to prenatal emotion processing (EP) and mother–infant interaction quality among Finnish SA and comparison mothers.

Attachment representations among substance abusers

Attachment representations are working models comprising meanings given to childhood experiences with primary caregivers (Hesse, 2008). When expecting a baby, these models become reactivated (Raphael-Leff, 1991; Stern, 1995). Based on the adult attachment interview (AAI; Main, Goldwyn, & Hesse, 2003), individuals' narratives of childhood experiences are classified as secure/autonomous (F, "free"), insecure/dismissing (Ds), and insecure/preoccupied (E, "enmeshed"). In addition to these three organized categories, an unresolved/disorganized (U) classification can be given regarding a specific loss or trauma. Further, if the attachment-related mental model(s) are more globally disorganized, a transcript receives a "cannot classify" (CC) rating (Hesse, 2008; Hesse & Main, 2000).

Autonomous individuals can fruitfully describe both positive and negative childhood experiences and the emotions they evoke. Also, they are able to evaluate experiences and their meaning in a meta-level. The coherence, freshness, and free flow of speech distinguish autonomous narratives from non-autonomous ones. In cases where an individual reports very unloving parenting behavior and still receives an autonomous classification, the transcript may be given an "earned secure/autonomous" label, implying that, despite harsh childhood relational experiences, the subject has succeeded in constructing balanced and coherent working models of attachment (Main et al., 2003).

Dismissing individuals typically turn attention away from negative experiences and emotions. Dismissing persons often claim their feelings are not hurt, or at least deny the impact of hurt or negative emotions upon them. The narratives are characterized by insistence upon lack of memory, idealization of one or both parents, and/or derogation of attachment (Hesse, 2008). Preoccupied individuals, in turn, seem overwhelmed by their experiences and are typically lost in their emotions when talking about them. They have difficulty coherently describing their emotions and instead exhibit active anger, fear, and/or confusion, the latter manifesting as passive, non-clear discussion (Hesse, 2008). Unresolved individuals differ qualitatively from individuals with organized attachment strategies, exhibiting disorientation or disorganization of discourse, reasoning, or

behavior specifically while discussing loss or trauma. These phenomena are seen as local breakdown in adaptive attentional and emotional strategies, and can appear at the levels of narrative/text (coherence of transcript) and/or ideation (coherence of mind) (Hesse & Main, 2000). Narratives receiving a CC rating are characterized by multiple and/or contradictory mental models with regard to self and one or several caregivers, and they reflect a more global breakdown of attentional–emotional strategies (Hesse, 2008; Hesse & Main, 2000).

Both organized insecure representations and U/CC representations are overrepresented among SA individuals. A meta-analysis of more than 200 studies (Bakermans-Kranenburg & van IJzendoorn, 2009) reported an AAI distribution of 14% for F, 22% for Ds, 28% for E, and 36% for U/CC in a risk group of individuals using self-directed violence, including drug abuse. Studies of AAI distributions among SA individuals during pregnancy or early parenting also consistently report high levels of insecure and unresolved/cannot classify strategies, ranging from 20–33% for Ds, 13–31% for E, and 22–45% for U or U/CC (Borelli, Goshin, Joestl, Clark, & Byrne, 2010; Finger, 2006; Riggs & Jacobvitz, 2002; Simonelli & Vizziello, 2002). In comparison, normative North American mothers show a distribution of 56% for F, 16% for Ds, 9% for E, and 18% for U/CC (Bakermans-Kranenburg & van IJzendoorn, 2009). Of normative Finnish mothers, 60% are classified as F, 24% as Ds, 6% as E, and 10% as U (Kouvo & Silvén, 2010).

The high rate of insecure and unresolved strategies among SA individuals is understandable, considering that experiences of neglect and abuse in relation to their own parents are common (Freeman, Collier, & Parillo, 2002; Medrano, Hatch, Zule, & Desmond, 2002). In concluding their meta-analysis, Bakermans-Kranenburg and van IJzendoorn (2009) suggested that a more specific analysis of clinical groups' attachment representations would be informative in understanding symptomatology. To our knowledge, this has not yet been done among SA mothers.

Prenatal emotion processing

During pregnancy, great demands for identity and role changes and parallel physiological and hormonal processes dispose future mothers to emotional turmoil. Ambivalence with both positive and negative emotions is common, reflecting the identity work of the mother-to-be and the demand for her to give up previously central interests and place her own needs as secondary. This emotional openness is conceptualized as serving mothers' ability to sensitize to their infants' emotional communications and needs (Raphael-Leff, 1991). Processing these diverse emotions provides information of the changing situation, and is thus inherently regulating (Gross & John, 2003). Besides considering the valence (positivity or negativity) of emotions, it is imperative to recognize emotions as multi-level phenomena manifesting in behavioral, psychophysiological, and experiential levels (Frijda, 1986; Scherer, 2001). In this study, we apply Frijda's (1986) multifocal theory of emotions, as it captures the valence and intensity of emotions at four levels: feeling states (e.g., agitated or calm feelings), behavioral urges to act (e.g., bodily sensations, urges to hit or hug), cognitive appraisals (e.g., perceived threat or mastery), and meta-evaluation of emotions (e.g., familiarity or strangeness).

Attachment theory is informative in explaining how and why individuals process and regulate their positive and negative emotions differently (Bretherton &

Munholland, 2008; Cassidy, 1994). Whereas autonomous individuals are able to explore a range of emotions in a balanced manner, dismissing individuals tend to over-regulate their emotions and preoccupied individuals under-regulate them (Cassidy, 1994). U/CC discourse in itself is conceptualized as an indicator of inability to form an organized attentional–emotional strategy when describing traumatic experiences (Hesse & Main, 2000). Some studies confirm that autonomous and insecure attachment representations contribute differently to emotionality. Adam, Gunnar, and Tanaka (2004) found that dismissing mothers of toddlers expressed less positive affect than autonomous or preoccupied mothers, whereas preoccupied mothers expressed more negative emotions than autonomous or dismissing mothers. Applying Frijda's multifocal theory of emotions, Kanninen, Punamäki, and Qouta (2003) showed that, among male trauma survivors, autonomous individuals exhibited balanced EP, evident as presence of both negative and positive valence, moderate intensity, and access to multiple EP (cognitive, feeling state, and behavioral) levels. Unbalanced EP, in turn, was typical to insecure individuals. Preoccupied individuals showed intensive feelings states and behavioral urges to act and lacked cognitive framing, whereas dismissing individuals relied solely on cognitive processing strategies. We found no empirical studies on the association between U/CC representations and EP. Further, to our knowledge, no studies are available on the role of attachment representations for mothers' EP in the prenatal period.

SA individuals may use substances in order to cope with overwhelmingly painful emotions (Cihan, Winstead, Laulis, & Feit, 2014; Padykula & Conklin, 2010). The demand to give up substances during pregnancy can result in a lack of EP strategies, reflected as high rates of anxiety, depression, and other psychopathologies that are common among SA mothers (Hans, Bernstein, & Henson, 1999; Pajulo et al., 2012). Such prenatal emotional imbalance can complicate the preparation for motherhood. A qualitative study showed that SA mothers attempt to balance between feelings of despair and hopefulness as well as identities of drug addict and mother (Brudenell, 1997). Feelings of guilt and fear about having harmed the infant with SA are common (Mayes & Truman, 2002). Previous studies suggest that SA mothers' intensive negative emotions may be dysfunctional rather than reflect moderate ambivalence (Mayes & Truman, 2002; Punamäki et al., 2013). Impulsivity and a low sense of mastery and predictability also characterize SA mothers' prenatal EP (Punamäki et al., 2013). Importantly, mothers' prenatal emotional imbalance, together with substance abuse, can compromise fetal in utero development, impacting fetus' immature stress and emotion regulation systems (Fisher, Kim, Bruce, & Pears, 2012; Lester, 2002).

Some research suggests that SA individuals' emotional problems and attempt to self-medicate them are characteristic of insecure individuals (e.g., Crittenden & Claussen, 2002; Magai, 1999). There is evidence that especially insecure SAs show emotional dysfunction such as depressive mood (Diaz, Horton, & Malloy, 2014); are unable to name and recognize emotions (De Rick & Vanheule, 2006); and cope poorly with negative emotions (Gatmaitan, 2013). Still, previous research has not considered how attachment representations contribute to SA individuals' emotionality in transition to parenthood.

Quality of parent–infant interaction

A cornerstone of attachment theory is that parents' representations have intergenerational effects that are evident in the quality of the mother–infant relationship. Autonomous mothers are sensitive and synchronous in interactions with their infants (Biringen et al., 2000; Crandell, Fitzgerald, & Whipple, 1997; Main, Kaplan, & Cassidy, 1985), and are able to regulate their infants' positive and negative emotions (Riva Crugnola et al., 2013). This results in infants' ability to form a secure attachment to their mothers (Fonagy, Steele, & Steele, 1991; van IJzendoorn, 1995). Preoccupied mothers have been shown to be angry and intrusive in their interactions (Adam et al., 2004), and dismissing mothers lack responsiveness and the ability to regulate their infants' negative emotions (Riva Crugnola et al., 2013). Finally, maternal U/CC representations are associated with anomalous and dysregulative parenting behaviors (Madigan et al., 2006).

There is ample evidence that SA mothers display global difficulties in dyadic interaction. They may fail to attune to their infants' emotional states (Pajulo et al., 2012; Tronick et al., 2005), lack structuring abilities (Belt et al., 2012; Pajulo, Savonlahti, Sourander, Piha, & Helenius, 2001; Salo et al., 2010), and act in intrusive, flat, and/or hostile manner (Belt et al., 2012; Flykt et al., 2012; Suchman, McMahon, Slade, & Luthar, 2005). Also, infants' interactive abilities can be compromised by mothers' use of illicit drugs during pregnancy, due to in utero exposure and consequential perinatal problems such as premature birth, low infant birth weight, and neonatal abstinence syndrome (Fischer, Bitschnau, Peternell, Eder, & Topitz, 1999; Minear & Zuckerman, 2013). Mothers' prenatal stress, depression, and anxiety can have similar harmful effects (Davis et al., 2004; Talge, Neal, & Glover, 2007). As a consequence, infants are harder to soothe and face difficulty engaging in dyadic interactions (Beeghly, Frank, Rose-Jacobs, Cabral, & Tronick, 2003). However, there is still a research gap concerning the role of attachment representations for the early mother–infant interaction quality among SA dyads.

Approach of the study

Attachment representations are thought to play a central role in transition to parenthood, yet their contribution remains uninvestigated among SA, high-risk mothers. This study analyzes how attachment representations are associated with prenatal EP, mother–infant interaction quality, and emotional availability (EA) among SA mothers and their non-using comparisons. The aims of the study are as follows:

(1) To identify the distributions of AAI classifications among SA and non-using comparison pregnant women. We hypothesize that SA mothers are more often non-autonomous (non-F), that is, insecure (dismissing [Ds] and preoccupied [E]) and unresolved or cannot classify (U/CC) than comparison mothers. Further, as suggested by Bakermans-Kranenburg and van IJzendoorn (2009), we expand the analysis to the central continuous subscales of AAI, exploring group differences in "earned secure" status, coherence of transcript and mind, reported losses and traumatic experiences, and related U states of mind; and states of mind related to the insecure classifications (Ds: idealization, derogation, and insistence upon lack

of memory; E: passivity and preoccupying anger). In addition, among the SA mothers, we explore whether attachment status is associated with features of SA indicating high risk/dependency, namely, prenatal and postnatal use of intravenous drugs, self-estimated psychological and physiological dependency on substances, and continued substance abuse (relapses) in the postnatal period.

(2) To examine how attachment representations are associated with prenatal EP and whether the associations differ between SA and comparison women. Our hypotheses are as follows:

(3) Non-F, especially E and U/CC mothers, show higher negative EP than F mothers, regardless of SA status. The hypothesis is due to previous results of E mothers' high expression of negative emotions and U/CC individuals' profile of showing lapses in attentional–emotional strategies.

(4) F mothers show higher meta-evaluation of prenatal emotions than the non-F groups in both SA and comparison groups due to their greater openness to diverse emotional experiences.

(5) To analyze the associations between mothers' attachment representations and mother–infant EA when the infants are four months old. We hypothesize that regardless of SA status, dyads with F mothers have higher EA than dyads with non-F mothers.

Method

Participants and procedure

The participants were 101 Finnish mothers and their infants (43.4% girls, 56.6% boys). Fifty-one of the participants were SA mothers with a psychiatric drug dependency diagnosis and more than three years of illicit drug use or polysubstance use history, evident from self-report and/or drug screening. They were enrolled in two intensive and holistic treatment programs in two SA family clinics: psychodynamic mother–infant group therapy (PGT) (n = 26) that comprised 20–24 weekly sessions, and individually tailored psychosocial support intervention (PSS) (n = 25), where appointments were arranged once or twice per week at the outpatient units or at home, and lasted on average of 12 months. The interventions started during pregnancy or after delivery and continued as active treatment and/or follow-up during the first year of the infant's life. (For a detailed account of the interventions, see Belt et al., 2012.)

Fifty of the participants comprised the comparison group. They were recruited from a maternity-outpatient clinic where they were followed for obstetric risks such as gestational diabetes, premature labor symptoms, or abnormalities in the ultrasound. Mothers with a lifetime history of illicit drug use or moderate to high alcohol consumption were excluded from the comparison group. Smoking was not an exclusion criterion in either group. Women with obstetric risks were selected as the comparison group because prenatal and perinatal complications are common among SA mothers, and the choice ensured that the two groups would not differ in terms of obstetric characteristics. Among both SA and comparison mothers, about half of the mothers were primiparous and half already had one to three children.

Study protocol was identical for both groups, comprising three assessment visits: T1 at the second or third trimester of pregnancy (or immediately after delivery, $n = 7$), T2 when the infants were four months old, and T3 when the infants were 12 months old. To avoid confounding the effects of treatment programs on the results, this study utilizes data from T1 and T2 but not T3. Consecutive clients of the clinics were informed about the study and its purpose (exploring mothers' experiences of pregnancy and early motherhood), its voluntary nature, and procedure at T1. The mothers willing to participate signed an informed consent form and were given the baseline questionnaire to be completed and returned at the following appointment, at which point the mothers were interviewed. T2 visits were administered at families' homes or at program residences, and included videotaping of mother–infant free-play interaction. The ethical committees of Päijät-Häme Central Hospital and the City of Tampere, Finland, approved this study.

Originally, 108 mothers were approached for the study. All comparison mothers approached agreed to participate. Seven SA mothers were excluded from the study as two declined, two had missing data, and three had been abstinent for several years, which left 101 participants for the final analysis. With the five comparison families that had twins, data of only one randomly selected twin was used in the analysis. Dropout rates from T1 to T2 were 8% ($n = 4$) in the SA and 14% ($n = 7$) in the comparison group. Mothers with lower education level (chi-square [χ^2] (3) = 14.66, $p < .01$) and single marital status (χ^2 (4) = 16.04, $p < .01$) had higher dropout rates (for further details of attrition rates see Belt et al., 2009; for a flow chart see Belt, 2012).

The present analysis is based on the 91 cases with AAI's administered. This number comprises 43 (84.3%) SA and 48 (96%) comparison mothers. Due to missing values of EP and EA, the final number was 31–36 (72.1–83.7%) SA and 47–48 (98–100%) comparison mothers in EP analysis and 33 (76.7%) SA and 42 (87.5%) comparison dyads in EA analysis.

Measures

Demographic and obstetric characteristics

Prenatally, mothers answered questions about age, length of their current relationship, marital status, education level, employment status, number of previous children, and financial difficulties. They also reported the occurrence of pregnancy-related medical risks, namely high blood pressure, high blood sugar level, bleeding, premature contractions, threat of miscarriage, and abnormalities in ultrasound screenings.

SA characteristics

SA women were administered a semi-structured questionnaire about their use of eight different drugs (1 = *no*, 2 = *yes*: cannabis, amphetamine, ecstasy, heroin, sniffing medicaments, lysergic acid diethylamide (LSD), medicines, and other (e.g., buprenorphine)). Open questions were used to indicate how often they had used each drug. Women reported their drug-use before pregnancy at T1, and indicated whether it had changed during pregnancy (1 = *no change*, 2 = *decreased*, 3 = *stopped*, 4 = *increased*). Postnatal drug-use was reported at T2, as well as changes in it after the delivery. In addition, women reported appraisal of psychological and physiological dependency on substances (1 = *not at all dependent*, 5 = *totally dependent*), the use of substitute

medication, and intravenous drug use. Alcohol consumption was assessed with seven items from the alcohol use disorders identification test (AUDIT; Saunders, Aasland, Babor, De la Fuente, & Grant, 1993). Comparison mothers were interviewed about their prenatal alcohol consumption by a public health nurse.

Attachment representations regarding own parents were assessed at T1 with the AAI (Main et al., 2003). The semi-structured interview explores how individuals describe their childhood relationships to their primary caregivers, and how these experiences are considered to influence their developmental history and current personality. The interview involves questions of attachment-activating incidents such as being hurt, upset, or separated from the caregiver, as well as questions of loss and trauma. Probable experiences in relation to caregivers and states of mind regarding attachment and loss/trauma are each scored on a scale ranging from 0–9 (for a detailed account of the coding system, see Hesse, 2008). Audiotaped narratives were transcribed verbatim and then classified into four categories: secure/autonomous (F), insecure/dismissing (Ds), insecure/preoccupied (E), and unresolved (U). Further, F transcripts that were given very low (< 3) score for loving behavior from either parent received a "earned secure" classification. The interviews classified as U received a secondary classification of one of the organized categories (F, Ds, or E). When a transcript did not fit to any of the above categories, it was categorized as cannot classify (CC). When a CC transcript was also assigned a U/d rating, the U/d was used as the primary classification.

The first author (S.I.), a reliable coder trained by A. Broberg and T. Ivarsson (AAI Institute in Oslo, 2012), classified the interviews. For interrater reliability, the second author (M.F.), trained by Broberg and Ivarsson in AAI institute in Gothenburg, 2011, analyzed 20% of the cases. The inter-rater reliability (Cohen's kappa) was .82, which is considered to be an excellent level of agreement (Fleiss, 1981). With the two cases rated differently, the classification was negotiated. Further, every transcript with a U or CC classification was double-checked by the second coder. Additionally, 24 transcripts were reread by the second author to ensure reliable classification. Finally, the AAI trainers (Broberg and Ivarsson) were consulted in the classification of one CC case without a primary U classification.

Prenatal emotion processing

EP variables are summarized in Table 1. The measurement of EP is based on the multifocal theory of emotional experience (Frijda, Kuipers, & Ter Schure, 1989; Larsen & Diener, 1992; Mayer & Stevens, 1994; Smith & Pope, 1992), which covers processing levels of cognitive appraisals (19 items), behavioral urges to act (17 items), feelings states (18 items), and meta-evaluation of emotions (8 items). Mothers were asked to estimate how intensively they experienced emotions related to their pregnancy on the Category Ratio-10 (CR10) scale (Borg, 1982), varying from 0 "nothing at all" to 10 "extremely strong". The sum variables were constructed separately for negative and positive emotional valence at each level of processing. The meta-emotion sum scale was a factor score (ranging from −6.67–6.50), as recommended by Mayer and Stevens (1994). The measure has been found to be reliable and valid among male war trauma victims (Näätänen, Kanninen, Qouta, & Punamäki, 2002) and employees with burn-out risk (Salmela-Aro, Näätänen, Tolvanen, & Nurmi, 2011). In this sample, the Cronbach's alpha values ranged from .71–.81.

Table 1. Descriptions of prenatal emotion processing variables.

Level of EP	Background theory	No. of items/ scale	Examples
Feeling states	Circumplex model of emotions (Larsen & Diener, 1992; Russell, 1980)		
Negative		18	"I feel sad / self-blaming / ashamed / angry"
Positive		27	"I feel happy / hopeful / trusting / relaxed"
Cognitive appraisals	Multifocal theory of emotions (Frijda et al., 1989)		
Negative		9	"My pregnancy is bothering me a lot" "I am helpless and not in control"
Positive		10	"I hoped for the pregnancy" "The pregnancy affects me positively"
Behavioral urges to act	Multifocal theory of emotions (Frijda et al., 1989)		
Negative		12	"I feel frozen or paralyzed from inside" "I feel like boiling inside"
Positive		5	" I feel like smiling and laughing all the time" " I feel like embracing the world"
Meta-evaluation of emotions	Meta-evaluation scale (Mayer & Stevens, 1994)	3	" I know exactly how I'm feeling" (clarity) "The feeling is familiar to me" (typicality) "There is nothing wrong in my feeling like that" (acceptability)

Quality of mother–infant interactions

Free-play mother–infant interaction was video-recorded for 7–10 minutes at T2. Mothers were instructed to play with their infants as they usually would. The videotapes were coded according to EA scales (4th ed.; Biringen, 2008). The interaction was evaluated on four maternal scales (sensitivity, structuring, nonintrusiveness, and nonhostility) and two child scales (responsiveness to mother and involvement of mother). The scales ranged from 1–7 (e.g., 1 = highly insensitive; 4 = inconsistently/apparently sensitive; 7 = highly sensitive). Sensitivity refers to mother's positive affect, ability to adequately read and respond to her infant's cues, acceptance of the infant, and ability to negotiate conflicts. Structuring refers to mother's age-specific scaffolding skills. Nonintrusiveness assesses how the mother can be available without interfering with the infant's autonomy. Nonhostility indicates lack of impatience, harshness, and malevolence in mother's behavior. Child responsiveness refers to infant's ability to respond to mother's interaction bids, and child involvement assesses to what degree the infant invites the mother to interact with her. The interactions were assessed by a reliable coder, the second author (M.F.), and additional 10% of the tapes were assessed by another reliable coder. The inter-rater reliability (Pearson's R) ranged from .82–.97. Additionally, 5% of the tapes were jointly coded with the method developer, Z. Biringen. All of the coders were blind to mothers' SA status and other background information, including attachment status.

Statistical and data analysis

Categorical background variables were analyzed with χ^2 and Fisher's exact test, and continuous ones with Student's *t*-test. The first research question of differences in attachment distributions between SA and comparison groups was answered using

Fisher's exact test (dichotomous F vs. non-F setting). Group differences in AAI subscales were explored with independent *t*-test for continuous variables and χ^2 and Fisher's exact test for categorical variables. Associations between attachment classification and dichotomized SA variables (1 = no use, 2 = use; 1 = no or little dependent, 2 = moderately to totally dependent) were analyzed using Fisher's exact test in F/non-F setting and in pairwise comparisons of the four attachment categories.

The second research question regarding associations between attachment representations and EP was answered using 2 (attachment: F/non-F and F/Ds) × 2 (SA vs. comparison) analysis of covariance (ANCOVAs) with main and interaction effects on EP scales as dependent variables. If interaction effects were significant, Bonferroni post hoc tests were conducted for pairwise comparisons. Mothers' financial difficulties (dummy variable: 0 = no or little financial difficulties; 1 = moderate or high financial difficulties) and age were used as covariates. In addition, because not all of the attachment categories were present among comparisons, ANCOVAs with Bonferroni post hoc tests were used only in SA group to analyze associations between all (F, Ds, E, U/CC) the attachment categories and EP. In the SA group analyses, the nature of intervention (PGT vs. PSS) was used as a covariate.

The third research question regarding associations between attachment representations and EA was answered with similar ANCOVAs, with the EA scale scores as dependent variables. ANCOVAs were used instead of multivariate analysis of covariance (MANCOVAs) because of very high multicollinearity between several EP and all of the EA variables.

In order to use parametric tests, EP variables (when comparing SA and comparison groups: negative feeling states and negative behavioral urges; in the within-SA analysis: negative feeling states, negative behavioral urges, positive behavioral urges, and meta-evaluation of emotions) were transformed to meet acceptable symmetry and kurtosis (George & Mallery, 2010). Variables were winsorized, that is, the extreme values (outliers) were replaced with the nearest value that was not an outlier. Missing values of background variables were replaced with expectation maximization (EM) for mothers who had participated in both T1 and T2. Missing values of the dependent variables were deleted listwise.

Results

Descriptive statistics

SA mothers were younger (M = 25.53 ± 4.16 years) than comparison mothers (M = 29.24 ± 5.02 years, $t = 4.07$, $p < .001$), and more often single (17–19% compared to 4%, $\chi^2 = p < .001$). Also, they had lower levels of education ($\chi^2 = 27.45, p < .001$), more unstable job statuses ($\chi^2 = 26.59$, $p < .001$), and more financial difficulties ($\chi^2 = 22.13$, $p < .001$) than comparison mothers. Comparison mothers had more pregnancy-related complications ($t = -3.35$, $p < .001$), which is due to their special obstetric status.

Pre-intervention, the majority of the SA women were poly-drug abusers (76.5%). A total of 80.9% had used drugs intravenously. During pregnancy, 15.7% of the women used substitute medication. In addition, 75% of mothers reported having used alcohol before the pregnancy, 35.2% reporting large-scale consumption (> 7 servings at once).

All mothers reported either decreasing (12%) or stopping (88%) illegal use during pregnancy (excluding substitute medication). Also, all mothers reporting high alcohol consumption decreased their consumption during pregnancy. At T2, none of the mothers reported regular use of illegal drugs but 15% reported relapses.

Attachment distributions in the SA and comparison group

The distributions of attachment classifications in the SA and comparison groups are presented in Figure 1. As hypothesized, there were significantly more non-autonomous (non-F) mothers in the SA group (Fisher's exact $p < .001$). The distribution among SA mothers was 18.6% for secure/autonomous (F) ($n = 8$), 30.2% for insecure/dismissing (Ds) ($n = 13$), 18.6% for insecure/preoccupied (E) ($n = 8$), and 30.2% for unresolved (U) ($n = 13$). One of the U cases had a secondary classification of cannot classify (CC). In addition, one SA mother was classified as CC without a U classification. For further analysis, the U and CC cases were merged because both categories are characterized by disorganized/un-integrated states of mind. Thus, 14 (32.6%) of the SA mothers were classified as U/CC. In total, 81.4% of the SA mothers were classified as non-F (comprising Ds, E, and U/CC). Among the comparison mothers, 70.8% ($n = 34$) were classified as F and 29.2% as Ds ($n = 14$), while E and U were absent.

Groups differed in several specific characteristics of the AAI. First, "earned secure" transcripts were in majority among F SA mothers (62.5%, $n = 5$) and in minority among F comparisons (17.6%, $n = 6$) ($\chi^2 = 6.74$, $p < .01$). There was no difference in coherence of transcript (CoT) or coherence of mind (CoM) between F mothers in the two groups, but non-F SA mothers had lower CoT and CoM scores than non-F (Ds) comparison mothers (CoT $t = -2.09$, $p < .05$; CoM $t = -2.20$, $p < .05$, equal variances not assumed). Concerning dismissing mental states (idealization, derogation, and lack of memory), SA

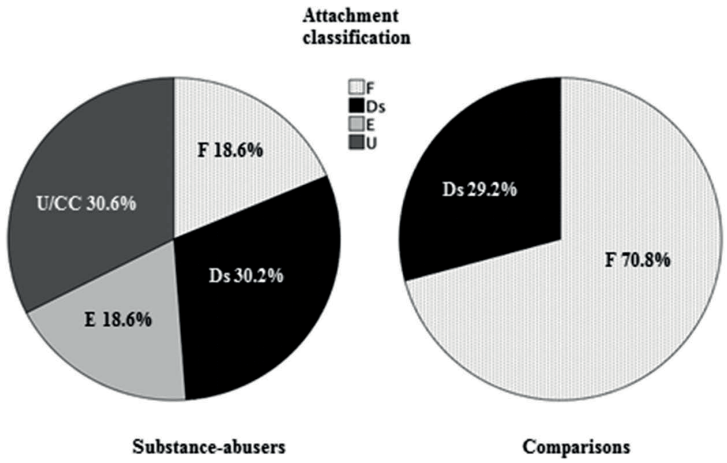

Figure 1. Attachment distributions in the substance-abusing and comparison groups. F = secure/autonomous, Ds = insecure/dismissing, E = insecure/preoccupied, U/CC = unresolved/cannot classify, Non-F = non-autonomous.

mothers expressed more highly derogative (> 5) states of mind of mother (Fisher's exact $p < .05$) and were more often highly derogative of attachment overall (Fisher's exact $p < .05$), than comparison mothers. Concerning states of mind related to preoccupied classification among the E and U/E SA mothers ($n = 13$), five mothers (38.5%) showed high (> 5) scores of passivity and four mothers (30.8%) showed high scores of preoccupied anger towards mother or father.

Expectedly, SA mothers reported significantly more experiences of sexual or physical abuse by their caregivers than comparisons (Fisher's exact $p < .001$). While 19% ($n = 8$) of SA mothers reported such experiences, this was absent among comparisons. All SA mothers reporting relational abuse were non-F. SA mothers also reported significantly more other traumatic experiences than comparisons (SA: 39.5%, $n = 17$; comparisons: 2%, $n = 1$; $\chi^2 = 21.05$, $p < .001$). Almost all of these SA mothers were also non-F ($n = 16$; 94.1%). By definition, all 13 SA mothers assigned a U score had high (≥ 5) scores of unresolved loss and/or trauma. Five (38.5%) mothers were classified unresolved in relation to loss, and eight (61.5%) in relation to trauma.

Finally, when analyzing associations between attachment classification and prenatal and postnatal use of intravenous drugs, psychological or physiological dependency, and drug use (relapses) in the postnatal period among the SA mothers, we found no group differences between autonomous and non-autonomous mothers or between any of the four attachment categories.

Attachment representations and prenatal emotion processing

As there were no E or U/CC mothers among comparisons, we performed two analyses to show the possible different associations between attachment representations and emotion EP in the SA and comparison groups. In the first, we used dichotomous F/non-F classification and in the second, compared only the F and Ds mothers (thus excluding the E and U/CC's from the SA group). Table 2 summarizes group means, standard errors, confidence intervals, *F* values indicating group differences, effect sizes, and Bonferroni post hoc comparisons for interaction effects. Means, standard errors, and confidence intervals are adjusted for covariates. Our hypothesis that non-F mothers would show more negative EP and lower level of meta-evaluation of emotions than F mothers in both SA and comparison groups was not substantiated.

Group × Attachment analysis showed that when comparing only the F and Ds mothers, attachment representations associated differently to EP in the SA and comparison groups. As Figure 2 illustrates, F SA mothers reported more negative cognitive appraisals than Ds SA mothers, whereas, as expected, F comparisons reported less negative appraisals than Ds comparison mothers. However, the Bonferroni post hoc test did not show significant pairwise differences. Also, F SA mothers reported less meta-evaluation of emotions than Ds SA mothers, whereas F comparisons reported more meta-emotions than Ds comparisons. Bonferroni post hoc comparisons showed that F SA mothers had lower levels of meta-emotions than F comparisons.

Results of group main effect showed that SA status was associated with high multilevel negative EP. In the F/non-F level of analysis, SA mothers reported higher negative feeling states and negative behavioral urges than comparison mothers. As groups did not have equal variances in negative feeling states (Levene's test $p < .05$), the difference

Table 2. Prenatal emotion processing according to mother's substance abuse status × attachment.

	substance-abusing group						Comparison group								
	Autonomous (n = 8)			Non-autonomous[1] (n = 23–28) (Ds) (n = 10–11)2			Autonomous (n = 33–34)			Non-autonomous[1] (n = 14)			ANCOVA F-values[3]		
		95%	CI[3]		95%	CI		95%	CI		95%	CI			
Levels of EP	M (*SE*)	LL	UL	M (*SE*)	LL	UL	M (*SE*)	LL	UL	M (*SE*)	LL	UL	SA main effect	Attachment main effect	SA × attachment
Cognitive appraisals Negative	2.41 (1.18)	1.76	3.17	2.06 (1.11)	1.82	2.66	1.51 (.22)	1.07	1.96	2.08 (.33)	1.44	2.73	2.53	.30	1.56
				1.36 (.35)	*.66*	*2.06*							*.12*	*.62*	***7.11*** **
Positive	4.89 (.44)	4.02	5.77	5.15 (.26)	4.62	5.67	5.40 (.23)	4.95	5.85	5.00 (.33)	4.34	5.65	.28	.06	1.08
				5.37 (1.21)	*4.62*	*6.30*							*.02*	*.05*	*1.40*
Feeling states Negative	1.55 (.29)	.98	2.11	1.78 (.18)	1.44	2.15	.78 (.15)	.51	1.09	.78 (.21)	.33	1.18	**15.88** ***	.20	.48
				1.38 (.25)	*.89*	*1.87*							***9.12*** **	*.23*	*.06*
Positive	5.62 (.62)	4.38	6.85	6.52 (.38)	5.75	7.28	6.90 (.32)	6.26	7.54	6.97 (.47)	6.04	7.90	3.25	1.10	*.84*
				7.49 (56)	*6.37*	8.60							*.40*	*3.77*	2.83
Behavioral urges Negative	1.16 (.27)	.63	1.69	1.47 (.16)	1.15	1.78	.55 (.14)	.28	.82	.79 (.20)	.39	1.19	**9.98** **	2.06	.028
				1,13 (.22)	*.68*	*1.58*							***5.77*** *	*.27*	*.49*
Positive	5.39 (.64)	4.11	6.67	6.49 (.38)	5.73	7.23	5.79 (.33)	5.13	6.45	6.16 (.48)	5.20	7.12	.00	2.45	.60
				6.89 (.59)	*5.71*	*8.08*							*.20*	*3.26*	*1.01*
Meta-evaluation	−.19 (.98)[a]	−2.14	1.76	.82 (.57)	−.30	1.95	3.15 (.51)[bc]	2.60	4.33	1.86 (.71)[ab]	.45	3.28	**7.97** **	.08	2.96
				2.46 (.82) [ab]	*.82*	*4.11*							*2.68*	*.57*	***7.50*** **

*** p < .001; ** p < .01; * p < .05 (2-tailed). [abc]Bonferroni post-hoc tests (p < .05) results conducted in significant interaction effects in F/Ds level are indicated by different upper letters.

[1] The insecure substance-abusing group comprise dismissing, preoccupied, and unresolved individuals, while the insecure comparison group comprise dismissing individuals. Differences in n are due to missing values.

[2] Values in lower line and in italics indicate results of group comparison in F- DS level.

[3] Covariates were mother's financial difficulties and age. *Df* for F/non-F analysis: Cognitive appraisals: (1,76); Feeling states: (1,73); Behavioral urges: (1,76); Meta-evaluation (1,78) and for F/Ds analysis: Cognitive appraisals: (1,61); Feeling states: (1,60); Behavioral urges: (1,61); Meta-evaluation (1,61).

Effect sizes (χ) in F/non-F analysis for significant SA main effects: negative feeling states: .18, negative behavioral urges: .12, meta-emotions: .09. In F/DS analysis, χ for significant SA main effects: negative feeling states: .11, Negative behavioral urges: .09. χ for Attachment × SA effect in negative cognitive appraisals: .11 and meta-evaluation: .10.

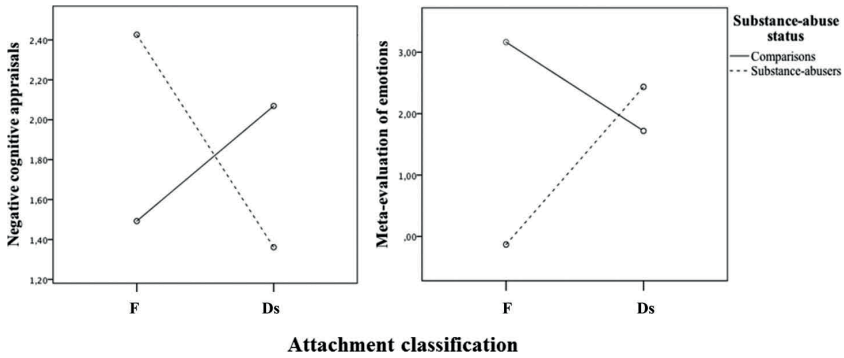

Figure 2. Prenatal emotion processing according to substance abuse and attachment classification among autonomous and dismissing mothers. F = autonomous, Ds = dismissing.

in SA and comparison group means was confirmed with Student's *t*-test for groups with unequal variances (t = (62, 951) = −5.97, $p < .001$, 2-tailed). Also, SA mothers reported less meta-evaluation of prenatal emotions than comparisons. When comparing the F and Ds individuals across groups, all SA mothers still reported more negative feeling states and more negative behavioral urges, but no longer reported less meta-evaluation of emotions than comparisons Again, the group difference in negative feeling states was confirmed with *t*-test for unequal group variances (t (21, 822) = −2.75, $p < .05$, two-tailed).

The hypothesis that E and U/CC mothers in particular would show more negative EP than the F mothers could only be tested among the SA mothers (see Table 3 for SA group means, standard deviations, confidence intervals, *F* values, standard errors, and Bonferroni post hoc tests). The hypothesis was not substantiated, as differences were non-significant both between E and F and between U/CC and F mothers. Instead, E mothers differed from Ds mothers in higher negative cognitive appraisals, confirmed by Bonferroni post-hoc tests. Concerning meta-evaluation of emotions, F mothers had the lowest means and Ds mothers the highest, but the difference only reached significance ($p > .06$) and the pairwise Bonferroni post-hoc comparison was non-significant.

Attachment representations and parent–infant interaction quality

Similar to EP, associations between attachment classification and EA were analyzed in F/non-F and F/Ds levels. Table 4 summarizes group means, standard errors, confidence intervals, *F* values, and effect sizes. The hypothesis that dyads with autonomous mothers would have higher EA in both SA and comparison groups was not substantiated. Unexpectedly, attachment representations were not associated with any of the EA variables (mother sensitivity, structuring, nonintrusiveness, and non-hostility; infant responsiveness and involving of mother) either among SA mothers or comparisons.

At the F/Ds level of analysis, a group × attachment interaction effect emerged in nonintrusiveness. As illustrated in Figure 3, F SA mothers were more intrusive than Ds SA mothers, whereas attachment was not associated with intrusiveness among comparison

Table 3. Emotion processing in the four attachment categories among substance-abusing mothers.

	F[1] (*n* = 8)			Ds (*n* = 10–11)			E (*n* = 4–6)			U/CC (*n* = 9–11)			
		95% CI[3]			95% CI			95% CI			95% CI		
Levels of EP	M (*SE*)	LL	UL	M (*SE*)	LL	UL	M (*SE*)	LL	UL	M (*SE*)	LL	UL	F^2 (*df*)
Cognitive appraisals Negative	2.43 (.43)[a]	1.54	3.32	1.36 (.39)[ab]	.56	2.16	3.52 (.57)[ac]	2.37	4.68	2.59 (.40)[abc]	1.79	3.38	**3.69** * (3,28)
Positive	4.84 (.42)	3.98	5.71	5.37 (.38)	4.59	6.15	4.48 (.56)	3.37	5.63	5.15 (.39)	4.39	5.93	.65 (3,28)
Feeling states Negative	1.57 (.35)	.86	2.29	1.39 (.31)	.75	2.04	2.26 (.51)	1.42	3.30	2.11 (.33)	1.42	2.79	1.26 (3,26)
Positive	5.59 (.54)	4.49	6.70	7.35 (.48)	6.37	8.34	5.56 (.93)	3.65	7.47	5.95 (.61)	4.70	7.21	1.89 (3,26)
Behavioral urges Negative	1.13 (.88)	.50	1.77	1.12 (.87)	.51	1.65	1.93 (.41)	1.10	2.76	1.63 (.28)	1.06	2.20	1.48 (3,28)
Positive	5.41 (.69)	4.00	6.82	6.93 (.62)	5.66	8.20	6.04 (.82)	4.36	7.72	6.54 (.56)	5.39	7.70	1.93 (3,28)
Meta-evaluation	−.65 (.90)	−2.48	1.18	2.32 (.77)	.76	3.89	−.27 (1.07)	−2.47	1.93	.-06 (.77)	−1.64	1.51	**2.92** † (3,31)

* $p < .05$; † $p < .10$ (2-tailed). [abc]Bonferroni post-hoc test ($p < .05$) results are indicated by different upper letters.
[1] F = autonomous, Ds = dismissing, E = preoccupied, U/CC = unresolved/cannot classify.
[2]Type of intervention (psychodynamic group therapy or psychosocial support) was used as covariate.
[3]Means, standard errors, and confidence intervals are adjusted for the covariate.
Effect size (χ) for Negative cognitive appraisals = .38 and for Meta-evaluation of emotions = .22.

Table 4. Emotional availability at infant age of four months according to mother's substance abuse status × attachment.

	Substance-abusing group						Comparison group								
	Autonomous (n = 7)			Non-autonomous[1] (n = 26) (Ds) (n = 10)2			Autonomous (n = 31)			Non-autonomous[1] (n = 11)			ANCOVA F-values[3] (df = 1,69)		
		95%	CI[4]		95%	CI		95%	CI		95%	CI			
EA scale	M (SE)	LL	UL	M (SE)	LL	UL	M (SE)	LL	UL	M (SE)	LL	UL	SA main effect	Attachment main effect	SA × attachment
Mother sensitivity	3.28 (.47)	2.35	4.20	3.13 (.26)	2.61	3.66	4.76 (.24)	4.29	5.23	4.04 (.37)	3.30	4.79	**10.99** **	1.57	.72
				3.06 (1.42)	*2.22*	*3.90*								*1.38*	*.58*
													10.29 **		
Mother structuring	3.55 (.42)	2.71	4.39	3.55 (.24)	3.08	4.03	4.88 (.21)	4.45	5.30	4.10 (.34)	3.43	4.77	**8.28** **	1.53	1.58
				3.22 (.38)	*2.46*	*3.99*							***9.38*** **	*2.32*	*51*
Mother nonintrusiveness	2.40[a] (.50)	1.40	3.40	3.33 (.28)	2.76	3.89	4.78[b] (.26)	4.27	5.29	4.52[b] (.40)	3.71	5.32	**21.06** ***	.80	2.63
				3.75[b] .(39)	*2.97*	*4.53*							***18.23*****	*2.60*	***5.86*** *
Mother nonhostility	5.05 (.50)	4.06	6.04	4.68 (.28)	4.12	5.24	5.93 (.25)	5.42	6.43	6.03 (.40)	5.24	6.83	**8.36** **	.14	.45
				4.82 (.43)	*3.96*	*5.68*							***6.52*** *	*.01*	*.16*
Infant responsiveness	3.21 (.49)	2.24	4.18	3.13 (.27)	2.58	3.68	4.70 (.25)	4.21	5.19	3.86 (.39)	3.08	4.64	**8.64** **	1.62	1.13
				3.09 (.42)									***9.26*** **	*1.41*	*1.24*
Infant involvement	2.92 (.48)	1.96	3.87	3.10 (.27)	2.56	3.64	4.29 (.24)	3.80	4.77	3.23 (.39)	2.46	4.00	**4.07** *	1.51	3.13
				2.9[c] (.44)	*2.10*	*3.85*							***4.18****	*1.48*	*2.22*

*** p < .001; ** p < .01; * p < .05 (2-tailed). Group means with different upper letter differed in Bonferroni post-hoc test (p < .05) for Attachment × Group effect in nonintrusiveness (F/Ds level of analysis).

1 The insecure substance-abusing group comprise dismissing, preoccupied, and unresolved individuals, while the insecure comparison group comprise dismissing individuals.

[2]Values in lower line and in italics indicate results of group comparison in F/DS level.

[3] SA and attachment main effects and SA × attachment interaction effects when mother's financial difficulties and age were the covariates.

[4] Means, standard errors, and confidence intervals are adjusted for covariates.

Effect sizes (χ) for SA main effects in the F/non-F analysis varied between .06 and .23 and in F/DS analysis between .07 and .26. χfor SA × Attachment interaction effect in F/DS analysis in mother nonintrusiveness was .10.

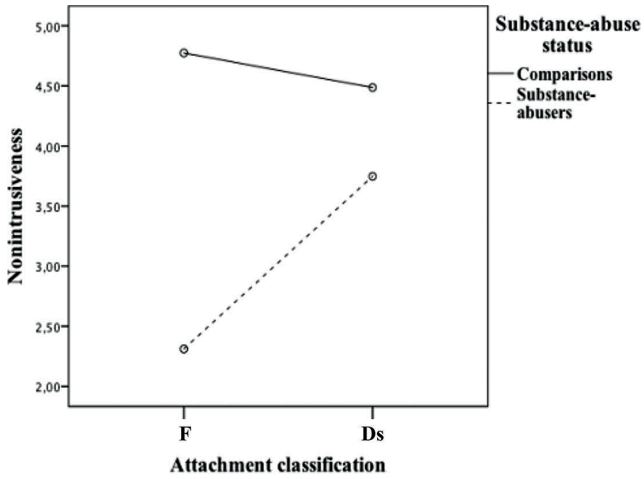

Figure 3. Mothers' nonintrusiveness according to substance abuse status and attachment classification among autonomous and dismissing mothers. F = autonomous, Ds = dismissing.

mothers. Bonferroni post hoc comparisons further specified that F SA mothers were more intrusive than Ds SA mothers and all comparison mothers.

Significant group main effects revealed that SA mothers showed lower EA than comparisons in all dimensions. Group variances were not equal in nonintrusiveness (Levene's test $p < .05$), so a *t*-test with no equal variances assumption was used to confirm the difference (t (73, 483) = 4.50, $p < .001$, two-tailed). Also, SA mothers' infants were less responsive and involving in interaction than those of comparisons. The differences were evident in both F/non-F and F/Ds analysis. In the F/Ds level, group difference in infant involvement was confirmed with a *t*-test for unequal group variances (t (32, 930) = 2.65, $p < .05$, two-tailed).

Finally, we analyzed how the four attachment classifications were associated with EA within the SA group. SA group means, standard errors, confidence intervals, and *F* values are reported in Table 5. No differences in EA were found according to attachment classification.

Discussion

Attachment representations are a central organizer of intra- and inter-individual behavior in transition to parenthood. Thus far, their quality and role in prenatal EP and quality of mother–infant interaction (EA) among SA women had not been investigated. Accordingly, this was the focus of our study, as well as exploring whether the role of attachment representations differs between SA and non-using comparison mothers. When interpreting these results, caution is warranted, as the group sizes were small.

As expected, majority of the SA mothers had non-autonomous attachment representations, while the opposite was true among comparisons. Further, a detailed examination of representations provided interesting information. In the context of this study and its small

Table 5. Emotional availability in the four attachment categories among substance-abusing mothers.

	F[1] (*n* = 7)			Ds (*n* = 10)			E (*n* = 6)			U/CC (*n* = 10)			
		95% CI[3]			95% CI			95% CI			95% CI		
EA scale	M (*SE*)	LL	UL	M (*SE*)	LL	UL	M (*SE*)	LL	UL	M (*SE*)	LL	UL	F^2 (*df* = 3,28)
Mother sensitivity	3.31 (.40)	2.50	4.13	3.20 (.33)	2.53	3.90	2.34 (.43)	1.46	3.22	3.54 (.32)	2.88	4.21	1.75
Mother structuring	3.61 (.35)	2.89	4.33	3.37 (.29)	2.77	3.97	2.98 (.38)	2.22	3.75	4.19 (.28)	3.61	4.77	2.59
Mother nonintrusiveness	2.39 (.58)	1.21	3.57	3.98 (.48)	3.00	4.96	2.46 (.63)	1.16	3.76	3.55 (.48)	2.57	4.54	2.18
Mother nonhostility	5.01 (.55)	3.89	6.13	4.92 (.45)	3.99	5.85	4.09 (.61)	2.83	5.34	5.01 (.46)	4.06	5.96	.58
Infant responsiveness	3.26 (.48)	2.27	4.24	3.32 (.40)	2.50	4.14	2.49 (.52)	1.42	3.56	3.29 (.39)	2.48	4.10	.65
Infant involvement	2.93 (1.17)	2.05	3.95	3.10 (1.31)	2.35	3.92	2.70 (.50)	1.67	3.73	3.34 (.38)	2.56	4.12	.37

[1] F = autonomous, DS = dismissing, E = preoccupied, U/CC = unresolved/disorganized.
[2]Type of intervention (psychodynamic group therapy or psychosocial support) was used as covariate.
[3]Means, standard errors, and confidence intervals are adjusted for covariate.

group sizes, the information of SA mothers' representation profiles is descriptive. Still, this description might help in understanding the current findings, as well as have implications for further research with larger sample sizes. The results suggest, for example, that derogative states of mind might be especially prevalent among dismissing SA mothers. Also, passive states of mind that are rare in normative groups were characteristic of preoccupied SA mothers. The associations of these strategies to early parenting, and possible differences in diverse clinical groups' profiles, are a task for further study.

We found that even most of the autonomous SA mothers had adverse childhood relational experiences, as evident from their "earned" secure/autonomous representations. Even if the autonomous status implies that these mothers had had possibility to work through their non-optimal early experiences in other secure relationships, these experiences might still impact their transition to parenthood, as they are reactivated during pregnancy (Stern, 1995). Interestingly, the autonomous mothers did not differ from the non-autonomous ones in their SA profile, namely, in the use of intravenous drugs, dependency on drugs, or relapses in the postnatal period. This might suggest that in such high-risk group, autonomous status is not self-evidently a protective factor, but it can instead conceal early vulnerabilities. The non-autonomous SA mothers, in turn, almost completely accounted for the traumatic experiences in the group. This traumatization likely contributes to the very low coherence of non-autonomous SA mothers' transcripts. As both autonomous and non-autonomous SA mothers showed more problematic EP and EA than comparisons, these findings imply that not only traumatic experiences, but also more subtle adversities in early relations, make SA mothers vulnerable during pregnancy and early motherhood.

All SA mothers showed more negative EP than comparisons, namely, negative feeling states and behavioral urges regardless of attachment classification. SA mothers also reported less meta-evaluation of emotions than comparisons. These findings are contrary to research showing that non-autonomous SA individuals have more emotional difficulties than autonomous individuals (Diaz et al., 2014; Gatmaitan, 2013). Our results might, indeed, be life-phase specific, and suggests that autonomous representations do not protect SA mothers from emotional turbulence in transition to parenthood. Inadequate caregiving, reported by most of the autonomous SA mothers, and surplus traumatic experiences that were common for non-autonomous SA mothers, might both be reasons for resorting to drugs as means of emotion regulation (Cihan et al., 2014; Padykula & Conklin, 2010). The emotional confusion and negative evaluations that SA mothers displayed during pregnancy might reflect their lack of adaptive EP strategies while withdrawing from drug-use. It also seems plausible that abuse itself might impair EP at the neural level or, more broadly, deteriorate self-awareness and self-regulation (Baler & Volkow, 2006; Goldstein et al., 2009), thus making the previous addicts vulnerable in their new sober life phase.

Comparing autonomous and dismissing mothers shed further light on the specific dynamics of attachment representations in the two very different groups. Whereas autonomous comparisons reported, as hypothesized, less negative cognitive appraisals regarding pregnancy and appraised their emotions as more clear, typical, and acceptable (here: meta-evaluation of emotions) than dismissing comparisons, the picture was reversed among SA mothers. Importantly, there were no differences in SA profiles of autonomous and dismissing SA mothers, implicating that drug use characteristics do not

account for the differences in EP. If autonomous strategy indeed allows access to freely explore emotions, this freedom might make high-risk mothers vulnerable in transition to parenthood. SA mothers face great role contradictions and demands for change (Brudenell, 1997), whereas challenges for other mothers might be less extreme and easier to adjust to. Still, we wonder whether the low level of reported meta-emotions reflects autonomous SA mothers' greater *openness* to the confusion that pregnancy and the emotions evoked by it bring, as this might be unavoidable in transition as challenging as pregnancy. We also acknowledge that differences may partly be due to dismissing mothers' lack of recognizing and reporting their negative experiences (e.g., Dozier & Lee, 1995), as dismissing individuals often idealize their experiences (Hesse, 2008).

Exploring the associations between all four attachment categories and EP within the SA groups showed that, contrary to hypothesis, preoccupied mothers did not differ from autonomous mothers in more negative EP. Instead, preoccupied mothers differed from dismissing mothers in more negative cognitive appraisals. This finding concurs with earlier results of dismissing individuals' over-controlling their emotions, and preoccupied under-controlling them (Adam et al., 2004; Kanninen et al., 2003). The finding that autonomous mothers had the lowest levels of meta-evaluation of all the SA mothers may reflect their open attempt to deal with the ambivalence of the life-change, but still, they are left in a state of emotional confusion.

Further, results show that unresolved/cannot classify (U/CC) classification did not account for differences in negative EP among pregnant mothers who struggle with SA. As we found no previous studies of EP among U/CC individuals, we expected these mothers to express highly negative/dysfunctional EP based on theory (Hesse & Main, 2000). According to our results, we tentatively suggest that the U/CC classification might not be central in capturing emotional dysregulation originating from trauma among high-risk mothers. Indeed, SA mothers are more likely to be complexly traumatized than to have experienced single, clear-cut trauma and losses that are the criteria for U classification (Finger, 2006). Even though CC classification could be an indicator of more complex trauma history, early-originating interpersonal trauma is reported to generate qualitatively different representations of attachment, such as hostile and/or helpless states of mind (e.g., Finger, 2006; Lyons-Ruth et al., 2005).

In conclusion, the finding that autonomous as well as non-autonomous SA mothers seemed to struggle with high levels of negative emotions and experience their emotions as confusing and non-familiar implies that the group as a whole is vulnerable during pregnancy. It is also possible that, rather than attachment representations, other factors such as cumulative life stressors and chaos in current everyday life (Nair et al., 2003; Punamäki & Belt, 2013) are central in explaining pregnant SA women's emotional well-being. The different EP profiles of autonomous SA and comparison mothers possibly reflect reactivation of qualitatively different early experiences that the mothers have.

Concerning EA, our hypothesis that autonomous attachment representations would promote optimal interaction both among SA mothers and comparisons was not supported. SA status, again, contributed to problematic EA rather than mothers' attachment representations. SA mothers and their infants had more problems in all areas of EA, namely, mothers were less sensitive, less structuring, more intrusive, more hostile, and infants less responsive and less involving of mother. Further, SA dyads did not differ in EA according to the four attachment classifications. These findings highlight the

assumptions postulated above: first, that even autonomous SA mothers might have early relational experiences that pose risk to second-generation mothering; and, second, that in such a high-risk group of mothers and infants, accumulation of risk might be more salient predictor of vulnerable mother–infant interaction than mothers' attachment strategy. The fact that autonomous SA mothers did not differ from non-autonomous ones in features of SA fits this picture. The finding that SA mothers' infants also struggled in the interactions proposes that they had internalized suboptimal features of the interaction with their mothers, which can seriously compromise later child development (Carter, Garrity-Rokous, Chazan-Cohen, Little, & Briggs-Gowan, 2001; Easterbrooks, Biesecker, & Lyons-Ruth, 2000). Still, not only dysfunctional caregiving but also exposure to mothers' SA and emotional imbalance in utero could have compromised infants' interaction abilities (Beeghly et al., 2003).

It is noteworthy that autonomous SA mothers were more intrusive than autonomous and dismissing comparisons and dismissing SA mothers. Again, if we presume that autonomous mothers access their own early relational experiences more freely than non-autonomous mothers, autonomous SA mothers in particular might be inclined to try harder or offer better care to their infants than they themselves received. However, combined with insufficient sensitivity, this over-trying would manifest as intrusiveness from the infants' point of view.

Contrary to expectations, autonomous representations did not promote EA even among comparisons. However, parallel results were found in our previous study (Flykt et al., 2012), where self-rated maternal representations did not associate with EA. As comparisons were a group with obstetric risks, prenatal anxiety, worry about the infants' well-being, and perinatal problems in infant health are more probable than among normative mothers. Our results suggest that these specific risks might override the protective role of mother's autonomous representations for early dyadic interaction.

In sum, pregnancy seems to be negatively valenced, turbulent, and confusing life-change for SA women. In addition, and perhaps consequently, autonomous as well as non-autonomous SA mothers and their infants were at global risk for interaction problems, when the infants were four months old. This finding is remarkable, as SA women in the study were enrolled in intensive and comprehensive interventions. A previous case study featuring an autonomous SA mother suggests that, for a former drug addict, achieving good-enough mothering requires not only comprehensive psychotherapeutic help but also a long time (Belt et al., 2013). As our study only reports results from the very beginning of SA mothers' and infants' joint life, further research is needed to show whether mothers' autonomous representations promote the mother–child relationship in a long run.

Limitations and strengths of the study

We identify three limitations in the current study. First, this study is a secondary analysis of previously collected data. Second, as stated before, the study's small sample size warrants caution in generalizing the results; however, we note that small sample sizes are common in high-risk studies. Third, there were limitations in administering the AAI to the comparison group mothers. While trained psychotherapists interviewed the SA mothers, the comparison group interviewer had less training to AAI. Accordingly, the protocols were

shorter and included less probing on loss and trauma. This may have complicated the identification of unresolved/disorganized cases among comparison mothers.

Strengths of the study include reporting results from a hard-to-reach and high-risk group of mothers, as well as the use of observational and interview measures of attachment and mother–infant interaction.

Clinical importance of the findings

Some suggestions for prenatal and postnatal treatment of dyads with SA history can be drawn from our results. As SA was more potent indicator of risk than attachment representations, comprehensive help in coping with SA-related accumulated problems should be emphasized. As SA women struggle with abstinence, lack of support, abusive current relationships, and other stressors, holistic treatment programs are needed. In this holding context, psychological work in preparing for motherhood may become possible. Therapists working with pregnant women should note that emotional processes during pregnancy can be qualitatively different among high-risk and lower-risk mothers, and thus avoid presumptions based on theories of normative psychology of childbearing. Guilt about drug use, feelings of inadequacy, and lack of preparation for motherhood might complicate the prenatal process, and active discussing and normalizing of the negative emotions might alleviate the painful experiences. Autonomous attachment strategy might still be beneficial, even among such high-risk mothers, if autonomous mothers indeed are most open and able to explore their pregnancy-related experiences, confusing and painful as they might be. Further, help in stabilizing and regulating emotions could possibly benefit SA mothers and their unborn infants.

Our results also suggest that minding the infant is of great importance in all interventions with high-risk dyads. Even if autonomous SA mothers' intrusiveness would be understood as an attempt to "try hard", this, of course, does not make it less harmful for the infants. Thus, as others have previously emphasized, drug-dependent mothers need help in mentalizing infants' intentions and needs, and matching their interaction bids to these (e.g., Pajulo et al., 2012; Suchman et al., 2010). Also, our results concur with previous findings of the special vulnerability of substance-exposed infants (Beeghly et al., 2003). Therefore, multidisciplinary and long-lasting support of infants' development is needed in addition to dyadic mother–infant treatment.

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PUBLICATION II

Maternal Trauma Affects Prenatal Mental Health and Infant Stress Regulation among Palestinian Dyads

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ARTICLE

MATERNAL TRAUMA AFFECTS PRENATAL MENTAL HEALTH AND INFANT STRESS REGULATION AMONG PALESTINIAN DYADS

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ABSTRACT: We examined how diverse and cumulated traumatic experiences predicted maternal prenatal mental health and infant stress regulation in war conditions and whether maternal mental health mediated the association between trauma and infant stress regulation. Participants were 511 Palestinian mothers from the Gaza Strip who reported exposure to current war trauma (WT), past childhood emotional (CEA) and physical abuse, socioeconomic status (SES), prenatal mental health problems (posttraumatic stress disorder and depression symptoms), and perceived stress during their secondtrimester of pregnancy as well as infant stress regulation at 4 months. While all trauma types were associated with high levels of prenatal symptoms, CEA had the most wide-ranging effects and was uniquely associated with depression symptoms. Concerning infant stress regulation, mothers' CEA predicted negative affectivity, but only among mothers with low WT. Against hypothesis, the effects of maternal trauma on infant stress regulation were not mediated by mental health symptoms. Mothers' higher SES was associated with better infant stress regulation whereas infant prematurity and male sex predisposed for difficulties. Our findings suggest that maternal childhood abuse, especially CEA, should be a central treatment target among war-exposed families. Cumulated psychosocial stressors might increase the risk for transgenerational problems.

Keywords: childhood abuse, war trauma, prenatal mental health, infant stress regulation, Palestinian

RESUMEN: Examinamos hasta qué punto las diversas y acumuladas experiencias traumáticas predecían la salud mental materna prenatal y la regulación del estrés del infante en condiciones de guerra y si la salud mental materna mediaba la asociación entre el trauma y la regulación del estrés del infante. Las participantes fueron 511 madres palestinas del Área de Gaza quienes reportaron el haber estado expuestas al trauma de la presente guerra (WT), pasado abuso emocional (CEA) y físico (CPA) en la niñez, la condición socio-económica (SES), problemas de salud mental prenatales (trastorno de estrés postraumático [PTSD] y síntomas de depresión), y el estrés percibido durante su segundo trimestre de embarazo (T1), así como la regulación

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del estrés del infante a los cuatro meses (T2). Mientras que todos los tipos de trauma se asociaron con altos niveles de síntomas prenatales, CEA presentó los efectos más amplios y de manera única se asoció con síntomas de depresión. Con respecto a la regulación del estrés del infante, el CEA de las madres predijo una afectividad negativa pero sólo entre madres con bajo nivel de WT. Contrario a la hipótesis, los efectos del trauma materno sobre la regulación del estrés del infante no fueron mediados por los síntomas de salud mental. El más alto nivel de SES de las madres se asoció con una mejor regulación del estrés del infante, mientras que la condición de prematuro del infante y el sexo masculino presentaban predisposición para dificultades. Nuestras conclusiones sugieren que el abuso de niñez materno, CEA especialmente, debe ser el enfoque de un tratamiento central entre familias expuestas a guerra. Los factores de estrés sicosociales acumulados pudieran aumentar el riesgo de problemas transgeneracionales.

Palabras claves: abuso en la niñez, trauma de guerra, salud mental prenatal, regulación de estrés del infante, palestinas

RÉSUMÉ: Nous avons examiné la manière dont des expériences traumatiques diverses et cumulées prédisaient la santé mentale prénatale et la régulation de stress du bébé dans des conditions de guerre et si la santé mentale maternelle intervenait dans le lien entre le trauma et la régulation du stress du bébé. Les participantes ont consisté en 511 mères Palestinienne de la bande de Gaza qui ont fait état d'exposition à un trauma de guerre (TG), de maltraitance émotionnelle de l'enfance (MEE) et de maltraitance physique (MP), d'un statut socio-économique (SSE), de problèmes de santé mentale prénatale (trouble de stress posttraumatique [TSPT] et symptômes de dépression), et d'un stress perçu durant le second trimestre de la grossesse (T1), ainsi que de régulation du stress du bébé à quatre mois (T2). Alors que les types de trauma sont liés à des niveaux élevés de symptômes prénatals, le CEA a eu les effets les plus forts à terme et était uniquement liés aux symptômes de dépression. Pour ce qui concerne la régulation du stress du bébé, la CEA des mères a prédit une affectivité négative mais seulement au soin des mères avec un WT peu élevé. Contrairement à l'hypothèse, les effets du trauma maternel sur la régulation du stress du bébé n'étaient pas changés par les symptômes de santé mentale. Le SES plus élevé des mères était liés à une meilleure régulation du stress du bébé, alors que la prématurité du bébé et le sexe masculin prédisposaient à des difficultés. Nos résultats suggèrent que la maltraitance maternelle durant l'enfance, surtout le CEA, devrait être le but de traitement central chez les familles exposées à la guerre. Les stresseurs psychosociaux cumulés pourraient augmenter le risque de problèmes intergénérationnels.

Mots clés: maltraitance durant l'enfance, traumatisme de guerre, santé mentale prénatale, régulation du stress du bébé, Palestinienne

ZUSAMMENFASSUNG: Wir untersuchten, wie verschiedene und kumulierte traumatische Erfahrungen die mütterliche pränatale psychische Gesundheit und die Stressregulation des Säuglings unter Kriegsbedingungen vorhersagten und ob die mütterliche psychische Gesundheit die Assoziation zwischen Trauma und der Stressregulation des Säuglings mediierte. Die Teilnehmer waren 511 palästinensische Mütter aus dem Gaza-Streifen, die über die Exposition gegenüber dem gegenwärtigen Kriegstrauma (WT), früheren emotionalen (CEA) und körperlichen Missbrauch aus der Kindheit (CPA), über ihren sozioökonomischen Status (SES), pränatale psychische Probleme (Posttraumatische Belastungsstörung [PTBS] und Depressionssymptome) und ihren wahrgenommenen Stress während ihres zweiten Schwangerschaftstrimesters (T1), sowie über die Stressregulation ihres Säuglings im Alter von vier Monaten (T2) berichteten. Während alle Trauma-Typen mit einem hohen Maß an pränatalen Symptomen assoziiert waren, hatte CEA die weitreichendsten Effekte und war eindeutig mit Depressionssymptomen assoziiert. In Bezug auf die Stressregulation des Säuglings sagte der mütterliche CEA die negative Affektivität voraus, jedoch nur bei Müttern mit niedrigem WT. Entgegen der Hypothese wurden die Auswirkungen des mütterlichen Traumas auf die Stressregulation des Säuglings nicht durch psychische Symptome mediiert. Ein höherer SES der Mütter war mit einer besseren Stressregulation des Säuglings assoziiert, während frühgeborene Säuglinge sowie Säuglinge des männlichen Geschlechts anfälliger für Schwierigkeiten waren. Unsere Ergebnisse deuten darauf hin, dass auf Seiten der Mutter Missbrauch im Kindesalter, vor allem CEA, ein zentrales Behandlungsthema bei Familien sein sollte, die dem Krieg ausgesetzt waren. Kumulierte psychosoziale Stressoren könnten das Risiko für transgenerationale Probleme erhöhen.

Stichwörter: Missbrauch im Kindesalter, Kriegstrauma, pränatale psychische Gesundheit, Stressregulation des Säuglings, Palästinenser/in

抄録: 戦争状況において、多様なそして蓄積された外傷体験が、どのように母親の出産前のメンタルヘルスと乳児のストレス調節を予測するか、そして母親のメンタルヘルスが外傷と乳児のストレス調節の間の関連に媒介するかどうかを、私たちは調査した。参加したのは、ガザ地区からの511人のパレスチナ人の母親で、彼女たちは現在の戦争トラウマ(WT)、過去の児童期の情緒的虐待(CEA)および身体的虐待(CPA)、社会経済状況(SES)、出産前のメンタルヘルス上の問題 (外傷後ストレス障害[PTSD]および抑うつ症状) 、ならびに妊娠中期(T1)に知覚したストレスと生後4ヶ月(T2)の乳児のストレス調節について報告した。すべてのタイプの外傷が高いレベルの出産前の症状に関連していたが、CEAがもっとも幅広い影響を持ち、抑うつ症状に特異的に関連していた。乳児のストレス調節に関しては、母親のCEAが否定的な感情性を予測したが、それはWTの低い母親にだけだった。仮説に反して、母親のトラウマが乳児のストレス調節に与える影響は、メンタルヘルスの症状により媒介されなかった。母親のより高いSESはより良い乳児のストレス調節と関連したが、その一方、乳児の未熟性と男児であることは、困難になりやすくさせていた。私たちの所見から、母親の子ども時代の虐待、特にCEAを、戦争にさらされた家族の中心的な治療目標とすべきであることが示唆される。蓄積された心理社会的ストレッサーが、世代間の問題へのリスクを増大させるだろう。

キーワード: 児童期の虐待, 戦争の外傷, 出産前のメンタルヘルス, 乳児のストレス調節, パレスチナ人

摘要: 我們檢查多樣化和累積的創傷經驗如何預測在戰爭下孕婦心理健康和嬰兒壓力調節, 以及母親心理健康是否介導創傷與嬰兒應激調節之間的關係。參加者是來自加沙地帶的511名巴勒斯坦母親, 他們報告目前的戰爭創傷 (WT) 、過去的童年情感 (CEA) 和身體虐待 (CPA) 、社會經濟地位 (SES) 、產前心理健康問題 (創傷後應激障礙[PTSD]和抑鬱症狀) 、妊娠中期感覺壓力 (T1) 、以及四個月 (T2) 時的嬰兒壓力調節。雖然所有創傷類型都與高水平的產前症狀相關, 但CEA具有最廣泛的作用, 與抑鬱症狀特別相關。關於嬰兒壓力調節, 低WT母親的CEA預測負面情緒。母親創傷對嬰兒壓力調節的影響不由精神健康症狀調節, 這與假設不乎。母親較高的SES與較好的嬰兒壓力調節有關, 而早產嬰兒和男童較易發生困難。我們的研究結果表明, 孕婦的兒童虐待歷史, 尤其是CEA, 應成為遭受戰爭影響家庭的中心治療目標。累積的社會心理壓力可能會增加跨代問題的風險。

關鍵詞: 童年虐待, 戰爭創傷, 產前心理健康, 嬰兒壓力調節, 巴勒斯坦人

ملخص: تناولت هذه الدراسة التجارب الصادمة التراكمية ومدى تنبؤها بالصحة النفسية الأمومية ما قبل الولادة وتنظيم الإجهاد العصبي لدى الرضيع في ظروف الحروب وماإذا كانت الصحة النفسية الأمومية تتوسط الارتباط بين الصدمة النفسية وتنظيم الإجهاد العصبي (stress regulation) لدى الرضيع. اشتمل المشاركون في الدراسة على 511 أم فلسطينية من قطاع غزة واللاتي أقررن بتعرضهن لصدمة حرب حالية (WT) وإساءة عاطفية في الطفولة (CEA) واعتداء بدني في (CPA) وحالة اجتماعية اقتصادية (SES) ومشاكل صحة نفسية ما قبل الولادة (اضطراب الاجهاد اللاحق للصدمة النفسية PTSD وأعراض اكتئاب) وواجهوا إجهاد عصبي أثناء الثلث الثاني للحمل (T1) وتنظيم إجهاد عصبي للرضيع في عمر 4 شهور (T2). وفي حين أن كل أنواع الصدمة النفسية كانت مرتبطة بمستويات عالية من أعراض ماقبل الولادة فإن الصدمة العاطفية النفسية أثناء الطفولة (CEA) كانت الأكثر تأثيرا ومرتبطة بشكل واضح بأعراض الاكتئاب. وبخصوص تنظيم إجهاد الرضع تنبأت (CEA) بالتأثير السلبي ولكن فقط بين الأمهات ذوي صدمات الحرب الخفيفة. وبخلاف فرضية الدراسة فإن تأثيرات الصدمة الأمومية على تنظيم الإجهاد العصبي للرضيع لم تتوسطها أعراض الصحة النفسية. وارتبطت المستويات الأعلى من (SES) بمستويات أفضل من تنظيم إجهاد الرضيع بينما كانت عوامل عدم اكتمال النضج وجنس الذكور مرتبطين بالتعرض للصعوبات. تشير نتائجنا إلى أن الامتهان أثناء الطفولة عند الأم (CEA) يجب أن يكون محور تركيز العلاج بين العائلات المعرضة للحروب حيث أن عوامل الضغط الاجتماعية النفسية التراكمية قد تزيد من مخاطرة المشاكل عبر الأجيال.

كلمات مفتاحية: امتهان الطفولة – صدمة الحرب- الصحة النفسية ما قبل الولادة- تنظيم ضغط الرضيع- فلسطيني

* * *

The core task of early mothering is to keep the infant alive and guarantee his or her beneficial development and well-being (Stern, 1995). Mothers expecting and caring for an infant in war conditions face extraordinary challenges in fulfilling this task. According to Save the Children (2014), more than 250 million children under the age of 5 years live in countries affected by armed conflicts. In addition to the dangers caused by war, such families often face the constant stress of poverty and a lack of basic resources such as clean water, proper nutrition, healthcare, and medication. The participants of this study are Palestinian women and their infants living in the Gaza Strip, which has been under Israeli military siege and international economic boycott since 2007. These women's families have experienced wars and multiple military attacks in recent years, resulting in extensive human and material losses (United Nations, 2009; United Nations Human Rights Council, 2015).

Traumatic war events can be especially harmful in the prenatal period as they may interfere with both the mental health of the mother and the stress and emotion regulation of the infant via in utero exposure to maternal hormonal imbalance (Brand, Engel, Canfield, & Yehuda, 2006; Kaitz, Levy, Ebstein, Faraone, & Mankuta, 2009; Yehuda et al., 2005). Consequently, the coregulated mother–infant relationship can be at risk. Further, attachment theory postulates that pregnancy reactivates mothers' own attachment experiences, including memories of childhood abuse (Bretherton & Munholland, 2008). Still, little is known about the interplay between mothers' childhood abuse and war trauma, which possibly poses a risk to the pre- and postnatal well-being of mothers and infants.

Research from peaceful countries has confirmed that mothers' childhood physical and emotional abuse are associated with both maternal prenatal psychopathology (Huth-Bocks, Krause, Ahlfs-Dunn, Gallagher, & Scott, 2013) and disturbances in infant stress regulation (Brand et al., 2010; Lang, Gartstein, Rodgers, & Lebeck, 2010), and that different childhood relational adversities can contribute to mental health and parenting problems in diverse ways (Briere & Jordan, 2009; Macmillan et al., 2001). Trauma research, in turn, has shown that current war trauma can activate earlier traumatic experiences (Mikulincer & Shaver, 2012) and that early life trauma increases vulnerability to later stressors and adversities (de Kloet, Sibug, Helmerhorst, & Schmidt, 2005; Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997). Thus, current threat and trauma as well as a mother's childhood abuse by caregivers can create severe risks in the pre- and postnatal periods.

The impacts of childhood abuse and war trauma on maternal and infant well-being have been mostly analyzed separately. Thus, studying the unique and joint effects of childhood and current maternal trauma on pre- and postnatal periods is pivotal. In addition, researchers have suggested that infants' in utero exposure to maternal prenatal mental health symptoms and stress might be especially potent in continuously dangerous environments (Glover, O'Connor, & O'Donnell, 2010). Accordingly, we analyze the associations between Palestinian mothers' past childhood abuse and current war trauma on maternal prenatal mental health and perceived stress as well as on infant stress reactivity.

MATERNAL TRAUMA AND PRENATAL MENTAL HEALTH

Researchers have suggested that the nature of trauma may have specific impacts on mental health. Interpersonal violence has been shown to be more harmful than are other types of trauma, and earlier onset of exposure has more severe impacts than does later trauma (Punamäki, 2014). Childhood abuse by caregivers can imply both a lack of parental regulatory help and exposure to parent-inflicted stress. This can result in disturbances in the development of stress and emotion regulation (Maccari Krugers, Morley-Fletcher, Szyf, & Brunton, 2014; Tarullo & Gunnar, 2006), increasing the risk for future mental health problems (Cloitre, Miranda, Stovall-McClough, & Han, 2005). Some research has suggested that children exposed to physical and emotional abuse may suffer from various types of emotion dysregulation and psychopathology in later life (Tyler, 2002). War trauma, in turn, has been shown to be associated with posttraumatic stress disorder (PTSD), depression, and dissociative symptoms (Brewin, Garnett, & Andrews, 2011; Punamäki, 2014).

There has been some evidence that interpersonal trauma has especially harmful effects in the prenatal period. Schwerdtfeger and Goff (2007) showed that interpersonal trauma, rather than trauma exposure in general, was associated with pregnant mothers' PTSD symptoms. In addition, past childhood abuse as a specific form of interpersonal trauma has been shown to have a unique association with heightened maternal prenatal PTSD symptoms when current partner violence was controlled for (Huth-Bocks et al., 2013). In the same study, mothers' experiences of emotional violence were more strongly associated with prenatal PTSD than were their experiences of physical or sexual violence. There has been less research on the effects of war trauma on prenatal mental health. Yet, a study on prenatal exposure to the 9/11 terror attack showed that a high share (46%) of exposed pregnant women developed PTSD (Brand et al., 2006).

We could not find earlier research analyzing the unique or joint impacts of childhood abuse and war trauma on maternal mental health in the prenatal period. However, two studies have focused on the nature of trauma in the general population, comparing the impacts of early interpersonal and adult trauma on later psychosocial well-being. Ehring and Quack (2010) reported that survivors of childhood interpersonal trauma suffered from more severe PTSD symptoms than did survivors of single-incident later trauma such as an accident or disaster. However, a Palestinian study has found that both past childhood abuse and current war trauma increased the risk for depression and PTSD, but only childhood abuse negatively impacted social relations (Punamäi, Komproe, Qouta, El-Masri, & De Jong, 2005).

MATERNAL TRAUMATIZATION AND INFANT STRESS REGULATION DEVELOPMENT

Prenatal maternal stress and psychopathology disturb the central nervous system's hypothalamic–pituitary–adrenal axis functioning and, consequently, the in utero secretion of the stress hormone cortisol (Davis, Glynn, Waffarn, & Sandman, 2011; Glover et al., 2010). Trauma exposure and PTSD have similar emotional dysregulating effects (Brand et al., 2010; Yehuda et al., 2005). Infants' central nervous systems' stress and emotion regulation structures are molded by their prenatal experiences, which makes them vulnerable to in utero hormonal imbalances (Glover et al., 2010; Talge, Neal, & Glover, 2007). Postnatal regulative caregiver–infant interactions continue to mold the infant's stress reactivity and consequentially their regulation abilities (Crockenberg & Leerkes, 2000; Tronick et al., 2005). Still, infants' stress regulation deficits originating from the prenatal period contribute substantially to these interactions (Beeghly, Frank, Rose-Jacobs, Cabral, & Tronick, 2003; Field, 2010). After birth, the in utero exposure can manifest as infant irritability, oversensitivity to environmental stimuli, and inability to soothe and recover from stressful experiences (Davis et al., 2011; Pesonen, Räikkönen, Strandberg, & Järvenpää, 2005).

More research is available on the links between mothers' childhood abuse and infant stress regulation than on the effects of war trauma. A study among North American mothers with a lifetime history of depression has found that mothers' childhood abuse was associated with both tmothers' own and their infants' deviating (lower) cortisol levels (Brand et al., 2010). Furthermore, infants whose mothers had both a childhood abuse history and current PTSD showed greater stress reactivity than did infants of mothers with no PTSD. The findings are important, as lower cortisol levels also indicate PTSD risk (Morris, Compas, & Garber, 2012; Yehuda, 2002).

Results have thus far been inconclusive as to whether mothers' childhood emotional and physical abuse play different roles in their children's stress responses. Jovanovic et al. (2011) found that in low-SES African American families, mothers' physical abuse was associated with their school-age children's greater stress reactivity whereas emotional abuse was associated with children's poorer recovery from distress (Jovanovic et al., 2011). However, a study based on a White, North American sample found that mothers' physical, but not emotional, abuse history was related to their 1-year-old children's poor recovery from distress (Lang et al., 2010). The study further showed that mothers' depression increased their infants' difficulties with emotion and stress regulation.

Research on the 9/11 terrorist attacks has provided information on prenatal maternal trauma impacting infant stress regulation. Infants whose mothers developed PTSD following exposure to the attacks manifested lower cortisol levels (Yehuda et al., 2005) and expressed more distress to novelty than did infants with mothers without PTSD (Brand et al., 2006). Interestingly, maternal depression was not associated with infants' low cortisol levels (Yehuda et al., 2005).

Previous research thus has confirmed that both past interpersonal and current trauma can increase risks for maternal prenatal psychopathology and disturb the development of infant stress regulation. The effects of maternal childhood abuse on infant stress regulation seem to transmit both directly and via maternal mental health problems, and may vary according to the type of abuse. The impacts of war trauma (terrorist attacks) have been reported

to mediate via posttraumatic psychopathology, namely PTSD. To our knowledge, no studies have analyzed the impacts of childhood emotional and physical abuse and current trauma exposure on maternal prenatal mental health and infant stress regulation among dyads living in life-endangering conditions of war. This is the task of the present study.

RESEARCH QUESTIONS

We examine the role of past and current maternal trauma in the pre- and postnatal periods among Palestinian women in the Gaza Strip. The present study fills a gap in the earlier literature by analyzing the unique and joint impacts of mothers' exposure to childhood abuse and war trauma on maternal prenatal mental health and infant stress regulation. The specific research questions are as follows:

RQ1: How are mothers' experiences of childhood emotional (CEA) and physical abuse (CPA) and current war trauma (WT) associated with their prenatal mental health (depression and PTSD symptoms) and perceived stress? We hypothesize that (a) CEA, CPA, and WT are all associated with elevated levels of prenatal mental health symptoms and perceived stress; and (b) mothers with high levels of both childhood abuse (either CEA or CPA) and WT are most vulnerable to prenatal mental health symptoms and experience the highest levels of perceived prenatal stress.

RQ2: Do maternal prenatal mental health symptoms and perceived stress mediate the association among maternal CEA, CPA, and WT as well as infant stress regulation at 4 months? In accordance with prior studies, we hypothesized that (a) CEA and CPA are associated with poorer infant stress regulation, both directly and via mothers' prenatal mental health symptoms and stress; and (b) the effects of maternal WT on infant stress regulation are mediated via mothers' PTSD symptoms and perceived maternal stress.

METHOD

Participants and Procedure

Participants were 511 Palestinian women from the Gaza Strip who were interviewed during the second trimester of pregnancy ($M = 17.59$ weeks of gestation, $SD = 3.08$) (T1) and again when their infants were 4 months old (T2). From T1 to T2, 34 participants (6.7%; total n at T2 = 477) dropped out. Dropout was not associated with differences in demographic or mental health variables (for further details on the reasons for dropout, Punamäki, Diab, Isosävi, Kuittinen, & Qouta, 2017).

Mothers were recruited from 10 maternal clinics in government primary healthcare centers (PHCC) representing the five Gaza Strip governorates: North (two clinics, $n = 136$), Gaza City (three clinics, $n = 191$), Middle (one clinic, $n = 55$), Khan Youniss (two clinics, $n = 69$), and Rafah (two clinics, $n = 60$). Inclusion criteria were living in the geographic area and being in the second trimester of pregnancy. Data were collected between August and September 2013 (T1) and April and June 2014 (T2).

The ethics board of the Palestinian Ministry of Health approved the study. Ten fieldworkers with bachelor's degrees in relevant fields and experience with research work attended a comprehensive training with the second and fourth authors on research procedures, interviewing skills, ethical rules, and conducting home visits. In addition, the trainers supervised the fieldworkers every other week.

The study protocol was identical for all participants. Research visits were conducted at PHCCs at T1, lasting approximately 45 min, and in the families' homes at T2, lasting about 60 min. Families received a small gift for participating. At T1, participants were informed of the purpose of the study and the study protocol as well as the voluntary nature of their participation, and they provided informed consent. Data were collected by interviewing the mothers and writing their answers on paper and/or audio recording them. The protocol ensured that the mothers similarly understood the questions and were helped if they needed clarification. In addition, as the questions involved sensitive topics such as trauma experiences and mental health, the interviews helped to form a good alliance between the participants and the fieldworkers.

Measures

Demographic and obstetric characteristics. At T1, the women answered open questions about their age, number of children, and length of marriage, and selected among alternatives for educational level (1 = *no formal schooling*, 2 = *elementary school*, 3 = *secondary school*, 4 = *high school*, 5 = *professional schooling*, 6 = *university or polytechnic*, 7 = *other*), civic status (1 = *married*, 2 = *cohabiting*, 3 = *single*, 4 = *divorced*, 5 = *widow*), and employment (1 = *permanent work*, 2 = *part-time work*, 3 = *self-employed/entrepreneur*, 4 = *unemployed*, 5 = *staying home taking care of children*, 6 = *retired*, 7 = *other*). Families' financial status was indicated by two questions regarding difficulties in paying their bills (1 = *no difficulties*, 5 = *extreme difficulties*) and sufficiency of monthly income (1 = *sufficient means*, 4 = *not enough money to cover monthly expenses*).

Concerning obstetric information, mothers reported whether they had diagnoses of pregnancy-related obstetric complications (high blood pressure, high blood sugar level, bleeding, early contractions, threat of miscarriage, abnormalities in ultrasound, and/or other problems; 1 = *yes*, 0 = *no*). At T2, mothers reported the method of delivery (1 = *normal vaginal*, 2 = *assisted vaginal*, 3 = *planned caesarean*, 4 = *emergency caesarean*).

CEA and CPA. At T1, women were presented with a 13-item questionnaire developed by the Transcultural Psychosocial Organization (Punamäki et al., 2005). Abuse experiences were probed in relation to both the mother and the father, covering the ages of 12 and younger. Seven items refer to emotional abuse (e.g., verbal threats, humiliation, ridiculing) and four items to physical abuse (e.g., being slapped or beaten). The scale includes two positive

relational items that were omitted from this analysis. Mothers reported how often they had experienced each type of abuse on a scale of 0 = (*never*) to 4 (*always*). Averaged composite scores were constructed separately for CEA and CPA; Cronbach's αs were .83 for CEA and .86 for CPA.

WT. At T1, a 25-item questionnaire was used to measure traumatic events common and typical during the 2008 to 2009 Gaza War and the 2012 military offensive. Six events refer to human losses (family member, friend), four to material losses (home damaged, having to flee home, loss of livelihood), four to being injured or witnessing persons close to them getting injured, and 11 to being exposed to and/or witnessing warfare (shelling, bombing, witnessing injury and death in war). The women reported whether they had been exposed to each war event (1 = *yes*, 0 = *no*). A summed composite score of total WT events was constructed.

PTSD. At T1, women responded to the 31-item Harvard Trauma Questionnaire (Mollica & Caspi-Yavin, 1991). The current analysis involves the 16 items that indicate PTSD symptoms (according to criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised* (American Psychiatric Association, 1987). The mothers evaluated the extent to which they had suffered from each of the symptoms during the previous month on a scale of 0 (*not at all*) to 3 (*severely*). The three core symptoms of avoidance, intrusion, and hypervigilance were used as parcel indicators in the analysis (discussed later). A cutoff score for clinical PTSD was constructed by taking the mean of the 16 items, with a result of 2.5 or higher signifying clinically recognizable PTSD (Ichikawa, Nakahara, & Wakai, 2006). The PTSD symptom scales have been found to be reliable and valid in Arab populations, including Palestinians (Salo, Qouta, & Punamäki, 2005). In this sample, internal consistencies were $\alpha = .77$ for intrusive, $\alpha = .75$ for avoidance, and $\alpha = .83$ for hyperarousal symptoms.

Depression symptoms. At T1, the 10-item Edinburgh Depression Scale (EDS; Cox, Holden, & Sagovsky, 1987) was applied to measure maternal prenatal depression symptoms, covering depression-related feelings, thoughts, and behaviors. Mothers estimated which alternative best fit their experience during the last 7 days on a scale of 0 () to 3 (). As suggested by previous studies, a cutoff score of ≥ 12 was used to detect mothers with clinically recognizable depression (Adouard, Glangeaud-Freudenthal, & Golse, 2005; Deave, Heron, Evans, & Emond, 2008; Su et al., 2007). The measure has been found reliable and valid among pregnant women in multiple samples (Bergink et al., 2011), including among Arab postnatal women (Ghubash, Abou-Saleh, & Daradkeh, 1997). A composite score was constructed, $\alpha = .78$.

Perceived stress. At T1, the 10-item Perceived Stress Scale (Cohen, 1994) was applied. The scale probes feelings of controlling and coping with everyday challenges and hassles, and being stressed, angry, anxious, and/or overwhelmed. Mothers evaluated the frequency of their experiences on a scale of 0 (*never*) to 4 (*often*). The measure has been found reliable and valid among Arab pre- and postpartum women (Chaaya, Osman, Naassan, & Mahfoud, 2010). In this sample, a nine-item version had an α value of .74, as one noncorrelating item was omitted.

Newborn characteristics. At T2, mothers reported the infant's sex, need for immediate treatment in a neonatal intensive care unit (NICU) or other observational ward (1 = *yes*, 0 = *no*), and later hospitalization during the first months, (1 = *yes*, 0 = *no*). The NICU and later hospitalization variables were combined (1 = *need for hospitalization at any point*, 0 = *no need for hospitalization*). Mothers also reported their infants' gestational age, and a dummy variable was created to indicate prematurity (1 = *premature* [gestational age <37 weeks], 0 = *full-term infant born at Gestational Week 37 or later*).

Infant stress regulation. The Infant Behavior Questionnaire-Revised (IBQ-R, short version; Gartstein & Rothbart, 2003; Putnam, Helbig, Gartstein, Rothbart, & Leerkes, 2014) was used to assess infant stress regulation at T2. The 91-item questionnaire assesses how parents evaluate their infant's typical behavior during the last 7 days. As the participants were interviewed and did not fill out the questionnaires themselves, the original 7-point answer scale was modified to a 3-point scale (0 = *never or rarely*, 1 = *sometimes*, 2 = *often/always*) according to feedback from participants that the wider range was confusing. One broad dimension (negative affectivity, consisting of subscales of sadness, distress to limitations, fear, loading negatively, and falling reactivity) and one specific scale (soothability) were used as indicators of infants' stress reactivity. Negative affectivity refers to the infant's tendency to react to stressors with anger, irritability, fear, or sadness (Rothbart, Ahadi, & Hershey, 1994), and is considered the core quality of infant negative temperament (Paulussen-Hoogeboom, Stams, Hermanns, & Peetsma, 2007). Soothability reflects success in caregiver-initiated regulation: how the infant will recover and calm down when sung to, held, rocked, and so on (Gartstein & Rothbart, 2003). The selected IBQ-R short form scales have been found to have acceptable reliability and validity (Putnam et al., 2014).

Translation of methods. All instruments were used in Arabic. The childhood abuse, WT, and PTSD questionnaires were already available in Arabic. A bilingual researcher translated the EDS, perceived prenatal stress, and IBQ scales from English to Arabic, and the second author conducted a back-translation to check for accuracy.

Statistical Analyses

A structural equation modeling (SEM) approach with a mix of latent and observed variables (Bollen, 1989) was applied to simultaneously test the unique and joint effects of mothers' CEA, CPA, and WT experiences on prenatal mental health (depression and PTSD symptoms) and perceived stress as well as on infant stress regulation. Both direct effects on infant stress regulation and effects mediated via prenatal maternal mental health and stress

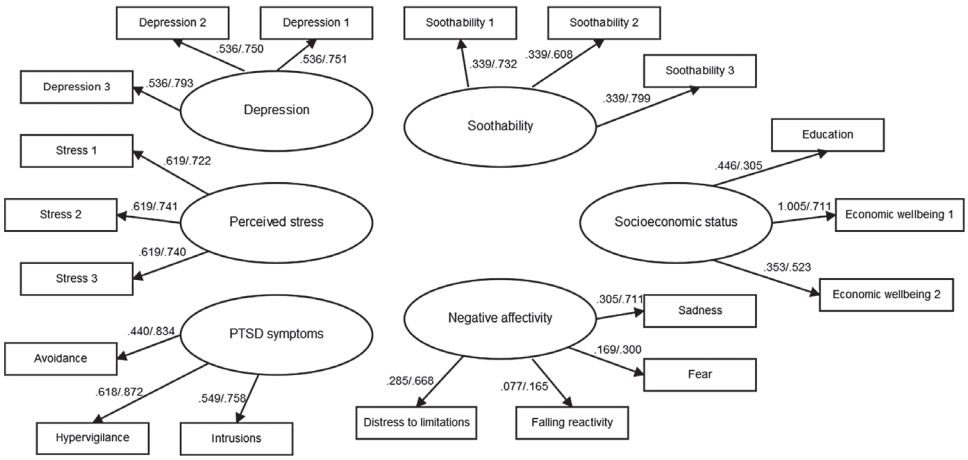

FIGURE 1. Measurement model for latent variables included in the structural equation modeling. Note. All latent variables allowed to covary freely; covariances not depicted for clarity. Nonstandardized/fully standardized loadings. All loadings significant at the $p < .001$ level, except for falling reactivity, where for the standardized loading $p = .078$.

were tested. Mothers' CEA, CPA, and WT experiences were included in the model as exogenous, continuous observed variables. Mothers' prenatal mental health and stress and infant stress regulation were modeled as latent variables. Figure 1 presents the measurement model for these latent constructs and their manifest indicators.

Parceling was used for indicators of constructs modeled as latent to improve reliability and communality and to decrease the likelihood of distributional violations and levels of Type II errors (Bagozzi & Heatherton, 1994; Little, Cunningham, Shahar, & Widaman, 2002; Little, Rhemtulla, Gibson, & Schoemann, 2013). A balancing approach or single-factor analysis parceling (Landis, Beal, & Tesluk, 2000) was applied for constructs judged to be theoretically unidimensional (maternal depression symptoms and perceived stress, and infant soothability). An internal consistency parceling approach (Little et al., 2002) was applied to better represent the multidimensional phenomenology of PTSD. A three-indicator structure with three facet-representative parcels was modeled corresponding to the avoidance, intrusion, and hypervigilance dimensions, loading onto a single latent PTSD construct. Parcel scores were thus the means of items in each of the three subscales. According to the instructions for the IBQ-R scoring sheet (Rothbart & Gartstein, 2000), infant negative affectivity was likewise modeled to consist of facet-representative parcels corresponding to the four dimensions of distress to limitations, falling reactivity, fear, and sadness, each represented by one scale of the IBQ-R. In addition, soothability was examined as an independent latent construct with three balanced parcels, as described earlier.

Infant gender, infant prematurity, need for infant hospital treatment, and the family's SES and number of children were included into the model as covariates. Research has suggested that newborn characteristics (de Bruijn, van Bakel, & van Baar, 2009; Weinberg, Tronick, Cohn, & Olson, 1999) and family SES (Bradley & Corwyn, 2002; Rich-Edwards et al., 2006) may influence early maternal mental health and infant development. Family size is relevant because in the Palestinian context, mothers are almost exclusively responsible for the home and for childcare. This, combined with poverty and poor and often crowded living conditions, may influence mothers' and infants' well-being (Rahim et al., 2009). SES was modeled as a latent construct with three indicators: the mother's level of education and the two questions on the family's financial status. The other covariates were observed manifest variables, with number of children modeled as continuous and the rest as binary.

For statistical analysis, confirmatory factor analyses (CFA) with single-factor models were first performed to assess the functioning of the multi-item measures used and their degree of unidimensionality. Second, a measurement model in which the latent constructs were all allowed to covary freely with all loadings free to vary was estimated, and its fit was assessed. Third, for the latent variables modeled with the balancing approach, loadings were set to equality (thus assuming tau-equivalent parcel indicators), another measurement model with these specifications was estimated, and the reduction in fit assessed. Finally, an a priori specified structural model was imposed on the measurement model to reflect the research hypotheses and account for the temporal sequence of the measurements. In this model, the maternal prenatal variables (depression and PTSD symptoms, perceived stress) were regressed on mothers' trauma experiences (CEA, CPA, WT) as well as on the interaction terms of CEA × WT and CPA × WT. The infant stress regulation constructs (negative affectivity, soothability) were regressed on the maternal prenatal variables and mothers' trauma

experiences as well as their interactions. The paths to the maternal prenatal variables were controlled for the effects of SES and number of children. The paths to the infant stress regulation outcome variables were controlled for the effects of all covariates (SES, gender, prematurity, hospital treatment, number of children.

All exogenous variables were allowed to covary freely, and the means and variances of the exogenous variables were included in the estimated model. The residuals of the three latent endogenous maternal prenatal variables as well as the two infant stress regulation latent variables were likewise allowed to covary to reflect shared sources of variance not included in the model.

The fit and parameters of this initial structural equation model were estimated. Nonsignificant interaction paths were then removed from the model to improve the interpretability of unique effects, arriving at the final model. This final model was then estimated and evaluated for significant direct or indirect effects. The significance of indirect (mediated) effects was tested with the product of coefficients method, using a first- and second-order Taylor series approximation for the standard error (*SE*) of the product (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

Weighted least squares means and variance-adjusted estimation was used for CFA with categorical items. Full-information maximum likelihood (FIML) estimation with robust *SE*s was used for all other analyses. Using all available data in estimating model parameters, these approaches apply missing data without excluding dropouts, and they are robust to deviations from normality assumptions. For variables included in the structural equation model, there were 1,191 missing data points (8.63% of total data), which is an acceptable amount when using FIML.

All analyses were carried out using Mplus 7.4 (Muthén & Muthén, 1998–2015). Input scripts used to carry out the analyses are available from the second author upon request.

RESULTS

Descriptive Statistics

Mothers' descriptive and obstetric characteristics and infant-related risks are summarized in Table 1. The women's ages ranged between 16 and 46 years, with the majority (80.2%) younger than 30. A minority of the women were expecting their first child while the majority (81.9%, $n = 406$) already had 1 to 11 children. Almost all (99.6%, $n = 509$) women were married, most (80.4%) for 10 years or less. About two thirds of the women (68.2%, $n = 348$) had secondary or lower schooling. Working outside the home was rare, as more than 8 of 10 women were occupied taking care of children at home. Concerning economic status, nearly all (99.4%, $n = 508$) mothers reported their family having a moderate to high degree of financial difficulties.

Diagnosed obstetric complications were rare, with only 5.3% of mothers reporting diagnostic risks. Over 80% of the mothers had a vaginal birth, about 10% a planned caesarean delivery, and 7% an emergency caesarean operation. A little over a half (54.3%, $n = 260$) of the infants were boys, and 45.7% ($n = 219$) were girls.

TABLE 1. *Distribution of Background and Pregnancy-Related Characteristics (%)*

	Participants	
	%	*n*
Age (years)		
16–20	26.6	136
21–30	53.6	274
31–40	18.2	93
41–46	1.6	8
No. of Children		
Exepting the First Child	18.1	90
1—3	58.9	292
4–6	20.0	99
7–11	3.0	15
Length of Marriage (years)		
<5	41.3	211
5–10	39.1	200
11–20	17.6	90
>20	1.8	9
Education		
No Formal Education	1.2	6
Elementary School	11.4	58
Secondary School	55.6	284
Higher Education	29.9	153
Other	2.0	10
Job Status		
Home Taking Care of the Children	82.4	421
Working Outside the Home	3.9	20
Student	9.8	50
Other	3.9	20
Financial Status[a]		
No Financial Difficulties	.6	3
Some/Moderate Difficulties	48.9	250
A Lot of Financial Difficulties	50.5	258
Obstetric Complications		
Any Obstetric Risk	5.3	27
High Blood Pressure	2.5	13
Gestational Diabetes	.4	2
Abnormalities in the Ultrasound	1.4	7
Early Contractions	2.2	11
Method of Delivery		
Vaginal	82.4	393
Planned Caesarean	10.3	49
Emergency Caesarean	7.3	35
Infant-Related Risks		
Primaturity	5.4	18
NICU	14.2	67
Need for Hospitalization Later	9.1	43

[a]Financial status is indicated from a three-class sum variable constructed of mothers' reports of difficulties to pay the bills and sufficiency of the family's monthly income. NICU = neonatal intensive care unit.

Prevalence of mothers' past and current traumatic experiences as well as prenatal mental health symptoms and stress are summarized in Table 2 The majority of mothers reported experiencing at least some degree of both CEA and CPA. The most common abuse experiences were parents scaring them (by the father: 45.5%,

TABLE 2. *Maternal Trauma Experiences and Prenatal Mental Health (%)*

	Participants	
	%	*ns*
Childhood Abuse Experiences[a]		
Emotional	65.6	334
Physical	77.6	395
War Experiences		
Human Losses	69.3	350
Self/Close Persons Injured	81.5	414
Material Losses	80.7	410
Witnessing War Events	96.9	492
Depression		
Clinical Cutoff ≥12	51.5	263
PTSD		
Clinical Cutoff ≥2.5	18.4	92
Prenatal Stress[b]		
2–13	18.2	93
14–22	49.3	252
23–38	32.5	166

[a]Occurence of abuse experiences is calculated from dummy variables. Occurence refers to abuse experienced from "sometimes" to "always." [b]Cohen (1994) reported that a score of 13.7 was the mean for females in a sample of 2,387 U.S. respondents. PTSD = posttraumatic stress disorder.

$n = 227$; by the mother: 46.5%, $n = 234$), humiliating them and shouting at them (by the father: 41.9%, $n = 211$; by the mother: 45.1%, $n = 228$), and threating beatings (by the father: 37.1%, $n = 187$; by the mother: 38.3%, $n = 193$). Almost all mothers reported experiences of WT such as bombings, shellings, and fires as well as witnessing people getting injured and killed. Over 80% of the mothers reported experiencing an injury to themselves or to someone close to them, and material losses. In addition, almost 7 of 10 mothers reported having lost a person close to them due to war.

The mothers reported a high level of prenatal mental health symptoms and perceived stress. Over half met the suggested cutoff point (EDS, 12 points or higher) for depression ($M = 12.03$, $SD = 5.95$). Concerning PTSD ($M = 46.19$, $SD = 12.56$), a little less than one fifth of the mothers exceeded the clinical cutoff score. Further, 81.8% ($n = 490$) of the mothers reported levels of prenatal stress exceeding the previously observed female mean of the Perceived Stress Scale (≥13.7; Cohen, 1994). For this sample, the mean was 19.62, and the *SD* was 6.56.

CFA

All items of the CEA and CPA scales and the EDS loaded on single factors with standardized loadings of .43 to .64, .64 to .83, and .22 to .79, respectively. One item of the Perceived Stress Scale did not load significantly on the common factor and was removed from further analysis. The remaining nine items loaded significantly, with standardized loadings ranging between .21 and .68.

For PTSD, all items loaded significantly to one of the three factors, with standardized loadings of .55 to .77 for intrusion, .64 to .76 for hypervigilance, and .28 to .65 for avoidance. One item of the avoidance factor had a low, but still significant, loading (standardized loading = .28) whereas the other items of the factor had significant loadings of .51 to .65.

For the IBQ scales, all items of the Soothability subscale and the Sadness subscale loaded on single factors with standardized loadings of .36 to .77 and .34 to .90, respectively. One item of the Distress to Limitations subscale was removed from analysis due to a nonsignificant, negative loading on the common factor. The remaining six items loaded on a common factor with standardized loadings of .16 to .99. One item of the Falling Reactivity scale was likewise removed due to a nonsignificant loading, and the remaining five items had standardized loadings of .19 to .95. One item of the Fear scale was similarly removed, and the remaining five items had loadings of .60 to .86.

SEM

A correlation matrix for variables included in the SEM is presented in Table 3. The results show significant correlations aomong all trauma types. Further, both past and current traumatic experiences correlate significantly with maternal mental health symptoms, and these symptoms correlate to some extent with infant stress regulation outcomes.

The measurement model had a good fit to the data, $\chi^2(137) = 217.43$, $p < .001$; root mean square of approximation (RMSEA) = .03, 90% confidence intervals (Cis) [.03–.04]; Comparative Fit Index (CFI; Bentler, 1990) = .97; standardized root mean square (SRMR) = .05. Although the $\hat{G}(\chi^2)$ statistic indicates misfit, it is well-known to greatly exaggerate misfit with larger samples (Bentler, 1990; Yuan, Hayashi, & Bentler, 2007). One indicator of the IBQ negative affectivity latent construct (the Falling Reactivity subscale) was only marginally significant, standardized loading $\lambda = .17$, $p = .08$, but because of its theoretical significance to the construct, it was retained in the measurement model.

Setting the indicator loadings of the balancing parceled latent constructs (maternal depression symptoms and perceived stress, infant soothability) to be tau-equivalent did not result in significant worsening of fit, Satorra–Bentler scaling corrected $\chi^2_{\text{diff}}(6) = 6.48$, $p = .38$. Thus, the applied final measurement model had tau-equivalent loadings for these variables and still fit the data well enough, $\chi^2(143) = 224.21$, $p < .001$, RMSEA = .03, 90% CIs [.025–.042], CFI = .97; SRMR = .05.

The final model combining the measurement and structural parts and including the covariates likewise fit the data well, $\chi^2(260) = 402.71$, $p < 0.001$; RMSEA = .03, 90% CIs [.03–.04]; CFI = .95; Tucker–Lewis Index (Tucker & Lewis, 1973) = 0.94; SRMR = .04.

Maternal Trauma Experiences and Prenatal Mental Health

The final SEM model with path estimates is presented in Figure 2 As hypothesized, CEA, CPA, and WT experiences were all separately associated with elevated levels of maternal prenatal mental health symptoms and perceived stress. CEA was found to have

TABLE 3. *Zero-Order Bivariate Correlations Between Observed Variables and Indicators Included in Structural Equation Model*

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1 War exposure																									
2 CPA	.14***																								
3 CEA	.19**	.66***																							
4 Intrusions	.33***	19***	16***																						
5 Avoidance	.33***	.30***	.32***	.63***																					
6 Hypervig.	.28***	.24***	.29***	.68***	.72***																				
7 Stress 1	19***	.14**	.21***	.23***	.36***	.39***																			
8 Stress 2	.18***	.16***	.20**	.27***	.39***	.37***	.55**																		
9 Stress 3	.13**	12**	.14***	.19***	.33***	.33***	.55***	.53***																	
10 Depression 1	.13**	.16***	.17**	.19***	.31***	.27***	.46*	.47***	.43***																
11 Depression 2	.10*	.18***	.18***	.26***	.37***	.37***	44***	.47***	.39***	57***															
12 Depression 3	17***	.15**	.22***	.23***	.40***	.41***	.52***	.51***	.45***	.59***	.58***														
13 Distress	.04	.04	.03	-.03	.02	-.07	.01	.03	-.01	-.07	-.03	-.05													
14 Sadness	-.04	-.01	.02	-.06	-.06	-.10*	-.05	.00	-.03	-.07	-.06	-.03	.42***												
15 F. reactivity	-.02	.05	.05	.04	.00	.03	.02	.00	.02	-.08	.01	.02	.17**	.08											
16 Fear	.00	-.03	-.01	.02	.05	-.02	-.02	.03	.04	.04	.01	.00	.18**	.18**	-.01										
17 Sooth 1	.04	-.04	-.03	-.06	-.04	.02	-.06	.01	-.01	.06	.05	.03	.01	.11*	-.18**	.01									
18 Sooth. 2	.05	.00	-.06	.02	.02	.01	.02	-.01	-.01	.05	.00	.03	-.14**	-.04	-.23**	-.06	.42**								
19 Sooth. 3	.03	.01	.00	-.01	.02	.01	-.04	.01	-.07	.02	.04	.01	.00	.10*	-.23**	.05	.54	.49**							
20 Education	-.10*	-.08	-.01	-.07	-.13**	-.11*	-.11*	-.09*	-.04	-.10*	-.18***	-.13**	.04	.04	-.04	.02	-.10*	-.05	-.05						
21 Econ 1	-.10*	-.08	-.11*	-.30***	-.28***	-.21***	-.21***	-.15**	-.12**	-.18***	-.19**	-.20***	.02	.09	.00	-.05	.15**	.04	.07	.19**					
22 Econ 2	-.11*	-.03	.01	-.15**	-.14**	-.15**	-.16***	-.09*	-.15**	-.12**	-.12**	-.15**	.08	.04	.05	-.04	.02	.06	.02	.20***	.37***				
23 Children	.11*	.04	.01	.04	.07	.06	.11*	.05	-.01	.12**	-.05	.07	-.01	-.05	-.09	-.02	-.03	-.08	-.03	-.22***	.03	-.07			
24 Gender	-.07.	.03	.01	.03	.02	.07	-.03	-.02	-.03	-.01	.00	-.04	-.10*	-.07	.01	-.01	-.02	-.05	.01	-.03	-.04	-.02	-.03		
25 Prematurity	-.02	.06	.04	.07	-.07	-.05	.07	-.02	.05	-.02	.01	.00	.02	-.03	-.03	-.03	-.02	-.08	-.04	.04	.10	.10	-.06	-.13*	
26 Hospital need	.08	.11*	.10*	.06	.11*	.05	.05	.10*	.09	.11*	.07	.08	.04	.00	-.01	-.03	.04	.00	-.01	-.12*	-.04	-.04	.06	-.01	.20***

Note. $N = 334–511$. CPA = maternal childhood physical abuse; CEA = maternal childhood emotional abuse; Hypervig. = hypervigilance symptoms; F. reactivity = falling reactivity; Sooth. = soothability; Econ. = economic well-being.
$^{*}p < .05.$, $^{**}p < .01.$, $^{***}p < .001.$

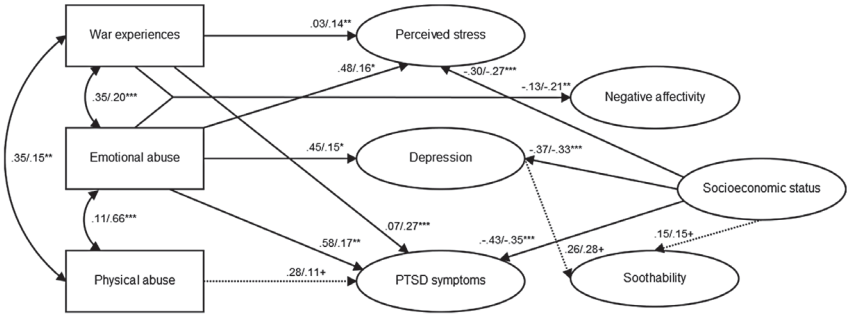

FIGURE 2. Final structural equation model linking maternal childhood abuse and war trauma, maternal prenatal mental health and stress, infant stress regulation, and socioeconomic status. Unstandardized/fully standardized robust maximum likelihood parameter estimates. Solid (dotted) lines indicate statistically significant (nearly significant) paths. Fused line indicates interaction term. Paths to maternal depression, prenatal PTSD symptoms, and stress controlled for effects of number of children. Paths to infant stress regulation variables controlled for effects of number of children, child prematurity, child gender, and child need for hospital care. Indicators of latent variables, covariates, modeled residual covariances, and error/disturbance terms omitted for clarity. $\chi^2(260) = 402.71$, $p < .001$; root mean square error of approximation = .033 [90 %]. $^{*}p < .05.$, $^{**}p < .01.$, $^{***}p < .001.$

a unique effect on prenatal depression symptoms. However, our hypothesis that exposure to both maternal childhood abuse and WT would be associated with high levels of prenatal mental health problems and perceived stress was not supported, as the interaction effects of maternal childhood abuse and WT were nonsignificant.

Maternal CEA had an effect on all prenatal mental health indicators: depression symptoms, fully standardized $\beta = .15$, $p < .05$, PTSD symptoms, $\beta = .17$, $p < .01$, and perceived stress, $\beta = .16$, $p = .01$. Instead, CPA had only a marginal effect on prenatal PTSD symptoms, $\beta = .11$, $p = .06$. WT was in turn positively

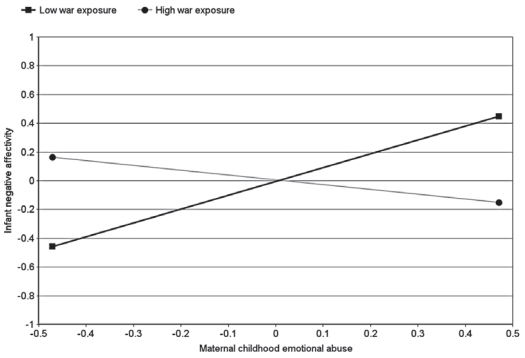

FIGURE 3. Conditional interaction effect of maternal childhood emotional abuse and maternal war trauma on infant negative affectivity. Illustrative representation of effect, based on robust maximum likelihood estimates of path coefficients embedded in full structural equation model. Illustrative mean-centered values shown for both the *x*-axis and the *y*-axis. High war experiences = 1 *SD* above mean. Low war experiences = 1 *SD* below mean. Lines drawn from 1.5 *SD*s below mean to 1.5 *SD*s above mean on the *x*-axis.

associated with levels of prenatal stress, $\beta = .14$, $p < .01$, and PTSD symptoms, $\beta = .27$, $p < .001$.

The results further showed that mothers' low SES was associated with high levels of CPA and WT, $r = -.13$, $p < .05$, and $r = -.18$, $p < .01$, respectively, but not with CEA. Mothers' SES also was negatively associated with prenatal depression symptoms, $\beta = -.33$, $p < .001$, PTSD, $\beta = -.27$, $p < .001$, and perceived stress, $\beta = -.35$, $p < .001$.

Maternal Trauma Experiences, Prenatal Mental Health, and Infant Stress Regulation

The hypothesis that maternal childhood abuse would have a direct effect on infant stress regulation (negative affectivity or soothability) did not receive support. However, there was a significant CEA × WT interaction effect on infant negative affectivity, $\beta = -.21$, $p = .002$. As Figure 3 illustrates, the association between CEA and infants' negative affectivity differed according to the level of WT. Only in dyads in which the mother was exposed to a low level of WT was high exposure to CEA associated with higher infant negative affectivity.

In addition, the results further showed that against our hypothesis, the impacts of CEA, CPA, or WT on infant stress regulation were not mediated via maternal prenatal mental health symptoms or perceived stress. Instead, we found that prenatal maternal depression symptoms had a marginally significant, yet unexpected, positive effect on infant soothability, $\beta = .28$, $p = .06$. Even though mothers' exposure to CEA was positively associated with prenatal depression symptoms, and these in turn were associated with higher infant soothability, the indirect effect of CEA on soothability via depression symptoms was nonsignificant, coefficient $\beta = .04$, $p = .40$.

The results also showed that mothers' high SES was marginally, positively associated with infant soothability, $\beta = .15$, $p = .09$. Infant characteristics also were found to be important, although only marginally significant, contributors to stress regulation: Infant prematurity was negatively associated with soothability, $\beta = .11$, $p = .08$, and male sex was positively associated with negative emotionality, $\beta = -.11$, $p = .09$. Note that male sex also was associated with infant prematurity, $r = -.13$, $p < .01$.

DISCUSSION

War and military conflict affect millions of infants and their parents. It is vital to understand the dynamics of intergenerational effects of trauma to provide evidence-based interventions for families in conflict areas and seeking asylum in peaceful countries. Early traumatic experiences may contribute to survivors' vulnerability, especially during the transition to parenthood. The present study therefore analyzed how Palestinian mothers' CEA and CPA and current WT experiences separately and jointly influenced their mental health and the development of their infants' stress regulation during the specific life phase of the pre- and postnatal periods.

Practically all the Gazan mothers had experienced war events such as losing family members, witnessing killings, or fleeing for their lives. However, CEA and CPA experiences also were common, as about 40% of the women reported childhood abuse. As hypothesized, both childhood abuse and WT heightened mothers' prenatal mental health symptoms and perceived stress. Importantly, CEA had more wide-reaching effects than had CPA or WT, as CEA contributed to all prenatal risk indicators: depression and PTSD symptoms, and perceived stress. Mothers' WT also was associated with PTSD symptoms and perceived stress, but CPA was only marginally associated with PTSD symptoms.

CEA by parents, such as ridicule or belittlement of one's feelings, uniquely increased depression symptoms when becoming a mother. The finding is important because half of the mothers in this study reported clinical levels of depression symptoms. Previous studies have confirmed that prenatal depression strongly predicts postnatal depression (Milgrom et al., 2008), and these cumulative mental health problems can pose a risk for the quality of the mother–infant relationship (Field, 2010; Martins & Gaffan, 2000).

The finding that CEA poses specific vulnerability to prenatal depression differs from that of Huth-Bocks et al. (2013), who instead found that CEA uniquely contributed to prenatal PTSD. Together, these results might suggest that maternal CEA-related prenatal vulnerability is universal. Thus, it is important to consider its role as a risk factor and a treatment target in non-Western contexts among women and their children who are exposed to acute stress and life threats. This study's results also concur with earlier studies that have demonstrated the general harmfulness of

CEA on mental health and specific ties to increased depression (Chapman et al., 2004; Gibb, Chelminski, & Zimmerman, 2007; Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003).

Against our hypothesis, we did not find that childhood abuse experiences added vulnerability in the face of later WT. Attachment theory might help in understanding why the effects of childhood abuse, especially CEA, on prenatal mental health were unique rather than cumulative with later trauma. It is plausible that experiences of CEA reflect insecure attachments, and when an insecure mother-to-be is revisiting her childhood experiences, she lacks necessary representations of adequately sensitive and loving parental figures (Brazelton & Cramer, 1990; Stern, 1995). In addition, in reflecting a lack of warmth and positive and regulating interactions, CEA in particular might make mothers-to-be vulnerable to emotional regulation difficulties, resulting in negative expectations in later life phases and transitions (Riggs, 2010).

Socioeconomic status was found to play an important role in mothers' trauma experiences and in prenatal well-being. The results showed that mothers with higher SES reported fewer CPA and WT experiences and less prenatal PTSD and depression symptoms as well as perceived stress than did mothers with lower SES. Previous research has identified childhood abuse as a core characteristic of a generally disadvantageous childhood in which parenting stress, parental mental health problems, and low SES together with abuse contribute to developmental risks (Appleyard, Egeland, Dulmen, & Sroufe, 2005; Sidebotham, Golding & the ALSPAC Study Team, 2001). It might be that mothers with high CPA exposure later experience low SES and mental health symptoms as intergenerationally transmitted problems and that they also are more vulnerable to WT. In the Palestinian context, these cumulating risk factors should be understood as part of the wider context of wars, displacement, and military conflicts that endanger parents' abilities to offer stable environments for their children's development.

Regarding infants' stress regulation, we hypothesized that mothers' childhood abuse experiences would influence their infants' negative affectivity and soothability both directly and via prenatal mental health symptoms and perceived stress, and that WT would hamper infant stress regulation via related prenatal PTSD and perceived stress. The results offered partial support for the direct transmission of childhood abuse, as mothers' high CEA was associated with increased infant negative affectivity, but only among mothers who had low levels of WT. Mothers exposed to high levels of WT did not show a similar connection between CEA experiences and infants' negative affectivity.

The finding seems perplexing because against the expectations, mothers with the most cumulated trauma exposure reported that their infants were less stress-reactive than did mothers with less WT. As the results are based on the mothers' *ratings* of their infants' behavior, a tentative explanation is that extreme and recent WT can blur mothers' perceptions of their infants' characteristics. Research has confirmed that severe trauma exposure can negatively alter posttraumatic mental states, such as through dissociation (Maercker, Beauducel, & Schützwohl, 2000). Severe life threats might interfere with mothers' capacity for caregiving (Belsky, 2008; George & Solomon, 2008) and thus also could disturb their attunement to infant stress signals. Therefore, a more realistic impact of CEA might come across in evaluations of less war-traumatized mothers. This interpretation, of course, raises concerns about the most severely traumatized mothers' capacities to read and sensitively respond to their infants' signals. In the future, using psychophysiological data in addition to maternal ratings could illuminate the complex traumatic impacts on maternal perceptions and interpretations of infants' signals.

A competing explanation why CEA did not seem to impact infant stress regulation among severely war-traumatized dyads relates to the specific Palestinian national ethos in war conditions. Earlier research has suggested that WT might mobilize social support, as survivors of enemy violence are considered heroes (Punamäki et al., 2005). In our case, more severely war-traumatized mothers might enjoy strong social affiliation and respect and receive help in caring for their infants, which might ameliorate their experiences of infant stress reactions. Investigating the role of social support and the value placed on interpersonal and military hardships is a task for further study. Qualitative analyses of meanings given to war experiences and infants' communications as well as conceptualizations of motherhood might help in understanding mothers' responses in this particular sociopolitical environment.

Surprisingly, the results did not support the hypothesis that prenatal mental health and perceived stress mediate the link between maternal trauma and infant stress reactivity. On the contrary, mothers' higher prenatal depression symptoms were associated with better infant soothability, although the link was only marginally significant. This unexpected finding makes sense when considering that soothability is actually a measure of parent–infant coregulation of infants' arousal and stress (Gartstein & Rothbart, 2003). The literature on depressed mother–infant dyadic interactions emphasizes infants' need to overadjust to low-stimulating and withdrawn mothers (Beebe, 2006; Tronick & Reck, 2009). Thus, infants of more depressed mothers might indeed appear easy to soothe. If this is the case, infants' excessive responsibility for regulating their own and dyadic responses suggests problems in the early dyadic interaction and in early child development (Beebe et al., 2000; Feldman, Greenbaum, & Yirmiya, 1999; Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001).

In addition to CEA and depressive symptoms, the family's SES and infant characteristics contributed to mothers' perceptions of infant stress regulation. Mothers with higher SES experienced their infants as more easy to soothe than did mothers with lower SES. It is plausible that mothers' better overall resources and fewer everyday socioeconomic burdens can facilitate attending to the needs of an infant. Understandably, mothers of premature infants reported more hard-to-soothe experiences than did mothers of full-term infants. This finding is consistent with well-established knowledge of preterm infants' regulatory difficulties (e.g., Clark, Woodward, Horwood, & Moor, 2008).

The findings that neither CPA nor WT were associated with infant stress regulation and that prenatal mental health and stress did

not mediate connections between maternal trauma and infant regulation deserve some thought. Culturally salient parenting practices and beliefs may be an extra factor affecting maternal ratings of their infants' stress reactivity. In collectivistic cultures such as that of Palestine, proximal parenting practices prevail. Parents keep their babies constantly close, and infants might be soothed in advance rather than needing their mothers to respond to communications of distress (Keller, 2007; Kuittinen et al., 2015). Further, preliminary findings from the same data have shown that in their socialization goals, Palestinian mothers promote emotion regulation and obedience in their small children rather than independence and a sense of self (Kuittinen et al., 2015). Although these suggestions are tentative, it is clear that more research is needed on the interconnectedness of culture, trauma, and early infant development. Future studies on cultural and trauma-specific effects on parenting and infants' well-being should apply multilevel approaches that measure objective and subjective levels of maternal, infant-related, and dyadic characteristics.

In addition to cultural and trauma-related factors, postnatal caregiving quality is likely to influence the ways that infants of war-traumatized mothers regulate stress and emotions (van Ee, Kleber, & Mooren, 2012). There is some evidence that when maternal WT results in dysfunctional parenting, very young children can suffer from pathological states of stress dysregulation such as PTSD (Feldman & Vengrober, 2011). Future research needs to study the effects of both the pre- and postnatal periods when considering how maternal trauma and mental health symptoms influence infant regulatory development.

Clinical Implications

The results of this study show that both mothers' early and current traumatic experiences affect the pre- and postnatal periods in war conditions; thus, they should be probed for during maternal and infant care. Our results also hint that those mothers who have been most severely traumatized by war might not report infant-related problems. Screening for severity of recent maternal traumatization might serve as an indicator of risks to early child development in families who do not communicate worries. Discrepancies between maternal reports of infant characteristics and clinicians' evaluations of infants also might help in evaluating how well traumatized mothers suffering from mental health problems detect and respond to their infants' communications. Further, in this study, socioeconomic disadvantages and infant characteristics increased the risk for mothers' mental health symptoms and infant regulation problems. Accordingly, infants in families with cumulated sociopsychological and medical risks are a key group to be identified and referred to treatment in conflict areas.

Such interventions should start during pregnancy, as the mothers in this study already suffered from high levels of mental health symptoms and stress prenatally. Theory suggests that pregnancy gives a mother a special openness to explore her own early experiences (Raphael-Leff, 1991; Stern, 1995). Our results show that especially experiences of CEA are harmful among war-affected mothers in early parenthood. Thus, identifying mothers' early abuse histories during pregnancy and working through such experiences in therapeutic relationships could help decrease the intergenerational risk for mothers in war conditions.

Limitations of the Study

The study deserves criticism for single reporting measures, the validity of some constructs, and retrospective accounts of childhood abuse. Mothers' self-reports were the sole source of information on infant stress regulation. Especially when working with a traumatized, high-risk group, maternal perceptions of their infants can deviate from those of professionals (van Ee et al., 2012). Hence, more research is needed with both objective and subjective measures. On the other hand, parents' *perceptions* of their infants' characteristics are clinically relevant because they, in addition to objectively measured infant characteristics, contribute to the development of children's regulatory abilities (Ghera, Hane, Malesa, & Fox, 2006).

Overall, reliability of the applied measurements was acceptable to good; yet, functioning of the IBQ-R items and scales in this sample was less than satisfactory. When examined by CFA, several items did not load significantly onto their common factor and were therefore not included in the analyses. Several other items had loadings that although significant, were still relatively low. This contributed to larger CIs in the estimates of SEM parameters, which may have obscured some effects. Also note that a version of the IBQ-R with a modified scale was used in this study, and reducing the range of the scale might have had some impact on the findings.

Finally, we retrospectively inquired into past maternal emotional and physical abuse. Evidence has shown that current moods may color our memories (Young, Erickson, & Drevets, 2012), and thus, depressive mothers may better remember their traumatic past or exaggerate it. On the other hand, research on autobiographic memory has shown that depressive persons tend to have more general memories (Williams et al., 2007), which would suggest that depressive mothers can underreport their past trauma. All in all, a prospective longitudinal research setting would have allowed for more reliable conclusions about the timing and nature of trauma.

Conclusion

The results of our study show that early adverse relational experiences are important determinants of pre- and postnatal development in acutely dangerous environments. This, together with the finding that prenatal mental health problems were highly common among Palestinian mothers in war conditions, calls for maternity- and infancy-informed psychological interventions for the families of infants in war zones, in addition to providing them material and medical aid. Further research is needed in considering how broader family relations, social support, cultural parenting practices, and beliefs as well as postnatal mother–infant interactions contribute

to the mental health and stress regulation of mother–infant dyads in war conditions.

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PUBLICATION III

Caregiving Representations in War Conditions: Associations with Maternal Trauma, Mental Health, and Mother-Infant Interaction

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Caregiving Representations in War Conditions: Associations with Maternal Trauma, Mental Health, and Mother-Infant Interaction

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Abstract

Risk features in mothers' caregiving representations remain understudied in dangerous environments where infants most urgently need protective parenting. This pilot study examines the feasibility of a novel coding system for the PDI interview (ARR, Assessment of Representational Risk) in assessing 50 war-exposed Palestinian mothers' caregiving representations. First, we explored the content and structure of risks in the representations. Second, we examined associations between the high-risk representations, mothers' pre- and postnatal exposure to traumatic war events (TWE), depressive and PTSD symptoms, and self-rated emotional availability (EA) with their one-year-old infants. Three dimensions of high-risk caregiving representations were identified: Self/dyadic Dysregulation, Unavailable, and Fearful. Mothers' prenatal depressive symptoms were associated with Dysregulating and Fearful representations, and their postnatal PTSD with Fearful representations. TWE were not associated with the high-risk representations. Moreover, mothers of boys reported more Fearful representations, and mothers with financial difficulties more Unavailable representations. TWE and high-risk representations were not associated with EA. However, qualitative analysis of the representations indicated risks in the mother–infant relationship. Further, older mothers and mothers with postnatal PTSD reported lower EA. Cultural variance in caregiving representations and the use of self-report measures among traumatized mothers is discussed.

Key words: war trauma, caregiving representations, pre- and postnatal, mental health, emotional availability

Dangerous environments, such as war conditions, highlight the protective function of adaptive caregiving for infant development (Lieberman, Chu, van Horn, & Harris, 2011; Masten & Narayan, 2012; Scheeringa & Zeanah, 2001). Research on European and American traumatized mothers shows that risk features in caregiving representations, such as idealization, fearfulness or hostility, specifically compromise a mother's ability to interpret and respond to her infant's needs in interactions (George & Solomon, 2008a; Lyons-Ruth, Bronfman & Parsons, 1999; Schechter et al., 2008). Thus far, there is little research on mothers' caregiving representations in conditions of war and military conflict. In order to plan preventive and early-onset interventions for the very vulnerable infant families living in such contexts, it is essential to identify the maternal characteristics that compromise caregiver–infant interactions.

The present pilot feasibility study explores the applicability of a novel assessment tool in studying the content and structure of risk features in war-exposed Palestinian mothers' caregiving representations. We further examine how the mothers' traumatic war experiences and mental health symptoms prior to pregnancy and in the postnatal period are associated with risks in the representations, and how all of these maternal variables are associated with the quality of the mothers' interactions with their one-year-old infants.

Effects of Trauma on Caregiving Representations

The pre- and postnatal periods play a central role in the formation of maternal mental representations. During pregnancy, the mother-to-be constructs working models of her infant and herself as a caregiver (Raphael-Leff, 1991; Slade, Cohen, Sadler, & Miller, 2009). These caregiving representations are further refined in the postnatal period, influenced by the family's resilience and risk factors as well as the infant's characteristics (Huth-Bocks, Levendosky, Bogat & Von Eye, 2004; Van Bakel & Riksen-Walraven, 2002). When caregiving representations are coherent, realistic, and mostly positive, they allow the mother to detect and respond to her infant's needs accurately in daily

interactions (Demers, Bernier, Tarabulsy, & Provost, 2010; Korja et al., 2010; Slade, Belsky, Aber & Jay, 1999). Importantly, a well-functioning caregiving representational system organizes maternal behavior around protecting the infant from excessive stress and environmental danger (George & Solomon, 2008a). This allows the child to rely on the mother at times of high arousal and stress, and to gradually internalize the dyadic procedures as his/her own stress and emotion regulation abilities (Ainsworth, Blehar & Waters, 1978; Rosenblum, Dayton, & Muzik, 2009; Sroufe, 1996). Because of their importance for parenting and infant development, caregiving representations are central treatment targets in parent–infant interventions (Lieberman, Silverman, & Pawl, 2000; Stern, 1995).

Research shows that traumatization can disturb mothers' caregiving representations, and consequently their ability to act as a regulating other for the infant (Huth-Bocks et al., 2004; Levendovsky, Huth-Bocks, & Bogat, 2011; Schechter et al., 2005, 2008). However, prior research mostly addresses the impact of interpersonal traumas, such as childhood abuse or later intimate partner violence. These existing studies suggest that infant attachment signals, such as crying or approaching the caregiver, as well as the caregiving responsibility of protecting the infant, can act as specific trauma reminders for the mothers, and evoke fight, flight or freeze reactions in interactions with their infants. Corresponding to these extreme stress reactions, hostile, helpless and fearful features have been found to characterize traumatized mothers' mental representations of themselves, their child, and their relationship (George & Solomon, 2000; Lyons-Ruth, 2003).

In accordance with her hostile representations, a traumatized mother may perceive her infant as a perpetrator or act in frightening or hostile ways towards him/her. Alternatively, the demands of caregiving may inflict a helpless sense of victimhood, and/or evoke fearfulness in a mother. Such states of mind can inflict dysregulating affects and arousal in a mother, and activate a need for self-protection and self-maintenance that overrides the caregiving inclination to help the infant promptly (Hesse & Main, 2000; Lyons-Ruth, 2003; Lyons-Ruth, Yellin, Melnick, & Atwood, 2005).

In their theory of the caregiving system, George and Solomon (2008a) describe how traumatized mothers segregate such intolerable caregiving representations from other mental content. Mothers either attempt to "constrict" the representations from activating, or they become "flooded" or emotionally overwhelmed when the representations are unwillingly activated by the caregiving role or infant signals. Hallmarks of the "constricted" strategy are idealized representations in which the infant is presented as not having any attachment needs that the mother would have to attend to, and role-reversed representations where the mother needs caretaking instead of or from her infant. "Flooded" representations entail a view of oneself as helpless and fearful and of the child as malevolent and impossible to handle. The caregiver's expressed wishes to abdicate from caregiving, due to a lack of willingness or ability, are seen as extremes of such segregated representations.

To our knowledge, there are no studies investigating the impacts of pre- or postnatal exposure to traumatic events on caregiving representations, despite the fundamental role of these periods in representation formation. Moreover, although constant danger in one's environment is likely to pose unique demands for caregiving (Belsky, 2008; Crittenden, 2006), information is scarce about the particular effects of military conflict and war on caregiving representations. Existing findings are summarized below.

War-exposed Mothers' Caregiving Representations

War and military violence pose an extremely challenging context for caregiving. The context for the current study is the Gaza Strip of Palestine. Participating mothers were exposed to wars and military offensives in 2008 and 2012, prior to becoming pregnant with their infants, and to war in 2014, after the infants were born. Due to international boycott and the Israeli military siege, the families continue to suffer from a chronic lack of basic supplies, such as electricity, clean water, nutrition, milk formula, and diapers, as well as medical treatment. Persistent unemployment, poverty, and overcrowded living conditions are additional stressors for the families (UN-Human Rights Council, 2015; Rahim et al., 2009).

Available studies on caregiving representations in war conditions are mostly qualitative, analyzing Israeli mothers expecting and caring for their infants in the aftermath of terrorist attacks (Kaiz et al., 2009; Levy, 2006) and refugee mothers seeking safety with their infants in Europe (Almqvist & Broberg, 2003). These studies suggest that risks in war-exposed mothers' caregiving representations might resemble the flooded/constricted and hostile/helpless-fearful risks identified from Euro-American interpersonally traumatized mothers' representations. War-exposed mothers have been reported to view themselves as damaged and incapable of taking care of their children, while simultaneously perceiving their children as difficult and overly demanding (Almqvist & Broberg 2003; Levy, 2006). Further, Kaitz et al. (2009) found that mothers often expressed fearfulness and overprotection or, in a constricted/idealized manner, described their children as "miraculous" and restorers of normalcy and life.

However, internal working models of caregiving also take influence from the sociocultural context of mothering. Ecological and social reality, cultural values, and mothers' available resources greatly affect their parenting values and behavior (Keller, 2013). Whereas urban and educated Euro-American mothers typically promote their children's independence and individualism, such socialization goals are not representative of caregiving worldwide (Kagitcibasi, 2005; Keller, 2003). In "Non-Western" or "collectivistic" contexts where resources are scarce and family sizes are larger, parents typically value children that adapt to the social group, maintain its harmony, and take others into consideration (Morelli et al., 2017).

Most psychological and developmental studies have concentrated on caregiving in educated, middle-class families in a Euro-American cultural context (i.e., "individualistic cultures"; see Henrich, Heine, & Norenzayan, 2010; Jensen, 2012; Nielsen, Haun, Kärtner, & Legare, 2017). To reach a more comprehensive understanding, an exploratory and open stance needs to be adopted when assessing representations among previously understudied caregivers, such as the Palestinian mothers of the current study. While cultural sensitivity is called for, it should not stand in the way of

recognizing risks in mothers' caregiving representations that can have a negative impact on child development.

High-Risk Caregiving Representations and Mother-Infant Interaction Quality

There is ample evidence that the distorted representations of interpersonally traumatized mothers are associated with dysregulating caregiving, such as hostile, frightened, withdrawn, role-reversed, or affectively contradictory behaviors. Such interactions leave the infant without regulatory help or further heighten his/her overwhelming stress (Crawford & Benoit, 2009; Lyons-Ruth et al., 2005; Main & Hesse, 1990) and have been shown among Euro-American participants to associate with disorganized attachment in infancy (Abrams, Rifkin-Graboi, & Hesse, 2006; Jacobvitz, Leon, & Hazen, 2006; Schuengel, Bakermans- Kranenburg, & van IJzendoorn, 1999) and severe psychopathology, such as personality disorders and dissociation in adulthood (Dutra, Bureau, Holmes, Lyubhik, & Lyons-Ruth, 2009; Lyons-Ruth, Dutra, Schuder, Bianchi, 2006).

There is some evidence that war-traumatized mothers with posttraumatic symptoms show similar dysregulating behaviors in response to their infants' attachment communications. The mothers may withdraw from distressed infants or exhibit unmodulated emotional distress in their presence (Almqvist & Broberg, 2003; Feldman & Vengrober, 2011). Feldman and Vengrober (2011) showed that, as a consequence, Israeli infants formed avoidant attachment patterns, thus sustaining maladaptive emotion regulation beyond the period when their mothers suffered from posttraumatic symptoms. However, to our knowledge, there are no quantitative studies investigating how maternal representations contribute to transmitting the harmful effects of war trauma onto mother–infant interactions.

Maternal Trauma, Mental Health and Caregiving Representations

Research shows that maternal posttraumatic mental health, rather than trauma exposure itself, determines the effect of the traumatic experience on caregiving (Scheeringa & Zeanah, 2001; Feldman & Vengrober, 2011). The pre-and postnatal periods involve great psycho-hormonal changes,

and might make traumatized women especially vulnerable to developing mental health problems, as evidenced by high prevalence of posttraumatic stress disorder (PTSD) and depressive symptoms (Banyard, Williams, & Siegel, 2003; Huth-Bocks, Krause, Ahlfs-Dunn, & Gallagher, & Scott, 2013; Roberts, O'Connor, Dunn, & Golding, 2004). This finding also applies to Palestinian war-exposed mothers ([*reference blinded for review*]).

Although maternal trauma-related mental health problems and dysfunctional representations have both been found to disturb caregiving, only a few studies have addressed the relationship between the two. Lyons-Ruth et al. (2007) showed that hostile and helpless representations were especially prevalent among North American mothers with borderline personality disorder, a condition that overlaps with the definition of complex PTSD (Herman, 1992; van der Kolk et al., 2005). Schechter et al. (2005) found that, among mothers exposed to childhood sexual abuse, PTSD symptoms were associated with highly negative and role-reversed representations of the child. Further, Sleed (2013) showed that maternal depression and borderline personality traits were associated with mothers' hostile, helpless, and narcissistic (idealizing and role-reversed) representations.

Despite the reported co-occurrence of maternal mental health symptoms and risk features in caregiving representations, it remains unclear whether they affect mother–infant interactions separately or whether mental health symptoms skew representations, which then compromise interaction quality.

The Current Study

In an attempt to fill the gaps in previous research, we explore risk features in Palestinian, war-exposed mothers' caregiving representations. We focus specifically on the effects that war exposure prior to pregnancy and in the postnatal period, and consequent mental health symptoms, have on these representations, and on how maternal war exposure, pre- and postnatal mental health symptoms, and high-risk representations affect mother–infant interaction quality. The specific research aims are:

1. to identify the structure and content of risk features in caregiving representations, by
    a. exploring their factor structure; and
    b. describing possible context-specific features of representational risks;
2. to analyze how mothers' traumatic war experiences (TWE) and mental health (depressive and PTSD) symptoms are associated with the identified risk features in their caregiving representations. We hypothesize that high levels of TWE and mental health symptoms are associated with risk features in the representations;
3. to analyze how maternal TWE, mental health, and high-risk representations are associated with mother-reported interaction quality (emotional availability, EA) and to examine whether the effects of TWE and mental health are mediated via risk features in the representations. We hypothesize that
    a. mothers' mental health symptoms and high-risk representations, rather than TWE, are directly associated with low EA; and
    b. that the harmful effects of pre- and postnatal TWE and mental health symptoms on EA are mediated through the high-risk representations.

Method

Participants and Procedure

The participants were 50 Palestinian mothers and their infants residing in the Gaza Strip. The sample was randomly selected from participants (n = 511) of a longitudinal research project 'Gaza Infant Study' who had completed a caregiving representation interview. The data were collected from 2013 to 2015 (for a description of the project, see Punamäki, Diab, Isosävi, Kuittinen, & Qouta, 2018). A smaller sample was necessary for in-depth and culturally valid analysis of the mothers'

representations. The subsample was deemed sufficient to detect medium to large effects in quantitative analyses. The subsample did not differ from the total sample in demographic characteristics, war trauma experiences, pre- or postnatal depressive symptoms, prenatal PTSD symptoms, or infant characteristics (sex, need for hospital care). However, mothers in the total sample reported more financial difficulties (M_{diff} = 0.39; 95% CI [0.05, 0.73], t (509) = 2.23, p = .03, Hedges's g_s = 0.33) and postnatal PTSD symptoms (M_{diff} = 3.05; 95% CI [0.48, 5.63], t(450) = 2.23, p = .03, Hedges's g_s = 0.33) than in the subsample.

The ethics board of the Palestinian Ministry of Health (MoH) approved the study. Participants of the larger study were recruited from ten Palestinian governmental primary health care centres (PHCCs) during their second trimester of pregnancy (T1) in order to obtain a geographically representative sample of the Gaza Strip. The geographical representativeness was retained in the selection of the current sample by randomly selecting a percentage of cases from each area that corresponded with the percentage of cases in that area in the total sample. The families were further studied in their homes when the infants were four months (T2) and twelve months old (T3). In the subsample, there was no dropout from T1 to T3, but two mothers (4%) had missed data collection at T2 (for a flow chart and a more specific account of dropout in the whole sample, see [*ref blinded for review*]).

The research visits were conducted by ten fieldworkers with Bachelor's degrees in relevant study fields who received training and supervision in the study procedure and methods. The study protocol was identical for all participants. At T1, the mothers were informed of the study's protocol, purpose, and voluntary nature, and they gave informed consent to participate. At each research visit, the fieldworkers interviewed the mothers and wrote down the answers, instead of asking the mothers to fill standardized questionnaires. This was done so that mothers who were unaccustomed to research practices and partly illiterate would understand the questions, and to form an alliance between fieldworkers and participants. At T3, the semi-structured representation interviews were audiotaped.

Measures

Demographic, obstetric, and newborn characteristics. At T1, the mothers answered open questions about age, number of children, and the length of their current relationship. They further chose education, civic, and employment status from predefined alternatives. A sum variable of the family's financial difficulties was constructed from questions indicating difficulty paying the bills (1 = *no difficulties* to 5 = *extreme difficulties*) and sufficiency of monthly income (1 = *sufficient means* to 4 = *not enough money to cover monthly expenses*).

Concerning obstetric data, at T1, the mothers reported whether they had any diagnosed pregnancy-related risks (high blood pressure, high blood sugar level, bleeding, early contractions, threat of miscarriage, abnormalities in the ultrasound and/or other problems; 0 = *no*, 1 = *yes*). At T2, the mothers reported the method of delivery, infant sex, gestational age, and birth height and weight. A dummy variable was formed to indicate infant prematurity (1 = *premature [gestational age <37 weeks]*; 0 = *full-term infant born at gestational week 37 or later*). Further, the mothers reported infant need for hospitalization during the newborn period or later on, and this information was dummy-coded for analysis (1 = *need for hospitalization*, 0 = *no need*).

Traumatic war experiences were measured at T1 and T3. At T1, the mothers were probed about typical experiences during the 2008/2009 war and the 2012 military offensive with a 25-point questionnaire, including questions about human losses (6 items), material losses (4 items), injuries (4 items), and being exposed to/witnessing warfare (11 items). At T3, a 28-item questionnaire comprising typical events during the 2014 war in Gaza was used, including questions about human losses (3 items), injuries (4 items), being exposed to/witnessing warfare (10 items), forced displacement/separation from family (5 items), and exposure to serious health threats (6 items). The mothers reported whether they had had any of the above experiences (1 = *yes*; 0 = *no*), and sum variables were constructed to indicate total exposure.

Maternal pre- and postnatal depressive symptoms were measured at T1 and T3 using the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987). The ten-item questionnaire includes questions on depression-related feelings, thoughts, and behaviors, with answers provided on a four-point scale (0 – 3) concerning the last seven days. A sum score of the ten items was used in analysis. Further, as suggested by previous studies, a cut-off score of ≥ 12 was used to indicate major depression (Adouard, Glangeaud-Freudenthal, & Golse, 2005; Deave, Heron, Evans, & Emond, 2008; Su et al., 2007). The measure has been found reliable and valid among pregnant women (Bergink et al., 2011) and Arab postnatal women (Ghubash, Abou-Saleh, & Daradkeh, 1997). In the current sample, internal consistencies (Cronbach's α) were .80 at T1 and .77 at T3.

Maternal pre- and postnatal PTSD symptoms were assessed at T1 and T3 using the Harvard Trauma Questionnaire (HTQ; Mollica & Caspi-Yavin 1991). The first 16 items of the 30-item questionnaire were used to indicate DSM-III-R criteria for avoidance, intrusion and hypervigilance symptoms of PTSD. The mothers reported to what extent they had suffered from the symptoms during the last month on a four-point scale (0 = *not at all* – 3 = *severely*). By taking the arithmetic mean of the 16 items, a cut-off score of 2.5 was used to indicate clinically significant PTSD (see, e.g., Ichikawa, Nakahara, Wakai, 2006). The HTQ has been found reliable among Palestinians (Salo, Qouta, & Punamäki, 2005). In this sample, internal consistencies were α = .90 at T1 and α = .89 at T3.

Risk features in caregiving representations were assessed at T3 using the semi-structured Parent Development Interview-revised short version (PDI-R S; Slade, Aber, Bresgi, Berger, & Kaplan, 2004), which enquires about views of oneself as a caregiver, the infant, the parent–infant relationship, and the affective experience of parenting. The interview was modified to include two questions regarding how the 2014 war affected the mothers as caregivers and their infants.

Audiotaped interviews were transcribed verbatim and translated from Arabic to English by the second author.

The first author, who is a trained and reliable coder, analyzed the interviews with a new coding system called the Assessment of Representational Risk (ARR, 3rd version; Sleed, Isosävi, & Wain, 2017). The ARR dimensions are summarized in Table 1. The instrument identifies representational risk features that have been found to be specifically associated with dysregulating caregiving behavior and infant disorganized attachment (Sleed, 2013). In the instrument's formation, operationalized representational and parent–infant interaction assessment tools were comprehensively reviewed and a list of correlates to risk features was made.[1] The ARR comprises ten scales, eight of which indicate risk: *hostile behavior, hostile experience, fearful affect, helplessness, emotional distress, enmeshment/role reversal, incoherence*, and *idealization*; and two that assess protective qualities of parenting: *supportive presence* and *mutual enjoyment*. The scales are not mutually exclusive. Each scale is scored from one to five, with high scores (4–5) indicating frequency and/or intensity of representational risk features that, as such, are likely to disturb the parent–infant interaction. Among mothers in the United Kingdom, the ARR has been found to have moderate to good internal consistency, good criterion validity to discriminate between high and low risk samples, and good concurrent and predictive validity in relation to maternal psychopathology and the quality of parent–infant interactions (Sleed, 2013). Further, the ARR showed clinical validity in a RCT study of parent–infant psychotherapy, where risk features in the psychotherapy-enrolled mothers' representations decreased from the pre- to post-intervention assessment (Fonagy, Sleed, & Baradon, 2016).

[1] The interview and interaction coding systems which were reviewed included: the Atypical Maternal Behaviour Instrument for Assessment and Classification (AMBIANCE; (Bronfman, Parsons, & Lyons-Ruth, 1999), the Frightened/Frightening coding system (FR; (Main & Hesse, 2005), the Parent Attachment Interview (Biringen, Matheny, Bretherton, Renouf, & Sherman, 2000), the Caregiving Interview (George & Solomon, 2008b), the Working Model of the Child Interview (Zeanah, Benoit, & Barton, 1986), the Adult Attachment Rating and Classification System (Main & Goldwyn, 1991), the Hostile/Helpless coding system (Lyons-Ruth, Melnick, Atwood & Yellin, 2003), the Maternal Insightfulness Assessment (Koren-Karie, Oppenheim, Dolev, Sher, & Etzion-Carasso, 2002; Oppenheim & Koren-Karie, 2002), and the adapted version of the AMBIANCE to be applied to parents' narratives (Crawford & Benoit, 2009).

Table 1

The evaluated dimensions of caregiving representations in the Assessment of Representational Risk (ARR) coding system

Dimension	Description
1. Hostile experience	Overt or covert description of the child or parenting in negative or derogatory terms: parent's experiences of the child as purposefully difficult or as the cause of their distress, and/or parenting as a hindrance to what they are able to do.
2. Hostile behavior	Expressed verbal or physical threatening, frightening and punitive behaviors towards the child. Ranging from teasing, mocking, refusal to help the child at times of heightened arousal, to physical abuse.
3. Fearful affect	Fears and worries about the parent's own or the child's wellbeing, safety or life. At high levels the fearfulness is irrational and preoccupies the parent's mind.
4. Helplessness	Descriptions of a reduced sense of power in relation to caring for their child. At high levels, the parent's view that the child has the power and of oneself as a victim.
5. Emotional distress	Expressions of overwhelming painful or negative emotions such as guilt, anxiety or depression that the parent struggles to regulate and which impinge on caregiving.
6. Idealisation	Descriptions that lack or deny the negative or challenging experiences of caregiving or the child. Such descriptions can be generalized and lacking in detail, or could show unrealistic glorification of parenting, the child or the relationship.
7. Enmeshment/Role reversal	Statements where the caregiver's and child's roles or boundaries are confused, e.g. difficulty to separate from child, descriptions of self and child as similar or the same, perceptions of the child as more powerful than self or demanding/expecting care from the child.
8. Incoherence	Confusing, off-the-point, hard-to-follow or bizarre descriptions, comprising the parent becoming lost in thought, wandering off topic, not collaborating and making (unnoticed) contradictions. Dysfluencies or grammatical errors are not coded as Incoherence.
9. Supportive presence	Parent's ability to recognize the child's needs and to respond to them appropriately with regulatory help, care and support (sensitivity), as well as capability to allow the infant to explore.
10. Mutual enjoyment	Descriptions where it is clear that the parent and child are both enjoying interactions with each other; shows parental "falling in love" with their child and serves as motivation to endure difficulties in parenting.

Note. A dimension is scored based on the frequency and intensity of incidents found in the parents' narrative. There are no specific demand questions of the PDI that are scored but instead the whole of parent's narrative is evaluated. Dimensions 1- 8 indicate representational risk features and dimensions 9 – 10 indicate protective factors for the parent – child relationship.

For inter-rater reliability, the fifth author, a trained and reliable coder in the ARR, analyzed 20% of the cases (n = 10). A mixed-effects model of consistency demonstrated an intraclass correlation (ICC) of .87 for a total risk score (sum of all scale scores with the two positive scales reversed); .94 for the first factor and .89 for the second factor found in this study, indicating good reliability; and .67 for the single ARR scale used in the analysis, indicating moderate reliability (Koo & Li, 2016).

Prior to this study, the ARR instrument had not been used with Middle-Eastern/Palestinian mothers. In order to ensure that the ARR reliably captured risks among the Palestinian mothers, and to allow for an exploration of potential context-specific features in the Palestinian mothers' representational risks, the first author kept a diary of qualitative aspects of risk features detected with the ARR. After coding all the cases, the qualitative diary was re-read several times, and the reoccurring phenomena were summarized. Throughout the process of analyzing the interviews, the first author held regular videocall meetings with the second (Palestinian) author in order to discuss possible cultural and contextual meanings in the mothers' representations.

Mother–infant interaction quality was assessed at T3 with the short version of the Emotional Availability Self-Report (EA-SR Brief; Biringen, Vliegen, Bijttebier, & Cluckers, 2002). The EA-SR Brief is based on the observational Emotional Availability Scales and has been shown to correlate significantly with its dimensions (Vliegen, Luyten, & Biringen, 2009). The 28-item questionnaire enquires about parental emotional availability, such as enjoyment of the relationship, ability to read the infant's signals, and structuring (13 items, e.g., "My baby is lots of fun to be around" and "Even if my baby doesn't get it right, I let him/her have the experience"). The questionnaire also enquires about non-availability, such as lack of positive interaction and inability to help the child in affect and stress regulation (15 items, e.g., "My baby doesn't seem to notice when I come back into the room" and "It is hard to soothe my baby and s/he seems to be distressed a lot").

The mothers evaluated how characteristic each statement was of their relationship with their infant on a 5-point scale (1 = *almost never*; 3 = *sometimes*; 5 = *always*). A previous study among Gazan mothers confirmed the two-factor structure underlying the items (Lahti et al., 2019). In the subsample, internal consistency for the non-availability subscale was unsatisfactory (Cronbach's $\alpha = .23$). Thus, only the sum of the items of the emotional availability subscale (Cronbach's $\alpha = .78$) was used to indicate interaction quality.

Translation of the measures. The questionnaires on traumatic war events and PTSD were already available in Arabic. A bilingual researcher translated the EPDS, PDI, and EA instruments from English to Arabic, and another member of the research team conducted a back-translation to check for accuracy. The concordance between the translation and back-translation of the measures was found to be satisfactory. The parts of the back-translation that showed less satisfactory concordance were discussed thoroughly with a third member of the research team, and the best-fitting phrasing was agreed upon and included in the final Arabic version of the measures.

Statistical Analyses

The factor structure of risk features in representations (ARR) was examined using Exploratory Factory Analysis (EFA). EFA was carried out using ordinary least-squares (OLS) factor extraction with the *EFAutilities 1.2.1* R package (Zhang, Jiang, Hattori, & Trichtinger, 2017). Standard errors and confidence intervals were estimated using the sandwich method provided by the package, which in the case of Likert-type or non-normal variables is equivalent to the infinitesimal jackknife method (Zhang, Preacher, & Jennrich, 2012). Oblique CF-varimax rotation was used, as the ARR factors were assumed to be correlated. Both the statistical significance of estimated loadings (at $\alpha = .05$) and their magnitude ($\lambda > .40$) were considered for the retention of items and determining optimal factor structure. The sample size of 50 is close to the minimum considered acceptable in research employing EFA, but it does satisfy the general recommendation of five participants per variable (Henson & Roberts, 2006).

As the factor loadings ascertained by EFA were computed from the same rather limited data that were used for further analysis, the factor scores relying on these loading estimates may be overly dependent on idiosyncrasies of the current data. Thus, aggregate mean scores were computed based on the factor structure suggested by EFA and used in further analyses, an approach deemed suitable for exploratory analysis (Tabachnick & Fidell, 2001).

Associations between mothers' traumatic war experiences (TWE) and pre- and postnatal mental health (depressive and PTSD) symptoms, background variables, ARR, and interaction quality (EA) were examined through bivariate correlations. Background variables that were associated with TWE, mental health symptoms or EA were included in the correlation analysis. Where several mental health, war trauma or background variables were correlated with a particular ARR dimension or EA, OLS multiple regression analysis was used to estimate the relative predictive contribution of each variable, accounting for the others.

Where correlations suggested possible mediation paths, indirect effects of TWE and mental health on EA via ARR dimensions were tested using OLS regression path analysis. Due to the complexities of combining bootstrapping and multiple imputation, the more straightforward product of coefficients method, combined with Aroian's second-order solution for the standard error of the product, was considered adequate for evaluating indirect effects. For regression analyses, the properly ordinal ARR fearfulness variable was treated as continuous, which is considered acceptable for a Likert-type item with five categories (Rhemtulla, Brosseau-Liard, & Savalei, 2012).

While the data for ARR and EA were complete, there were 27 data points (3.2% of total data) missing for demographic variables, TWE, and mental health variables. Little's test failed to reject the hypothesis that data were missing completely at random ($p = .52$). Multiple imputation with chained equations, using the *mice 2.46.0* R package (van Buuren & Groothuis-Oudshoorn, 2011), was used to handle missing data. Twenty imputation sets were generated, with predictive mean matching used for continuous variables and logistic regression used for binary ones. All analyses were carried out

using these multiple imputation data sets and the results were pooled following Rubin's rules and Fisher transformation for correlation coefficients.

Descriptive statistics were calculated using SPSS version 24, and are reported based on non-imputed data. All other data processing and analyses were carried out using R 3.4.3 (R Core Team, 2017). The R input scripts that were used are available from the fourth author upon request.

Results

Descriptive Statistics, Traumatic War Experiences and Mental Health Symptoms

The mean age of the mothers in the study was 24.7 years (*SD* = 5.83), ranging from 17 to 46 years. They were all married, with the mean length of the marriage being 6.14 years (*SD* = 4.17) and ranging from 1 to 19.5 years. Approximately half of the mothers had attended secondary school (56.0%, *n* = 28), and almost a third possessed a higher degree (30.0%, *n* = 15). A vast majority of the mothers were primarily occupied as caregivers (86.0%, *n* = 43), and 14% (*n* = 7) were working outside the home. About one-fifth of the mothers were expecting their first child (22.9%, *n* = 11). The maximum number of children in the families was six, while the most common family size was three children (*M* = 2.86; *SD* = 2.85). All the mothers reported the family having some degree of financial difficulty, and 38.0%, (*n* = 19) reported having significant difficulties. The mothers rarely reported any pregnancy-related risks (8.0% *n* = 4).

Concerning childbirth, eight out of ten of the mothers (81.3%, *n* = 39) had a vaginal delivery. A little less than a fifth (18.7%, *n* = 9) of the mothers had a Caesarean section, five of them (10.0% of all births) being emergency C-sections. A little over half (54.2 %, *n* = 26) of the infants were boys and 45.8% (*n* = 22) were girls. Only two infants (5.7%) were born prematurely. The mothers reported

that about a fifth (21.3%, n = 10) of the infants needed extra hospital treatment during the neonatal period or later on.

The mothers' traumatic war experiences (TWE) and mental health symptoms in the pre- and postnatal periods are summarized in Table 2. Nearly all the mothers reported exposure to war events both before pregnancy and in their postpartum period. During the 2008 and 2012 wars, material losses and injuries to self or significant others were the most common traumatic events. Regarding the 2014 war, mothers most often reported displacement and exposure to health and life-threatening environmental hazards.

Concerning the mothers' mental health, depressive symptoms were found to be especially prevalent. In the prenatal period, over half of the mothers reported symptom levels that met the criteria for major depression, and 60.0% reported such symptoms in the postnatal period. About 15-16% of the mothers reported PTSD symptoms exceeding the diagnostic cut-off point both in the pre- and postnatal periods.

Table 2

Maternal pre- and postnatal war experiences and mental health symptoms

	Participants	
	%	*n*
Traumatic war experiences before pregnancy		
Exposure to war events	95.9	47
Injury	75.5	37
Material losses	73.5	36
Human losses	64.6	31
Traumatic war experiences in postpartum		
Exposure to war events	98.0	49
Displacement	88.0	36
Exposure to serious health threats	72.0	36
Human losses	28.0	14
Injury	24.0	12
Prenatal Depression		
Clinical cut-off ≥ 12	54,0	27
Postnatal depression		
Clinical cut-off ≥ 12	60,0	30
Prenatal PTSD		
Clinical cut-off ≥ 2.5	14,6	7
Postnatal PTSD		
Clinical cut-off ≥ 2.5	16,0	8

Note. Total *N* of mothers ranged from 48 to 50 due to missing values. PTSD = Posttraumatic Stress Disorder Symptoms.

The Structure and Content of Mothers' High-Risk Representations

Visual inspection of both the scree plot and eigenvalues suggested a two-factor solution for the ARR risk features in mothers' representations. In the two-factor solution provided by EFA with oblique rotation, three items did not show satisfactory loadings to a single factor. *Enmeshment* and *fearfulness* did not load above $\lambda = .40$ on either factor, whereas *supportive presence* loaded equally on both factors. As previous research suggests that *fearfulness* is a central representational risk feature, it was retained for further analysis as a single-item scale. *Enmeshment* and *supportive presence* were dropped from further analysis.

A final EFA with the seven retained items further supported a two-factor solution. *Hostile experience*, *hostile behavior*, *helplessness*, and *emotional distress* loaded strongly ($\lambda = .62$-$.86$) on the first factor, named Dysregulating representations, reflecting the mother's inability to regulate her own emotions and her infant during interactions. *Idealization*, *incoherence*, and *mutual enjoyment-reversed* loaded strongly ($\lambda = .58$-$.81$) on the second factor, named Unavailable representations, reflecting a lack of maternal motivation and realism in interpreting and responding to infant signals. The final EFA model is presented in Figure 1. The model fit the data reasonably well (F (8) = 10.87. $p = .21$. *RMSEA* = .08, 90% CI [.00, .20]).

Cross-loadings were statistically significant for *helplessness*, *idealization*, and *incoherence*, and highest for *incoherence* ($\lambda = .36$ loading on Dysregulating representations). Because *incoherence* theoretically co-occurs with *idealization* (idealized narratives lack realism and are thus incoherent), it was retained as part of Unavailable representations despite the cross-loading. Based on these results, mean scores were calculated for Dysregulating representations and Unavailable representations. These aggregate scores had good ($\alpha = .84$) and satisfactory ($\alpha = .69$) reliability, respectively.

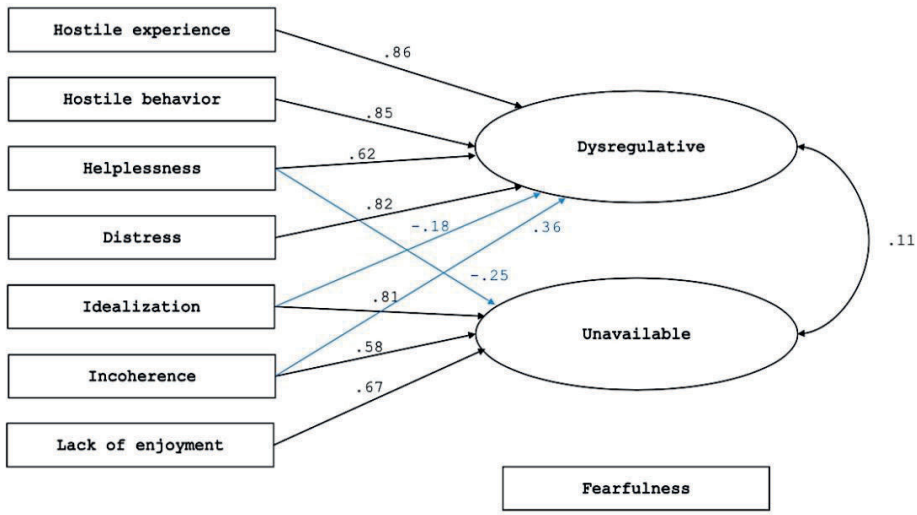

Figure 1. Results of exploratory factor analysis for Assessment of Representational Risk. N = 50. Only significant loadings shown.

Qualitative remarks on the content of representation dimensions. The qualitative analysis substantiated the argument that Dysregulating, Unavailable, and Fearful features were central and recurrent risk features in the mothers' representations. The contents of the Dysregulating representations typically incorporated mothers' descriptions of themselves as nervous or unable to regulate their anxious or angry outbursts in the presence of their infants. The mothers repeatedly stated that their overburdening responsibilities of taking care of the house and the extended family, as well as the chronic shortage in basic supplies, were the cause of their distress. In addition to identifying their holistic caregiving role as a source of burden, the mothers gave very negative descriptions of their infants as purposefully difficult and tiring them. Alarmingly, the mothers also talked about not attending to the infants' needs, slapping or beating their infants in response to undesired behaviors, and severely dysregulated infant reactions (e.g., banging head on floor, pulling hair).

The *lack of enjoyment* in the Unavailable representations manifested as maternal expressions of not having the time or motivation to interact with their infants and of experiencing the infants as bothering them. *Idealization and incoherence* were evident when mothers spontaneously spoke about their distress or punitive behavior, but when asked specifically about negative emotional experiences (such as feeling angry or guilty as a parent) or difficulties in relation to the child (i.e., "describe a time when you and your child really didn't 'click'"), they denied having any. Another *incoherent* answering pattern was irrelevant or very concrete answers given to the PDI's psychologically-oriented questions. For example, mothers responded to the question "how has having the child changed you?" with answers such as "my weight has increased", "nothing", or "the family expenses increased". Furthermore, when probed about the child's emotional experience (such as "what would you describe as his/her favorite thing to do"; "tell me about the times your child has most trouble with"), the mothers often described their infant's behavior or physical characteristics. Such answers gave the impression that the mothers were not familiar or comfortable with reflecting upon their own or the infants' mental states.

Regarding Fearfulness**,** a majority of the mothers described preoccupation with fear during the most recent war in Gaza in 2014. When the fearful states of mind were limited to descriptions of the past, they were not considered indicative of high-level Fearfulness that is characterized by unrealism and lack of connection to an objective source. Instead, expressions of Fearfulness that originated from the 2014 war and still preoccupied the mothers' minds a year later received a high rating. Typically, the mothers expressed fearing that something bad would happen to their infant (e.g. constant worry that s/he would trip on stairs) or fear of losing them. Further, it was common for the mothers to describe a constant fear of a new war. This threat, in tandem with reports of extreme difficulties in providing their children with everyday necessities, gave rise to some mothers' expressions that they wished not to have any children. This was not deemed as "abdication from caregiving" that reflects an extremely hostile or helpless stance towards parenting (George &

Solomon, 2008a) but rather as an understandable response to the pain that the mothers bore for both their own and their children's sake in the intolerable situation.

Associations between Traumatic War Experiences, Mental Health and High-Risk Representations

Bivariate correlations between background and demographic variables, traumatic war experiences (TWE) and mental health, the identified ARR dimensions, and interaction quality (EA) are presented in Table 3. Our hypothesis that high levels of TWE and mental health symptoms would be associated with the high-risk representations was partially confirmed, as prenatal depressive symptoms were positively associated with Dysregulating representations ($r = .30$, $p = .03$) and Fearful representations ($r = .33$, $p = .02$) and postnatal PTSD was positively associated with Fearful representations ($r = .29$, $p = .04$). However, TWE were not significantly associated with any of the ARR dimensions. The results further showed that mothers with male infants had more Fearful representations ($r = .38$, $p = .007$), and that financial difficulties were positively correlated with the Unavailable representations ($r = .29$, $p = .04$).

Prenatal depressive symptoms, postnatal PTSD symptoms, and infant gender were all included as predictors of Fearful representations in a multiple regression model, presented in Table 4. In this model, infant male gender was a significant predictor ($b = 0.72$, 95% CI [0.20, 1.24], $p = .008$) and prenatal depressive symptoms a marginally significant predictor ($b = 0.04$, 95% CI [-0.006, 0.09], $p = .09$). However, postnatal PTSD was not significantly associated with Fearful representations. The model explained a total of 26.8% of variance in Fearful representations ($R^2 = .27$, 95% CI [.08, .49]).

Table 2

Bivariate correlations between maternal background variables, war experiences, mental health, high-risk representations and emotional availability.

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Age																
2 Education	.18 [-.11, .44]															
3 Financial difficulties	-.17 [-.43, .11]	-.31* [-.54, -.03]														
4 Number of children	.62*** [.40, .76]	-.10 [-.37, .18]	.06 [-.22, .34]													
5 Male child	.19 [-.10, .45]	-.17 [-.43, .11]	.14 [-.14, .41]	.27 [-.02, .52]												
6 Premature birth	-.03 [-.34, .28]	.24 [-.19, .59]	-.05 [-.38, .29]	-.01 [-.31, .29]	-.05 [-.41, .32]											
7 Hospital care	.13 [-.17, .40]	-.10 [-.37, .18]	.04 [-.24, .32]	.08 [-.21, .36]	-.04 [-.33, .25]	.01 [-.31, .33]										
8 T1 War experiences	.12 [-.17, .39]	-.09 [-.36, .20]	.10 [-.18, .38]	.21 [-.08, .47]	.15 [-.14, .42]	.19 [-.17, .50]	.04 [-.26, .34]									
9 T3 War experiences	.06 [-.22, .34]	-.09 [-.36, .19]	.33* [.06, .56]	.21 [-.08, .46]	.13 [-.17, .40]	.22 [-.12, .51]	.06 [-.23, .35]	.10 [-.18, .37]								
10 T1 Depression	-.14 [-.41, .14]	.03 [-.25, .31]	.17 [-.11, .43]	.14 [-.14, .41]	.04 [-.25, .32]	.07 [-.25, .37]	.03 [-.26, .31]	.16 [-.12, .42]	.36** [.09, .58]							
11 T3 Depression	.07 [-.21, .34]	-.10 [-.36, .19]	.16 [-.12, .42]	.26 [-.02, .50]	.12 [-.16, .39]	.07 [-.24, .37]	.08 [-.21, .35]	.18 [-.11, .44]	.39** [.13, .60]	.41** [.15, .62]						
12 T1 PTSD	-.37* [-.59, -.10]	-.04 [-.31, .25]	.36* [.08, .58]	-.03 [-.31, .25]	.09 [-.20, .36]	-.04 [-.40, .32]	.09 [-.20, .37]	.13 [-.16, .40]	.22 [-.07, .47]	.42** [.16, .63]	.17 [-.12, .43]					
13 T3 PTSD	-.06 [-.33, .22]	.19 [-.10, .44]	.27 [-.01, .51]	.07 [-.22, .34]	.04 [-.25, .32]	.24 [-.10, .53]	-.24 [-.50, .05]	.10 [-.18, .37]	.12 [-.17, .38]	.42** [.15, .62]	.26 [-.02, .50]	.28 [-.00, .52]				
14 Fearful	.09 [-.19, .36]	-.07 [-.34, .21]	-.02 [-.30, .26]	.22 [-.06, .47]	.37** [.10, .59]	.06 [-.29, .40]	-.22 [-.48, .06]	.18 [-.11, .44]	.21 [-.07, .46]	.33* [.06, .56]	.24 [-.04, .49]	.13 [-.15, .40]	.29* [.02, .53]			
15 Dysregulating	.07 [-.21, .34]	.08 [-.20, .35]	.22 [-.06, .47]	.17 [-.11, .43]	.15 [-.14, .42]	-.02 [-.39, .36]	-.05 [-.33, .24]	-.05 [-.34, .24]	.27 [-.01, .51]	.30* [.03, .54]	.11 [-.17, .38]	.19 [-.10, .44]	.11 [-.17, .38]	.18 [-.10, .44]		
16 Unavailable	.09 [-.19, .36]	-.18 [-.44, .10]	.29* [.01, .52]	.14 [-.14, .41]	.08 [-.22, .36]	-.25 [-.58, .14]	.01 [-.29, .30]	-.16 [-.42, .12]	-.02 [-.29, .26]	-.04 [-.31, .24]	.16 [-.13, .42]	.01 [-.27, .30]	.00 [-.28, .28]	-.13 [-.40, .15]	.19 [-.09, .44]	
17 EA	-.33* [-.56, -.06]	-.16 [-.42, .12]	-.15 [-.41, .14]	-.21 [-.46, .08]	-.13 [-.40, .16]	-.16 [-.46, .18]	.26 [-.03, .50]	-.19 [-.45, .10]	-.06 [-.33, .23]	-.04 [-.32, .24]	-.10 [-.37, .18]	-.02 [-.30, .26]	-.41** [-.62, -.15]	-.12 [-.39, .16]	-.09 [-.36, .19]	.13 [-.16, .39]

Note. $N = 50$. EA = self-rated Emotional Availability. PTSD = Posttraumatic Stress Disorder symptoms. Pooled estimates based on 20 multiple imputation sets. Numbers in brackets indicate lower and upper 95% confidence limits.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4.

Prenatal depression, postnatal PTSD and infant gender predicting Fearful caregiving representations among Palestinian mothers.

Predictor	*B*	*SE*	*t*
Intercept	0.62	0.49	1.27
Child gender (male)	0.72	0.26	2.78**
Prenatal depression	0.04	0.02	1.75+
Postnatal PTSD	0.02	0.02	1.29

Note. $N = 50$. $R^2 = .27$. PTSD = Posttraumatic Stress Disorder symptoms. Pooled estimates based on 20 multiple imputation sets. + $p < .10$; ** $p < .01$.

Associations between Traumatic War Experiences, Mental Health, High-Risk Representations and Interaction Quality

Our hypothesis that mental health symptoms and representational risk features, rather than TWE, are directly associated with low EA in mother–infant interaction received partial support, as high level of mothers' postnatal PTSD was associated with a low level of EA ($r = -.41$, $p = .003$). However, neither prenatal mental health symptoms, postnatal depressive symptoms, nor the high-risk representations were associated with EA. Results further showed that older mothers reported lower EA than younger mothers ($r = -.33$, $p = .02$). The hypothesis that high-risk representations would mediate the effects of TWE or mental health on EA was not supported, as the representations were not significantly associated with EA. Hence, we did not test for indirect effects on EA via the representations.

When included jointly in a multiple regression model, both the mother's age ($b = -0.42$, 95% CI [-0.70, -0.13], $p = .005$) and postnatal PTSD symptoms ($b = -0.34$, 95% CI [-0.53, -0.14], $p = .001$)

significantly predicted lower EA. This model explained a total of 29.8% of variance in EA (R^2 = .30, 95% CI [.10, .51]).

Discussion

This pilot study investigated the structure, content, and importance of high-risk caregiving representations in a previously understudied sample, that of war-exposed Palestinian mothers. The results are to be considered as preliminary and their generalization requires replication with larger and diverse samples. We identified three dimensions of high-risk caregiving representations: Dysregulating, Unavailable and Fearful. To an extent, these working models resemble Euro-American mothers' high-risk representational features: flooded-constricted (George & Solomon, 2008a), hostile-helpless (Lyons-Ruth & Block, 1996; Lyons-Ruth et al., 2005) and fearful (Main and Hesse, 1990). However, the mothers' representational risks also showed context-specificity that needs to be acknowledged.

The mothers were interviewed with the Parent Development Interview (PDI; Slade et al., 2004) which probes about caregiving representations in relation to a specific child. Despite this, they typically narrated broader working models of themselves as caregivers to many children and to the extended family. Earlier studies from the same data have shown that the mothers favor collectivistic family values, with an emphasis on relatedness over individualism and autonomy (Kuittinen et al., 2014). Hence, Palestinian mothers' caregiving representations may focus less on a single infant's psychological experiences and the dyadic relationship with him/her, and more on taking care of a large family, than those of Euro-American mothers. Intertwined with this socio-culturally constructed caregiving identity, the stressful and dangerous military conflict is a specific context for mothering in the Gaza Strip. Accordingly, we consider the relation between these contextual determinants of caregiving and the identified representational risks.

The mothers reported chronic overburdening as a catalyst for their Dysregulating representations. In these the mothers described, first, expressing unmodulated emotional distress in the company of their infants, and second, extremely negative views of their infants and dysregulating behaviors towards them, such as leaving the infants' distress unattended and using physical violence. Thus, while reflecting a caregiving role that went beyond the infant and the dyadic relationship, the Dysregulating representations communicated severe risks to infant development.

Focus on relatedness rather than individualism can partly help to explain the identified Unavailable representational features. The mothers' statements about not having any negative feelings toward or difficulties with their children, as well as their tangential or concrete accounts of their own or their infants' experiences, may be products of a socialization process in which a focus on subjective experiences is discouraged (Dwairy, 2004; Keller et al., 2006). Although a psychological-mentalizing orientation characterizes parenting in peaceful and urban contexts, it is not typical, or even desired, among parents living under different contextual restraints, values, and demands (Keller, 2013). The mothers' spontaneous reports of their distress, which seemingly contradicted the denial of difficult emotions, were, in fact, often descriptions of *behavioral* dysregulation (such as acting in a nervous or angry way). However, in addition to disregarding their infants' psychological experiences, the Unavailable representations were also characterized by a lack of enjoyment, which conveys the mothers' lack of motivation to interact with their infants. Hence, although the Unavailable representations likely reflect culturally salient working models, they are also suggestive of the war-exposed mothers' neglectful stance towards their infants' regulatory needs.

In assessing the mothers' Fearfulness, accounting for war context was pivotal. Only when a mother's fears preoccupied her mind in the post-war interview setting were they deemed unrealistic or unconnected to a source. However, assessing the "realism" of the mothers' fears was complicated by the context of ceaseless military conflict, where a new war was a constant possibility and the mothers were repeatedly reminded of their past exposure by hearing the roar of military airplanes.

While the mothers' Fearful representations are understandable in such circumstances, they have still been shown to lead to non-optimal caregiving, such as constant hypervigilance and overprotection (Kaitz et al., 2009).

In sum, the qualitative analysis of the Palestinian mothers' caregiving representations suggests that caution is warranted in labelling cultural variations as incoherence or idealizing. More research among Middle-Eastern mothers is needed to differentiate culturally salient disregard of negative emotions from "constricted" representations. In contrast, identifying flooded, fearful, and hostile representational features was very unambiguous in this sample. Our results tentatively suggest that such representational features could serve as global risk indicators among mothers with diverse trauma histories.

Regarding associations between mothers' war exposure, mental health, and representations, we found that the mothers' representations showed high-risk features only when they developed pre- and postnatal mental health symptoms. The finding concurs with previous results showing that mothers' posttraumatic psychopathology, rather than the trauma itself, interferes with caregiving behavior (Feldman & Vengrober, 2011; Scheeringa & Zeanah, 2001). The current study confirmed that this effect is similar with regard to caregiving representations.

Prenatal depressive symptoms were linked with both Dysregulating and Fearful representations. As found with other groups of mothers (Ahlqvist-Björkroth et al., 2016; Lindgren, 2001), depression during pregnancy could have interfered with war-traumatized mothers' formation of caregiving representations. We further found that postnatal PTSD symptoms were associated with Fearful representations. As earlier research has shown that infant attachment communications can trigger mothers' posttraumatic symptoms (Almqvist & Broberg, 2001; Schechter & Willheim, 2009), this result might suggest that hypervigilant arousal states characteristic of PTSD also generate Fearful representations. An important finding was that financial difficulties were associated with the mothers'

Unavailable representations. This strengthens the view that chronic stress stemming from living in a military conflict area is a central risk for adaptive caregiving.

Unexpectedly, we found that caring for an infant boy predicted high levels of Fearful representations. The different socialization goals and roles that Middle-Eastern parents assign to boys and girls (Moghadam, 2004) offer a tentative explanation for this finding. Mothers' greater alertness or worrying may result from boys being more highly valued than girls, as they take the role of family providers as adults whereas girls move to their husbands' homes. Furthermore, research on older children shows that war-traumatized boys develop externalizing symptoms more often than girls (Dmitry, 2011; Qouta, Punamäki, & El Sarraj, 2005). If infant boys similarly express high levels of distress after war exposure, it might specifically trigger maternal Fearfulness. More research is needed on whether war-exposed boys are more susceptible to a fearful caregiving pattern than girls, and on whether unique risk patterns can be identified for the war-traumatized mothers of girls.

Contrary to expectations, we did not find the high-risk representations to be associated with quality of interactions between Palestinian mothers and their infants; nor did we find support for the mediating role of representations between mothers' traumatic war experiences or pre- and postnatal maternal mental health symptoms and interaction quality. Instead, mothers' postnatal PTSD was linked to reporting of fewer emotionally available interactions with their infants. This finding concords with earlier findings of mothers' posttraumatic stress symptoms interfering with their caregiving (Almqvist & Broberg, 2001; Feldman & Vengrober, 2011; Schechter et al., 2006). Furthermore, older mothers reported lower emotional availability. As these women likely have more children and a heavier set of responsibilities in the home, they may have fewer resources for attending to the youngest child in the family. The older mothers have also the longest exposure to the military conflict, which in itself may desensitize the mothers to the needs of their infants (Lieberman & Van Horn, 2011).

The lack of association between the representational risks and emotional availability is in contradiction with the dysregulation, unattendance, and fearful arousal found in the qualitative analysis of the mothers' narratives. In line with previous studies (van Ee et al., 2012; the authors, 2017), we suggest that traumatized mothers' self-reports may produce unreliable results. In fact, self-reported interaction quality is a type of maternal representation of the relationship, and hence subject to distortions. The Palestinian mothers' tendency to produce views of their overall caregiving, rather than focus on the relationship with the specific child, may further limit the validity of their self-reports on dyadic interactions.

It is also notable that the Emotional Availability questionnaire is premised on maternal sensitivity, which may not be the central feature for capturing risks among traumatized Middle-Eastern dyads. Dysregulating, such as hostile-frightening and fearful-withdrawn caregiving behaviors, predicts attachment disorganization more strongly than lack of maternal sensitivity (Haltigan et al., 2017; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). Moreover, proximity and concrete help, rather than emotional attunement, have been shown to support Palestinian children's optimal development (Feldman & Masalha, 2006; Morelli et al., 2017). Future studies are needed to evaluate how risks in war-exposed mothers' representations are linked with dysregulating interactions, as well as with culturally salient variations of parenting behaviors. Furthermore, as infants are also exposed to traumatic war events, research is needed that considers the effects of infants' own post-traumatic symptoms on relational dysregulation.

Strengths and Limitations of the Study

The strengths of this study include its prospective, longitudinal nature; its investigation of a very hard-to-reach, high-risk, and understudied group of mothers and infants; and its combination of quantitative and qualitative approaches to analyzing maternal representations. Furthermore, the exploratory nature of the study precluded pre-fixed assumptions about the high-risk structure of caregiving representations among the Palestinian mothers. However, the exploratory approach also

poses limitations. Confirmatory analyses are needed to verify whether the identified structure of risk dimensions characterize maternal representations in other war-traumatized groups. In the current analysis, cross-loadings for some items, especially *incoherence*, were ignored; thus, the Dysregulating and Unavailable dimensions might provide an overly simplified view of risks.

Due to the small sample size, our results should be considered as tentative. As the number of participants was close to the minimum required for EFA, reliability of the results may be limited. In other analyses, the limited sample size meant only medium-sized and larger effects could be detected. Thus, some links between pre- and postnatal war trauma, mental health symptoms, mothers' high-risk representations, and mother-infant interaction may not have been detected.

Further limitations of this study concern measures. First, although the EPDS, PDI, and EA measures were translated and back-translated, they were not recalibrated during the translation process. Second, mother–infant interaction was assessed via a self-report measure with a focus on maternal sensitivity, which may have resulted in certain risks in caregiving representations and behavior remaining undetected. To address this limitation, it would be advisable to use objective, video-recorded assessments of mother–infant interaction, as well as tools capturing dysregulating caregiving behavior (such as the AMBIANCE; Bronfman et al., 1999) in future studies of war-exposed dyads.

The focus of this study was limited to exploring the mother–infant relationship. However, Palestinian children commonly have several caregivers, including older siblings, the father, and extended family members. Thus, research is needed that considers the more complex risk and protective factors that wider family relationships pose on infants developing in war contexts (but see Feldman & Masalha, 2010). In addition, future research should investigate the resilience factors that are protective of, and not only risks to, caregiving representations in war conditions.

Clinical Implications

The current study shows that the chronic burdening that stems from living in a war context imposes risks on Palestinian mothers' caregiving representations. Coupled with high levels of depression originating in the prenatal period and continuing into postpartum in tandem with PTSD symptoms, this likely significantly compromises the mothers' ability to care for their infants. While finding a political solution to the Palestine-Israel conflict would certainly benefit the families most, in the meanwhile it is necessary to alleviate the mothers' burden by all possible means. This includes family-centered mental health services, peer support, practical help, and family planning. Early recognition of very negative, emotionally overwhelmed, or fearful maternal representations during pregnancy may help in identifying mothers whose caregiving is at the highest risk. Prenatal interventions would help these mothers' preparation for caregiving, and protect their infants from the harmful effects of maternal prenatal stress.

Although the Palestinian mothers were perhaps unaccustomed to thinking about the dyadic relationship with their infant as separate from their holistic caregiving role, probing about caregiving to the specific child revealed various risks for the infants' development. Interventions that help war-exposed mothers interpret their infants' attachment needs in a less malevolent way, and that provide information on the harmful effects of dysregulating interactions, could perhaps protect the war-exposed children's development and restore the mothers' sense of themselves as 'good-enough' mothers. Mothers' representations as caregivers to extended families should be respectfully taken as starting points for such interventions.

The pervasive high-stress environment in which war-exposed families live is likely to create wider dysfunctionality in relationships between members of the household (Wadsworth, 2010). Home-based interventions that include all willing family members could protect Palestinian infants' development by strengthening relationships with their numerous caregivers.

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