

**Psychosocial Predictors of Maternal Emotional Availability: Longitudinal
Analyses of the Mercy Pregnancy and Emotional Wellbeing Study (MPEWS)
Pregnancy Cohort**

**Kelli K MacMillan
Registered Psychologist
BSc (Honours)**

**School of Psychology
Murdoch University**

Submitted in fulfilment of the requirements for the Doctor of Psychology in Clinical
Psychology

November 2019

Declaration Statement

I declare that this thesis is my own account of my research and contains as its main content work that has not previously been submitted for a degree at any tertiary education institution.

Statement of Contribution of Others

This thesis has been developed in the format of Thesis by Publication. Chapters Four, Five, and Six within this thesis are currently in review to scientific journals. These chapters represent collaborative works; however, the Doctoral candidate for which this thesis represents has completed the majority of the study design, data collection, data analyses and interpretation, and drafting of the manuscript.

Percentage contribution

Chapter Four: Maternal depression and the emotional availability of mothers at six months postpartum: findings from the MPEWS pregnancy cohort

Name	Design of MPEWS	This Paper Design	Video coding	Data analyses	Interpretation	Manuscript development
K.MacMillan	0%	30%	80%	50%	40%	50%
A.Lewis	50%	30%	0%	25%	20%	20%
M.Galbally	50%	30%	20%	0%	20%	20%
S.Watson	0%	10%	0%	25%	20%	10%

Confirmation of contribution

As a contributor to this Chapter, I confirm that the level of contribution attributed to me is correct.

K.K.MacMillan
31.10.2019

M. Galbally
31.10.2019

A.J.Lewis
31.10.2019

S.Watson
31.10.2019

Chapter Five: Maternal childhood trauma and the emotional availability of mothers at six months postpartum: findings from the MPEWS pregnancy cohort.

Name	Design of MPEWS	This Paper	Video coding	Data analyses	Interpretation	Manuscript development
K.MacMillan	0%	30%	80%	50%	40%	50%
A.Lewis	50%	30%	0%	25%	20%	15%
M.Galbally	50%	30%	20%	0%	20%	15%
B.Jansen	0%	0%	0%	0%	0%	10%
S.Watson	0%	10%	0%	25%	20%	10%

Confirmation of contribution

As a contributor to this Chapter, I confirm that the level of contribution attributed to me is correct.

K.K.MacMillan
31.10.2019

M. Galbally
31.10.2019

A.J.Lewis
31.10.2019

S.Watson
31.10.2019

Chapter Six: Maternal psychosocial predictors of pacifier use: findings from the MPEWS pregnancy cohort.

Name	Design of MPEWS	This Paper	Video coding	Data analyses	Interpretation	Manuscript development
K.MacMillan	0%	30%	60%	50%	50%	50%
A.Lewis	50%	30%	0%	25%	20%	15%
M.Galbally	50%	30%	20%	0%	20%	15%
J.Power	0%	0%	20%	0%	0%	5%
S.Watson	0%	10%	0%	25%	10%	15%

Confirmation of contribution

As a contributor to this Chapter, I confirm that the level of contribution attributed to me is correct.

Signed:

K.K.MacMillan
31.10.2019

M. Galbally
31.10.2019

AJ..Lewis
31.10.2019

S.Watson
31.10.2019

J.Power
31.10.2019

Table of Contents

Abstract	9
Acknowledgements	10
Publications and Conferences	12
List of Tables	14
List of Figures	16
Chapter 1: Executive Summary of Dissertation and Literature Review	17
1.1. Executive summary of dissertation	18
Literature Review	
1.2. The Perinatal Period	21
1.2.1. Definition	21
1.2.2. Significance of the perinatal period for maternal mental health	22
1.3. The Mother-Infant Relationship	24
1.3.1. Defining the mother-infant relationship	24
1.3.2. Perinatal mental health and the mother infant relationship	25
1.3.3. Perinatal maternal depression and the mother-infant relationship	26
1.4. Attachment Theory	28
1.4.1. Antecedents to attachment	30
1.4.2. Parenting qualities	30
1.5. The Theory of Emotional Availability	33
1.5.1. Emotional Availability framework	33
1.5.2. The Emotional Availability Scales	34
1.6. Perinatal Depression	37
1.6.1. Rationale	37
1.6.2. Defining perinatal depression.	38
1.6.3. Prevalence of perinatal depression	39
1.6.4. Perinatal depression and the mother-infant relationship	40
1.6.5. Empirical study one	44

1.7. Maternal Trauma	45
1.7.1. Rationale	45
1.7.2. Defining trauma.	46
1.7.3. Prevalence of maternal trauma in the perinatal period	47
1.7.4. Cumulative trauma exposure	48
1.7.5. Proximate trauma exposure	49
1.7.6. Childhood trauma	49
1.7.7. Childbirth experience	52
1.7.8. Stressful life events	54
1.7.9. Empirical study two	55
1.8. Pacifier Use for Non-Sleep Settling Purposes	55
1.8.1. Rationale	55
1.8.2. Defining the pacifier	56
1.8.3. Existing literature about pacifier use	57
1.8.4. Empirical study three	59
1.9. Translational Research	60
1.9.1. Rationale	60
1.9.2. Defining translational research	61
1.10.3. Collaboration with King Edward Memorial Hospital for Women	62
1.10.4 Translational research study four	63
1.10. Implications of Dissertation Findings	63
1.10.1 The importance of the mother-infant relationship	63
1.10.2. For the mother	64
1.10.3. For the infant and the child	65
1.10.4. For the family system	67
1.11 This Dissertation and a Preventative Framework for Child Mental Health	69
1.11.1. What is a preventative framework	69
1.11.2. Improving the quality of the mother-infant relationship	70

Chapter 2: Methodological Issues Related to Dissertation Research	71
2.1. Background	71
2.2. Measurement of depression	71
2.2.1. Conceptualisation of depression	71
2.2.2. Repeated measures design	73
2.3. Measurement of mother-infant interaction	74
2.3.1. Mother-infant observational tools	74
2.3.2. Psychometric properties of the Emotional Availability Scales	75
2.3.3. Issues related to the application of the Emotional Availability Scales	77
2.3.4 Differing psychometric approaches to the Emotional Availability Scales	77
2.4 Design of MPEWS and the Data Analytic Approach to Investigate the Psychosocial Predictors of Maternal EA	80
2.4.1. Structural equation modelling	80
2.4.2. Multiple mediation analyses	80
Chapter 3: Dissertation Aims and Hypotheses	82
3.1. Dissertation overview	82
3.1.1. Study one	82
3.1.2. Study two	82
3.1.3. Study three	84
3.1.4. Study four	85
Chapter 4: Study 1: Maternal depression and the emotional availability of mothers at six months postpartum: findings from the MPEWS pregnancy cohort	86
4.1. Preface	88
4.2. Introduction	89
4.2.1. Aims and hypotheses	93
4.3. Method	94
4.3.1. Participants	94

4.3.2. Procedure	95
4.3.3. Measures	95
4.3.4. Covariates	98
4.3.5. Statistical Analyses	98
4.4. Results	99
4.4.1. Sample socio-demographic and other key characteristics	99
4.5. Discussion	106
4.5.1. Study One: Limitations	110
4.5.2. Study One: Conclusions	110
Chapter 5: Study 2: Maternal childhood trauma and the emotional availability of mothers at six months postpartum: findings from the MPEWS pregnancy cohort.	112
5.1. Preface	114
5.2. Introduction	115
5.2.1. Aims and Hypotheses	120
5.3. Method	122
5.3.1. Participants	122
5.3.2. Procedure	123
5.3.3. Measures	123
5.3.4. Other covariates	127
5.3.5. Statistical analyses	127
5.4. Results	129
5.4.1. Sample socio-demographic and other key characteristics	129
5.4.2. Frequency of trauma experience within each of the maternal EA clinical screener categories	130
5.4.3. Maternal trauma and maternal EA at six months postpartum	133
5.3.5. Indirect pathway analyses testing mediation hypotheses	135
5.5. Discussion	139
5.5.1. Study Two: Limitations	144

5.5.2. Study Two: Conclusions	144
Chapter 6: Maternal psychosocial predictors of pacifier use: findings from the MPEWS pregnancy cohort.	146
6.1. Preface	148
6.2. Introduction	149
6.2.1. Aims and Hypotheses	155
6.3. Materials and Methods	156
6.3.1. Participants	156
6.3.2. Procedure	157
6.3.3. Measures	158
6.3.5. Covariate: breastfeeding cessation.	160
6.3.6. Statistical analyses.	161
6.4. Results	161
6.4.1. Sample characteristics	161
6.4.2. Unadjusted predictors of pacifier use	163
6.4.3. Adjusted predictors of pacifier use in a multivariate model	165
6.5. Discussion	167
6.5.1. Study three: Strengths and Limitations	171
6.5.2. Study three: Conclusion	172
Chapter 7: Dual Treatment in Perinatal Mental Health Services: The Translation of Mother-Infant Assessment to King Edward Memorial Hospital for Women	173
7.1. Preface	173
7.2 Assessment of the Mother-Infant Interaction in Clinical Practice	174
7.3. Nature of Translational Research	175
7.4. Consultation and Service Context: King Edward Memorial Hospital for Women (KEMH)	176
7.5. The Development of a Partnership with KEMH: Presentation Series	178
7.5.1. Aims and Hypotheses	178
7.5.2. Collaboration process with KEMH	178

7.5.3. Clinician feedback from KEMH	179
7.6. The Development of a Response to Clinician Consultation	180
7.7. Methods	181
7.7.1. Ethics	181
7.7.2. Search strategy	181
7.7.3. Eligibility for inclusion	182
7.7.4. Study selection and evaluation	182
7.8. Results	183
7.9. Discussion	187
7.9.1. Summary	187
7.9.2. Link between the emotional availability scales and attachment security	188
7.9.3. Interaction length for emotional availability scales sample	189
7.9.4. Cross cultural application of the emotional availability scales	190
7.9.5. Application of the emotional availability scales to individuals with special needs	191
7.9.6. Limitations of the emotional availability scales	192
7.9.7. “What treatment works and for whom” Fonagy et al. (2014)	194
7.9.8. Application of the EAS to assessment and clinical intervention	194
7.9.9. Model of translation of attachment measures to clinical practice	195
7.10. Summary of Recommendations to Service Provider and Service Delivery Sector	196
7.10.1. Study Four: Conclusions	197
Chapter 8: General Discussion of the Overall Dissertation Findings	199
8.1. Preface	199

8.2. Review of Dissertation Aims and Key Findings	200
8.2.1. Study one: maternal depression and maternal EA	200
8.2.2. Study two: maternal trauma and maternal EA	203
8.2.3. Study three: psychosocial predictors of pacifier use	207
8.2.3. Summary of the three empirical studies	208
8.2.4. Study four: translational research.	210
8.3. Timing	211
8.4. Prenatal Clinical Intervention	213
8.5. Dual Treatment of Perinatal Mental Health and the Mother-Infant Relationship	215
8.6.1. Mother-infant psychotherapy	216
8.6. Maternal Emotional Availability and Child Developmental Outcomes	219
8.7. Issues Translating the Emotional Availability Scales to a Clinical Setting	222
8.7.1. Use of the EAS in clinical intervention	223
8.8. Dissertation Limitations	225
8.8.1. Inclusion of Fathers	225
8.8.2. Emotional Availability Scales limitations	225
8.8.3. Other parenting constructs	226
8.8.4 Comorbid disorders	226
8.8.5. Infant characteristics	228
8.9. Next steps in Emotional Availability Research	228
8.9.1. Extension to women with severe mental health disorders	228
8.9.2. The measurement of maternal representations	230
8.9.3. Childbirth research	231
8.9.4. Future research regarding pacifier use	232
8.9.5. Consultation with another service provider regarding translation of research	233
8.10. Conclusions	234

Appendix 1	
Emotional Availability Scales Factor Analytic Exploration	236
Appendix 2	
Main analyses from Chapter 4 using the maternal sensitivity scale versus the latent variable maternal EA	238
Appendix 3	
Slides from presentation series at KEMH presented by researcher (K.K.M) as part of the translational research study	239
Appendix 4	
Translational research study table 3: Empirical studies that evidence psychometric support for the EAS	244
Appendix 5	
Review of empirical studies applying the emotional availability scales from 1991 to present	251
References	312

Abstract

Understanding the psychosocial predictors of the mother-infant relationship may provide important information to explain the variation in interaction quality observed between dyads. This research examined specific psychosocial predictors of maternal emotional availability (EA): maternal depression and trauma. In addition, the maternal psychosocial predictors of pacifier use during a mother-infant interaction were investigated. Data for the three empirical studies was drawn from 210 women recruited in early pregnancy until six-months postpartum within an Australian pregnancy cohort, the Mercy Pregnancy and Emotional Wellbeing Study. Women video-recorded interacting with their infants at six months postpartum were included, with the quality of their interactions assessed using the EA Scales (EAS). Depression was measured symptomatically and diagnostically at three time points from early pregnancy to six-months postpartum. Maternal trauma was specified as childhood trauma, childbirth experience and also included stressful life events. Observational data regarding pacifier use was collected by the viewing of each interaction, with the fourth translational study including a systematic review of the EA literature to facilitate integration of the EAS into clinical practice. First, results showed a small negative association between antenatal depressive symptoms and maternal EA. Second, moderate to severe childhood trauma and current stressful life events were negatively associated with maternal EA. Third, maternal EA status was associated with pacifier use during the mother-infant interaction. This dissertation highlights that beyond women with depression or trauma, there are other women experiencing reduced EA at six months postpartum. Given maternal EA could be a protective factor for both child outcomes, and the future mother-child relationship, consideration of integrating the EAS into a clinical setting should be explored.

Acknowledgements

I want to thank my Supervisors, Professors Andrew Lewis and Megan Galbally, for the opportunity to be part of the Mercy Pregnancy and Emotional Wellbeing Study (MPEWS), and for their role in the development of my skills as a researcher and a clinician over the last three years. The quality of MPEWS reflects the breadth of their knowledge, clinical ability and commitment to perinatal mental health. And to learn alongside people who share a love of their discipline is a privilege that I hold close.

For the brave women and infants involved in MPEWS, as well as the other researchers, collaborators and students who facilitated this research, and the team of SMPEWS researchers particularly Dr. Stuart Watson and Kylie Marston. It is your dedication and hard work that allows us to ask the questions that we see in our clinical practice at a wider level through research. I thank you. I also want to acknowledge my Academic Chair, Professor Peter Drummond, for his support and guidance during the Doctoral process.

To my parents, Elizabeth and Peter MacMillan, two of the most courageous and talented people, who instilled in me a sense of social justice as well as the desire to take the path less travelled. For my sisters, Claire and Victoria MacMillan, I cannot imagine walking life's journey without their support, humour, guidance and inspiration.

For my own beautiful family; Heath, Lachlan, Sebastian and Amelia. First to my three children, you are my greatest accomplishment and being your mother is my most important role. I wish for each of you to find what is meaningful to you, and to have the confidence to pursue it. To my husband who has never questioned his wife

through the years of study, exams, theses, and lack of sleep, I am so grateful to have you as my partner, and will always remember the part that you have played in this.

And finally, for the women and infants who might be struggling to connect emotionally and not have access to services or support, particularly those who might feel the weight of their own family history, know that you can change the story and break the cycle. This research is for you.

I am not what happened to me, I am what I choose to become.

Carl Jung.

Publications arising from this dissertation.

Included in this dissertation are papers in *Chapters Four, Five and Six*, which are co-authored with other researchers. My contribution to each co-authored paper is outlined at the front of the relevant chapter. The bibliographic details for these papers including all authors are:

MacMillan, K.K., Lewis, A.J., Watson, S., & Galbally, M. (2020). Maternal Depression and the emotional availability of mothers at six months postpartum: findings from the Mercy Pregnancy and Emotional Wellbeing Study (MPEWS) pregnancy cohort. *Journal of Affective Disorders*, 266, 678 – 685. <https://doi.org/10.1016/j.jad.2020.01.109>

MacMillan, K.K., Lewis, A.J., Watson, S., Jansen, B., & Galbally, M. (*under review*, 2020). Maternal trauma and emotional availability in early mother-infant interaction: findings from the MPEWS cohort. *Journal of Attachment and Human Development*.

MacMillan, K.K., Lewis, A.J., Watson, S., Power, J., & Galbally, M. (*under review*, 2020). Maternal psychosocial predictors of pacifier use in a mother-infant interaction task: an observational study from the Mercy Pregnancy and Emotional Wellbeing Study (MPEWS) pregnancy cohort. *Journal of Infant Behaviour*.

Conference presentations undertaken in relation to the dissertation

8th World Congress on Women's Mental Health - Paris, France, 2019

Galbally, M., MacMillan, K. & Power, J. (2019). Understanding Maternal Mental Health and Child Outcomes: Mercy Pregnancy and Emotional Wellbeing Study

Australasian Marce Society for Perinatal Mental Health - Perth, Australia, 2019

Galbally, M., MacMillan, K. & Power, J. (2019). Understanding Maternal Mental Health, Mother-Infant Relationship and Child Outcomes: Mercy Pregnancy and Emotional Wellbeing Study

Perinatal and Infant Mental Health Symposium - Perth, Australia, 2019.

MacMillan, K.K. (2019) Mother-Infant Emotional Availability Scale: Relevance to Perinatal Mental Health Care.

List of Tables

Table 1	Summary of the eight empirical studies that investigate the association between maternal EA and maternal depression using mother-infant dyads.	43
Table 2	MPEWS Cohort demographic characteristics and frequencies for other key variables ($N = 210$)	100
Table 3	Frequency of EA Category across depression diagnosis at six months postpartum ($N = 211$)	101
Table 4	Descriptive statistics and bivariate correlation coefficients for all variables in the model ($N = 211$)	103
Table 5	Standardised and unstandardised coefficients for CFA of EAS	104
Table 6	MPEWS Cohort demographic characteristics and frequencies for other key variables ($N = 210$)	130
Table 7	Frequency of EA clinical screener according to type of maternal trauma reported	132
Table 8	Descriptive statistics and bivariate correlation coefficients for all variables in the model ($N = 211$)	134
Table 9	Standardised indirect effects in the multiple mediation model between distal trauma from childhood and proximate traumas from childbirth experience and stressful life events in pregnancy and the postpartum ($N = 211$).	138
Table 10	MPEWS Cohort demographic characteristics and frequencies for other key variables ($N = 210$)	162

Table 11	Unadjusted odds ratios for hypothesized predictors of using a pacifier during a mother infant interaction task at six months postpartum	164
Table 12	Descriptive statistics and bivariate correlation coefficients for all variables in the regression model ($N = 211$)	166
Table 13	Results of the multivariate binary logistic regression analysis predicting pacifier use in mothers and their six month old infants	166
Table 14	Characteristics of the empirical studies using the EAS identified in the systematic review ($N = 196$)	185
Table 15	Characteristics of the samples in the empirical studies using the EAS identified as part of the systematic review ($N = 196$)	186
Table 16	Empirical studies that evidence psychometric support for the EAS	244
Table 17	Review of the empirical studies applying the EAS from 1991 to present including special features of the sample, length of interaction and application of the EAS scoring system ($N = 196$)	249

List of Figures

Figure 1	Hypothesized multiple mediation model showing the pathway between maternal childhood trauma and maternal EA at six months postpartum (study 2)	84
Figure 2	Final model with standardised parameter estimates with parenthized standard errors (study 1)	106
Figure 3	Hypothesized multiple mediation model showing the pathway between maternal childhood trauma and maternal EA at six months postpartum (study 2)	121
Figure 4	Final multiple mediation analyses with standardised parameter estimates with parenthized standard errors (study 2)	137
Figure 5	Flow diagram for process of inclusion and exclusion of studies in systematic review (study 4)	184

1. Chapter 1: Executive Summary of Dissertation and Literature Review

The centrality of the mother-infant relationship to child outcomes is frequently cited (e.g., Goodman & Gotlib, 1999; Poobalan, Aucott, Ross, Smith, Helms, & Williams, 2007). In addition, the relationship quality between a mother and her infant can have an effect on the infant, the mother and the wider family system. Given the mother-infant relationship can be targeted by direct clinical intervention (e.g., Lieberman, Weston & Pawl, 1991; Salomonsson & Sandell, 2011), it is important to understand the psychosocial factors that may contribute to the quality of that relationship. This could facilitate the identification of women most likely to struggle to form an early relationship with their infant, so that service access can be facilitated. In addition, information regarding the key factors that might influence the strength of the mother-infant dyad can be used to inform treatment interventions. This dissertation aims to explore the psychosocial predictors of the mother-infant relationship at six months postpartum using data from the longitudinal pregnancy cohort study the Mercy Pregnancy and Emotional Wellbeing Study (MPEWS).

This chapter will first provide an executive summary of this dissertation, it will then set out a literature review to highlight how the three empirical studies and one translational research study that comprise this dissertation will address existing gaps in our knowledge of the psychosocial predictors of the mother-infant relationship at six months postpartum.

1.1. Executive Summary of Dissertation

This dissertation examines the psychosocial predictors of maternal emotional availability (EA) at six months postpartum using data from the Mercy Pregnancy and Emotional Wellbeing Study (MPEWS). A substantial literature has emerged that supports the centrality of the mother-infant relationship to child outcomes (Goodman & Gotlib, 1999; Poobalan et al., 2007). Whether the mother-infant relationship is a risk factor that might increase the likelihood of adverse child outcomes, or conversely, a protective factor that might reduce that likelihood, is dependent on the quality of that relationship. It is important to understand the psychosocial predictors that might influence the formation of the mother-infant relationship, so that vulnerable mother-infant dyads might be identified for clinical intervention. In addition, information is required to inform the optimal timing for clinical intervention, whether that be in pregnancy or the postpartum. Finally, knowledge obtained from the research pertaining to this dissertation needs to be translated to clinical practice, so the mental health outcomes of women and infants might be improved.

It is not easy to measure a construct like the mother-infant relationship, and whilst a range of maternal self-report and observational measures are applied in the research (Lotzin et al., 2015; van Bussel, Spitz & Demyttenaere, 2010), there is a tendency in clinical practice to treat maternal mental health only and not directly target the mother-infant interaction in treatment (Stein et al., 2014). The EA theory provides the framework to assess the quality of mother-infant interaction. The EA in a mother-infant dyad can be assessed using the EA Scales (EAS; Biringen, Robinson & Emde, 2008), one of the most widely applied observational tools for assessment of the mother-infant interaction in the developmental literature (Biringen & Easterbrooks, 2012). Application of the EAS to the mother-infant interaction provides detailed

information regarding maternal sensitivity, structuring, non-hostility and non-intrusiveness, as well as the child's perspective including their responsiveness and involvement. In this dissertation, we applied the EAS coding system to assess the quality of 211 mother-infant dyads that were recorded interacting for a minimum of 40 minutes as part of MPEWS. We were then able to investigate possible psychosocial predictors of the quality of those mother-infant relationships measured using the EAS coding system.

Maternal mental health is frequently posited as a predictor of the quality of the mother-infant relationship (Murray, Fiori-Cowley, Hooper & Cooper, 1996; Nylén, Moran, Franklin & O'Hara, 2006). With the highest prevalence rates of the perinatal mental health disorders (Bennett, Einarson, Taddio, Koren & Einarson, 2004), substantial literature has been devoted to understanding the impact of maternal depression on the mother-infant relationship (Murray, Halligan & Cooper, 2010). However, the existing EA literature tends to conceptualise maternal depression using either diagnostic or symptomatic measures, with measurement mostly focused on the postnatal period particularly in the context of mother-infant dyads (Kingston, Tough & Whitfield, 2012). Though examined to a lesser extent, there is also evidence to suggest that maternal childhood trauma may impact maternal parenting capacity (e.g., Lyons-Ruth & Block, 1996). Although the possibility of cumulative trauma effects (Cloitre et al., 2009), requires the investigation of other proximate traumas and not maternal childhood trauma alone, this is not reflected in the existing literature (e.g., Fuchs, Mohler, Resch & Kaess, 2015). Empirical study one and two of this dissertation aim to address those gaps by examining maternal depression and maternal trauma as psychosocial predictors of maternal EA at six months postpartum. To the best of our knowledge, study one is the first time the association between perinatal

maternal depression and maternal EA is investigated using diagnostic and symptomatic measurement of depression at multiple time points from early pregnancy to the postpartum. Similarly, study two is the first to test the association between maternal childhood trauma and maternal EA in the context of other proximate trauma exposure specific to the perinatal period: childbirth experience and stressful life events.

In addition, empirical study three of this dissertation addresses a controversial issue for perinatal mental health: maternal pacifier use during the mother-infant interaction. Though the maternal behaviour of pacifier use is documented worldwide in mother-infant dyads (Mauch, Scott, Magarey & Daniels, 2012), there is little understanding of when pacifier use occurs outside of a sleep-settling context. To the best of our knowledge, study three of this dissertation is the first study to investigate the maternal psychosocial predictors of pacifier use (i.e., maternal depression, maternal childhood trauma and maternal EA). The findings from this research might be helpful to inform clinician's recommendations to women about pacifier use for non-sleep settling purposes. This might be particularly relevant for vulnerable women with depression or childhood trauma history, where reliance on an object like the pacifier to soothe the infant might reduce maternal stress and create emotional space for the dyad.

Finally, this dissertation documents the targeting of a core issue in scientific research: the translation of research knowledge to clinical practice. Paramount to this dissertation is the centrality of the mother-infant relationship during the perinatal period. It follows that clinical intervention for maternal mental health during the perinatal period should occur within a dual treatment model that targets the mother's symptoms, as well as the mother-infant dyad directly (Spielman, 2002). In fact, some

evidence suggests that dual treatment may be necessary if we are to improve child developmental outcomes (Stein et al., 2014). To engage with the mother-infant relationship in treatment, clinicians require access to a valid and reliable assessment tool capable of identifying the mother-infant dynamics to target in therapy.

Consequently, we collaborated with a service provider for perinatal mental health services in Western Australia to explore the possibility of integration of the EAS into clinical practice. The findings set out in study four highlight the difficulties encountered in the translation of research knowledge to clinical practice, and the importance of flexibility during the collaboration process.

Examination of the psychosocial predictors of maternal EA is important given that infant exposure to environmental factors, including maternal mental health, may influence child mental health outcomes. This dissertation posits the mother-infant relationship as a vehicle by which maternal risk of adverse child outcomes may be transferred to the infant. The clinical significance of this research is therefore to support the mother, the infant and the family outcomes, so that vulnerable women might be more likely to engage in emotionally available interactions with their infant. First, however, it is necessary to define the perinatal period and outline its significance for maternal mental health.

Literature Review

1.2. The Perinatal Period

1.2.1. Definition. The perinatal period is a woman's pregnancy (i.e., prenatal or antenatal period), and the first 12 months following delivery of the infant/s (i.e., postnatal period; Gavin, Gaynes, Lohr, Meltzer-Brody, Gartlehner, & Swinson, 2005). Though the antenatal and postnatal period can be defined separately, a

woman's mental health in each is related. This is highlighted by the example of perinatal depression. It is estimated that as many as 50% of women with postnatal depressive symptoms also experienced depressive symptoms in pregnancy (Gotlib, Whiffen, Mount, Milne, & Cordy, 1989). It is therefore not clear for the studies that only measure postnatal depression, whether the contribution is distinct from the postnatal period, or cumulative from pregnancy (Stein et al., 2014). Evidence of this nature supports psychological assessment in pregnancy as well as following childbirth (Lewis, Galbally, Gannon & Symeonides, 2014). Timing of exposure to perinatal mental health is also relevant as it can inform the optimal time for clinical intervention. For these reasons, longitudinal measurement of maternal mental health from pregnancy to the postpartum is preferable so the processes that might lead to psychopathology can be targeted at the optimal time. The perinatal period is increasingly acknowledged as an important window in which child outcomes might be influenced, though with the possibility of mental health difficulties for some women, it can carry the risk of those outcomes being negatively influenced.

1.2.2. Significance of the perinatal period for maternal mental health. The perinatal period is one of extraordinary change for women physically, emotionally and psychologically (Howard, Piot & Stein, 2014). For some women pregnancy and childbirth might represent hope and bring fulfilment (Cramer, 1993). However, for other women the changes may leave them vulnerable to mental health problems (Jevitt, Zapata, Harrington, & Berry, 2005), with the role of caring for an infant experienced with psychological, physical and emotional difficulty. Pregnancy generally marks the beginnings of the changes for women. These changes might occur to a woman's relationships, lifestyle (e.g., leave from employment or preparing to stop working; social activities; dietary consumption; increased financial restriction),

or physical and emotional health (Lang, Reschke, & Neyer, 2006). Some of the adjustments might be made before conception to optimise the likelihood of pregnancy (e.g., dietary changes, exercise or other lifestyle factors), and others might only take place in pregnancy. Childbirth marks the start of the second part of the perinatal period: the postpartum period. It is in the postpartum that women develop their mother-crafting skills, whilst concurrently recovering from the physical and emotional effects of childbirth (Cassibba, Castoro, Costantino, Sette, & van IJzendoorn, 2015). Each of these stages poses different challenges for women, and for the women who experience the perinatal period, or parts of it, as excessively difficult, mental health problems might develop. It is estimated that more than 10% of women experience psychological difficulties during the perinatal period (Priest, Austin, Barnett & Buist, 2008). Maternal mental health difficulties are increasingly acknowledged as one of the most significant morbidities of pregnancy (Galbally, Snellen & Power, 2014), and with the potential to impact on the mother and the child (Howard, Molyneaux, Dennis, Rochat, Stein & Milgrom, 2014), issues pertaining to perinatal mental health require investigation including the mother-infant relationship.

The mother-infant relationship is central to the perinatal period. There is increasing support for the notion that women's mental health problems in the perinatal period cannot be treated without the dual treatment of the mother-infant dyad (Cramer, 1993). For instance, empirical studies report the concurrent reduction in maternal depressive symptoms following direct treatment of the mother-infant relationship through mother-infant psychotherapy (Nylen et al., 2006; Gelfand, Teti, Seiner & Jameson, 1996; Heinicke, Fineman, Ruth, Recchia, Guthrie & Rodning, 1999). Though this proposition is supported by recent meta-analytic review with the small effect of mother-infant psychotherapy on the short term of reduction of

depressive symptoms, these effects were not maintained long term (Huang et al., 2020). Despite this evidence not supporting the long-term effects of mother-infant psychotherapy, the initial reduction of depressive symptoms reported by Huang suggests the role that the mother-infant relationship can play in the treatment of perinatal mental health. Before further exploration of the association between maternal mental health and the mother-infant dyad, it is necessary to define the mother-infant relationship.

1.3. The Mother-Infant Relationship

1.3.1. Defining the mother-infant relationship. It is difficult to define a construct like a relationship and different attempts have been documented (Ainsworth, 1979; Solomon & George, 1996; Isabella, Belsky, & von Eye, 1989), with Bowlby's original attachment theory in 1969 possibly the most well known. One model proposed by Stern-Brushweiler and Stern (1989) is that the mother-infant relationship consists of the interactive behaviour between the two parties, as well as the mother's subjective experience of the interaction. Based on this model, the mother's subjective experience includes the maternal mental representations of the memories and past interactions with the infant (Zeanah, Benoit, Hirschberg, Barton & Reagan, 1994; Zeanah et al., 1997; Bowlby, 1982). Mental representations might be defined as the mother's thoughts and feelings about the child which can be interfered with by her own history (Schechter et al., 2005; Cramer & Stern, 1988). Perhaps what is most significant from this framework is the notion that assessment of the mother-infant relationship should employ a measure or measures capable of assessing the external behavioural parts of the relationship (i.e., what is observable), as well as the maternal

mental representations of the interaction (i.e., what is internal and subjective to the woman that can be captured using maternal self-report measures).

The EAS is designed to assess the interactive behaviours, as well as the emotional connection between two parties (Biringen & Easterbrooks, 2012). An emotional connection is by its very nature a reflection of the interactional history of two parties, for it is through our interactions with others that an emotional bond develops. It follows that by assessing the emotional ‘barometer’ of a relationship (Emde, 1980) using the EAS, we might obtain some insight into the interactional history between a mother and her infant. For example, where the mother appears sensitive to her infant’s cues and responses, but the infant shows low responsiveness and involvement, this might represent apparent sensitivity. That is, when the maternal behaviours observed in the dyad do not reflect the dynamic the infant has come to expect from the mother or their interactional history (Biringen, 2008). In this dissertation, when we refer to assessment of the mother-infant interaction using the EAS, we are proposing the EAS as capable of quantifying the quality of the mother-infant relationship.

1.3.2. Perinatal mental health and the mother infant relationship.

Understanding the influence of risk factors that might be transmitted to the infant through the mother-infant relationship is important for the prevention of adverse child developmental outcomes (Howard et al., 2014). Perinatal mental disorders have been increasingly investigated as a possible risk factor to the quality of the mother-infant interaction (see review: Poobalan et al., 2007). Empirical studies have documented the negative impact of perinatal depression on mother-infant interactions. However, with higher prevalence rates, the body of evidence testing the relationship between perinatal maternal depression and the mother-infant relationship is larger than any

other mental disorder (Field, 2011). Many mother-infant interaction studies document that women with depression show lower sensitivity and increased negative affect, less positivity (e.g., Cohn, Campbell, Matias & Hopkins, 1990, but see, e.g., Sidor, Kunz, Schweyer, Eickhorst, & Cierpka, 2011), as well as reduced verbal input, maternal speech and physical touch behaviours (Rowe, Pan & Ayoub, 2005; Herrera, Reissland, & Shepherd, 2004). In addition, mothers with depression have been recorded with a reduction in responsiveness (Murray et al., 1996; Weinberg, Olson, Beeghly & Tronick, 2006), play, mutuality and reciprocity (Field, Sandberg, Garcia, Vega-Lahr, Goldstein, & Guy, 1985). Collectively, this evidence has informed a view of maternal perinatal depression as a predictor of poorer quality mother-infant interaction.

1.3.3. Perinatal maternal depression and the mother-infant relationship.

Studies evidence the adverse effect of maternal depression on the mother-infant relationship measured by attachment security (e.g., Martins & Gaffan, 2000; Lyons-Ruth, Lyubik, Wolfe & Bronfman, 2002), as well as other observable measures (e.g., the Thorpe Interaction Measure: Pearson et al., 2012). However, the findings are conflicting with other research that reports women with depression are still able to engage sensitively with their infants (e.g., Cicchetti, Toth, & Rogosch, 1999). This suggests that poorer mother-infant interaction quality may not be the inevitable outcome in the presence of maternal depression alone (e.g., Van Doesum, Hosman, Riksen-Walraven & Hoefnagels, 2007; Fonseca, Silva & Otta, 2010). Although together with other risk factors, maternal depression may be likely to lead to relationship difficulties between the mother and infant (e.g., maternal trauma; Kluczniok et al., 2016). The challenge for research is to determine which psychosocial factors may influence the impact of maternal depression on the mother-

infant dyad. The possibility that maternal depression may be one of the contributing factors that influence the mother-infant relationship is highlighted by Beck et al.'s (1995) meta-analysis. Beck analysed 19 studies that measure the effect of postpartum depression on the mother-infant interaction during the first year. Beck reported a moderate to large effect of postpartum depression ($d = .68 - 1.15$) on the mother-infant interaction in the first 12 months. The variation in the effect size reported by Beck tells us that depression does not account for all of the variance in mother-infant interactions observed in the research studies comprising the meta-analysis.

Although studies over the last few decades have documented differences to specific parts of the mother-infant interaction in women with depression compared to women without depression (e.g., Field, Sandberg, Garcia, Vega-Lahr, Goldstein & Guy, 1985; Field et al., 1988), the differing methodology creates some uncertainty around the strength of perinatal depression as a predictor. For example, Campbell, Cohn and Meyers (1995) reported that women with depression were less positive during mother-infant interactions. However, the interaction samples were three minutes in length and were coded for mother and infant gaze, facial expression, use of voice, body language and posture only. These findings replicated earlier research by Cohn et al. (1990), in which women with depression were also reported to show reduced positivity. Though again the interaction samples were three minutes, with only facial expression, gaze, vocalisations, body movements and affect coded. In a more recent study, Herrera et al. (2005) reported that maternal depression might influence maternal touch and speech. They relied on five-minute interaction samples with the quality of the mother-infant exchange captured by counting the frequency of touch, infant vocalisation and affect quality. These examples highlight the variation in the conceptualisation of the mother-infant interaction quality. Consequently, when

reviewing meta-analysis of a moderate association between maternal depression and negative parenting behaviour (see review by, Lovejoy, Graczyk, O'Hare, Neuman, 2000), some caution may need to be exercised given the methodological differences between those studies that comprise the meta-analysis.

There is therefore a gap in the developmental literature's exploration of the mother-infant interaction in the context of depression. Research is required using a measure capable of providing an overview of the maternal behavior and affective quality of the mother's engagement with her infant, before we can determine the level of risk that maternal depression poses to the mother-infant interaction. Central to this examination of the mother-infant relationship is attachment theory, which also forms the foundation of the EA construct.

1.4. Attachment theory

As set out in the above section, attachment theory forms the foundation of the EA construct. Understanding the basis of attachment theory, as well as Ainsworth's notion of maternal sensitivity (1969), is central to the conceptualisation of the mother-infant relationship quality applied to this dissertation research. Bowlby's attachment theory (1969) is arguably one of the most influential theories of developmental psychology. Since its inception there has been an explosion of theoretical research as well as the empirical assessment of the early mother-infant relationship. Researchers have tried to understand the link between attachment and child emotional, cognitive and psychological outcomes, as well as the factors that might explain the different classification of mother-infant dyads into secure or insecure categories.

According to attachment theory, mammalian infants are biologically predisposed to form an attachment to a primary caregiver to enhance their chances of

survival (Bowlby, 1969). Bowlby discussed the notion of caregiver sensitivity, suggesting that it is the capacity of the caregiver to respond sensitively to the infant's signals. Infant signalling is how the infant communicates their needs to the caregiver and elicits their attention. The detection of signals from other parties forms a core component of successful communication. The origins of understanding infant signalling can be found in ethological research (Hinde, 1981). It is suggested that Bowlby's attachment theory was influenced by collaboration with Robert Hinde, an ethologist, who studied the mother-infant interaction of rhesus monkeys (Hinde & McGinnis, 1975). According to ethological theory, signals carry precise information about animal behaviour, with the behaviour following a signal sometimes dependant on the response of the other party to the initial signalling. Signals may also be classified as graded signals, where the context and intensity determine the meaning of the signal, or discrete signals that carry a single message only (Marler, Evans & Hausler, 1992). A core component of signaling is the ability to identify the signal, and to then decode the message contained in the signal. In the case of the mother-infant interaction, this ability is captured within the construct of maternal sensitivity (Ainsworth, 1969).

A variety of infant signals might be used to obtain a maternal response including, verbal (e.g., crying, talking, sounds, sucking), physical (e.g., touch, eye contact/gaze, positioning, head orientation, following), or facial (affect, smiling, frowning, confused; Donovan, Leavitt & Balling, 1978). According to Bowlby, it is the maternal responsiveness to infant signals that facilitates the formation of the attachment relationship. In the first volume of his attachment series, 'Attachment', Bowlby (1969) called for the urgent need to identify the antecedents for the development of attachment.

1.4.1. Antecedents to attachment. Ainsworth was the first to respond to Bowlby's call with her seminal work in Uganda (Ainsworth, 1969), and later the Baltimore Studies (Ainsworth, Blehar & Waters, 1978), in which Ainsworth observed 26 mother-infant dyads in over 70 hours of at home observation during the infant's first year. Ainsworth completed detailed narratives describing what was taking place between the mother and her infant, and applying this knowledge devised a way to empirically test Bowlby's attachment theory using the 'strange situation' procedure. The strange situation procedure is a standardised laboratory procedure designed to assess differences in attachment. It involves short periods of separation and reunion between the child and caregiver with the presence of specific behavioural markers to indicate secure or insecure attachment. Using data from the Baltimore studies and by analysing the link between mother-infant interactions and infant attachment at 12 months, Ainsworth proposed that maternal sensitivity was the most important antecedent to attachment quality (Ainsworth et al., 1978; Ainsworth, Bell & Stayton, 1974).

1.4.2. Parenting qualities. Maternal sensitivity is the capacity of a mother to identify her infant's signals and communications, and respond in an effective, appropriate and timely manner (Ainsworth, 1969). Maternal sensitivity affects the formation of mother-infant attachment as well as the quality of the mother-infant interaction. The data from Ainsworth's early work exploring maternal sensitivity reported fewer displays of affection and reduced responsiveness to infant crying from mothers classified as insecurely attached (Ainsworth et al., 1978). This notion of maternal sensitivity as a predictor of attachment security has been replicated (Aviezer, Sagi, Joels, & Ziv, 1999; Pederson, Gleason, Moran, & Bento, 1998), and questioned in subsequent studies (e.g., Goldsmith & Alansky, 1987).

However, maternal sensitivity is only one of the dimensions that comprises the mother-infant interaction. This is supported by the moderately strong association between maternal sensitivity and attachment security that was reported in meta-analysis of 66 studies by Wolff and van IJzendoorn (1997). Other parenting dimensions identified in the literature include maternal hostility, structuring and intrusiveness. To understand the reason for use of the EA construct to represent the quality of the mother-infant relationship at six months postpartum, it is necessary to establish what maternal qualities might comprise that relationship. The first of the maternal qualities outside of maternal sensitivity is maternal hostility.

Exposure to anger is likely to negatively impact on a child's interaction with their mother. Cummings (1987) tested this notion in 85 mother-child dyads by exposing them to different background conditions (i.e., no emotion, positive emotion, anger) during their play. Increased aggressiveness during child play was observed following exposure to the anger condition, as well as heightened arousal. This has led to an investigation of hostility in studies analysing the mother-child interaction (e.g., Stack et al., 2012). Hostility encompasses covert (i.e., concealed), and overt (i.e., open) hostility. Hostility includes words, actions or behaviours that might be overtly observed, as well as more subtle signs of boredom, anger or impatience. Arguably hostility does not need to be directed towards the child for it to have an adverse effect, with background anger (i.e., adult showing hostility to another person), equally significant for child development (Cummings, 1987; Biringen & Easterbooks, 2012; Biringen, Derscheid, Vliegen, Closson & Easterbrooks, 2014). Maternal hostility is a parenting dimension that may be necessary to examine when assessing the quality of the mother-infant interaction.

Intrusiveness is another parenting dimension that studies suggest explains a proportion of the variance in the mother-infant exchange. Intrusiveness can be observed in the over-protection, interference, or over-stimulation of a child, as well as a parent treating the child as if they were younger (Biringen & Easterbooks, 2012). Intrusiveness captures the level at which the parent undercuts the child's autonomy, particularly if the child indicates the parent's behaviour and involvement is not accepted. For example, Garvin, Tarullo, Van Ryzin & Gunnar (2012) presented data suggesting that adoptive mothers of children were higher in intrusiveness than mothers of non-adopted children. Garvin's study evidenced the parenting quality of intrusiveness to explain the differences in the quality of mother-infant exchange that was observed in a vulnerable group of children from institutionalised care. This research supports the investigation of maternal intrusiveness as a parenting dimension capable of influencing the mother-infant exchange.

In addition, structuring is identified as a parenting dimension of the mother-infant interaction that can influence the overall quality of the exchange. Structuring is the ability of the parent to extend the child's play and knowledge, or the degree to which the parent scaffolds, guides and mentors the child's activities. It requires the parent to follow the child's lead and set appropriate limits, without inhibiting the child's autonomy (Biringen & Easterbooks, 2012). It is on the basis of this collective evidence that sensitivity, structuring, intrusiveness and hostility comprise the parenting dimensions of the EAS (Biringen et al., 2014).

The EA theory purports to extend the assessment of the mother-infant interaction beyond Ainsworth's maternal sensitivity to include other parenting dimensions; structuring, non-intrusiveness, non-hostility, as well as the child's side to the interaction (i.e., child involvement and responsiveness; Biringen, 2008), though

this is contrary to the one factor model of the parental EA scales (Garvin et al., 2005). In the next section the EA theory is presented as a means for assessing the mother-infant relationship, with the EAS providing a valid and reliable observational tool for the mother-infant interaction.

1.5. The Theory of Emotional Availability

1.5.1. Emotional Availability framework. The EA framework emphasizes the emotional features and dyadic exchange between a mother and her infant (Emde, 1980; Sorce & Emde, 1981; Ziv, Aviezer, Gini, Sagi & Karie, 2000). Attachment theory (Bowlby, 1969), including the role of maternal sensitivity, is central to the construct (Bretherton, 2000; Ainsworth et al., 1978). Biringen and colleagues (2012) postulate that the EA framework moves beyond maternal sensitivity to include other parenting dimensions structuring, intrusiveness and hostility, as well as the child's perspective (Biringen, 2008). However, as noted above, this assertion may not be consistent with studies of the factor structure of the EAS that support a one-factor model (Garvin et al., 2012; MacMillan, Lewis, Watson & Galbally, 2020), though there is reference to a two-factor model in the early work of Biringen and Robinson (see personal correspondence, 1995; cited by Biringen et al., 2014), the two factor model is not published.

EA has been defined as the supportive maternal presence in the context of an infant's autonomy and exploration (Biringen, 2000). Most importantly, it is the affective quality of the connection between the mother and her infant (Emde & Easterbrooks, 1985), with the emotional tone of the interaction described by early EA theorists as a 'barometer' for the interaction quality (Emde, 1980). A relational construct, EA requires the evaluation of how each person affects the other, rather than

just how the person behaves (Biringen et al., 2014; Biringen, 2004). An EA mother is attuned to her child's emotional signals and responses, both positive and negative, with this information forming the emotional feedback system that is intrinsic to a reciprocal emotional connection (Emde, 1980).

1.5.2. The Emotional Availability Scales. The conceptualisation of EA is captured by the EAS (Biringen et al., 2014). The EAS is the only valid and reliable measure for the assessment of the EA in a relationship. The original EAS was published in 1987 by viewing mother-child interactions and checking the attachment indicators for the relationships. Developed to assess the capacity of a dyad to share an emotional connection, the EAS is comprised of six dimensions; four parental (i.e., sensitivity, structuring, non-intrusiveness and non-hostility) and two child scales (i.e., child responsiveness and child involvement; Biringen, 2008). Additionally, the EAS uses a 100-point scale to assign an EA zone (formerly clinical screener; highly emotionally available; complicated, detached or problematic), to the adult and child side to the interaction to provide an overview of the EA in the relationship. The dyadic nature of the EAS is incorporated into the scoring of the subscales of each dimension. For example, in the structuring scale of the parenting dimension, a parent is assessed on their attempts to structure, as well as whether that structuring is accepted by the child (Biringen, 2008). It is on this basis that studies interested in examining the parental side to the interaction, have used the parental dimensions only (e.g., Garvin et al., 2012).

Significantly in the context of mother-infant research, the EAS is capable of assessing mother-infant interactions. In fact, the majority of the studies that initially applied the EAS used samples of children aged from three months to three years (e.g., Biringen et al., 1999). This emphasis on infancy is still present in the EA literature

(e.g., de Falco, Venuti, Esposito & Biringen, 2009), and is illustrated by Biringen and colleagues (2014) review that noted fewer studies applying the EAS to samples of school-aged children compared to samples of infants. The EAS is therefore a valid and reliable tool for mother-infant interaction assessment.

It is also necessary to consider the EA construct in the context of parenting styles. The theoretical framework by Baumrind (1967; 1971) and later developed by Maccoby and Martin (1983), defines four parenting categories: authoritative parenting (i.e., high responsiveness and high demandingness); authoritarian parenting (i.e., high demandingness but low responsiveness); permissive parenting (i.e., low demandingness and high responsiveness); and finally, neglectful parenting (i.e., low responsiveness and low demandingness). Surprisingly, there has been limited exploration of the relationship between EA and these parenting categories. For example, using a sample of 313 adolescent mothers and their toddlers, Chaudhuri, Easterbrooks and Davis (2009) examined the relationship between EA and parenting style. Using a cluster analysis of the EA data, three parenting styles emerged: democratic, which was associated with the highest scores on the parenting dimensions of the EAS; strict loving, that had high scores on the parenting EAS dimensions but also increased use of punishment; and finally, directive, with the lowest sensitivity and structuring scores and the highest levels of intrusiveness and hostility. It follows that the qualities comprising the parenting categories may align to those of the EAS dimensions. That is except the EA sensitivity scale, which would instead be captured by warmth, a core component of Baumrind's parenting framework, as well as other parenting studies (e.g., Fagot, 1995; Sears, Maccoby & Levin, 1957). However, according to Ainsworth and Marvin (1995), maternal sensitivity may constitute a

stronger component of parenting than warmth, with this position endorsed by EA theorists (e.g., Biringen et al., 2014).

Empirical research supports the predictive ability of the EAS on attachment security between a mother and her child (Easterbrooks & Biringen, 2000; Biringen & Easterbrooks, 2012). Bretherton (2000) reviewed studies using the EAS and attachment measures (Ziv et al., 2000; Swanson et al., 2000; Easterbooks et al., 2000; Oyen, Landy & Hilburn-Cobb, 2000; Biringen, Matheny Bretherton, Renouf, & Sherman, 2000), and concluded that highly emotionally available dyads were associated with secure parent/child attachment classification (measured using the strange situation procedure and the 18 month parent attachment interview: Ainsworth et al., 1978; George, Kaplan, Main, 1996). Other studies note that children of mothers that score high on sensitivity are more likely to be securely attached (e.g., Sagi, Koren-Karie, Gini, Ziv & Joels, 2002). The child dimensions of the EAS are also said to be predictive of attachment security in infants (Easterbrooks & Biringen, 2000). It is possible that this association may extend to insecure attachment formation, though we only found evidence of this in a single related study. Easterbrooks, Bureau and Lyons-Ruth (2012) observed a moderate to large association between maternal sensitivity and non-hostility (measured by the EAS) and disorganised attachment behaviour (measured by the Middle Childhood Disorganisation and Control Scales) in middle childhood. Taken together, there is evidence to support an association between the EAS dimensions and infant attachment security.

Given the considerable body of evidence that supports attachment categories as a predictor of developmental, cognitive, and psychological outcomes (e.g., Groh, Roisman, van IJzendoorn, Bakermans-Kranenburg & Fearon, 2012; Schoenmaker et al., 2015), the link between EA and attachment categories highlights the likely

significance of maternal EA in the context of child development. It is therefore necessary to understand the psychosocial factors that might influence the level of EA in a mother-infant interaction. One psychosocial factor frequently posited in the literature is maternal mental health.

The association between maternal mental health and child development is well documented (Grote, Bridge, Gavin, Melville, Iyengar, & Katon, 2010). Indeed, evidence from studies that report the association between perinatal mental health and adverse child outcomes (Leis, Heron, Stuart, & Mendelson, 2013; Barker et al., 2011; Pawlby et al., 2009; Hay et al., 2008) has directed efforts to the improvement of treatment for postnatal mental health disorders (Stephens, Ford, Paudyal, & Smith, 2016). However, with the link between maternal exposure to psychopathology from pregnancy and child mental health, this focus may need to shift to preconception and pregnancy (Lewis et al., 2014). One of the mechanisms present from pregnancy is the mother-infant relationship. With high prevalence of perinatal depression (Bennett et al., 2004), it is therefore important to understand whether perinatal depression is a psychosocial predictor of the mother-infant relationship, and if so, to what extent.

1.6. Perinatal Depression

1.6.1. Rationale. As set out in the section above, one of the psychosocial factors that might influence maternal EA is maternal mental health. There are a variety of mental health disorders that may occur or be exacerbated during pregnancy or the postpartum. Perinatal depression is one of the most common pregnancy complications (Fisher et al., 2012). A growing body of research suggests that perinatal depression is associated with child developmental outcomes, including child mental health. One of the mechanisms by which the risk of exposure to perinatal depression

might be transferred to an infant is through the mother-infant relationship.

Understanding whether perinatal depression is a psychosocial predictor of maternal EA is important to determine the risk to the mother-infant dyad, as well as the optimal timing for clinical intervention. In this section we will define perinatal depression, examine the existing literature of the association between perinatal depression and the mother-infant relationship, and identify the gaps in the EA literature that will be addressed by empirical study one of this dissertation.

1.6.2. Defining perinatal depression. Pragmatically, perinatal depression can be defined as depressive episodes that take place during either or both pregnancy and up to 12 months postpartum. Perinatal depression includes depression that is present before the pregnancy, that which is recurring, or that which occurs comorbidly with other disorders (O'Hara & Wisner, 2014). Perinatal depression is unique because of the implications of depressive symptoms for the mother and the infant when they occur in pregnancy or the postpartum. For example, low mood, fatigue, feelings of worthlessness or loss of interest may translate to poorer maternal self-care (e.g., attendance at antenatal appointments or nutrition; Chung, Lau, Yip, Chiu & Lee, 2001). There is the possibility that reduced maternal self-care could impact on childbirth (e.g., preterm delivery or birth weight; Smith, Shao, Howell, & Lin, 2011; Rahman, Iqbal, Bunn, Lovel, & Harrington, 2004), or infant outcomes (Coverdale, McCullough, Chervenak & Bayer, 1996; Milgrom & Gemmill, 2014). Increasing focus in the developmental research is to understand what impact exposure to depression might have on infant and child development (Goodman & Gotlib, 1999; Galbally & Lewis, 2017). Treatment of perinatal depression therefore requires the conceptualisation of depressive symptoms within the context of the perinatal period and the mother-infant dyad. As one of the most common comorbidities in pregnancy,

there is increasing recognition of the importance of perinatal depression as a psychosocial predictor of maternal and infant outcomes including the mother-infant relationship (Goodman, 2009).

1.6.3. Prevalence of perinatal depression. Of the perinatal mental health disorders, depression is the most common though prevalence estimates vary. Bennett et al. (2009) reported that 7 – 13% of women experience depression in pregnancy, and 10 – 15% during the first six months postpartum. Similarly, Gavin and colleagues (2005) reported perinatal depression estimates between 6.5% and 12.9%.

Interestingly, Gavin noted that most of the major depressive episodes occurred postpartum, though this proposition has been disputed elsewhere in the literature. For example, Field et al. (2011) reported that evidence points to more frequent antenatal depression rates. In reaching this conclusion, Field referred to estimates of depression in pregnancy as high as 31% in England (Hay, Pawlby, Waters & Sharp, 2008), 30% in Italy (Marchesi, Bertoni & Maggini, 2009); and 38% in the United States (Records & Rice, 2007). Depression is also reported to be an issue throughout a woman's pregnancy, for example, Bennett et al. (2004) recorded depression rates of 7.5%, 12.8% and 12%, for trimesters one, two and three of pregnancy, respectively. This indicates the importance of measurement of maternal depression at multiple time points throughout the perinatal period if the disorder is to be accurately captured.

The wide variation in the estimated rates of perinatal depression recorded across the studies reflects the difficulties associated with obtaining an accurate assessment of prevalence. In their meta-analysis of the existing depression prevalence research, Gaynes et al. (2005) excluded studies that relied exclusively on self-report measurement because of the possibility that incidence may be over-estimated. The variation in the assessment of depression (e.g., self-report, diagnostic interview,

telephone interview), has led to wide estimate variation. The timing of the assessment is also significant. For example, a woman assessed at five weeks postpartum versus six months postpartum is likely to encompass different findings because each stage of the perinatal period carries its own unique stressors and challenges. Despite the inconsistency in the reporting of prevalence rates, the evidence points to the disease burden of perinatal depression.

Whilst it is not conclusive whether prenatal or postnatal depression rates are higher, there is sufficient evidence to indicate that prenatal depression is equally an issue for women in pregnancy as it is for women postnatally. Yet, when reviewing the developmental literature, most of the focus is directed towards postnatal depression and the impact that postnatal depression has on child development (e.g., Cummings & Davies, 1994; Murray & Cooper, 1997). If perinatal depression poses a risk to child development from early pregnancy to the postpartum, it is important to consider the impact of perinatal depression on the mother-infant relationship, for the relationship is a construct that can be targeted by clinical treatment.

1.6.4. Perinatal depression and the mother-infant relationship. There are two primary issues with the existing research that investigates perinatal maternal depression and the mother-infant dyad. The first issue is that despite prevalence estimates of depression in pregnancy, studies assessing the relationship between maternal depression and the mother-infant interaction focus on postnatal depression. For example, numerous studies report postnatal depression as a risk factor to the quality of the mother-infant dyad (Murray & Cooper, 1997; Campbell, Cohn & Meyers, 1995; Weinberg et al., 2006; Murray, Fearon, & Cooper, 2015). This needs to be addressed because if a woman has depression in pregnancy, it is possible that the presence of antenatal depression might impact on the beginning of the woman's

relationship with her infant. Indeed, the association between depression in pregnancy and the mother-infant relationship is of equal importance to the association between postnatal depression and the mother-infant relationship. This is highlighted by evidence of the link between a woman's representation of her infant in pregnancy and the later attachment relationship. Van Bussel, Spitz and Demyttenaere (2010) reported that women who avoided thinking about their infant and role as a mother were more likely to show impaired bonding compared to women who reported feelings of closeness and transition towards the arrival of the infant. Similarly, Fonagy, Steele and Steele (1991) noted that mothers' attachment representations in pregnancy predicted attachment security at 12 months.

Winnicott (1956) described these prenatal processes as the 'primary maternal preoccupation' that prepares women for motherhood. This notion that what is happening for the woman in pregnancy can impact on her capacity to connect with her infant after the birth is important in the context of understanding the relationship between perinatal depression and the mother-infant interaction. If depression is not measured from pregnancy, we might miss important information about why deficits in the mother-infant interaction quality emerge for some dyads during the postpartum period, and not for others.

The second issue in the existing studies that examine perinatal depression and the mother-infant relationship (as outlined in section 1.3.3, above) is the tendency to assess the mother-infant interaction using a measure that may not capture the quality of a mother-infant interaction in its entirety. We propose the EAS as capable of providing an overview of the mother-infant interaction. Yet we only identified eight studies testing the association between maternal depression and EA using mother-infant dyads (Easterbrooks, Chaudhuri & Gestsdottir, 2005; Fonseca et al., 2010;

Goldman-Fraser, Harris-Britt, Thakkallapalli, Kurtz-Costes & Martin, 2010;
Newland, Parade, Dickstein & Seifer, 2016; van Doesum et al., 2007; Vliegen,
Luyten & Biringen, 2009; Cornish, McMahon & Ungerer, 2008; Rossen et al., 2018).
The sample characteristics and study findings for the eight EA studies are captured in
Table 1.

Table 1. Summary of the eight empirical studies that investigate the association between maternal EA and maternal depression using mother-infant dyads.

	Sample characteristics	Depression measurement	Findings: EA and depression
Easterbrooks et al. (2005)	80 mother-infant dyads; five minutes of free play	Centre for Epidemiological Studies Depression (CES-D) Scale once in the postpartum	The cluster of mothers with average mother-infant interaction quality had the highest rates of depressive symptoms
Fonseca et al. (2010)	131 mother-infant dyads; 14 minute interaction with toys	EPDS once in the postpartum	No significant differences between scores of women with depression and women without depression
Goldman-Fraser et al., 2010	48 mother-infant dyads; 10 minute interaction	Symptom checklist 90 R	Significant correlation between depressive symptoms and maternal intrusiveness and structuring only
Newland et al., 2016	167 parent-infant dyads; 45 minute interaction	Hamilton Rating Scale for Depression at 4 months postpartum	Higher levels of depression at four months significantly associated with reduced maternal sensitivity at 15 months
van Doesum et al., 2007	84 mother-infant dyads; 15 minute interaction during bathing	The Mini International Neuropsychiatric Interview; Beck Depression Inventory (BDI) once in the postpartum	Depressive symptoms explained 2.3% of the variance in maternal sensitivity
Vliegen et al. 2009	49 mother-infant dyads; 30 minute free play interaction	BDI once in the postpartum	Women with depression had lower EA scores on each dimension except non-hostility then women without depression
Cornish et al., 2008	112 mother-infant dyads; two five-minute free play interactions.	Composite International Diagnostic Interview at 4 and 12 months postpartum; CES-D at 4, 12 and 15 months postpartum	Significant differences between depressed and non-depressed group for non-intrusiveness only. All other EAS scales showed no significant differences between the groups

Rossen et al., 2018	191 mother/partner-infant dyads; 20 minute free play interaction.	EPDS once at 8 weeks postpartum.	Depression was a significant predictor of reduced EA at 12 months postpartum
---------------------	---	----------------------------------	--

None of the studies identified in Table 1 measure depression in pregnancy, instead the focus is on the postnatal period. Moreover, there is only one other study, Cornish et al. (2008), that employed diagnostic and symptomatic measurement of depression using longitudinal design. Rossen et al. (2018) recently tried to address these gaps in the EA literature. Rossen measured depression using the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden & Sagovsky, 1987) at eight weeks postpartum only, and the women with depression in their sample had a mean score of 3.86 ($SD = 3.47$), below the EPDS clinical cut off for depression (i.e. a score of more than or equal to 13; Cox et al., 1987). The issue with the mean score of the sample is because there was no diagnostic measurement applied in conjunction with the symptomatic measure, it is not possible to ascertain whether any of the women with ‘depression’ in Rossen’s sample in fact had depression. There is a need for examination of the relationship between perinatal maternal depression measured diagnostically and symptomatically from pregnancy to the postpartum, and the mother-infant relationship captured by a comprehensive tool such as the EAS.

1.6.5. Empirical study one. Study one of this dissertation is the only study, to our knowledge, that captures perinatal maternal depression from pregnancy to the postpartum, using both symptomatic and diagnostic measures at three different time points. Maternal EA is conceptualised using one latent variable, thereby including each of the parenting dimensions of the EAS rather than specific parts of the mother-infant interaction. This makes a unique contribution to the EA literature in two ways:

first, by providing a factor analysis of the parenting dimensions of the EAS in addition to Garvin and colleagues (2012), and second, by comprehensively examining the association between perinatal depression and the mother-infant relationship using the parental scales of the EAS and diagnostic and symptomatic measurement to capture perinatal depression.

1.7. Maternal trauma

1.7.1. Rationale. As stated above, one of the psychosocial predictors that might influence maternal EA at six months postpartum is perinatal depression. Maternal trauma is another issue that may be triggered during the perinatal period with trauma exposure linked to our mental health outcomes (e.g., Merrick, Ports, Ford, Afifi, Gershoff & Grogan-Kaylor, 2017). The experience of trauma might impact on the capacity to be an emotionally available parent (Fuchs et al., 2015). There is considerable literature that documents the difficulty survivors of childhood trauma can experience in forming trusting and consistent relationships with others (Gobin & Freyd, 2014). Yet trust and consistency are core components of an EA relationship, in which repeated reciprocal exchanges shape the infant's expectations of the mother's ability to respond to their needs effectively (Biringen et al., 2014). Some researchers also suggest that childhood trauma impacts on the formation of the self, with a sense of disconnect, lack of cohesion, fear or dissociation recorded in some survivors (Pearlman, 1997). These effects might reduce the individual's capacity to respond to the emotional and physical needs of an infant particularly the ability to regulate an infant's emotional experience (Tronick & Gianino, 1986; Calkins & Hill, 2007). Individuals with childhood trauma history are more likely to find the experience of negative emotions difficult to tolerate or regulate (Briere &

Rickards, 2007), with increased avoidance (Marx & Sloan, 2002), and fear (Tull, Jakupcak, McFadden & Roemer, 2007). A feature of an emotionally available relationship is the acceptance of positive and negative emotions (Emde, 1980). One can therefore hypothesize that maternal childhood trauma might negatively impact the mother-infant dyad. Taken together, this evidence supports the hypothesis that childhood trauma might reduce maternal EA in a mother-infant interaction.

Whilst the literature supports a negative association between maternal childhood trauma and maternal EA (e.g., Fuchs et al., 2015), it does not account for the theory and empirical research regarding the cumulative effects of early trauma exposure (Kessler, 2000; Ogle, Rubin & Siegler, 2013). According to this research, women with childhood trauma are more likely to experience additional subsequent trauma. Cumulative effects theory informed the basis of our second empirical study in which we investigate the relationship between maternal EA and childhood trauma, and proximate trauma specific to the perinatal period: childbirth experience and stressful life events. Understanding the contribution of different types of trauma is critical to understand how abuse impacts on the mother-infant relationship, with this information necessary for treatment.

1.7.2. Defining trauma. Trauma is a term widely applied that can encompass a variety of circumstances, experiences and exposures. In the trauma research, the term includes exposure to a range of traumatic events including, natural or other disaster, military combat or war, criminal violence (e.g., physical or sexual assault or rape), hearing about violent injury or death of a loved one, diagnosis with a life-threatening illness, or witnessing violence (Breslau, 2002; DSM-V; American Psychiatric Association, 2013). Trauma has been difficult to define with the challenges around this reflected in the conceptual debate about trauma seen in the

literature (e.g., Weathers & Keane, 2007). The experience of trauma captures the subjective appraisal and personal meaning making of an event. The subjectivity of psychological trauma is also important given the development of post traumatic stress disorder (PTSD; DSM-V, 2013) following trauma exposure is likely to be influenced by individual factors including, family context, genetics, personality traits, biological factors, information processing and cognitive style (see, meta-analysis of vulnerability and PTSD; Zuckerman, 1999; Agaibi & Wilson, 2005). It is this complex interaction that may lead to differences in the psychological outcome between individuals exposed to the same traumatic event (Elder & Clipp, 1988; Wilson, 1995; Wilson & Drozdek, 2004).

The wide-ranging application of the term trauma is reflected in the epidemiological research studies with ranging trauma prevalence estimates. Exposure rates as high as 90% are documented (Breslau, Kessler, Chilcoat, Schultz, Davis & Andreski, 1998), with other studies estimating prevalence of 40% to 60% (Breslau, Davis, Andreski, Peterson, 1991; Norris, 1992; Resnick, Kilpatrick, Dansky, Saunders & Best, 1993; Kessler, Sonnega, Bromet, & Nelson, 1995). Consideration of the specific trauma investigated as well as how that trauma will be captured conceptually (e.g., counting the number of stressors, measuring PTSD symptoms or diagnosis, report of the worst event exposed to; Breslau, 2002), is critical in the examination of maternal trauma as a psychosocial predictor of the mother-infant relationship.

1.7.3. Prevalence of maternal trauma in the perinatal period. The estimated levels of maternal trauma during the perinatal period highlight the importance of examining maternal trauma in the context of the mother-infant relationship. Of 1,581 women surveyed in an obstetric setting in the United States, a lifetime rate of PTSD was estimated at 20.2% (Seng, Low, Sperlich, Ronis &

Liberzon, 2009). Interestingly, the rates of trauma prevalence were higher in the obstetric population than the general population that estimates lifetime PTSD prevalence of 12.3% (Resnick, Kilpatrick, Dansky, Saunders & Best, 1993). Similarly, Smith, Poschman, Cavaleri, Howell, and Yonkers (2006) noted that of 948 pregnant women screened in the United States, almost one-third reported lifetime trauma exposure. Consequently, the experience of perinatal trauma is common. However, it may not be sufficient to examine maternal childhood trauma alone, with cumulative effects theory pointing to the likelihood that women who experienced childhood trauma are more likely to experience subsequent additional trauma. To understand the relationship between maternal trauma and the mother infant relationship, both distal and proximate trauma exposures may need to be investigated.

1.7.4. Cumulative trauma exposure. It is well established that an individual who has experienced one type of trauma is more likely to experience other traumas across their lifetime (Kessler, 2000). This notion of exposure to repeated or multiple traumas is particularly evident in the developmental literature exploring childhood trauma (Cloitre et al., 2009). When considering the relationship between maternal trauma and the mother-infant relationship, it is necessary to consider the types of trauma a woman might be exposed to. This distinction has not traditionally been made in the developmental literature. Research examining trauma and the early mother-infant relationship tends to focus on distal childhood trauma only. For example, Moehler, Biringen and Poustka (2006) examined the link between maternal childhood trauma and maternal EA. However, with no other types of trauma identified, it is possible that the negative effect of maternal childhood trauma on the mother-infant interaction reported in that study might be attributable to other proximate trauma exposure.

The notion that individuals who experience one type of trauma are more likely to have additional trauma exposure is understandable when considering the possible effect childhood trauma can have on development (e.g., Lim, Radua & Rubia, 2014; Cross, Fani, Powers, & Bradley, 2017; Toth & Manly, 2019). Research has documented the negative impact of childhood trauma on emotional regulation, the formation of a coherent sense of self, memory functioning, and interpersonal relationship outcomes (Goodman, Quas & Ogle, 2010), as well as individual's physical health (see review; Mulvihill, 2005). In addition, according to the stress-sensitization hypothesis, the capacity to respond to stress may be affected by trauma exposure (Rutter, 1989). Stress related research suggests that adverse experience through traumatic events can alter the sensitivity of stress response systems which leads to an increased likelihood of adverse outcomes for that individual during future stress exposure (McLaughlin, Conron, Koenen & Gilman, 2010). This theory about the long-term effects of childhood trauma exposure is important to consider when thinking about how maternal trauma might influence the mother-infant relationship. It follows that individuals with childhood trauma history are also more likely to experience additional trauma, so capturing distal and proximate trauma in the analysis of the relationship is critical.

1.7.5. Proximate trauma exposure. Two types of maternal trauma exposures specific to the perinatal period are from childbirth and stressful life events. With increasing consensus in perinatal research and clinical practice of the distress and trauma that is associated with childbirth for some women (Dekel, Stuebe & Dishy, 2017), childbirth experience may be a proximate trauma exposure that could influence early mother-infant interactions. The other proximate trauma exposure might be from traumatic life events exposure in pregnancy or the postpartum. If we are to understand

the association between maternal childhood trauma and the mother-infant relationship, we need to account for the possible contribution of other traumas specific to the perinatal period. First, however, we need to examine the existing evidence of the relationship between childhood trauma and the mother infant relationship.

1.7.6. Childhood trauma. Fraiberg, Adelson and Shapiro's (1975) seminal work first proposed that maternal 'ghosts' in the nursery might play out in the mother-infant exchange thereby contributing to the infant's development. Researchers have since theorised how a parent's representations of their infant might stem from their own history (Kreiser & Cramer, 1981). These attributions can inform the way a parent interprets and responds to infant behaviour. As pointed out by Main and Hesse (1990), unresolved trauma and loss (i.e., the unprocessed memories and emotions associated with a traumatic experience; van der Kolk, 1994), can play out in the mother-infant relationship particularly in the attachment behaviours. Empirical studies have tested this theory, for example, Lyons-Ruth and Block (1996) noted a moderate association between childhood physical abuse and negative affect hostility and intrusiveness, as well as between childhood sexual abuse and reduced infant involvement and limited affect. These results have since been replicated (e.g., Banyard, 1997; Lillo et al., 2000), with some researchers theorising that the disturbance caused by the experience of childhood trauma impacts the development of empathy, thereby limiting maternal understanding of the infant's experience and perspective, a fundamental skill for an emotionally available exchange (Cierpka & Cierpka, 1997).

We identified three studies that examine the relationship between maternal EA and maternal childhood trauma using mother-infant dyads (Moehler et al., 2007;

Driscoll & Easterbrooks; Fuchs et al., 2015). Consistent in each of the study findings is a negative association between maternal childhood trauma and maternal EA. Moehler et al. (2006) reported that women with a history of sexual or physical abuse scored over six times more on intrusiveness than women without that history. These findings were replicated in a sample of 107 mother-infant dyads where mothers with a history of severe physical abuse were twice as likely to score lower sensitivity and structuring scores compared to mothers without that childhood abuse history (Driscoll & Easterbrooks, 2007). More recently, in 119 mother-infant dyads, Fuchs et al. (2015) noted that maternal physical or sexual childhood abuse accounted for 13% of the variance in maternal EA. However, there are two key issues with the existing research. The first issue is that the examination of maternal childhood trauma in the EA literature is limited to physical and sexual abuse only, without accounting for the possible deleterious effects of emotional and physical neglect (e.g., Clément, Bérubé, & Chamberland, 2016). For example, Pollak, Cicchetti, Hornung and Reed (2000) reported the increased difficulty that neglected children had in differentiating emotional expressions compared to children with physical abuse or no abuse history. This highlights the distinct effects that different types of child abuse may have on child development (e.g., Claussen & Crittenden, 1991). There is even evidence to suggest that the most severe psychological effects may result from neglect over sexual or physical abuse (Ney, Fung & Wickett, 1994). If we are to analyse the impact of maternal childhood abuse on the mother-infant dyad, physical and emotional neglect need to be captured.

The second issue is that existing EA studies do not account for other proximate trauma that might influence a woman's capacity to be emotionally available to their infant. Instead, there is the assumption that the effect between

maternal childhood trauma and maternal EA is attributable to the distal trauma exposure. We aim to address each of these issues in study two of this dissertation by incorporating all types of childhood trauma (i.e., sexual, physical and emotional abuse, as well as emotional and physical neglect) to the childhood trauma variable, and by specifying other types of proximate trauma specific to the perinatal period that might mediate the association between maternal childhood trauma and the mother-infant relationship. The first type of proximate trauma specific to the perinatal period that we will capture is from childbirth experience.

1.7.7. Childbirth experience. The research regarding childbirth trauma and the mother infant interaction is still in its infancy, with findings mixed. Part of the difficulty in the childbirth trauma research lies in the methodological differences in how childbirth trauma is defined and measured, as well as the assessment of the mother-infant relationship. For example, of the childbirth trauma studies that utilise self-report measures, there are some that assess criterion A for the diagnosis of PTSD, (Sawyer & Ayers, 2009; Seng et al., 2013; Zambaldi, Cantilino, Farias, Moraes & Sougey, 2011), whereas others do not (Lefkowitz, Baxt, & Evans, 2010; Armstrong Hutti & Myers, 2009). However, as pointed out by Grekin & O'Hara (2014), the issue with not applying diagnostic criteria is that some women with symptoms of another disorder might be captured by the symptoms of PTSD, and there is also the likelihood of comorbidity between disorders (Shalev et al., 1998; Ginzburg, Ein-Dor, & Solomon, 2010). Further research is required to understand adverse childbirth experience for women, particularly the implications it has for the woman and her infant. This may involve longer-term studies that assess the mother-infant dyad across the first year.

Another consideration, like that for childhood trauma, is how to ensure the traumatic event being measured is from childbirth and not from another traumatic event. This is difficult in the existing literature which appears to identify two groups of women who experience childbirth trauma. The first group of women might experience a traumatic intervention during the childbirth (e.g., vacuum, emergency caesarian), birth related complications (e.g., postpartum hemorrhage), or feel a loss of control, extreme pain, or infant complications (e.g., premature delivery, medical complications, or special needs), and do not feel informed or supported (i.e., by medical staff and/or their partner). For these women, traumatic symptoms develop based on the childbirth itself. The other group of women who develop trauma symptoms following childbirth are those women whose previous trauma history (e.g., childhood abuse) placed them at increased vulnerability. The importance of distinguishing the source of trauma is demonstrated in the following empirical studies.

A longitudinal pregnancy cohort study of 837 women, Lev-Wiesel, Daphna-Tekoah and Hallack (2009) reported higher PTSD symptoms (intrusion and arousal) following childbirth for women with childhood sexual abuse history compared to women who had experienced other trauma and women who reported no trauma. Yet the existing research does not distinguish the different types of women that might report childbirth trauma. Cigoli, Gilli and Saita (2006) examined PTSD symptoms in 160 women at three to six months postpartum to test the association between trauma symptoms and perceptions of support. However, the study did not capture past traumatic experiences for the women in the sample, either from distal childhood trauma or proximate stressful life events. The question then arises whether Cigoli's findings represent women who because of other trauma were vulnerable to PTSD

symptoms that were triggered in childbirth, or whether the sample represents women who experienced the event of childbirth in of itself as traumatic. Similarly, in a Dutch study of 140 women, Olde, der Hart, Kleber, van Son, Wijnen and Pop (2005) examined the prevalence of PTSD symptoms from one week to three months postpartum. In their findings, 2.1% of the women met the criteria for PTSD with 21.4% experiencing childbirth as traumatic, but there is no distinction regarding whether the women had any prior trauma history. It is not clear whether the rates supported by Olde's data represent women with trauma history (i.e., distal and/or proximate), or women who experienced childbirth trauma from the event. When thinking about implications for targeted clinical intervention and preventative research, the distinction between the source of maternal trauma is important. The second proximate trauma important to capture is from exposure to stressful life events in pregnancy or the postpartum.

1.7.8. Stressful life events. A growing body of evidence in the developmental literature has linked prenatal stress exposure to adverse child outcomes (Yam, Naninck, Schmidt, Lucassen & Korosi, 2015). For example, maternal exposure to disaster related stress in pregnancy accounted for 6.5% of the variance in five-year old children's IQ scores (Laplante, Brunet, Schmitz, Ciampi & King, 2008). Similarly, in a sample of 1,800 women, those exposed to prenatal stress were over two times more likely to have a preterm birth compared to those not exposed to prenatal stress (Zhu, Tao, Hao, Sun & Jiang, 2010). Whilst one might hypothesize that maternal exposure to a stressful life event would reduce a mother's capacity to connect with her infant, there is a paucity of research that has tested the association between perinatal stressful life events and the quality of the mother-infant interaction (Muller-Nix, Forcada-Guex, Pierrehumbert, Jaunin, Borghini, & Ansermet,

2004). Based on the literature that documents the adverse impact of parenting stress on parenting skills (Morgan, Robinson, & Aldridge, 2002), one might hypothesize that current stress is likely to affect maternal EA, though to the best of our knowledge, this is yet to be tested empirically.

1.7.9. Empirical study two. Study two of this dissertation is the only study, to our knowledge, to examine whether the relationship between maternal childhood trauma and maternal EA is mediated by proximate trauma specific to the perinatal period: childbirth experience and stressful life events. Using a multiple mediation model, we will simultaneously test the direct relationships between each of the different types of maternal trauma and maternal EA, as well as the indirect relationship between maternal childhood trauma and maternal EA mediated by childbirth experience and stressful life events. Information from this research can be used to target the specific trauma in treatment most likely to influence the quality of the mother-infant relationship at six months postpartum.

1.8. Pacifier use for non-sleep settling purposes

1.8.1. Rationale. This dissertation investigates the maternal psychosocial predictors of maternal EA. A common question for clinicians in perinatal mental health might be how to increase the mother's capacity to improve the quality of the relationship. Infants look to the mother to regulate their emotional experience and soothe their distress (Kogan & Carter, 1996), an experience some women might find challenging and overwhelming. One suggestion might be to introduce an inanimate object (e.g., blanket, toy or pacifier), that carries special value to the infant thereby allowing them to self-soothe. Winnicott (1969) captured this phenomenon in his

transitional object theory. According to this theory, infant reliance on an object facilitates an important developmental phase for the infant in the establishment of the self as separate to the external environment (Elmhirst, 1980). However, the introduction of a transitional object may be controversial for some parents (e.g., Marter & Argruss, 2007). Buschs and McKnight (1973) observed parental anxiety over the use of transitional objects within the dyadic repertoire. The authors concluded that parental anxiety may reflect an underlying fear that the infant's reliance on the object to self-soothe was the product of some deficiency in their own parent-child relationship. Given the possible complexities around the introduction of an object to the mother-infant dyad, research is required to inform parent's decision-making process.

1.8.2. Defining the pacifier. A common object used by mothers worldwide is the pacifier (Mauch et al., 2012). Pacifiers, otherwise known as dummies, soothers, or comforters, are designed to stimulate non-nutritive sucking (NNS) to sooth or calm the infant, as well as facilitate the transition to sleep. Though some theorists argue that pacifiers do not constitute transitional objects because their use is more controlled by the mother than the infant (Gaddini, 1970), an infant can develop the ability to self-soothe separately to the mother using a pacifier. Consequently, researchers have argued there is a basis for categorizing the pacifier as a transitional object (e.g., Halonen & Passman, 1978; Triebenbacher, 1997). Whilst pacifier use has been investigated in relation to its impact on breastfeeding, child safety, medical and immunological outcomes (e.g., Horne, Hauck, Moon, L'Hoir, & Blair, 2014; Mitchell, Blair, & L'Hoir, 2006; Elserafy, Alsaedi, Louwrens, Sadiq, & Mersel, 2009), little is known about the possible outcomes that may be associated with maternal use of the pacifier outside of the sleep context, for example, during a

mother-infant interaction. In fact, the maternal psychosocial predictors of pacifier use have yet to be empirically tested. The third empirical study of this dissertation addresses this gap by analysing whether women with childhood trauma history, depression diagnosis or EA are more or less likely to use a pacifier during the mother-infant interaction.

1.8.3. Existing literature about pacifier use. Substantial literature has been devoted to informing recommendations to mothers for pacifier use. For example, the association between pacifier use and breastfeeding duration and cessation (Horne et al., 2014); the possible reduction in sudden infant death syndrome associated with pacifier use for sleeping purposes (SIDS; Mitchell et al., 2006; Hauck, Omojoken, & Siadaty, 2005); as well as the benefits of pacifiers for pre-term infants (Blass & Hoffmeyer, 1991; Pinelli & Symington, 2005) and to relieve pain (Elserafy et al., 2009). However, the understanding of this maternal behaviour within the context of the mother-infant dyad is extremely limited.

There has been some attempt to identify maternal motivations for pacifier use. Pansy, Zotter, Sauseng, Schneuber, Lang and Kerbl (2008) investigated 174 mother-infant dyads reasons for using a pacifier at birth, seven weeks and five months postpartum using a self-report questionnaire. Of the mothers that initially reported they did not plan to use the pacifier, 70.6% had introduced the pacifier by seven weeks postpartum primarily to soothe the infant. This is interesting because one of the core components of an emotionally available relationship is the capacity to soothe. One idea is that pacifiers might be more likely to be used by women who are struggling to connect with their infant as the pacifier provides the infant with the opportunity to self-soothe separately to the mother, thereby creating some emotional space in the dyad. Yet there is no investigation of pacifier use in the context of

maternal EA or the quality of the mother-infant interaction. There has been some preliminary evidence to suggest a possible association between pacifier use and perinatal maternal depression.

Feldens, Ardenghi, Cruz, Cunha Scalco and Vitolo (2013) examined the association between maternal depression and pacifier use in a sample of 375 Brazilian women. Their data indicated that women who reported moderate-to-severe depressive symptoms at 12 months postpartum were 40% more likely to use a pacifier in the first year than other women in the sample. However, the examination of pacifier use relied upon maternal self-report (Gresham, Forder, Chojenta, Byles, Loxton & Hure, 2015). There is the possibility that the data obtained from maternal self-report may not be as accurate as that from observational assessment. Moreover, it is not specified whether the pacifier use recorded in that sample was for sleep purposes or during mother-infant interaction. Whilst this provides a basis for examination of the relationship between pacifier use and maternal depression, further investigation is required with the possibility that pacifier use might form an important part of a mother-infant repertoire particularly for women with depression.

Depression in adulthood is also associated with a history of childhood abuse (Norman Byambaa, Butchart, Scott, & Vos, 2012), with evidence to suggest that maternal experience of child abuse might impact on parenting ability (DiLillo & Damashek, 2003; Smith, Poschman, Cavaleri, Howell & Yonkers, 2014). As noted above, maternal history of childhood maltreatment can negatively impact on the development of maternal parenting qualities including, sensitivity, intrusiveness and hostility (Fuchs et al., 2015; Lyons-Ruth & Block, 1996). The increased likelihood of maternal intrusiveness for women with childhood trauma history reflects the need for interpersonal control that is associated with childhood trauma experience (Lawrence,

Edwards, Barraclough, Church & Hetherington, 1995). Maternal use of the pacifier during mother-infant interaction might be considered intrusive, because it is the placing of an object in an infant's mouth. Moreover, a pacifier is used to soothe an infant. Women with childhood trauma history can also struggle with the acceptance and tolerance of negative emotions (Briere & Rickards, 2007). Consequently, a question for research is whether women with childhood trauma history are less able to manage the expression of distress from their infant. Given the role of the pacifier to soothe an infant, it would be interesting to assess whether women with childhood trauma history are more likely to use the pacifier during the mother-infant interaction. To the best of our knowledge, maternal childhood trauma has yet to be tested as a predictor of pacifier use during mother-infant interaction.

1.8.4. Empirical study three. In this study we use a multivariate approach to examine three maternal psychosocial predictors (i.e., maternal depression, maternal childhood trauma and maternal EA) of pacifier use for non-sleep settling purposes. It is possible that women with depression, childhood trauma or a lack of EA, might be more likely to rely upon the pacifier during the mother-infant interaction. By using the observation of this common maternal behaviour, it is possible to test whether these maternal psychosocial factors predict pacifier use in a context other than sleep.

Information from the empirical studies comprising this dissertation is derived from the assessment of the mother-infant interaction. Yet it is not clear whether the standardised assessment of the mother-infant dyad occurs in clinical practice when treating women with mental health issues during the perinatal period. Our translational research study aimed to translate the knowledge of mother-infant

interaction assessment to a clinical service provider of women's mental health in the perinatal period.

1.9. Translational Research

1.9.1. Rationale. One growing criticism of some health research is that information from empirical studies is not translated to a clinical setting (e.g., Woolf, 2008). This has led to a push towards translational research, which is defined in the section below (see, 1.9.2). An issue for perinatal mental health is the treatment of maternal mental health and whether this should involve the dual treatment of maternal mental health and the mother-infant relationship (Paris et al., 2011; Huang et al., 2020). Mother-infant psychotherapy refers to a dyadic therapy whereby the aim of treatment is the improvement of the mother-infant relationship to enhance the attachment relationship and encourage positive infant development (Beebe, 2003; Salo, 2007). Mother-infant psychotherapy is an interpersonal therapy that concentrates on the relationship with the mother and the infant present during treatment (Guedeney, Guedeney, Wendland & Burtchen, 2013). The effectiveness of mother-infant psychotherapy in improving the relationship quality of the mother-infant dyad as well as treating maternal mental health is supported by empirical evidence.

Salomonsson and Sandell (2011) conducted a randomised controlled trial (RCT) to assess the relationship quality and depressive symptoms of 80 mother-infant dyads at 12 months who received mother-infant psychoanalytic treatment. Their results showed a small effect of the intervention on reducing depressive symptoms, as well as a medium sized effect on increasing maternal sensitivity (measured by the EAS). Recent review reported short term effectiveness of mother-infant

psychotherapy at treating postpartum depression, but not long term maintenance (see, Huang et al., 2020). Notably, this review did not assess the relationship outcomes of the mother-infant psychotherapy. Treatment of the mother-infant dyad is important given the mother-infant relationship is proposed as a vehicle through which the risk of negative child outcomes associated with maternal mental health may be transmitted (Martins & Gaffan, 2000; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999; Atkinson, Paglia & Coolbear, 2000). Even if the evidence regarding long term maintenance of treatment is not consistent, interventions capable of improving the mother-infant relationship is an important component of perinatal mental health services. Despite this growing body of literature, most treatment for postpartum depression focuses on the mother's mental health to the exclusion of the mother-infant dyad (Poobalan et al., 2007; Nylén et al., 2006).

It is difficult for clinicians to incorporate the mother-infant dyad into treatment without standardised assessment of the relationship (Kumar & Hipwell, 1996). Particularly given the first question must be an assessment of the degree of interactional difficulties present for the mother and infant. There is also the possibility that without access to valid and reliable assessment, a service may rely on clinical interventions that may not be effective (e.g., Circle of Security; Cassidy et al., 2017), and with no standardised assessment of the dyad, the service may have no way of capturing this information. Given the knowledge of mother-infant interactions required for this dissertation, the translational research study was designed to translate knowledge of mother-infant assessment to a clinical service provider. In the translation of this knowledge the bridge between research and clinical practice might be targeted.

1.9.2. Defining translational research. Translational research can be defined as the integration of research for the long-term aim of improving public health (Rubio et al., 2010). Findings in the developmental literature reviewed for this dissertation highlight the importance of the mother-infant relationship in the context of child development and perinatal mental health. However, for mental health practitioners without access to a valid and reliable measure to assess the mother-infant relationship, it is difficult to: (1) identify mother-infant dyads for treatment; and (2) to incorporate the mother-infant relationship into treatment.

The limited studies that document assessment of mother-infant dyads in a clinical setting do not indicate the use of formal assessment measures, with most work relying upon staff's clinical judgments (e.g., Salmon, Abel, Cordingley, Friedman & Appleby, 2003). Although the EAS has not been applied extensively to measure the mother-infant relationship quality in the context of perinatal depression, there is extensive use of the EAS documented in research studies using mother-infant dyads. The EAS might therefore translate to the clinical setting of a perinatal service provider.

1.9.3. Collaboration with King Edward Memorial Hospital for Women.

To assess the possibility of translation of knowledge about mother-infant observational assessment to a clinical setting we collaborated with King Edward Memorial Hospital for Women (KEMH), Western Australia's stand-alone tertiary maternity, neonatal and gynaecological hospital and only quaternary centre for the management of high-risk pregnancies. The collaborative process with KEMH occurred both before and during the third and final placement as a trainee clinical psychologist of the researcher who conducted the translational research study

included in this dissertation (K.K.M). The clinical placement was completed as part of the Doctor of Psychology in Clinical Psychology program.

KEMH provides mental health services to women during the perinatal period through the Psychological Medicine Department as well as the mother baby unit. At the time, neither of the services at KEMH had implemented a standardised measure for the assessment of the mother-infant relationship. Instead clinicians rely upon the observed documentation of mother-crafting skills (e.g., feeding, settling to sleep, changing the baby's nappy) to evidence what is taking place between the mother and her infant. However, a mother might physically meet the needs of her infant, but not be emotionally available (Biringen et al., 2014). Moreover, in treating maternal mental health, if the clinician does not consider the mother-infant relationship, the mother's capacity for full recovery including in her parenting role may be limited (Salomonsson & Sandell, 2011; Nylén et al., 2006). Translational research was required to examine whether the EAS translated to clinical practice at KEMH to facilitate the identification of vulnerable mother-infant dyads for the dual treatment of the mother's mental health and the mother-infant relationship?

1.9.4. Translational research study four. Study four of this dissertation is a translational research study that documents the collaborative process between a researcher and perinatal mental health service provider regarding the integration of the EAS for the assessment of the mother-infant relationship. As part of the study, a systematic review of the empirical studies that apply the EAS was conducted to address the areas of uncertainty about application of the scale and to facilitate the translation of the EAS to clinical practice.

1.10. Implications of Dissertation Findings

1.10.1. Importance of the mother-infant relationship. The three empirical studies and translational research study that comprise this dissertation are designed to investigate specific psychosocial predictors of maternal EA (i.e., maternal depression and maternal trauma), and pacifier use during the mother-infant interaction. The next section of this chapter examines the possible implications of strengthening the mother-infant relationship for the mother, the infant and the wider family context. First we acknowledge the significance of the mother-infant relationship for the mother.

1.10.2. For the mother. A growing literature explores the significance of becoming a mother for a woman's sense of self (Baraitser, 2006; Laney et al., 2014). Motherhood can lead to the reexamination of a woman's physical appearance, occupational life, sexuality, autonomy and identity (Nicolson, 1999; Steinberg, 2005). Some theorists describe this process as one that involves a fracture in identity and self-loss, followed by the transition to the mothering identity (Laney, Hall, Anderson & Willingham, 2015). Though this ideally begins in pregnancy (Steinberg, 2005), the process continues into the postpartum, as the mother's identity is shaped by the practice of being a mother and the interactional exchanges with her infant. The quality of the mother-infant relationship and the level of synchrony, reciprocity and mutual enjoyment experienced will inform the woman's notion of her competence as a mother, her confidence in that role, and influence the reintegration of her identity as an individual and a mother. This process may have an impact on the woman's mental health, with a loss of sense of self a risk factor in psychopathology including depression (Lewis & Nicolson, 1998; Seymour-Smith, Cruwys, Haslam, & Brodribb, 2017), and trauma (Wilson, 2007).

The impact of how the woman perceives herself as a mother can influence the development or maintenance of her mental health symptoms. For example, in a meta-analysis of qualitative research regarding postnatal depression, Knudson-Martin and Silverstein (2009) identified the shame, anxiety and fear expressed by women with postpartum depression that they had failed to be a 'good' mother.

The impact of how the woman perceives herself as a mother can influence the development or maintenance of her mental health symptoms. For example, in a meta-analysis of qualitative research regarding postnatal depression, Knudson-Martin and Silverstein (2009) identified the shame, anxiety and fear expressed by women with postpartum depression that they had failed to be a 'good' mother. Similarly, Cichetti, Toth and Rogosch (2004) also noted the impact that relational dynamics can have on perpetuating a woman's depressive symptoms. For example, in related research, Gartstein and Sheeber (2004) reported among 69 preschool aged children that with one standard deviation increase in child externalizing problems (measured by the Child Behaviour Checklist) maternal depression increased by .53. Given a child's behavior is generally viewed, in part at least, in the context of the parent-child relationship (Carr, 2014), it is possible that enhancing the quality of the mother-infant dyad could reduce the likelihood of child conduct issues (e.g., Vando, Rhule-Louie, McMahon & Spieker, 2008), and therefore the adverse impact of the child's behaviour on maternal depression. The importance of evidence that comprehensively examines psychosocial predictors of the mother-infant relationship such as perinatal depression or maternal trauma is therefore critical for the dissemination of accurate information to women. It follows that the research contained in this dissertation is designed to enhance the outcomes for the mother, as well as the child.

1.10.3. For the infant and the child. The quality of the mother-infant relationship is significant for infants as it is often their first experience of a relationship. This notion is captured by Bowlby's attachment theory (1969), which suggests that early interactions shape the infant's model of the world, significant people in that world, and themselves. According to Bowlby, these internal working models continue to develop as the infant grows, and ultimately, can predict the child's future relationships (Bretherton, 1987; Main, 1994). Attachment theorists propose that a child who is parented with acceptance, sensitivity and affection is likely to reflect a perception of themselves as lovable and worthy, with relationships viewed as mutual and responsive (Bowlby, 1973). Conversely, a child in an insecure attachment relationship may be accustomed to socially avoidant or hostile interactions, thereby interfering with the development of their own peer relationships (Sroufe & Fleeson, 1985). This proposition is supported by empirical research using attachment security as a measure of the quality of that relationship.

The mother-infant relationship may impact on a child's social-emotional competence. For example, in a meta-analysis of 80 studies, a small effect was observed between attachment security and social competence in childhood and this effect was not moderated by the age of assessment for peer competence (Groh et al., 2014). This was replicated by recent meta-analysis in which attachment security was reported to be modestly associated with children's peer interactions and social competence (Groh, Fearon, vanIJzendoorn, Bakermans-Kranenburg & Roisman, 2017). These findings are consistent with evidence of the association between insecure attachment and reduced social skills (Lyons-Ruth, Easterbrooks & Cibelli, 1997; Suess, Grossman & Sroufe, 1992), as well as peer acceptance in older childhood (Cassidy, Kirsh, Scotlon & Parke, 1996). The effect size reported in the

meta-analyses regarding the relationship between attachment security and social competence highlights the range of factors likely to contribute to the socio-emotional functioning of a person, with the quality of the attachment relationship but one of those factors.

In addition, child mental health outcomes may also be implicated in the mother-infant relationship. Research documents an association between perinatal mental health, including perinatal depression and maternal trauma, and child mental health outcomes (Letourneau, Tramonte & Willms, 2013; Hayes, Goodman, & Carlson, 2013; van Ee, Kleber & Mooren, 2012), though meta-analytic review notes the size of the effects are mostly small or moderate (Stein et al., 2014). It is possible that the maternal risk associated with perinatal mental health disorders is transmitted to the infant through the mother-infant relationship, and even if that effect is small, because of the impact that child psychopathology has on the individual, their family and broader society (Belfer, 2008), understanding the factors that might increase or decrease the likelihood of child mental health outcomes is crucial. Moreover, given that adult mental health problems can start in early life (Kessler et al., 2007), it is possible that strengthening the mother-infant relationship may provide the individual with a protective factor in the context of later adult psychopathology (e.g., Harrington et al., 1994; Offord & Bennett, 1994). This argument regarding the role of the mother-infant relationship in relation to child outcomes, involves a preventative framework to child mental health. It is this preventative approach that underlies the wider MPEWS research, with the possibility that factors such as the quality of the mother-infant relationship might influence the causal chain that leads to the development of adverse child outcomes (Fonagy, 1998).

1.10.4. For the family system. The arrival of an infant has an impact on the functioning of the family system, including the relationships with other children, as well as the marital relationship (Belsky & Isabella, 1985). This is supported by family systems therapy, namely the notion that the behavior of each family member is influenced by the pattern of interactions between one another (Bateson, 1972, 1979). The mother-infant relationship occurs within the context of the family system, thereby impacting on the other members, as they also impact on that relationship. The level of difficulty or adverse effects this interaction might involve may be associated with the quality of the mother-infant relationship. For example, if the infant is frequently distressed and the mother perceives she is not effective in soothing the infant, the mother's self-efficacy as a parent may be reduced. This may impact the mother's capacity to parent other children in the family, as maternal self-efficacy involves the mother's beliefs about her own competency as a parent (Teti & Gefland, 1981). The significance of the family system in the treatment of depression highlights the relationship between the mother-infant relationship, the family system and maternal mental health.

Research indicates that perinatal depression may have a bidirectional association with family functioning, as it can be both a predictor (Field, Diego, & Hernandez-Reif, 2010) and a consequence of depression (Fisher, Feekery, & Rowe-Murray, 2002). For example, conflict regarding the distribution of domestic tasks and family responsibilities, partner availability, gender roles or physical and emotional intimacy (Morse, Buist, Durkin, 2000; Logsdon & Usui, 2001; Feinberg, 2003), may lead to depressive symptoms. Conversely, depressive symptoms may cause conflict between family members as the person with depression may not have the same capacity to function in their relationships. The family system has implications for the

treatment of perinatal depression. Understanding perinatal depression, or other perinatal mental health disorders, within the context in which they occur is important in the conceptualization and treatment of the disorder. Approaching the treatment of perinatal depression using a family systems approach may optimize the outcomes for the woman, the infant, and the family. Although there is limited examination of family therapy for perinatal depression, meta-analysis reported a small effect of family therapy on both depressive symptoms and family functioning (Cluxton-Keller & Bruce, 2018). Finally, the notion of examining the psychosocial predictors of the mother-infant relationship within a preventative framework for child mental health is outlined below. This approach has informed the design of MPEWS, the project upon which studies one, two and three of this dissertation are based. MPEWS aims to target the precursors to adverse child developmental outcomes, with the mother-infant relationship a potential precursor that may be capable of direct intervention.

1.11. This Dissertation: A Preventative Framework for Child Mental Health

This dissertation investigates specific psychosocial predictors of the mother-infant relationship. Although we do not measure child outcomes as a part of this dissertation research, the desire to understand the factors that may influence the quality of the mother-infant relationship is driven by a preventative framework for adverse child outcomes (Lewis et al., 2014).

1.11.1. What is a preventative framework. A preventative framework involves moving away from the traditional disease model so that risk factors associated with the likelihood of adverse outcomes can be targeted and reduced (Zubrick et al., 2000). For child mental health, there is increasing evidence to support the efficacy of preventative intervention (Kieling et al., 2011). Insight into the

mechanisms causing and maintaining mental health problems facilitates a better understanding of the pathways that might lead to maladaptive developmental outcomes such as child psychopathology (Cicchetti & Toth, 2009). There is enough evidence to suggest that the mother-infant relationship might be one of the mechanisms underlying child mental health (Colonnesi, Draijer, Stams, Van der Bruggen & Bogels, 2011; Dadds & Roth, 2001), and adult mental health (Bosmans, Braet, Van Vlierberghe, 2010; Meyer & Pilkonis, 2005). For an infant whether the relationship with their mother increases or decreases the likelihood of child psychopathology depends on the quality of that relationship.

1.11.2. Improving the quality of the mother-infant relationship. A

preventative approach to child mental health involves targeting precursors that may reduce risk factors (i.e., increase the likelihood of an adverse outcome) and enhance protective factors (i.e., reduce the likelihood of an adverse outcome), thereby promoting healthy development (Catalano, Fagan, Gavin, Greenberg, Irwin, Ross & Shek, 2012). Maternal mental health and the mother-infant relationship are established risk and protective factors for child developmental outcomes (Kirsh & Cassidy, 1997; Belsky, Spritz, & Crnic, 1996). The idea that to reduce negative child outcomes we need to address the precursors to those outcomes from pregnancy, requires a deeper understanding of the maternal psychosocial factors that may influence the formation of the mother-infant relationship, so those factors can be targeted by clinical intervention.

Chapter 2. Methodological Issues Related to Dissertation Research

This chapter will discuss methodological issues that pertain to the empirical and translational studies in this dissertation. The methodological issues include the measurement of perinatal maternal depression, the measurement of the mother-infant relationship, and issues specifically relating to the EAS particularly the statistical approach applied to analyse the EAS in the empirical studies. In addition, this chapter will analyse the methodological design of MPEWS, as well as the statistical approach to answering each of the study hypotheses.

2.1 Background

Differences in the methodological approach in the measurement of maternal depression (e.g., symptomatic versus diagnostic: Kluczniok et al., 2016), and the mother-infant interaction are evident. The limitations of categorical and dimensional measurement of mental health problems are set out below, with these informing the methodological approach of MPEWS. Similarly, for the assessment of the mother-infant interaction, there are different types of observational measures available (see review, Lotzin et al., 2015). Awareness of the limitations of the type of measurement tool selected is necessary to interpret findings of this dissertation research, as well as to compare and interpret findings from other existing studies that analyse the mother-infant relationship.

2.2. Measurement of depression

2.2.1. Conceptualisation of depression. To assess the association between perinatal maternal depression and maternal EA, we need to conceptualise the construct of depression and identify measures that can reliably and validly measure

that construct. There is a tendency in the EA research to conceptualise depression either categorically or dimensionally (e.g., Kluczniok et al., 2016). Characteristic of categorical classification is the application of clinical cut offs to determine if someone does or does not have the disorder (Kotov et al., 2018). This approach fails to account for evidence of the continuous nature of mood symptoms (Carragher, Krueger, Eaton & Slade, 2015); the common occurrence of comorbidity (Ormel et al., 2015); or the poor reliability demonstrated in some studies testing existing categorical measures of mental disorders. Symptomatic measures, by contrast, ensure that a woman is not omitted for falling outside of diagnostic criteria (Klein, 2008).

Conversely, dimensional measurement acknowledges the growing evidence of the psychosocial impairment that can be experienced by individuals with sub-threshold depression (Gotlib, Lewinsohn & Seeley, 1995). The use of symptomatic measurement may require measurement at multiple time points, with reliance of measurement at only one time point (e.g., Fonseca et al., 2010), failing to address the symptom fluctuation that can occur (Laurent, Ablow & Measelle, 2011). Moreover, reliance on symptomatic measures without diagnostic assessment carries the risk that the sample of women ‘with depression’ might fall within the normal range of scores with no way of establishing if any of the women in the sample have depression (e.g., Rossen et al., 2018).

There are different tools that capture dimensional measurement of depression for instance, the Hamilton Depression Rating Scale (Hamilton, 1967) and the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, 1961). The validity of these scales for women in the postpartum period is uncertain with regards to questions about concentration, sleep, and listlessness; issues often characteristic of the postpartum period and not necessarily representative of depressive symptoms. Use of

a scale designed specifically for the measurement of postpartum depression is necessary. The EPDS (Cox et al., 1987) was designed specifically for this purpose and has been validated in 103 Australian women at 12 weeks postpartum (Boyce, Stubbs & Todd, 1993). The EPDS is widely applied as a screening tool for postnatal depression worldwide (e.g., Kadir, Nordin, Ismail, Yaacob, Mustapha, Rushidi, 2004; Adouard, Glangeaud-Freudenthal & Golse, 2005).

The difficulty associated with using symptomatic measurement of depression only is highlighted by Flykt, Kanninen, Sinkkonen, & Punamaki (2010). Maternal depression was measured in 59 mother-infant dyads using the EPDS at three time points across the perinatal period. Flykt reported that prenatal depressive symptoms explained 13% of the variation in maternal responsiveness observed during the mother-infant interactions. Yet only 11.8% of their sample ever met the criteria for probable depression, so whether these results represent women with depression is arguable. Application of a diagnostic measure in conjunction to the symptomatic measure may have addressed this issue. It is this knowledge that informed the conceptualisation and measurement of perinatal depression in MPEWS and captured by study one of this dissertation.

2.2.2. Repeated measures design. The chronicity of the maternal depression may influence any impact of the disorder on the quality of the mother-infant interaction (Campbell, Cohn & Meyers, 1995). For example, Campbell et al. (1995) did not observe an effect of maternal depression on the quality of the mother-infant interaction until the chronicity of the disorder was incorporated into the analyses. Campbell then reported a main effect of chronic depression on maternal sensitivity, infant engagement and maternal affect. Despite this evidence, as well as the reported association between antenatal and postnatal depression (Milgrom et al., 2008), we

were unable to locate another study that measured maternal depression at multiple time points from pregnancy to the postpartum and assessed its relationship with maternal EA. Indeed, Cornish et al. (2008) adopted a longitudinal design but depression was measured in the postpartum only. The postnatal focus limits the information available because it is not possible to know whether the woman's depression was present since pregnancy. Considering the moderate association between maternal fetal attachment and the later mother-infant interaction quality (e.g., Siddiqui & Hägglöf, 2000), understanding the impact of maternal depression on the prenatal and the postnatal period is of equal importance. A repeated measures design to capture depression from early pregnancy to the postpartum is necessary to comprehensively examine the relationship between perinatal depression and the mother-infant relationship. This is the basis of the design for study one that measures depressive symptoms at three time points, and diagnosis at two time points. Findings from study one may inform the optimal timing for clinical intervention.

2.3. Measurement of Mother-Infant Interaction

2.3.1. Mother-infant observational tools. Observational tools facilitate the objective assessment of the mother-infant interaction (Lotzin et al., 2015). Observational tools are designed to obtain detail that parties may not be aware of during the dyadic exchange for example, how each party is affected by the behaviour of the other (Gardner, 2000). Whilst observational tools generally encompass specific training, financial cost for certification, as well as the time for administration of the measure, they are capable of comprehensive assessment. In the context of mother-infant assessment, the information extracted from observational measurement might be used to inform clinical intervention. Lotzin et al. (2015) conducted a systematic

review of the literature to identify the mother-infant observational assessment measures with information regarding the individual psychometric properties of each measure. Of the 24 observational mother-infant assessment tools identified by Lotzin, a number of parenting constructs were examined including; maternal sensitivity, structuring, hostility, intrusiveness, mother-care skills, body positioning, self-regulation, attachment, communication, gaze and play. The most widely cited of those observational tools is the EAS. The EAS also includes the most comprehensive assessment of the mother-infant interaction.

2.3.2. Psychometric properties of the emotional availability scales. When selecting an observational tool for application in assessing mother-infant interaction it is necessary to analyse its psychometric properties. Biringen and colleagues (2014) review analysed existing empirical studies from 1990 to 2014 that rely on the EAS and extracted information regarding the psychometric properties of the scale. Reliability was evidenced by studies including Bornstein, Gini, Suwalsky, Putnick, & Haynes (2006), who using 52 mother-infant dyads at five months, conducted two home observations one week apart. Test re-test reliability was supported by intra class correlations (ICCs) of between .72 and .96. In separate studies, using 34 mother-infant dyads at two years, Bornstein, Gini and Leach et al. (2006) and Bornstein, Gini, Putnick et al. (2006), also noted ICCs between .76 - .96. Longer term reliability is reported by Biringen et al. (2000) in 40 mother-child dyads assessed using the EAS at 18, 24 and 39 months. However, whilst EA was stable between 18 and 24 months, both assessed at home, the 39-month assessment in the laboratory was not. There may be some variation in EA explained between the later application of the EAS and the earlier assessments because of the change in context from the home to the laboratory.

However, this study also highlights that whilst reliability of the EAS is supported by empirical studies, the evidence is not entirely consistent.

Construct validity of the EAS is supported by the link between the EA and the attachment construct. In 687 mother-infant dyads at 12 months, Ziv et al. (2000) reported a link between EAS dimensions maternal sensitivity, child responsiveness and involvement and infant attachment classification (measured using the strange situation procedure). However, the evidence in respect to construct validity is not unanimous, for instance, van den Dries, Juffer, van IJzendoorn, Bakermans-Kranenburg and Alink (2012) did not observe an association between EA dimensions and attachment security. Notably, mother-infant interaction samples in that study were eight minutes in length, below the recommended 20-minute minimum for application of the EAS (Biringen, 2005). Moreover, van den Dries' sample consisted of children aged 11 to 16 months who had been adopted from institutions or foster care in China. Consequently, although there is some evidence of construct validity for the EAS, that evidence is not to be overstated.

Finally, there is extensive evidence of the cross-cultural application of the EAS to dyads across Asia, North America, Europe, Australia and Africa. For instance, mother-child samples are documented from the United States (Altenhofen, & Biringen, 2010); Israel (Aviezer et al., 1999); Italy (Cassibba et al., 2015); Germany (Dittrich et al., 2017); Canada (Espinet, Jeong, Motz, Racine, Major & Pepler, 2013); Australia (Evans, Boyd, Colditz, Sanders & Whittingham, 2017); Netherlands (Endendijk, Groeneveld, Deković & van den Boomen, 2019); Brazil (Fonseca et al., 2010); Finland (Flykt et al., 2012); Norway (Høivik, LydersenRanøyen & Berg-Nielsen, 2018); and Portugal (Negrao et al., 2016). This cross-cultural applicability is highlighted by Bornstein and colleagues (2008) in which they compared 220 mother-

child dyads across Argentina, Italy and the United States. The patterns of EA were universal across the different countries and rural or metropolitan settings. With EA purported to be an innate part of the mother-infant relationship, one would expect to see its universality. The cross-cultural application of the EAS is an important consideration given that some women in the sample came from a culturally diverse background.

An issue when reviewing the studies that use the EAS is the wide-ranging variation in terms of how the scale is applied (e.g., length of interaction sample, scoring of the EAS, reliability of the coders). This creates some uncertainty in understanding the conditions that are required for the valid and reliable application of the EAS.

2.3.3. Issues related to the application of the EAS. The EAS is applied differently throughout the EA literature. For instance, whilst a minimum 20-minute interaction sample is recommended for validity and reliability (Biringen, 2005), there are studies applying the EAS to interaction samples of less than 15 minutes (e.g., Flykt et al., 2012; Aviezier et al., 2003; Belt, Flykt, Punamäki, Pajulo, Posa, & Tamminen, 2012; Dirks & Rieffe, 2019), and even less than five minutes (e.g., MacKinnon et al., 2018; Salo et al., 2010).

2.3.4. Differing psychometric approaches to the EAS. Another less than consistent part of the research is the way in which the EAS is analysed. As highlighted by Oppenheim (2012), researchers have struggled to deal with the multiple EA scales that comprise the measure, whilst still understanding what it means when the scales are combined. For example, some studies create a composite maternal EA variable by summing the direct scores for each of the parental dimensions (e.g., Kim, Capistrano, Erhart, Gray-Schiff & Xu 2017; Carter, Garrity-

Rokous, Chazan-Cohen, Little & Briggs-Gowan, 2001; Din, Pillai, & Gordner, 2001).

Other studies use an aggregate EA variable formed by averaging the scores from different coded interactions on either each of the EAS dimensions (e.g., the parental and child scales: Dolev, Oppenheim, Koren-Karie & Yirmiya, 2009), some of EAS dimensions (e.g., sensitivity and responsiveness; Koren-Karie et al., 2009; sensitivity and structuring; Stack et al., 2018), or one of the EAS dimensions (e.g., sensitivity only; Newland et al., 2016).

There are also a large proportion of studies that only report specific dimensions of the EAS, and in fact, Bornstein, Suwalsky & Breakstone (2012) proposed this as the most common variable approach to EAS analysis. Of those scales used as a single variable, the most widely applied is maternal sensitivity (e.g., Bornstein et al., 2019; Mielke, Neukel, Bertsch, Reck, Möhler & Herpertz, 2016; Newland et al., 2016), but also non-intrusiveness (e.g., Swanson et al., 2000), as well as combinations of the scales (e.g., sensitivity and structuring: Feniger-Schaal & Joels, 2018; Ekmekci et al., 2016).

Alternatively, there is some support for the identification of patterns between the six EAS dimensions (Oppenheim, 2012). For instance, in a sample of 80 mothers and their infants, Easterbrooks et al. (2005) reported a cluster analysis of the EAS with four distinct groups emerging. Cluster one included the low functioning dyads with EAS scores significantly lower than the other clusters. Cluster two were the average dyads with the largest number of mothers and infants with adequate scoring across the EAS. Cluster three was the average parenting and disengaged infants, distinguished by the low levels of infant involvement and responsiveness on the child scales. Finally, cluster four were the high functioning dyads with high EAS scores

across the parenting dimensions including the highest scores on the child scales of any other cluster.

Another way to address the issue of managing the multiple EA scales, would be to conduct a factor analysis (Fabrigar, MacCallum, Wegener, Strahan, 1999). We located one published study that uses a factor analytic approach for the parental dimensions of the EAS. Garvin et al. (2012) reported the parental dimensions represent one latent factor; parental EA. Though early work of Biringen and Robinson (see personal correspondence, 1995; cited by Biringen et al., 2014) refers to a two-factor model of the EAS (one factor affective and the other control), we are not able to compare these two models because details of the two factor model are not published. That said, we found support for a one and two factor model of the parenting EAS dimensions using the MPEWS data that comprises this dissertation. The one factor model includes the four parenting EAS dimensions, whereas the two factor model consists of the sensitivity and structuring dimensions as one factor, and the non-intrusiveness and non-hostility dimensions as the second factor. One could hypothesize that the two factors reflect Biringen's unpublished model of an affective and a control factor. However, the aim of this dissertation is to examine the relationship between maternal psychosocial predictors and maternal EA, moreover, our one factor model is informed by the published findings from Garvin et al. (2012). Consequently, for parsimonious reasons we applied the latent factor maternal EA informed by each of the parenting EAS dimensions, as the measurement model in Chapters 4 and 5 of this dissertation. The results of our one and two factor models are documented at Appendix One.

Despite the wide-ranging application of the EAS, empirical studies document the psychometric properties of the scale, and highlight the EAS' cross-cultural

application to obtain a measure of the quality of a mother-infant interaction.

Moreover, by providing an assessment of the exchange between a mother and infant, the EAS can provide an insight into the developing relationship (Biringen et al., 2010).

2.4. Design of MPEWS and the Data Analytic Approach to Investigate the Psychosocial Predictors of Maternal EA

2.4.1. Structural equation modelling and study one. Study one aims to comprehensively assess the strength of perinatal depression captured diagnostically and symptomatically as a predictor of maternal EA at multiple time points from early pregnancy to six months postpartum. Structural equation modelling (**SEM**) facilitates the simultaneous assessment of each of the predictor variables for depression using path analysis methods to determine the strength of influence of depression at each specific time point on maternal EA. The information derived from the SEM analyses can be used to inform the optimal time for clinical intervention for those dyads that are struggling to form an emotional connection at six months postpartum.

2.4.2. Multiple mediation analyses. Study two aims to investigate whether the relationship between distal childhood trauma and maternal EA is mediated by proximate traumas specific to the perinatal period. Study two involves two mediators: childbirth experience and stressful life events in pregnancy and the postpartum. It is preferable to examine mediators simultaneously to assess whether one may have a stronger mediation effect than the other (Kazdin & Nock, 2003). If we account for the cumulative effect of trauma in the hypothesized model, it is necessary to account for more than one proximate trauma, as it is unlikely that women will be exposed to only one type of additional trauma during the perinatal period. Using SEM with multiple

mediation analyses we simultaneously tested the indirect and direct pathways between distal and proximate traumas, and the outcome variable of maternal EA. This provided information regarding the mediation pathways, but also the direct relationships between each of the trauma types and maternal EA, as well as between distal childhood trauma and the specific proximate traumas.

Chapter 3. Dissertation Aims and Hypotheses

In this chapter we will outline the aim of the research contained in this dissertation and set out how this will be addressed using three empirical studies and one translational research study.

3.1. Dissertation Overview

This dissertation presents an analysis of the maternal psychosocial predictors of maternal EA at six months postpartum using three empirical studies and one translational research study. Specifically, this dissertation investigates: (1) maternal psychosocial predictors of maternal EA: maternal depression and maternal trauma; (2) the maternal psychosocial predictors of pacifier use during mother-infant interaction; and (3) the possibility of integration of the EAS into practice at a clinical service provider to facilitate the assessment of the mother-infant dyad and dual treatment of the mother's mental health symptoms and the mother-infant relationship.

3.1.1. Study one. The first aim of this dissertation was to examine the association between perinatal depression and maternal EA at six months postpartum. This was addressed using empirical study one. To test this aim we simultaneously assessed the associations between maternal depression diagnosis and the chronicity of women's depressive symptoms from early pregnancy to six months postpartum, by modelling their predictive pathways to maternal EA. Specifically we predicted that maternal depression diagnosis and maternal depressive symptoms would have a small to medium sized negative association with maternal EA at six months postpartum.

3.1.2. Study two. The second aim of this dissertation was to examine if the relationship between distal trauma from childhood and maternal EA at six months postpartum is mediated by more proximate trauma specific to the perinatal period.

This was addressed using empirical study two. To test this aim we investigated whether the data fit our hypothesized multiple mediation model set out at Figure 1 by simultaneously assessing the relationships between maternal childhood trauma, childbirth experience, antenatal and postnatal stressful life events, and modelling their predictive pathways to maternal EA. In mediation analyses, the relationship examined is the one between the predictor variable, the mediating variable and the ability of both the predictor and the mediator to predict the outcome (Jose, 2013). For this dissertation research, we conducted multiple mediation analyses to assess the relationship between the predictor (i.e., maternal childhood trauma), the outcome (i.e., maternal EA) and two mediators (i.e., proximate traumas specific to the perinatal period). Evidence for a mediation analyses is where the pathway between the predictor and the mediator, and the mediator and the outcome are controlled, and the direct effect previously observed between the predictor variable (i.e., maternal childhood trauma) and the outcome (i.e., maternal EA) is significantly reduced (Baron & Kenny, 1986).

Given the existing research, we firstly hypothesized there would be a distal relationship between maternal childhood trauma and maternal EA at 6 months postpartum. Then based on a model assuming a cumulative effect of trauma experiences, we hypothesized that this direct relationship would be mediated by more proximate trauma exposure in pregnancy and the postpartum; specifically, childbirth experience and stressful life events. We hypothesized two mediation pathways. First, the relationship between maternal childhood trauma and maternal EA would be mediated by childbirth experience. Second, the relationship between maternal childhood trauma and maternal EA would be mediated sequentially by stressful life events in pregnancy and the postpartum. Finally, we wanted to test the indirect

pathway between maternal childhood trauma and maternal EA through each of the proximate factors specific to the perinatal period in the order of their occurrence (i.e., antenatal stressful life events, childbirth experience and postnatal stressful life events). We then expected these relationships to hold after adjusting for the conditional effects of maternal depression, maternal age and maternal education.

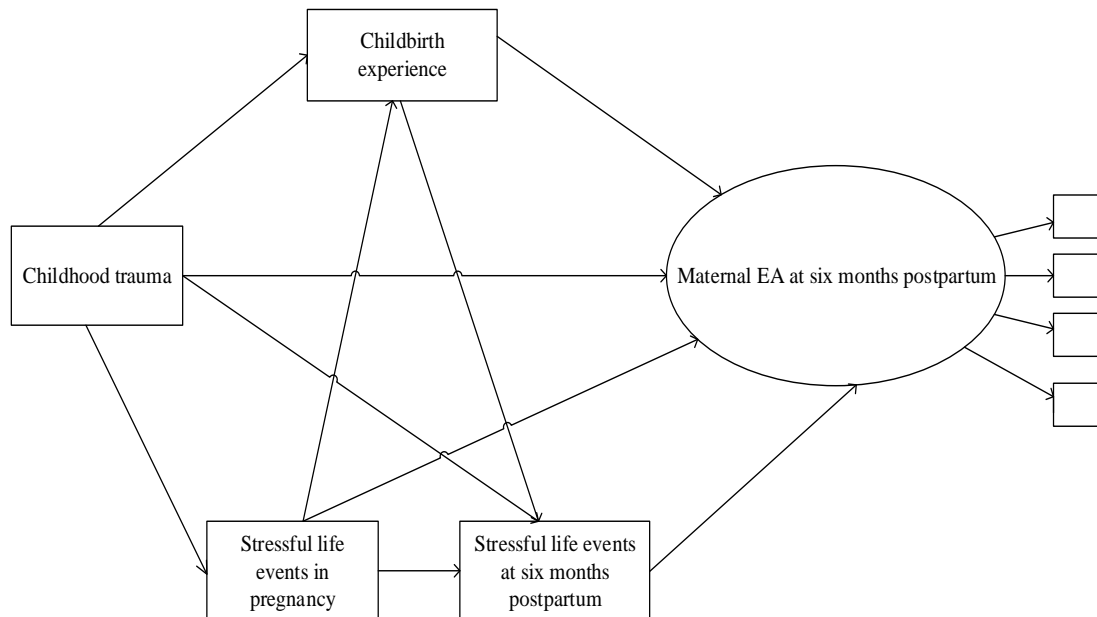


Figure 1. The hypothesized model for the indirect pathway between childhood trauma and maternal EA mediated by negative childbirth experience and sequential stressful life events in pregnancy and the postpartum.

3.1.3. Study three. The third aim of this dissertation was to examine the maternal psychosocial predictors of pacifier use during an interaction task at six months postpartum. Specifically, we hypothesized that:

1. A mother classified as not emotionally available to her infant will be more likely to use a pacifier during an interaction task.
2. A mother diagnosed with depression will be more likely to use a pacifier during an interaction task.
3. A mother with a history of childhood trauma will be more likely to use a pacifier during an interaction task.

3.1.4. Study four. The final aim of this dissertation was to address the issue of incorporation of comprehensive mother-infant relationship assessment at a perinatal mental health service provider. Specifically, the research question was would KEMH consider integration of the EAS, a standardised method to assess the mother-infant interaction, to identify mother-infant dyads in need of clinical intervention and to facilitate the dual treatment of the mother's mental health, and the mother-infant relationship. Incorporation of a measure like the EAS will require an informed decision-making process for the service provider. Based on the issues that we have identified in the existing literature using the EAS, we hypothesized the following questions about use of the EAS might arise in the collaboration process with KEMH:

1. What is the empirical support for the relationship between the EAS dimensions and attachment security?
1. Given the wide range of options, how do the existing empirical studies using the EAS approach the scoring of the scale?
2. What is the recommended length of interaction samples for use of the EAS given the wide range of sample lengths documented in studies applying the scale?
3. Can the EAS be applied to children with special needs including physical (e.g., visual or hearing impairment), neurodevelopmental (e.g., Autism), and intellectual disability?

Chapter 4: Study One

Maternal Depression and the Emotional Availability of Mothers at Six Months

Postpartum: Findings from the MPEWS pregnancy cohort

This chapter includes a modified version of a co-authored paper. The bibliographic details of the co-authored paper including all authors are:

MacMillan, K.K., Lewis, A.J., Watson, S., & Galbally, M. (2020). Maternal depression and the emotional availability of mothers at six months postpartum: findings from the MPEWS pregnancy cohort. *Journal of Affective Disorders*, 266, 678 – 685. <http://doi.org/10.1016/j.jad.2020.01.109>

My contribution to the paper involved:

I coded 194 of the 211 mother-infant interactions that comprise the data, was involved in preparation of the data, formulated the questions, analysed the data, and drafted the manuscript.

A.J. Lewis contribution to the paper involved:

Collaboration regarding the formulation of the questions and the data analytic approach, reviewed the manuscript, suggesting edits. Chief investigator on both the grants and ethics for the study and co-designed and co-supervised the 6 month assessment data collection.

S.Watson contribution to the paper involved:

Preparation of the data, collaboration regarding the data analytic approach, reviewed the manuscript, suggesting edits.

M.Galbally contribution to the paper involved:

Led the grants and ethics for the overall study data collection including the pregnancy and 6 month data used and co-designed and co-supervised the 6 month assessment data collection with A.J. Lewis. Provided supervision regarding the assessment of the

211 mother-infant interactions, collaborated regarding the formulation of the questions, reviewed the manuscript, suggesting edits.

The 6 month assessments were undertaken by Tina Vaiano, Brittany Watkins, Alexandra Flowers, Rebecca Knapp and Emma Austin at the Mercy Hospital for Women in Melbourne.

4. Maternal Depression and the Emotional Availability of Mothers at Six Months

Postpartum: Findings from the MPEWS pregnancy cohort

4.1. Preface.

Beck's (1995) meta-analysis of the research regarding perinatal depression and mother-infant interactions in the first 12 months, noted compromised dynamics in mothers with depression including withdrawn, flat, affect, intrusiveness, hostility, and over-stimulation. However, each of the studies analysed in Beck's meta-analysis refers to deficits to specific components of the mother-infant interaction rather than the mother-infant interaction in its entirety. The EA framework offers a comprehensive examination of a maternal behaviour during the mother-infant interaction regardless of the infants age. Other studies exploring maternal EA in mother-infant dyads of six months of age, have used the parental scales of the EAS only (e.g. Teti, Kim, Mayer, & Countermine, 2010). This reflects the limited behavioural repertoire of an infant at six months, as well as the focus on the mother's behaviour in that research. The study contained in this chapter, was interested in examining the relationship between perinatal depression from early pregnancy to six months postpartum and maternal EA. Consequently, use of the parental dimensions of the EAS reflected that maternal focus.

There is only one other study that we located that assessed the relationship between perinatal depression in pregnancy and maternal EA (Flykt et al., 2010), that is despite empirical evidence that links postnatal depressive symptoms to antenatal depressive symptoms (Gotlib et al., 1998). Moreover, caution is required in the interpretation of some of the existing EA research findings with a tendency in the literature to conceptualise depression using either symptomatic or diagnostic measurement, with some studies possibly not representing women with 'depression'

as a result (e.g., Rossen et al., 2018). In Chapter Four we aim to examine the association between maternal EA and perinatal maternal depression, measured symptomatically and diagnostically, from pregnancy to the postpartum in 211 mother-infant dyads. Using structural equation modelling, a model simultaneously tests the associations between maternal EA and maternal depression whilst accounting for the confounding effects of maternal age and education.

4.2. Introduction

Maternal depression during the antenatal and postnatal (perinatal) period is recognised as a major issue for women's health as well being a risk factor for poorer child cognitive, social, and emotional development (WHO, 2008; Cummings & Davies, 1994; Goodman et al., 2011). Research also suggests a relationship between perinatal depression and the quality of the mother-infant interaction (Beck et al., 1995), and it is through this association that perinatal depression might impact on child development (Galbally et al., 2018).

Assessing the quality of the mother-infant interaction is challenging with measures ranging from maternal self-report through to coding of structured observational tasks. Discrepancies are reported between a mother's perception of the interaction, and the trained observer's assessment (Vliegen, 2006). To avoid the maternal bias that might be associated with the parental self-report of the mother-child relationship (Corcoran & Fisher, 2013), observational measures are preferable.

One of the most widely used observational measures is the Emotional Availability Scales (EAS) developed by Biringen and colleagues (Biringen et al., 2008, 4th edition). Cited in an estimated 15 studies per year (Lotzin et al., 2015) in over 22 countries (Biringen et al., 2014), the EAS provides a relationship assessment of the emotional quality of a mother-infant interaction (Biringen & Easterbrooks,

2012). It includes a broad range of constructs to measure the quality of the interaction, and these in turn form the six dimensions that comprise the scale; four capturing the parent's side (i.e. sensitivity, structuring, non-intrusiveness and non-hostility), and two the child's contribution (child responsiveness and child involvement; Biringen, 2008).

The emotional availability (EA) framework emphasizes the emotional features and dyadic exchange between a mother and her infant (Sorce & Emde, 1981; Ziv et al., 2000). EA is defined as the supportive maternal presence in the context of an infant's autonomy and exploration (Mahler et al., 1975). Most importantly, it is the affective quality of the connection between the mother and her infant (Emde & Easterbrooks, 1985). A relational construct, EA requires the evaluation of how each person affects the other, rather than just how the person behaves (Biringen et al., 2014). An EA mother is attuned to her child's positive and negative emotional signals with this information forming the emotional feedback system that is intrinsic to a reciprocal emotional connection (Emde, 1980).

Attachment theory (Bowlby, 1969), including understanding the role of maternal sensitivity, is central to the EA construct (Bretherton, 2000). Ainsworth proposed maternal sensitivity, that is a mother's ability to accurately identify and respond to the infant's cues and communications, as the most important antecedent to the formation of attachment (Ainsworth et al., 1978). Whilst this has been questioned in replication studies (Goldsmith & Alansky, 1987), meta-analytic review confirmed a moderately strong association between sensitivity and infant attachment security (DeWolff & van IJzendoorn, 1997). Biringen and Easterbrooks (2012) postulate that the EA framework moves beyond maternal sensitivity to include other parenting

dimensions, as well as the child's perspective. However, this is not consistent with factor analysis of the EAS that supports a one-factor model (Garvin et al., 2012).

Maternal emotionally available behaviours reflect those elicited by a securely attached parent-child relationship (Biringen & Easterbrooks, 2012). Feniger-Schaal and Joels (2018) observed a medium effect of maternal sensitivity and structuring on the secure versus insecure attachment classification of the child using the Strange Situation Procedure ($d = .69 - .70$). This replicated findings from other studies (Aviezer et al., 1999; Ziv et al., 2000; Oyen et al., 2000). Conversely, Easterbrooks et al. (2012) noted that child attachment insecurity at 18 months, along with maternal depressive symptoms, explained 47% of the variance in maternal hostility; 59% of the variance in maternal sensitivity; and 21% of the variance in maternal non-intrusiveness in the mother-infant dyad at seven years.

Formative work by Field, Cohn, Tronick and colleagues comparing mother-infant dyads for women with depression versus those without depression, informed a view that maternal depression compromises the quality of mother-infant interactions (Cohn, Matias, Tronick, Connell & Lyons-Ruth, 1986, Field et al., 1985, Field et al., 1988). However, the difference observed between the two groups in the mother-infant interactions is not consistent – even across those studies..This is evident in Beck's (1995) meta-analysis of 19 studies in which the size of the effect of postpartum depression on the mother-infant interaction varies from moderate to large ($d = .68 - 1.15$). Wide differences in the effect of depression indicate additional other factors that might influence the effect it has on the interaction. These may include symptom severity, time of onset and duration of the depressive episode (Goodman & Gotlib, 1999).

Yet the literature even recently continues to document the adverse effect of maternal depression on the quality of mother-infant interactions (e.g., Murray et al., 2015; Newland et al., 2016). Most of the studies used to support this assertion report an association between maternal depression and a specific aspect of the interaction measured. Herrera et al. (2004) counted the number of physical touch behaviours between the infant and mother, as well as the frequency of infant vocalisation, and maternal speech. Rowe et al. (2005) reported that maternal depression and education explained 22% of the variance in maternal verbal input. Similarly, Pearson et al. (2012) noted that women with prenatal depressive symptoms were 1.31 times more likely to respond neutrally to their infant than a woman without depressive symptoms, though interestingly no effect was observed of postpartum depression or the cumulative effect of antenatal and postpartum depression. Even recent meta-analysis by Bernard, Nissim, Vaccaro, Harris & Lindhiem (2018) reported only a small effect size between maternal depression and maternal sensitivity. Caution is therefore required in not overstating the impact of maternal depression on the mother-infant interaction.

In the literature examining maternal depression and EA, there are three primary issues. Less than half of the samples used consist of mother and infant (Vliegen et al., 2009), with the majority of studies comprising school-aged children (Trapolini et al., 2008). Despite 7 – 10% of women experiencing depression in pregnancy (Bennett et al., 2004), we identified only one study assessing the association between antenatal depression and maternal EA (Flykt et al., 2010). Finally, of the eight EA studies identified that examine mother-infant dyads (Easterbrooks et al., 2005; Fonseca et al., 2010; Goldman-Fraser et al., 2010; Newland et al., 2016; van Doesum et al., 2007; Vliegen et al., 2009; Cornish et al.,

2008; Rossen et al., 2018), only parts of the EAS are reported. For instance, Cornish et al. (2008) reported that women with brief or chronic depression were 2.81 and 3.48 times (respectively), more likely to be intrusive interacting with their infant at 15 months postpartum, than women who had never been diagnosed with depression. Rossen et al. (2018) tried to address these gaps. Using a sample of 191 mother/partner-infant dyads, they reported a reduction of .35 in maternal EA for women with depression at 12-months postpartum. However, there are two primary issues with this study. Depression was measured by the EPDS (Cox et al., 1987) at eight weeks postpartum only. With one time point of data collected using symptomatic measurement, the data might represent mood fluctuation rather than clinical depression. Secondly, women's mean score of 3.86 ($SD = 3.47$) on the EPDS tells us that most of the sample did not meet the EPDS clinical cut-off for depression (i.e., a score of more than or equal to 13; Cox et al., 1987).

4.2.1. Aims and Hypotheses. The aim of this paper was to examine the association of maternal perinatal depression and maternal EA at six months postpartum. Specifically, we conceptualised maternal depression both diagnostically and symptomatically, using a repeated-measures design at three time-points from early pregnancy to six months postpartum. To address the aim, we first tested the hypothesis that the EAS sub-factors reflect one latent factor of EA. We did this using a measurement model of the parental sub-factors of the EAS, consistent with Garvin and colleagues' (2012) one factor, EA model.

Then, using the results of the EA tested by the first hypothesis, we simultaneously assessed the associations between maternal depression diagnosis and the chronicity of women's symptoms from early pregnancy to six months postpartum, by modelling their predictive pathways to maternal EA. Based on related research, we

hypothesised that maternal depression and depressive symptoms would both be negatively associated with maternal EA at six months postpartum, even after adjusting for the conditional effects of maternal age, education and parity on maternal EA.

4.3. Method

Data used in this study were drawn from the Mercy Pregnancy and Emotional Wellbeing Study, a prospective pregnancy cohort based in Melbourne, Australia (Galbally et al., 2017). Recruitment of women was at less than 20 of weeks pregnancy. Women were initially invited through antenatal bookings with a letter of invitation to participate in MPEWS included in the welcome pack sent out to all women who deliver at Mercy Hospital for Women. The Mercy Health Human Research Ethics Committee approved the study with participants providing their written informed consent prior to participation.

4.3.1. Participants. For this study, the sample comprised of 210 mother-infant dyads (78.44% of the first cohort), only those who completed data collection including the mother-infant interaction task at six months postpartum were included in this study. No differences in baseline demographics were observed between the original sample and those included in this study.

The data used were collected at three measurement points: early pregnancy (less than 20 weeks), third trimester, and six months postpartum. For this study we used two groups: women who met the criteria for Major Depressive Disorder (MDD; past two years prior to pregnancy and current; MDD; $n = 59$), and control women who did not meet diagnostic criteria for depression ($n = 152$). There were 210 women, as one of the participants had twins and was recorded twice in two separate dyads, so the total was 211 ($N = 211$). Details of the study protocol are published (Galbally et

al., 2017). Inclusion required English proficiency and participants being under 20 weeks pregnant, with women who experienced complications in pregnancy remaining eligible. Not included were women diagnosed with bipolar or psychotic disorder, substance abuse disorder, intellectual disability, child protection involvement, a serious pre-existing physical illness, or a current psychiatric illness requiring acute inpatient admission.

4.3.2. Procedure. *Mother-infant interactions.* At six months postpartum, mothers and their babies attended Mercy Hospital for Women to be recorded in a 40 to 60 minute interaction. All mother-infant interactions comprised of three parts: semi-structured free-play (10-minutes), followed by unstructured play (30-minutes), and time taken to obtain three saliva samples 15 minutes apart (this was done as part of the wider MPEWS). For the semi-structured play, mothers were instructed to place their infant on a baby beanbag and to engage in face-to-face interaction with them, “just as they would do at home”. A basket of toys was brought in for the unstructured play including toys such as a rattle, balls, and a spinning top. The infant’s own toys were not used and mothers were asked to refrain from feeding. The interaction was recorded from three angles: en-face to the infant and the mother, as well as another video behind a one way screen operated by the assessor which captured both parties. Video recorded interactions were subsequently coded for maternal EA using the EAS.

4.3.3. Measures. *Depression.* The SCID-IV-TR was administered to assess past or present depression diagnosis (i.e., MDD or Dysthymia) in first trimester of pregnancy (time-point one) and to screen for bipolar disorder. A modified version was re-administered at six months postpartum (time-point four) to capture new episodes of depression. The SCID-IV is validated for use in the perinatal period (Gibson, 2009).

Depressive symptoms. Depressive symptoms were captured at time-point one, two and four by the EPDS. The EPDS is a ten item self-report screening measure used to assess depressive symptoms. Symptoms are rated on a 4-point (0 - 3) scale, with higher scores indicating increased symptom severity, and a total score between 0 and 30. We treated depressive symptoms as continuous, though cut-off scores of commonly 12 or 13 (Milgrom, Westley & Gemmill, 2011) have been applied in other studies to postpartum depression screening of women (Thombs & Ziegelstein, 2015). A reliable tool, the EPDS is validated for use in the perinatal period with Australian women (Boyce, Stubbs & Todd, 1993).

Quality of the mother-infant interaction. The EAS were designed to evaluate EA by observing and rating parent-child interactions. Construct validity is established in longitudinal studies (e.g., Easterbrooks & Biringen, 2000), with its specific application to interactions between mothers with depression and their children (Moehler et al., 2007). Test retest reliability of mothers and their five-month old infants was observed using intra-class correlations in a two-way random effects model (Bornstein et al., 2006). Good ICCs for inter-rater reliability are noted in home versus laboratory contexts (Bornstein et al., 2006). Cross-cultural applicability is evidenced by application of the scales to dyads in a range of countries (Oyen et al., 2000; Sagi, et al., 2002; Ziv, et al., 2000).

The EAS are scored on the specific behaviours of the dyad captured by the seven subscales of each dimension, with a higher score indicating increased observation of that dimension, as well as the global ratings reflected by the direct and total scores. Given the total score is computed by adding each of the subscales scores; it encompasses the specific behaviours that comprise the EAS. We used these scores to represent each EAS dimension. EAS direct scores and total scores were

significantly correlated ($p < .001$), indicating that use of total scores encompassed the scorers overall rating of each parenting dimension. Recorded mother-infant interactions were scored using the EAS by one of the two MPEWS researchers certified as reliable by Professor Biringen following training and reliability certification. The coders were blind to the mental health history of the mother and any other individual participant study data at the time of coding. Inter-rater reliability of $r = .8$ was found on the EA zones (previously EA clinical screener) classification (i.e., emotionally available, complicated, detached or problematic) of the relationship in a randomly selected subsample of ten video recordings. Inter-rater reliability between the two MPEWS researchers of $r = .8$ was found on the EA zone of the relationship in a randomly selected subsample of ten video recordings. Reliability for the direct scores of the maternal scales for the subsample of recordings was calculated using ICC two-way random effects model with absolute agreement (McGraw & Wong, 1996): sensitivity = .81, structuring = .79, non-hostility = .81, and non-intrusiveness = .89. Disagreements in scoring were minor (i.e., within 1.5 points of each other), and were resolved by the coders' joint-viewing of the interaction thereby reaching agreement on a new score. Disagreements in scoring were minor (i.e., within 1.5 points of each other), and were resolved by the coders' joint-viewing of the interaction thereby reaching agreement on a new score.

The use of the parenting scales reflects our interest in the mother's side of the relationship. To ensure that results still encompassed the child side to the interaction, we assessed the relationship between the parental and child scales. The child scales were highly correlated with the latent variable maternal EA ($r [209] = .86, p < .001; r = .86 [209], p < .001$). In the proceeding analysis, we only used latent variable, maternal EA, reflected by the parental scales as indicators.

4.3.3. Covariates. We examined potential covariates maternal age, parity and maternal education captured by self-report.

4.3.4. Statistical Analyses. We conducted an exploratory analyses using SPSS version 24 (SPSS; IBM Corp., 2016). Pearson correlations (r and p values) were used to examine bivariate associations between observed study variables, including socio-demographic variables identified as covariates of EA by previous research. These covariates are parity, maternal age, and tertiary education (Rossen et al., 2018; Van Doesum et al., 2007). We also present descriptive statistics to obtain an overview of the frequency of women diagnosed with depression that were classified as EA.

To address the first hypothesis that the parental EA sub-factors indicate a parsimonious single factor, we fit a confirmatory factor analysis specifying the parental EA scales as reflective indicators of one latent factor, maternal EA. To address our second hypothesis, we conducted a SEM controlling for the covariates in *Mplus* version 7 (Muthén & Muthén, 2012). We used depressive symptoms in early pregnancy and in the third trimester, and postnatally at six months postpartum, and depression diagnosis at six months postpartum as predictors of the latent variable maternal EA confirmed in the previous step. We addressed the issue of covariance of the repeated measures of depressive symptoms by co-varying each of the depressive time points with each other. The final model is presented in Figure 1. The regression coefficients of the pathways indicate the degree of change estimated by the predictors in the outcome variable (B values), with the p -value indicating the probability that the size of the estimated coefficient differs significantly from zero.

Model fit tests and indices are used to determine how well the specified model fits the data. The overall fit of a model to the data is supported by a non-significant ($p > .05$) chi-square goodness-of-fit test. Acceptable model fit can be further supported

by fit indices: the standardised root mean square residual (SRMR < .08), root mean square error of approximation (RMSEA < .08), comparative fit index and Tucker-Lewis index (CFI and TLI > .95; Hu & Bentler, 1999). Modelling was conducted using *Mplus*.

4.4. Results

4.4.1. Sample socio-demographic and other key characteristics. Women were, on average, 31.50 years ($SD = 4.67$) at recruitment, ranging from 19 to 48 years of age. Infant ($n = 114$; 54.0% male) mean age at six months postpartum was 6.76 months ($SD = 1.08$; range: 4.75 – 11.25). Participant demographics are set out at Table 2.

Table 2. MPEWS Cohort Demographic Characteristics, and Frequencies for Other Key Variables ($N = 210$)^a

Baseline characteristics	<i>N</i>	% ^b
<i>Relationship status</i> ^c		
Not currently in a relationship	10	4.8
In a relationship	64	30.8
Married	134	64.4
<i>Maternal education</i> ^d		
No further study after school	13	6.2
Post-secondary qualification (e.g., apprenticeship/certificate)	51	24.6
Tertiary education	144	69.2
<i>Employment status</i> ^e		
Employed	191	91.9
Unemployed	6	2.9
Other	11	5.2
<i>Depression Diagnosis at recruitment or six months postpartum</i>		
Depressed	59	28.0
Not Depressed	152	72.0

^a 211 dyads were analysed - one woman had twins so was recorded separately with each infant; ^b Valid percentage shown; ^c Missing = 2; ^d Missing = 2; ^e Missing = 1; ^f Missing = 5; ^g Missing = 5

Maternal EA by depression diagnosis. Table 3 sets out the frequency of each category of the EA zone stratified by the specific depression diagnosis given at six months postpartum. Of the 62 mothers with a diagnosis of depression either in pregnancy or postnatal, or on antidepressant medication, 70.97% ($n = 44$) were rated as not emotionally available (i.e., complicated, detached or problematic) in the interaction with their infant at six months postpartum. This provided preliminary support for the modelling of the relationship between maternal depression and maternal EA.

Table 3. Frequency of EA zone across depression diagnosis at six months postpartum ($N = 211$).

	No diagnosis N (%) ^b	MDD pregnancy N (%)	MDD postnatal N (%)	MDD current N (%)	Current Dysthymia N (%)	DepD NOS ^a N (%)
<i>EA zone</i>						
EA	81(45.5)	1 (20)	-	3 (25)	-	-
Complicated	54 (30.3)	3 (60)	6 (75)	3 (25)	1 (100)	1 (50)
Detached	40 (22.5)	1 (20)	2 (25)	4 (33.3)	-	1 (50)
Problematic	3 (1.7)	-	-	2 (16.7)	-	-

^a DepD NOS means Depressive Disorder Not Otherwise Specified (DSM-V, 2013); ^b Valid percent.

Maternal Depression and Maternal EA at 6 months postpartum. The descriptive statistics and bivariate correlations for all of the variables included in the modelling are reported in Table 4. Pearson correlations revealed a small negative effect between antenatal depressive symptoms and latent factor maternal EA, with the strongest predictor at time one ($r [208] = -.215, p = .002$; $r [207] = -.197, p = .004$, respectively). Likewise, depression diagnosis at 6 months postpartum showed a small correlation with maternal EA ($r [207] = -.15, p = .03$). Covariates maternal age and tertiary education were significantly correlated with maternal EA, with maternal age showing the strongest association ($r [209] = .239, p < .002$; $r [209] = .158, p = .021$, respectively). This provided evidence for predictors in the final model including antenatal depressive symptoms (i.e. early pregnancy and third trimester) and depression diagnosis at six months postpartum, as well as covariates maternal age and tertiary education.

Table 4. Descriptive Statistics and Bivariate Correlation Coefficients for all Variables in the Regression Model ($N = 211$).

	1	2	3	4	5	6	7	8	9
1. Depression Time One									
2. Depression Time Two	.36***								
3. Depressive symptoms T1	.32***	.22***							
4. Depressive symptoms T2	.28***	.32***	-.67***						
5. Depressive symptoms T3	.28***	.40***	.49***	.54***					
6. Maternal EA	-.07	-.14*	-.20**	-.18*	-.05				
7. Maternal Education	-.15*	-.06	-.193*	-.12	-.11	.15*			
8. Maternal Age	-.14*	.03	.034	.03	.12	.24***	.12		
9. Parity	.06	.06	.086	-.05	.14	-.10	-.17*	.1	
Mean	0.23	0.35	6.42	6.20	5.86	23.13	0.69	31.34	0.09
Standard Deviation	0.42	1.01	4.71	4.45	4.48	3.64	0.46	5.11	0.29
Range	0 - 1	0 - 1	0 - 27	0 - 25	24	10.38 - 29	0 - 1	19 - 48	1-3

* $p < .05$ ** $p < .01$ *** $p < .001$; T1 = early pregnancy; T2 = third trimester; T4 = 6 months postpartum.

Confirming a single-factor parental EAS. We used confirmatory factor analysis to test the fit of a single-factor model of parental EAS. Appendix One of the Dissertation contains additional data in support of this model. The model fit indices were adequate to reject the null hypothesis; the one-factor model is a strong fit to the data: $\chi^2 (d.f. = 2) = 2.92, p = .23$; CFI = .99, TLI = .98, SRMR = .01, RMSEA = .05 [95% CI = .00, .15]. The unstandardised and standardised factor loadings are presented in Table 5. Each loading was significant and above the recommended cut-off ($\geq .40$; Stevens, 2002) and collectively, the model accounted for 74% of the variance. In addition, common variances in the sub-factors accounted for by the maternal EA factor ranged between 64.7% and 89.5%. Taken together, these results indicate a strong, uni-dimensional factor for maternal EA. Thus, we used the confirmed measurement model as the basis for the proceeding SEM to test our second hypothesis.

Table 5 Standardized and unstandardized coefficients for CFA of EAS.

Observed variable	Latent construct	B	SE	β
2. Sensitivity	Maternal EA	1.00	.01	.94
3. Structuring	Maternal EA	.815	.01	.91
4. Non-intrusiveness	Maternal EA	.841	.03	.77
5. Non-hostility	Maternal EA	.573	.03	.80

Maternal depression predicting maternal EA as a latent factor. To address the second hypothesis that maternal depression and depressive symptoms from pregnancy to postpartum would negatively predict maternal EA, a SEM was conducted in *Mplus* using maximum likelihood estimator with robust standard errors. Although the chi-squared test suggested a significant discrepancy in the fit between model and data, model fit indices suggested the model fit the data well (CFI = .95, TLI = .95, SRMR = .08, RMSEA = .07 [95% CI = .05, .10]). The SEM literature supports the use of fit indices in addition to the chi-squared test to assess the fit of a

model to the data for larger samples and complex models as the chi-squared test is sensitive to these characteristics (Jöreskog & Sörbom, 1993). All of the predictors were exogenous variables and their covariances were estimated concurrently to their individual conditional effects on the latent variable, maternal EA. Collectively, the model explained 11.90% of the variance in maternal EA ($r^2 = .119, p = .009$).

Results for the model are displayed in Figure 2. The only significant predictor of maternal EA at six months postpartum was depressive symptoms in early pregnancy ($\beta = -.19, p = .048$). The size of this effect between early pregnancy depressive symptoms through to each of the observed EA sub-factors is then proportionate to the individual loadings on the latent factor. EPDS at third trimester and six months postpartum were not significant predictors of maternal EA. These results suggest that depressive symptoms in late pregnancy and the postpartum do little to predict the quality of the mother-infant interaction beyond depressive symptoms measured in early pregnancy. Although a depression diagnosis at six months was not a significant predictor of maternal EA, the path estimate was trending towards significance ($\beta = -.12, p = .083$), suggesting that diagnosed depression could be a unique additive predictor of maternal EA in the context of depressive symptoms and the included covariates.

Tertiary education was not a significant predictor of maternal EA in our model, suggesting that the presence of a university education did not account for the differences in women's EA with their infants in the context of maternal depression, depressive symptoms and age. However, maternal age was a significant predictor, with results indicating that women who were one standard deviation older ($SD = 4.67$) than the average age in the sample ($M = 31.50$) scored, on average, .16 of one standard deviation higher on the latent maternal EA factor ($p = .001$).

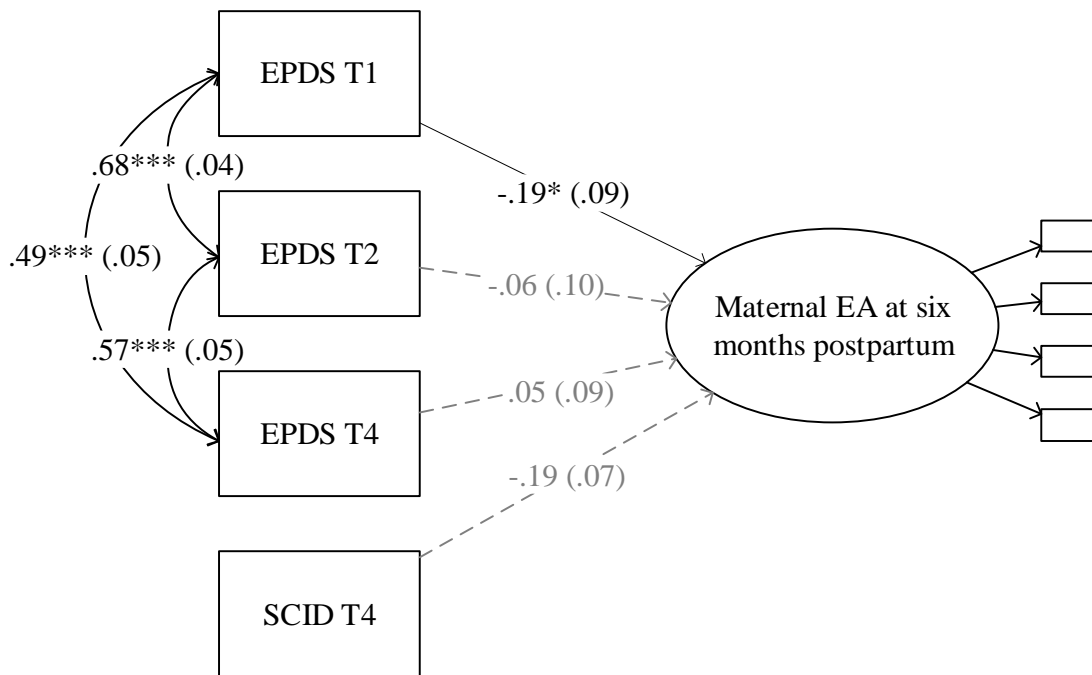


Figure Two. Final model with standardized parameter estimates with parenthesized standard errors. T1 = early pregnancy; T2 = third trimester; T4 = 6 months postpartum. Maternal EA indicator loadings are presented in Table 4. Although not shown in the figure, we also included covariates in the model maternal education and maternal age.

* $p > .05$; *** $p > .001$.

4.5. Discussion

Comparative to the EA research, this study utilised access to a large sample of mother-infant dyads, including a clinical sample of women diagnosed with depression. Furthermore, we tested the association between maternal EA and depression using both dimensional and categorical data about depression collected longitudinally from early pregnancy to six months postpartum, with an observational measure applied to assess maternal EA. In our study depressive symptoms in early pregnancy predicted reduced maternal EA, though the strength of this association was small and there was no association with the diagnostic measure of maternal depression at the same time point. Overall our findings do not support a relationship between maternal EA and either depressive symptoms in late pregnancy or the

postpartum, or with depression diagnosis. Contrary to our expectations, maternal depression did not account for the proportion of variance in maternal EA we had anticipated.

Our finding of depressive symptoms in early pregnancy as a predictor of maternal EA highlights the importance of extending the depression research to include the antenatal period (Galbally et al., 2017). The presence of depression in pregnancy might adversely affect the development of the woman's maternal identity, as well as the beginnings of the bond with her infant (i.e., maternal fetal attachment; Brandon et al., 2009). If pregnancy marks the beginnings of a mother's relationship with her infant (Ainsworth et al., 1974), the measurement of factors that might impact on that relationship should include the entire perinatal period. It is possible for women with depressive symptoms who experience a reduced fetal attachment, that this may be a precursor for the later observable relationship between the mother and her infant (Alhusen, 2008).

The significance of depressive symptoms in early pregnancy as a predictor of maternal EA reflects related research on depression in the antenatal period and the mother-infant interaction (Parfitt, Pike & Ayers, 2013). Flykt et al. (2010) measured depressive symptoms at three time-points and examined its relationship to maternal responsiveness in 59 mother-infant dyads. Whilst antenatal depressive symptoms explained 13% of the variation in maternal responsiveness, only 11.8% of their sample ever met the criteria for 'probable depression'. The smaller effect of depressive symptoms we observed might reflect the fact that 28% of the women in our sample were diagnosed with depression.

Depressive symptoms in late pregnancy or at six months postpartum did not account for variance in maternal EA. Using the EPDS at four time-points from 18

weeks gestation to 12 months postpartum, Raine, Cockshaw, Boyce & Thorpe, 2016) found little evidence of a relationship between depressive symptoms and the mother-infant interaction (measured by the Thorpe Interaction Measure; TIM). However, depressive symptoms earlier in pregnancy were a stronger predictor than those in later pregnancy or postpartum. Similarly, Pearson et al. (2012) recorded that women with depressive symptoms at 18 weeks were 1.31 times more likely to show neutral maternal responsiveness (measured by TIM) at 12 months postpartum. Notably, both Raine and Pearson used data from five-minute mother-infant interactions assessed using the TIM, a measure that only analyses maternal content and responsiveness. It is debatable as to whether this represents the mother-infant interaction in its entirety.

Depression diagnosis was not a significant predictor of maternal EA. Whilst Cornish et al. (2008) reported that mothers with brief or chronic depression were 35% more likely to show intrusive behaviour they found no difference between women diagnosed with depression and women without depression for each of the other EAS dimensions. Cornish and colleagues share our conclusions that a substantial number of women might be able to maintain an emotional connection with their infant even in the presence of maternal depression. However, the brevity of mother-infant interactions relied upon in their study raise questions about the reliability of the findings. Ten minutes samples do not meet the recommended minimum length of 20 minutes (Biringen et al., 2014). Our study is the first to examine the relationship between depression and maternal EA using behavioural samples of the optimal length of over 30 minutes of recorded interaction (Biringen et al., 2014).

Interestingly, maternal age was the only socio-demographic variable that accounted for a significant proportion of the variance in maternal EA. Women who were older than the average age of the sample showed higher maternal EA. The

primary focus in the literature examining maternal age and parenting capacity is on adolescent mothers (Easterbrooks et al., 2005). The mean age of this sample was 31 years, so the results are not representative of a younger mother or adolescent sample. Information about the positives of increased maternal age might be useful when considering the common framing of age and fertility in the media which is generally more negative (Shaw & Giles, 2009).

Strength in this study lies in its measurement of maternal depression and the repeated measures design. There is a tendency to use either categorical or dimensional measures in existing studies (Kluczniok et al., 2016). Categorical classification fails to account for evidence of the continuous nature of mood disorders (Carragher et al., 2015); the prevalence of comorbidity (Ormel et al., 2015); or the poor reliability demonstrated by some measures (Regier et al., 2013). Conversely, symptomatic measures ensure that a woman is not omitted for falling outside of diagnostic criteria, which acknowledges the psychosocial impairment that can be experienced by sub-threshold depression (Gotlib et al., 1995). However, reliance of symptomatic measurement at one time-point (Rossen et al., 2018), does not account for symptom fluctuation (Laurent, Ablow & Measelle, 2011), hence our measurement of depressive symptoms at three time-points.

Children of mothers with depression are exposed to increased risk of adverse behavioural and psychological outcomes (Ashman, Dawson & Panagiotides, 2008), however these outcomes are not inevitable (Cornish et al., 2008). Studies examining the mechanisms that lead to the transmission of maternal depression to child outcomes are required to account for the complexity of factors that might influence development (Galbally et al., 2018), for example, the mother-infant relationship. Whilst the association between depression and non-optimal mother-infant interaction

is well documented, there is a paucity of research that assesses the mother-infant interaction using a global measure like the EAS (Rossen et al., 2018), and even fewer EA studies that measure depression from pregnancy to postpartum. Information from studies like this one can guide clinical intervention by informing clinicians of which dyads are at greater risk of their emotional connection being compromised (Cassibba et al., 2015).

4.5.1. Limitations. Despite the strength of this study's design in its conceptualisation of depression and longitudinal measurement, there are limitations. Our findings apply to mothers only. There is little research exploring the effect of paternal depression on EA, even though evidence in related studies suggests that paternal depression increases the effect of maternal depression on internalising child behaviours if the father spends a significant amount of time with the infant (Mezulis, Hyde & Clark, 2004). Our findings also do little to explain the differences in maternal EA recorded between the dyads. This may suggest there are additional important factors that influence a mother's capacity to connect with her infant.

4.5.2. Conclusion. Whilst maternal depression has been associated with a range of maternal and child outcomes our study did not find it was associated with the quality of maternal EA. According to our data, depression in early pregnancy may have a small association with EA but overall this study indicates that women with depression are emotionally available to their infant. This suggests that mothers are still able to engage in quality interactions despite experiencing depression. Future research examining maternal depression and mother-infant interactions requires careful measurement of maternal depression and the interaction in samples that include clinically depressed women if we are to progress our understanding. Research focus might also consider the inclusion of other potential risk factors that

might influence the capacity of mothers with depression to be emotionally available to their infants (Kluczniok et al., 2016).

Chapter 5: Study Two

Maternal trauma and emotional availability in early mother-infant interaction: findings from the MPEWS cohort.

This chapter includes a modified version of a co-authored paper. The bibliographic details of the co-authored paper including all authors are:

MacMillan, K.K., Lewis, A.J., Watson, S., Jansen, B., & Galbally, M. (2020; *under review*).

Maternal trauma and emotional availability in early mother-infant interaction: findings from the MPEWS pregnancy cohort. *Journal of Attachment and Human Development*.

My contribution to the paper involved:

I coded 194 of the 211 mother-infant interactions that comprise the data, was involved in preparation of the data, formulated the questions, analysed the data, and drafted the manuscript.

A.J. Lewis contribution to the paper involved:

Collaboration regarding the formulation of the questions and the data analytic approach, reviewed the manuscript, suggesting edits. Chief investigator on both the grants and ethics for the study and co-designed and co-supervised the 6 month assessment data collection.

S.Watson contribution to the paper involved:

Preparation of the data, collaboration regarding the data analytic approach, reviewed the manuscript, suggesting edits.

M.Galbally contribution to the paper involved:

Led the grants and ethics for the overall study data collection including the pregnancy and 6 month data used and co-designed and co-supervised the 6 month assessment data collection with A.J.Lewis. Provided supervision regarding the assessment of the 211 mother-infant

interactions, collaborated regarding the formulation of the questions, reviewed the manuscript, suggesting edits.

B.Jansen contribution to the paper involved:

Reviewed the paper, suggesting edits.

The 6 month assessments were undertaken by Tina Vaiano, Brittany Watkins, Alexandra Flowers, Rebecca Knapp and Emma Austin from the Mercy Hospital, Melbourne.

5. Maternal trauma and emotional availability in early mother-infant interaction: findings from the MPEWS cohort.

5.1. Preface.

A consistent negative association is documented in the literature between maternal childhood trauma and mother-infant relationship quality (e.g., Lyons-Ruth & Block, 1996). Given estimated prevalence rates of 32.3% for sexual abuse and 19.5% for physical abuse in women in the general population (Briere & Elliot, 2003), as well as the recorded rates of 20.2% of PTSD during the perinatal period (Seng et al., 2009), investigating maternal childhood trauma as a psychosocial predictor of the mother-infant relationship is necessary to understand possible risks to child development. Consequently, the next psychosocial predictor we examined was maternal trauma and maternal EA at six months postpartum. Maternal depression was only included as a covariate because it was not a strong predictor of maternal EA in the findings from our first study.

Currently although the existing literature has examined the association between distal trauma from childhood and maternal EA (e.g., Fuchs, Mohler, Resch & Kaess, 2015), there are no studies that we have found that acknowledge the possibility of other proximate trauma exposures that might also influence the mother's emotional capacity. This is important in the context of the theory of cumulative trauma: namely individuals who have experienced one type of trauma are more vulnerable to future traumas (Kessler, 2000). Indeed, if women with childhood trauma are more likely to have experienced additional subsequent trauma, then it follows that their EA may be impacted by the distal trauma from childhood as well as the proximate trauma exposure. Consequently, to understand the effect of childhood trauma on maternal EA, proximate traumas should be identified. Those pertaining to the perinatal period include childbirth experience (Dekel, Thiel, Dishy & Ashenfarb, 2019), and stressful life

events exposure (Muller-Nix, Forcada-Guex, Pierrehumbert, Jaunin, Borghini, & Ansermet, 2004).

Chapter Five includes the second of the empirical studies to examine a maternal psychosocial predictor of maternal EA at six months postpartum: maternal trauma. Consistently with Chapter Four (above), we only used the parental EA scales to comprise the latent factor maternal EA. Again, this reflects our interest in examining the mother's interactional quality, with the limited behavioural repertoire of infants at six months of age reinforcing the focus on the maternal side (see, also Teti et al., 2010). The gaps in the EA literature are addressed by specifying, for the first time, whether the relationship between maternal childhood trauma and maternal EA is mediated by childbirth experience or sequential antenatal and postnatal stressful life events. Using multiple mediation analyses we test the direct and indirect effects of each of the different types of trauma exposures, with information elucidated providing a comprehensive examination of the relationship between maternal trauma and a mother's capacity to engage in an emotionally available interaction with her infant at six months postpartum.

5.2. Introduction

There is much research and clinical interest in the relationship between maternal trauma and mother-infant interaction (Lyons-Ruth & Block, 1996). The timing of the mother's exposure to traumatic experiences is important in such a relationship (Dulin & Passmore, 2010; Shrira, Shmotkin & Litwin, 2012). Some studies have focussed on intergenerational patterns of trauma (Schwerdtfeger et al., 2007), others distal trauma experienced in a mother's own childhood (Moehler, Biringen & Poustka, 2006). In addition, the impact of more proximate exposures is documented (e.g., van Ee, Kleber, & Mooren, 2012). Some traumatic but others better considered stressors, which occur in pregnancy itself or indeed the impact of traumatic experiences in childbirth (e.g., Dekel et al., 2017).

However, relatively few studies have examined the relationship between distal childhood traumas and more proximate experiences in pregnancy and childbirth, which will be our focus in this paper.

The investigation of the relationship between distal trauma and more proximate exposures is central to understanding the effect of trauma exposure on the mother-infant dyad. It is well established that exposure to adverse childhood experiences (ACEs) is associated with negative health related outcomes in adulthood (Felitti et al., 1998). More recently, researchers have confirmed the link between ACEs and increased risk of problematic parent-child relationships (Murphy et al., 2014). This reflects the relationship observed in the literature between maternal childhood trauma and the mother-infant relationship (e.g., Lyons-Ruth & Block, 1996). It is also well accepted that individuals who experience one type of trauma are more likely to experience other traumas (Kessler, 2000). This increased vulnerability to additional negative life experiences is understandable if we consider the detrimental impact early trauma experience can have on an individual's interpersonal relationships, ability to regulate their emotions, and formation of a coherent sense of self (Ogle, Rubin & Siegler, 2013). In this study we mediate the relationship between distal factor maternal childhood trauma and the mother-infant relationship by using two proximate factors specific to the perinatal period: childbirth experience and stressful life events. In doing so, we examine the relationship between maternal trauma and the mother-infant relationship in a way that captures the theory and empirical research about the enduring effects of childhood trauma and long-term consequences of those experiences.

Assessing the quality of the mother-infant interaction ranges from maternal self-report to coding of structured observational tasks. One of the most widely employed observational measures is the Emotional Availability Scales (EAS; Biringen et al., 2008). The EAS, cited in an estimated 15 studies per year (Lotzin et al., 2015), in over 22 countries (Biringen,

Derscheid, Vliegen, Closson & Easterbrooks, 2014), is commonly used to examine the mother-infant relationship in research. The EAS consists of six scales incorporating four dimensions of parenting characteristics (i.e., sensitivity, non-intrusiveness, structuring and non-hostility), and two child dimensions (child responsiveness and child involvement; Biringen et al., 2008).

Based on emotional availability (EA) theory, the EAS examines the emotional quality of an interaction, and facilitates assessment of the dyadic exchange (Emde, 1980; Sorce & Emde, 1981; Ziv, Aviezer, Gini, Sagi & Karie, 2000). According to EA theorists, an EA mother is receptive to positive and negative emotional signals from her child (Emde, 1980), providing the supportive maternal presence in the context of her child's autonomy and exploration (Mahler, Pine, Bergman, 1975).

Central to understanding the utility of the EAS in mother-infant relationship assessment, is the role of maternal sensitivity. Proposed as the most important antecedent to attachment quality (Ainsworth, Blehar & Waters, 1978), subsequent research suggests that maternal sensitivity is but one of the dimensions that comprises the mother-child relationship (see meta-analysis: deWolff & vanIJzendoorn, 1997). The EAS purports to move beyond maternal sensitivity to include other parenting dimensions such as structuring, non-intrusiveness and non-hostility, as well as the child's side to the interaction (Biringen & Easterbrooks, 2012). This may not reflect the one factor model observed in the EAS factor analysis (MacMillan et al., 2020; Garvin et al., 2012), though there is also support for a two-factor model though this is not published (personal correspondence of Biringen & Robinson, 1995 cited by Biringen et al., 2014).

It was Fraiberg, Adelson, and Shapiro's (1975) seminal 'Ghost of the nursery' that first proposed how a mother's own experience of childhood trauma might limit her ability to understand and respond sensitively to her infant. We located three EA studies that assess the

relationship between maternal childhood trauma and maternal EA using mother-infant dyads, with each of those studies reporting a negative association between the variables (Moehler et al., 2006; Driscoll and Easterbrooks, 2007; Fuchs, Mohler, Resch & Kaess, 2015). Driscoll and Easterbrooks (2007) noted that mothers with a history of childhood abuse were twice as likely to have lower scores in sensitivity and structuring, and one and a half times more likely to score higher on intrusiveness. Similarly, Moehler et al. (2006) reported that women with a history of sexual and physical abuse were over six times more intrusive than women without a history of child abuse, and Fuchs et al. (2015) reported a large effect of childhood trauma on maternal EA at 12 months postpartum. However, childhood trauma only captures physical or sexual childhood abuse in each of these studies. Childhood trauma by definition includes physical, sexual, or emotional abuse, as well as emotional and physical neglect (Bernstein et al., 2003). The significance of other types of childhood abuse is supported by evidence of a moderate association between neglect, emotional abuse and increased maternal hostility during mother-child interactions (Bailey, DeOliverira, Wolfe, Evans & Hartwick, 2012). Consequently, we extend the examination of maternal childhood trauma in the EA literature, to include all types of childhood trauma.

The other issue with the existing research is that it only investigates the relationship between distal trauma in childhood and the mother-infant relationship. Other more proximate traumas specific to the perinatal period include childbirth. Although childbirth is increasingly postulated in the research as traumatic for some women (MacKinnon, Houazene, Robins, Feeley & Zelkowitz, 2018), to our knowledge there are no published studies that have examined the association between childbirth experience and maternal EA. As an aside we note that central to childbirth trauma is the woman's subjective experience (Garthus-Niegel, Soest, Vollrath & Eberhard-Gran, 2013). It is therefore necessary to use maternal self-report of a woman's experience of childbirth or diagnostic assessment of childbirth trauma

symptoms, rather than medical knowledge of the type of birth (Buultjens & Liamputtong, 2007). Interestingly, related studies have found different effects of childbirth trauma on the mother-infant dyad including avoidance of the infant, resentment and maternal detachment, as well as negative perceptions of the infant (Ballard et al., 1995; Allen, 1998; Davies, Slade, Wright, and Stewart, 2008). One might therefore hypothesize that women who report a negative childbirth experience might struggle to be emotionally available to their infant. The other proximate trauma specific to the perinatal period is from stressful life events exposure.

The importance of distinguishing maternal exposure to stress prenatally and postnatally has started to receive some attention. For example, prenatal stress exposure has been linked to child cognitive (Laplante, Brunet, Schmitz, Ciampi & King, 2008), and physical outcomes (e.g., preterm birth; Zhu, Tao, Hao, Sun & Jiang, 2010). Conversely, there is a lack of research exploring the relationship between maternal stress and the mother-infant interaction (Muller-Nix, Forcada-Guex, Pierrehumbert, Jaunin, Borghini, & Ansermet, 2004). One study that we located showed evidence of an inverse association between stress exposure and maternal sensitivity. Crnic, Ragozin, Greenberg, Robinson and Basham (1983) reported a reduction of .21 in maternal sensitivity to infant cues (measured by Barnard Teaching Scales) for mothers exposed to negative life stress (measured by the Life Experience Survey). However, stress exposure was measured from pregnancy to only one month postpartum, whereas the mother-infant interaction was recorded at four months postpartum. Related is the importance of the timing of measurement of the stressful life event, as if the event occurred during pregnancy, the impact on the woman might have lessened at six months postpartum. However, for postnatal stressful life events, the woman's functioning might still be impacted. Obtaining information about the relationship between each of these trauma variables and maternal EA is useful when considering how to identify vulnerable dyads in need of clinical services, as well as the timing for intervention.

We are also interested in the cumulative risk posed by depression for women who experience trauma. This issue reflects findings by Kluczniok et al. (2016) who reported a medium effect of childhood trauma history on maternal sensitivity for mothers with depression. However, our data does not support a significant association between maternal EA and depression diagnosis (see, MacMillan et al., 2020). The difference in our findings to Kluczniok may be explained by the fact their sample of women with depression were in fact in remission (measured by the HAMD), whereas the women in our sample were clinically depressed. Moreover, Kluczniok was not testing the association between maternal depression and maternal EA, but only a dimension of EA - maternal sensitivity. To capture maternal depression, we used it as a covariate in this study.

5.2.1. Aims and hypotheses. This study aims to examine if the relationship between distal trauma from childhood and maternal EA at six months postpartum is mediated by more proximate trauma specific to the perinatal period. This is done using a multiple mediation model with data from longitudinal pregnancy cohort study, the Mercy Pregnancy and Emotional Well-being Study. Using videos of mothers interacting with their babies for a minimum of 40 minutes at six-month postpartum, observational data of the mother-infant relationship was captured using samples of optimal length for assessment by the EAS (Biringen et al., 2014). Data was collected regarding maternal childhood trauma, as well as different types of maternal trauma specific to the perinatal period: childbirth experience and antenatal and postnatal stressful life events. In addition, information about covariates maternal depression, age and tertiary education were captured. This study is the first, to our knowledge, to test the relationship between maternal childhood trauma and the mother-infant relationship at six months postpartum accounting for the possibility that more recent trauma specific to the perinatal period might account for some of the effect between the two variables.

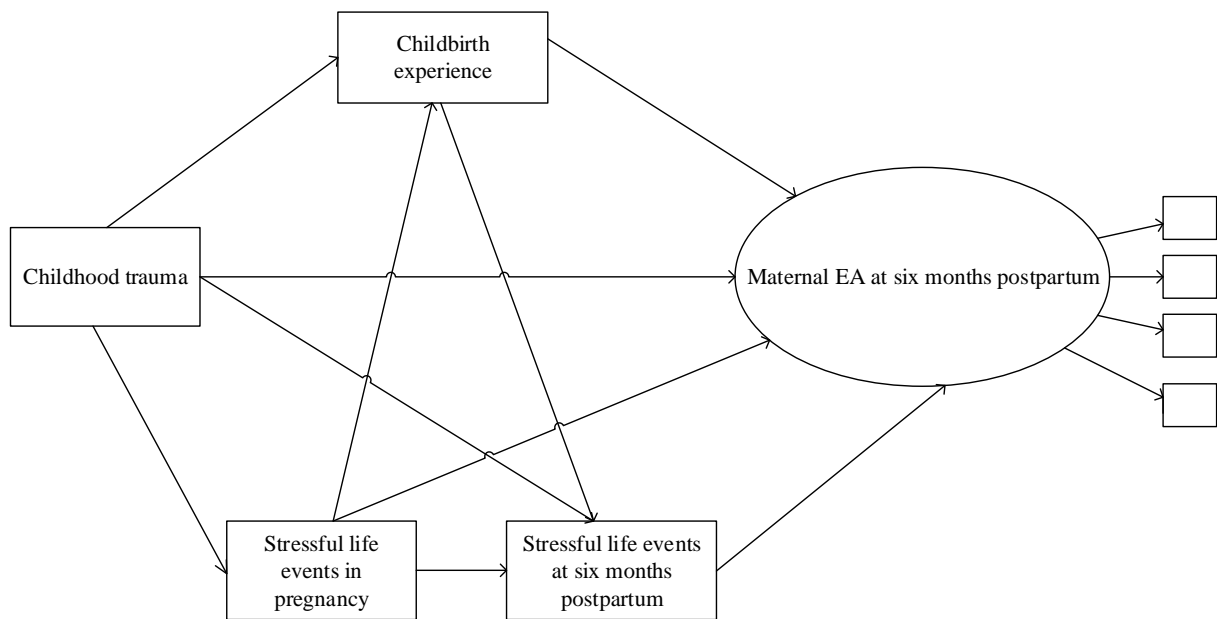


Figure 3. Hypothesized mediation model showing the pathway between childhood maternal trauma and maternal EA at six months postpartum mediated by childbirth experience and stressful life events in pregnancy and the postpartum.

To address this aim we tested whether the data fit our hypothesized multiple mediation model set out at Figure 3 by simultaneously assessing the relationships between maternal childhood trauma, childbirth experience, antenatal and postnatal stressful life events, and modelling their predictive pathways to maternal EA. Given the existing research, we firstly hypothesized that there would be a distal relationship between maternal childhood trauma and maternal EA at 6 months postpartum. Then based on a model assuming a cumulative effect of trauma experiences, we hypothesized that this direct relationship would be mediated by more proximate trauma exposure in pregnancy and the postpartum; specifically, childbirth experience and stressful life events. We hypothesized two mediation pathways. First, the relationship between maternal childhood trauma and maternal EA would be mediated by childbirth experience. Second, the relationship between maternal childhood trauma and maternal EA would be mediated sequentially by stressful life events in pregnancy and the postpartum. Finally, we wanted to test the indirect pathway between maternal

childhood trauma and maternal EA through each of the proximate factors specific to the perinatal period in the order of their occurrence (i.e., antenatal stressful life events, childbirth experience and postnatal stressful life events). We then expected these relationships to hold after adjusting for the conditional effects of maternal depression, maternal age and maternal education.

5.3 Method

Data used in this study were drawn from the Mercy Pregnancy and Emotional Well-being Study (MPEWS), a prospective pregnancy cohort study based in Melbourne, Australia (Galbally et al., 2017). Recruitment of women was at less than 20 weeks of pregnancy and initially occurred through antenatal bookings with a letter of invitation to participate in MPEWS included in the welcome pack sent out to all women who were to deliver at Mercy Hospital. The Mercy Health Human Research Ethics Committee approved the study with participants providing their written informed consent prior to participation.

5.3.1. Participants. For this study, the sample comprised of 211 mother-infant dyads (78.4% of the full cohort). This represented only those who completed data collection, including the mother-infant interaction task at six months postpartum. No significant differences in baseline demographics (i.e., maternal demographics and birth outcomes) were observed between the original sample and those included in this study.

The data used were collected at three Waves: early pregnancy (less than 20 weeks), third trimester, and six months postpartum. There were 210 women because one woman had twins and was recorded twice in separate dyads, so the total was 211 ($N = 211$). Details of the study protocol are published in Galbally et al. (2017). Inclusion required English proficiency and participants being under 20 weeks pregnant, with women who experienced complications in pregnancy remaining eligible. Not included were women diagnosed with bipolar or psychotic disorders, substance abuse disorder, intellectual disability, child protection

involvement, a serious pre-existing physical illness, or a current psychiatric illness requiring acute inpatient admission.

5.3.2. Procedure. *Mother-Infant Interaction Task.* At six months post-partum mothers and their babies attended Mercy Hospital to be recorded in a 40 to 60-minute interaction. All mother-infant interactions comprised of three parts: semi-structured free-play (10 minutes), followed by unstructured play (30 minutes), and time taken to obtain three saliva samples 15 minutes apart (this was done as part of the wider MPEWS). For the semi-structured play, mothers were instructed to place their infant on a baby beanbag and to engage in face to face interaction with them, “just as they would do at home”. A basket of toys was brought in for the unstructured play including toys such as a rattle, balls, and a spinning top. The infant’s own toys were not used, and mothers were asked to refrain from feeding throughout the interaction. The interaction was recorded from three angles: enface to the infant and the mother, as well as another video behind a one-way screen operated by the assessor which captured both parties.

5.3.3. Measures. *Maternal Emotional Availability.* The EAS is scored on observed specific behaviours of the dyad captured by the seven subscales of the six dimensions. Each subscale consists of seven items, the first two items are scored between 1 and 7, and the remaining five items are scored between 1 and 3. The maximum total score for each subscale is 29, with a higher score indicating increased observation of that dimension. A direct score between 1 and 7 is also assigned to each dimension to demonstrate the extent to which the dyad reflected that parenting quality. Additionally, the EAS uses a 100-point scale to assign an EA zone (formerly clinical screener; highly emotionally available; complicated, detached or problematic), to the adult and child side to the interaction. The EA zone is designed to provide an overview of the EA in the dyad, with evidence that each of the four EA zones maps onto the four attachment categories (Saunders, Kraus, Barone & Biringen, 2015). Given

the total score is computed by adding each of the subscales scores; it encompasses the specific behaviours that comprise the EAS. We used these scores to represent each of the EAS dimensions. Notably, the direct scores and total scores were significantly correlated ($p < .001$), indicating that our use of total scores encompassed the scorers overall rating of each parenting dimension.

Construct validity of the EAS is established (Biringen & Easterbrooks, 2012; Ziv et al., 2000), with test retest reliability (Bornstein, Gini, Suwalsky, Putnick & Haynes, 2006), and good inter-rater reliability (Bornstein, Gini, Putnick, Haynes, Painter & Suwalsky, 2006). Cross-cultural applicability is also demonstrated (Oyen, Landy, Hilburn-Cobb, 2000; Sagi, Karie, Gini, Ziv & Joels, 2002; Ziv et al., 2000). Recorded mother-infant interactions were scored using the EAS by one of the two MPEWS researchers certified as reliable by Professor Biringen following completion of the formal training program. The coders were blind to the mental health history of the mother and any other individual participant study data at the time of coding. Inter-rater reliability between the two MPEWS researchers of $r = .8$ was found on the EA zone of the relationship in a randomly selected subsample of ten video recordings. Reliability for the direct scores of the maternal scales for the subsample of recordings was calculated using ICC two-way random effects model with absolute agreement (McGraw & Wong, 1996): sensitivity = .81, structuring = .79, non-hostility = .81, and non-intrusiveness = .89. Disagreements in scoring were minor (i.e., within 1.5 points of each other), and were resolved by the coders' joint-viewing of the interaction thereby reaching agreement on a new score.

The use of the parenting scales reflects our interest in the mother's side of the relationship. To ensure that results still encompassed the child side to the interaction, we assessed the association between the parental and child scales. The child scales were highly correlated with the latent variable, maternal EA ($r [209] = .86, p < .001$; $r [209] = .86, p <$

.001). In the proceeding analysis we only used the parental scales as indicators of latent variable, maternal EA.

Maternal childhood abuse. The mothers' history of abuse was measured using the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1999), which is a 28-item self-report questionnaire. In addition to a total sum score, types of childhood trauma are measured on five summed subscales; these are emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect. The CTQ quantifies the frequency of abusive experiences from childhood to adolescence on a five-point scale (0 = *never* to 5 = *very often*), with cut-off scores used to identify four severity categories of the abuse (i.e., minimal, minor, moderate, and severe; Bernstein & Fink, 1999). The CTQ has strong psychometric properties (e.g., Spinhoven et al., 2014) in clinical (e.g., Bernstein et al., 2003) and community samples (Scher, Stein, Asmundson, McCreary, & Forde, 2001), and is the leading retrospective assessment of childhood maltreatment in the literature (Tonmyr, Draca, Crain & MacMillan, 2011). In our study, we used a binary cut-point for the total score CTQ, which is described in the CTQ manual. The cut-point has been developed using an American population and aims to maximise identification of abuse cases. Total scores greater than 36 indicate *moderate-to-severe childhood trauma* (coded 1); scores of 36 and below indicate *none-to-minimal childhood trauma* (coded 0).

Childbirth experience. Women completed the childbirth experience questionnaire (Dencker, Taft, Bergqvist, Lilja, & Berg, 2010; CEQ) at six months postpartum. Designed to assess women's perceptions of labour and birth, this study utilised a 14-item version of the CEQ. Validated on 920 primiparous women at one month postpartum (Dencker et al., 2010), the CEQ is reported as a valid and reliable measure of a woman's childbirth experience using a sample of postnatal women in the UK (Walker, Wilson, Bugg, Dencker & Thornton, 2015). The CEQ assesses four dimensions of the childbirth experience: own capacity (i.e., maternal

emotions, sense of control and experienced labour pain), perceived security, participation, and professional support. Items are rated on a four-point Likert scale with a higher rating on the scale indicating increased endorsement of the domain and therefore a more positive childbirth experience. The sum of the items was used to create a total CEQ score, which captured the amount of adversity experienced in childbirth by each woman.

Stressful life events. Women completed the Stressful Life Events Questionnaire at each Wave (SLE; Brown, Yelland, Sutehrland, Baghurst & Robinson, 2011). The SLE is a revised 24-item self-report measure that assesses the incidence of common and pregnancy-specific life stressors, with other pregnancy cohort studies utilising the measure (e.g., Flach et al., 2011). We computed an antenatal SLE variable by summing the number of stressful events from the SLE in early pregnancy and at third trimester, and postnatal SLE was represented by the sum of stressful events reported at six months postpartum.

Maternal Depression. The Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV, American Psychiatric Association, 2008; SCID-IV-TR, First, Spitzer, Gibbon & Williams, 1997), was administered to assess past or present diagnosis of a depressive disorder (i.e., Major Depressive Disorder or Dysthymia) at recruitment and to screen for bipolar disorder. A modified version was re-administered at six months postpartum to capture new episodes of depression. The SCID-IV has been validated for use in the perinatal period (Gibson, McKenzie, McHarg, Shakespeare, Price & Gray, 2009). The women who met the DSM-IV criteria for Major Depression or Dysthymia irrespective of antidepressant use at recruitment or six months postpartum were coded as 1 (*depressed*; $n = 59$), and all other women were coded as 0 (*not depressed*; $n = 152$).

5.3.4. Other covariates. We also collected and included maternal age, parity, and tertiary education attainment, both measured by self-report at entry to the study, as potential covariates of maternal EA.

5.3.5. Statistical Analyses. We conducted exploratory analyses using SPSS version 24 (SPSS; IBM Corp., 2016). Pearson correlations to assess bivariate associations between observed study variables, including maternal depression and sociodemographic variables maternal age, maternal education and parity that were identified as correlates of EA by previous research (Fuchs et al., 2015; Kluczniok et al., 2015). Parity was not significantly correlated with the parental EAS dimensions, so was not controlled for in the analyses.

As part of our preliminary data analysis, a measurement model for the EAS was conducted. The model fit indices were adequate to support a one factor model: $\chi^2 (df = 2) = 2.92, p = .23$; CFI = .99, TLI = .98, SRMR = .01, RMSEA = .05 [95% CI = .00 - .15]. The standardised structural loadings ranged between .77 and .94. Each loading was significant and above the cut off value of .40 (Stevens, 2001), and collectively the model accounted for 74% of the variance. Taken together, these results suggest a strong unidimensional factor for maternal EA. We therefore used this measurement model of maternal EA as a latent outcome in the structural equation model.

Prior to reporting the results of the structural equation model, we present the frequency of each of the EA zones for each type of maternal trauma by conducting a cross-tabs analysis using SPSS. We also present the percentage of women with each EA zone for the different types of maternal trauma in the sample. We then compared the likelihood of EA, compared to not EA, according to maternal trauma type, by calculating unadjusted odds ratios (*OR*), associated significance tests for the *OR*, and 95% confidence intervals (*C.I.*) around the *OR*, using MedCalc (2018), version 18.11.

To determine how well our hypothesised model fit the data, we inspected and report several model fit indices. The overall fit of the model was supported by a non-significant chi squared goodness of fit ($p > .05$). Acceptable model fit was further supported by the standardised root mean square residual (SRMR $< .08$), the root mean square error of approximation (RMSEA $< .08$), and comparative fit index and tucker lewis index (CFI and TLI $> .95$; Hu & Bentler, 1999).

To address our hypotheses, structural equation modelling with indirect effects to test multiple-mediation was conducted using Maximum Likelihood estimation in *Mplus*. As demonstrated in Figure 3, to test our first hypothesis, we estimated in the model the direct association between maternal childhood trauma and maternal EA. To address our second hypothesis concerning the mediating role of maternal trauma proximate to pregnancy and the postpartum between maternal childhood trauma and maternal EA at 6 months, we estimated indirect pathways in the structural equation model. The first indirect pathway tested whether childbirth experience mediated the association between maternal childhood trauma and the latent factor indicating maternal EA. The second indirect pathway tested whether stressful life events in pregnancy and the postpartum were sequential mediators of the association between maternal childhood trauma and maternal EA. Finally, we tested the indirect pathway between maternal childhood trauma, each of the proximate maternal traumas in the order of their occurrence and maternal EA, by estimating the total indirect pathway (Figure 3) and assessed whether this effect was maintained with the inclusion of each of the covariates. In addition to the estimated paths for the final model, we also present the results for the indirect path analyses that address our hypotheses. To do this, we used the model indirect command in *Mplus*, which tests the significance of indirect paths by calculating bootstrapped (1000 samples) 95% confidence intervals and associated p -values.

5.4. Results

5.4.1. Sample Socio-demographic and other Key Characteristics. Women were, on average, 31.50 years ($SD = 4.67$) at recruitment, ranging from 19 to 48 years of age. Infant ($n = 114$; 54.0% male) mean age at six months postpartum was 6.76 months ($SD = 1.08$; range: 4.75 – 11.25). There were 90.5% first time mothers ($n = 191$), and 84.4% ($n = 136$) of women reported an Anglo background, with other ethnic groups including women from European, Asian, Middle-Eastern and Indigenous Australian backgrounds. Participant demographics are set out at Table 6.

Table 6. MPEWS Cohort Demographic Characteristics, and Frequencies for Other Key Variables ($N = 210$)^a

Baseline characteristics	<i>N</i>	% ^b
<i>Relationship status</i> ^c		
Not currently in a relationship	10	4.8
In a relationship	64	30.8
Married	134	64.4
<i>Maternal education</i> ^d		
No further study after school	13	6.2
Post-secondary qualification (e.g., apprenticeship/certificate)	51	24.6
Tertiary education	144	69.2
<i>Employment status</i> ^e		
Employed	191	91.9
Unemployed	6	2.9
Other	11	5.2
<i>Depression Diagnosis</i>		
Depressed	59	28.0
Not Depressed	152	72.0
<i>Maternal EA Zone</i>		
Emotionally available	86	40.8
Complicated	72	34.1
Detached	48	22.7
Problematic	5	2.4
<i>Maternal trauma</i> ^f		
None-to-minimal	117	73.6
Moderate-to-severe	42	26.4
<i>Antenatal stressful life events</i>		
Less than two stressors	181	86.2
Three or more stressors	29	13.8
<i>Postnatal stressful life events</i>		
Less than two stressors	176	83.8
Three or more stressors	34	16.2

^a 211 dyads were analysed - one woman had twins so was recorded separately with each infant; ^b Valid percentage shown; ^c Missing = 2; ^d Missing = 2; ^e Missing = 1; ^f Missing = 5; ^g Missing = 5

5.4.2. Frequency of trauma experience within each of the maternal EA

categories. Childhood Trauma. Of those women who completed the CTQ, one-quarter (26.3%; $n = 42$) reported trauma in their childhood that was classified between moderate and severe. The bivariate frequencies of EA for women who had experienced childhood trauma are set out at Table 7. The results suggest that women who experienced childhood trauma

were 41% more likely to be classified with a non-emotionally available zone during mother-infant interaction at six months postpartum.

Childbirth experience. Women mostly endorsed items assessing their own capacity during the birth ($M = 2.58$; $SD = .46$; range = 1 to 4), with only 1% of the sample selecting the lowest rating for the domain. The domain with the lowest ratings was professional support in the birth ($M = 2.12$; $SD = .99$), with 28.5% of women recording the lowest endorsement for that domain. Women mostly endorsed items assessing their participation ($M = 2.06$; $SD = .55$); and safety ($M = 2.17$; $SD = .63$) in the birth, with only 3% and 6.4% of women (respectively) providing the lowest ratings for those domains. The results suggest that women who endorsed more negative childbirth experience were 4% more likely to be classified with a non-emotionally available zone during the mother-infant interaction at six months postpartum (Table 7).

Stressful life events. During pregnancy 13.8% ($n = 29$) of women reported three or more stressors, and 16.2% ($n = 34$) of women reported three or more stressors at six months postpartum. The frequencies of EA for women who experienced three or more stressful life events are set out at Table 7. The results suggest that women who experienced three or more stressful life events in pregnancy or the postpartum were 67% and 61% (respectively), more likely to be classified with a non-emotionally available zone during the mother-infant interaction at six months postpartum.

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 132

Table 7. Frequency of Maternal EA Zone According to the Type of Maternal Trauma Reported and Unadjusted Odds Ratios for Maternal EA According to Maternal Trauma Type at Six Months Postpartum ($N = 211$).

	Not-EA			Total Not-EA ^d ($n = 125$)	EA ($n = 86$)	<i>OR</i>	<i>95% CI</i>
	Complicated ($n = 72$)	Detached ($n = 48$)	Problematic ($n = 5$)				
	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>		
Moderate to severe childhood trauma ^a ($n = 42$)	16 (22.2)	10 (20.8)	3 (60.0)	29(23.2)	13 (15.1)	.59	.29 - 1.21
Negative childbirth experience ^b ($n = 102$)	36 (50.0)	22 (45.8)	3 (60.0)	61 (48.8)	41 (47.7)	.96	.55 - 1.66
<i>Stressful life events^c</i>							
Three or more antenatal ($n = 29$)	10 (13.8)	13 (27.1)	0 (0.0)	23 (18.4)	6 (7.0)	.33*	.13 - .86
Three or more postnatal ($n = 34$)	11 (15.3)	16 (33.3)	2 (40.0)	29 (23.2)	9 (10.5)	.39*	.17 - .87

^a Measured by the Childhood Trauma Questionnaire; ^b Measured by the Childbirth Experience Questionnaire; ^c Measured by the Stressful Life Events Questionnaire.

^d Total number of women who received a non-emotionally available zone (i.e., complicated, detached or problematic) for each type of maternal trauma measured.

* $p < .05$.

5.4.3. Maternal trauma and maternal EA at six months postpartum.

The descriptive statistics and bivariate correlations for all of the variables included in the modelling are presented in Table 8. Pearson correlations demonstrated a small-to-moderate effect between maternal childhood trauma and EAS dimensions: maternal sensitivity, maternal structuring, and maternal non-intrusiveness. Similarly, a small to moderate effect was observed between postnatal stressful life events and maternal sensitivity, maternal structuring, maternal non-intrusiveness, and maternal non-hostility. Of the EAS dimensions, maternal depression showed an association with maternal non-hostility only. Of the covariates maternal age showed the strongest association with maternal sensitivity, maternal structuring, maternal non-intrusiveness and maternal non-hostility, and maternal education with maternal sensitivity and non-hostility. This provided evidence for predictors in the final model including childhood trauma, as well as the mediation effects of childbirth experience and stressful life events in pregnancy and the postpartum, as well as covariates maternal depression, age and tertiary education.

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 134

Table 8. Descriptive Statistics and Bivariate Correlation Coefficients for all Variables in the model ($N = 211$)^a

	1	2	3	4	5	6	7	8	9	10	11
1. Sensitivity											
2. Structuring	.87**										
3. Non-intrusiveness	.73**	.69**									
4. Non-hostility	.75**	.75**	.63**								
5. Moderate-to-severe childhood trauma ^b	-.18*	-.16*	-.26**	-.11							
6. Childbirth experience	-.03	-.03	-.04	-.01	.04						
7. Antenatal stressful life events ^c	-.12	-.10	-.10	-.08	.33**	-.15*					
8. Postnatal stressful life events ^d	-.20**	-.25**	-.14*	-.19**	.22**	.12	.30**				
9. Maternal age	.16*	.19**	.24**	.22**	-.07	.05	.08	.08			
10. Education	-.15*	.13	.104	.17*	-.06	.15*	.04	-.15*	.08		
11. Depression ^e	-.11	-.10	-.02	-.14*	.15*	-.00	.14*	-.06	-.14*	.04	
Mean	21.71	22.58	20.45	25.09	.26	31.49	1.47	1.26	31.50	.68	.28
SD	4.66	3.91	4.83	3.15	.44	6.20	1.23	1.50	4.67	.47	.45

^a 211 dyads were analysed - one woman had twins so was recorded separately with each infant.

^b Any correlations with this variable are point biserial.

^c Antenatal stressful life events measured as a count variable of stressful life events in pregnancy.

^d Postnatal stressful life events measured as a count variable of stressful life events at six months postpartum. ^e Depression measured using the SCID-IV-TR in early pregnancy and at six months postpartum.

The model was a good fit to the data (CFI = .97, TLI = .95, SRMR = .05, RMSEA = .06 [95% CI = .03 - .08]); path coefficients for the model are displayed in Figure 4. Collectively the model explained 13.3% of the variance in maternal EA ($r^2 = .13$, $p = .008$). The results for the model supported the first hypothesis with a significant direct negative effect of maternal childhood trauma to latent factor maternal EA, such that mothers who reported moderate-to-severe childhood trauma displayed significantly lower EA to their child during the interaction task at 6 months postpartum (Figure 4). The size of the effect between maternal childhood trauma and each of the observed EA sub-factors is proportionate to the individual loadings on the latent factor, maternal EA. The model also demonstrated a significant direct pathway between postnatal stressful life events and maternal EA, such that each additional stressful life event experienced by the mother at 6 months postpartum was associated with lower emotional availability to their child during the interaction task at 6 months postpartum (Figure 4). However, the other direct pathways between both proximate factors childbirth experience and antenatal stressful life events, with the latent factor maternal EA were not significant (Figure 4).

Maternal childhood trauma showed a significant direct association with both childbirth experience, as well as stressful life events in pregnancy and the postpartum (Figure 4). This indicates that women who experienced childhood trauma were also more likely to report negative childbirth experience, and report more stressful life events during both in pregnancy and the postpartum

5.4.5. Indirect Pathway Analyses Testing Mediation Hypotheses. Addressing the second hypothesis about mediating pathways, the hypothesized indirect pathway between maternal childhood trauma and maternal EA first through childbirth experience, and a second sequential indirect pathway through antenatal and postnatal stressful life events were each not

significant (Figure 4). To address the final hypothesis regarding a specific mediating pathway between maternal childhood trauma and maternal EA, through each of the proximate traumas in order of their occurrence (i.e., stressful life events in pregnancy to childbirth experience to stressful life events in the postpartum) was not significant (see Table 9). Our model does not support the transmission of the effect of childhood trauma on maternal EA sequentially through specific traumatic experiences in pregnancy, a negative child-birthing experience and further specific traumatic experiences in the postpartum.

In addition to the specific hypothesised indirect pathways, the sum of all indirect pathways from maternal childhood trauma to maternal EA was not significant, ($\beta = -.05$, $p = .159$). Standardised indirect effects between childhood trauma and maternal EA through each of the proximate traumas are set out at Table 9, as well as the composition of the total effect. Consequently, our data does not support a combined effect of all the indirect pathways starting at maternal childhood trauma through proximate trauma specific to the perinatal period to maternal EA. Although the total indirect effect accounted for almost one-quarter of the total effect from maternal childhood trauma to maternal EA, our data demonstrates the strength of the effect of childhood trauma on observed maternal EA at 6 months postpartum in the context of more proximal traumas. Relative the total indirect effect, the direct effect of moderate-to-severe childhood trauma accounted for more than three-quarters of the total effect on maternal EA.

With the inclusion of maternal depression and maternal education as covariates in the model, the model did not account for a significant unique proportion of variance in maternal EA. Maternal age was a significant predictor, with results indicating that women who were one standard deviation older ($SD = 4.67$) than the average age of the sample ($M = 31.50$) scored, on average, .20 of one standard deviation higher on the latent maternal EA factor ($p = .007$).

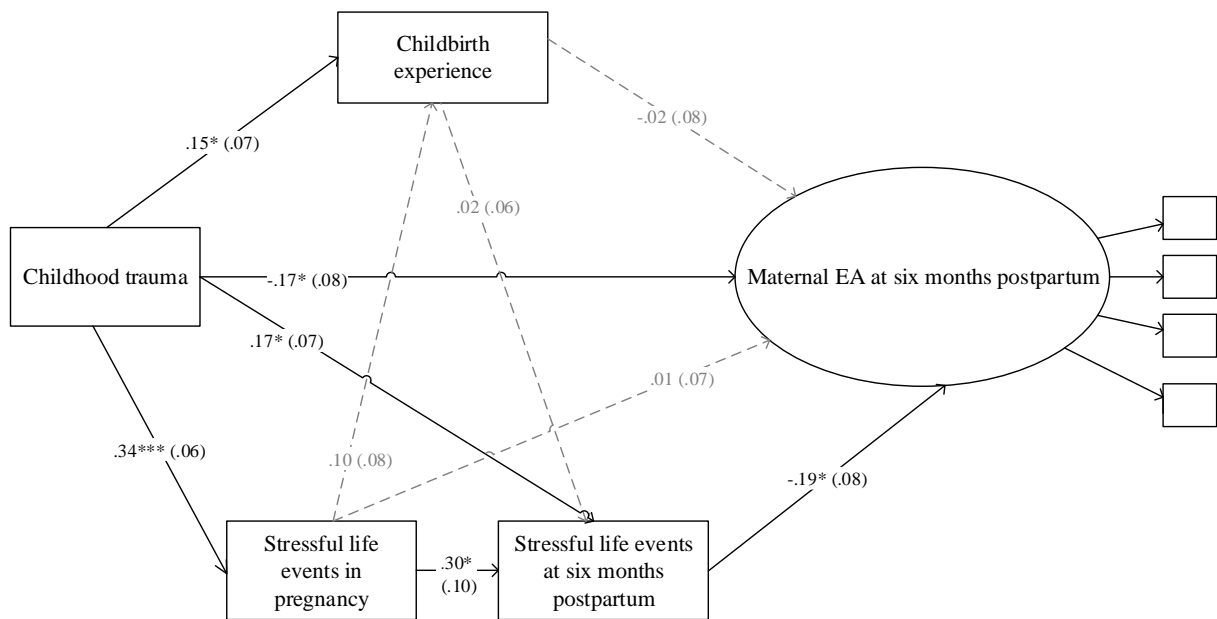


Figure 4. Final multiple mediation model with standardised parameter estimates with parenthesized standard errors. Although not shown in the model we included covariates perinatal maternal depression, maternal age and maternal education.
 $p > .05$; *** $p > .001$.

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 138

Table 9. Standardised indirect effects in the multiple mediation model between distal trauma from childhood and proximate traumas from childbirth experience and stressful life events in pregnancy and the postpartum ($N = 211$).

	<i>B</i>	<i>95% CI</i>	<i>S.E.</i>	<i>p-value</i>
Childhood trauma ^b → Childbirth experience ^c → Maternal EA	-.002	-.03, .03	.01	.868
Childhood trauma → Antenatal SLE ^d → Maternal EA	-.01	-.04, .06	.03	.841
Childhood trauma → Postnatal SLE ^d → Maternal EA	-.03	-.08, -.001	.02	.108
Childhood trauma → Childbirth experience → Antenatal SLE → Maternal EA	-.001	-.01, .01	.003	.880
Childhood trauma → Childbirth experience → Postnatal SLE → Maternal EA	-.001	-.01, .004	.002	.728
Childhood trauma → Antenatal SLE → Postnatal SLE → Maternal EA	-.02	-.05, -.001	.01	.112
Childhood trauma → Antenatal SLE → Childbirth experience → Postnatal SLE → Maternal EA	<-.001	-.002, .001	.001	.787
Sum direct effect	-.17			
Sum indirect effect	-.05			
Total effect	-.22			
Ratio (indirect/total)	23.39%			

^a The reported effects included covariates maternal depression, maternal age and maternal education.

^b Childhood Trauma Questionnaire; ^cChildbirth Experience Questionnaire; ^dStressful Life Events Questionnaire.

5.5. Discussion

To our knowledge, this is the first study to analyse the relationship between distal trauma in childhood and maternal EA, and test using a multiple mediation analyses, whether it is mediated by proximate trauma specific to the perinatal period in childbirth experience or stressful life events. Consistent with our first hypothesis, the direct negative effect of maternal childhood trauma on maternal EA at six months postpartum, whilst controlling for the covariates, was sustained. Whilst we observed direct pathways between maternal childhood trauma and antenatal and postnatal stressful life events, the pathway between childhood trauma and maternal EA was not clearly mediated by stressful life events in pregnancy and the postpartum. Similarly, though we observed direct pathways between maternal childhood trauma and childbirth experience, the pathway between childhood trauma and maternal EA was not mediated by childbirth experience. These findings indicate that the presence of maternal childhood trauma alone is associated with lower maternal EA within the mother-infant relationship, though this is not influenced by childbirth trauma experience, and it may not be influenced by stressful life events.

Our findings supporting a negative association between women's experience of childhood trauma and maternal EA is consistent with the existing studies (Moehler et al., 2007; Driscoll & Easterbrooks, 2007; Fuchs et al., 2015). However, of those studies, Fuchs et al. (2015) is the only study that relies upon interaction samples of the recommended length of 15 minutes or more (Biringen et al., 2014). Using 119 mother-infant dyads, the EA of mothers with childhood trauma did not differ significantly at five months postpartum compared to mothers without childhood trauma history; however, by 12 months postpartum there was a medium difference between the two groups (Fuchs et al., 2015). The authors concluded there might be a window period for clinical intervention before childhood trauma history may influence non-normative mother-infant dynamics. If we apply Fuch's findings to

our study, then we would expect the direct association observed between maternal childhood trauma and maternal EA at six months postpartum, to increase by 12 months postpartum. Our study also extends the understanding of the relationship between maternal childhood trauma and maternal EA, as unlike the existing studies that focus on physical and sexual abuse only, we included emotional and physical neglect. Moreover, we understand this study to be the first to acknowledge the possibility of proximate trauma specific to the perinatal period that might also contribute to a reduction in maternal EA. Consequently, our findings make a valuable contribution to a limited EA literature that investigates maternal trauma using mother-infant dyads, by utilising a sample of over 200 mothers and infants using interactions of at least 40 minutes.

In addition, our findings may have implications for our understanding of the EAS and the parenting constructs it is measuring. Since Ainsworth and colleagues (1978) first proposed maternal sensitivity as the most important antecedent to attachment quality, researchers have both refuted (e.g., Goldsmith and Alansky, 1987), and supported this notion (e.g., Aviezer, Sagi, Joels, & Ziv, 1999). Though evidence supports the identification of other parenting qualities in the assessment of the parent-child relationship (e.g., Stack et al., 2012), our results indicate that the parental EA scales may in fact represent one dimension. Future research needs to assess whether the one dimension underlying the EAS may in fact be maternal sensitivity, and therefore indicate no advancement on Ainsworth's findings.

According to our findings, childbirth experience did not mediate the relationship between maternal childhood trauma and maternal EA, with no direct effect of childbirth experience on maternal EA either. This lack of association might reflect methodological differences in the examination of childbirth and the mother-infant dyad in the literature. Although Parfitt and Ayers (2009) noted a relationship between Post-Traumatic Stress Disorder (PTSD) symptoms after birth and the parent-infant bond, their evidence is

correlational, with a small effect size, and evidence from other studies is mostly observational (e.g., Ballard, 1995; Allen, 1998). It is also worth considering the relevance of timing of assessment of the mother-infant dyad. Davies et al. (2008) reported that women with PTSD symptoms perceived their infant as less 'warm', more invasive and temperamentally challenging when compared to women without PTSD symptoms, however, maternal perception of the attachment relationship was measured at six weeks postpartum. In contrast, we assessed the mother-infant dyad at six months postpartum. Women who experience traumatic birth might plausibly have more negative representations of the infant in the first few months after childbirth, though by six months postpartum the effects of the childbirth experience on the mother's feelings towards the infant may have resolved. Future longitudinal research is required to test this hypothesis.

While not associated with EAS, we did find a significant effect of maternal childhood trauma on the negativity of women's childbirth experience. This is consistent with existing research (Soet, Brack & Dilorio, 2003). Lev-Wiesel, Daphna-Tekoah, & Hallak (2009) reported that women with childhood sexual abuse history showed higher PTSD scores following childbirth than women without childhood trauma. This might be because women with a history of childhood trauma may be more sensitive to pain and distress during delivery, or to experience a loss of control around the birth procedures (Lev-Wiesel, Chen, Daphna-Tekoah & Hod, 2009; Ayers, 2004). Childbirth requires pain tolerance, as well as careful communication, cooperation and responsiveness to medical staff. Childhood trauma might disrupt the development of socio-emotional skills (Gibb, Schofield & Coles, 2009; Beck, Grant, Clapp, & Palyo, 2009), so one can hypothesize how individuals with childhood trauma history might be more susceptible to experience childbirth as traumatic. This is valuable clinical information for practitioners, as it suggests that women with childhood trauma history should be monitored more closely during pregnancy, with consideration

provided towards clinical support in preparing for the event of childbirth, to reduce the likelihood of a traumatic childbirth experience.

Contrary to our expectations, maternal exposure to antenatal and postnatal stressful life events did not sequentially mediate the relationship between maternal childhood trauma and maternal EA. Whilst the bootstrapped distribution for the indirect effect of postnatal stressful life events as a mediator indicated with 95% confidence that the upper estimate is bordering on significance, this is likely to translate to a negligible effect, particularly in the context of the other hypothesized pathways. Interestingly, we observed a direct effect of stressful life events at six months postpartum on maternal EA. This finding reflects related research regarding parental perception of the infant and parenting stress. Mäntymaa, Puura, Luoma, Salmelin and Tamminen (2006) observed that parental stress (examined by Parenting Stress Index) increased the likelihood by ten-fold of the infant being perceived by the parent as difficult (examined by Infant Characteristics Questionnaire). This replicated findings from previous studies (Gelfand, Teti & Fox, 1992; Ostberg & Hagekull, 2000), which indicates the emerging evidence about maternal stress exposure and the risk it poses to mother-infant outcomes, including the mother-infant relationship.

Although we did not observe a total indirect effect between maternal childhood trauma and maternal EA mediated by the proximate traumas in our sample, replication of these results is needed with data collected using variations in methodology and study design. The direct associations observed in our model between maternal childhood trauma and each of the proximate traumas, support the theory that individuals who experience trauma may be more likely to experience subsequent trauma (Kessler, 2000). In addition, our model supported a direct negative effect of maternal childhood trauma and postnatal stressful life events on maternal EA. The lack of significance in our indirect effects may be a product of our approach to operationalizing both stressful life events and childbirth experience. We

measured women's exposure to stressful life events as a sum of common stressful events; however, it is possible that a woman might be exposed to a stressor and not experience adverse psychological or emotional effects that inhibit the ability to emotionally connect with her infant. It would be interesting to test the same relationships in our model capturing stressful life events based on a woman's subjective experience of the stressful event. Similarly, for childbirth experience, it is whether the woman has adverse psychological or emotional effects (e.g., testing for PTSD symptoms and/or presence of a disorder) by reason of childbirth that might reduce her EA, rather than the rating of the childbirth experience as negative alone.

Maternal depression and maternal education were not significant covariates in our model. Maternal age was the only covariate that accounted for a significant proportion of the variance in maternal EA. Women who were older than the average age of the sample showed higher maternal EA. Given the focus in the developmental literature around age and parenting capacity generally focuses on the risks associated with adolescent or younger mothers (Easterbrooks et al., 2005), this information provides a different perspective on the positives of increased maternal age in the context of parenting capacity.

The findings in this study support early identification of mothers with moderate to severe childhood trauma history, as well as those exposed to current stressful life events for clinical intervention. This may require clinicians working with women in the perinatal period to consider questions from measures such as the CTQ or other assessments of ACEs to ascertain whether there has been a history of childhood trauma. It is possible that with the provision of resources and support to those women, that the risk of reduced capacity to deliver emotionally available care to the infant may be mitigated. Our findings do not justify screening for childhood trauma, with additional research required to address the time, cost

and possibility of false positives and overtreatment that can be associated with screening procedures (Finkelhor, 2018).

5.5.1. Limitations. This study examined for the first time the specific pathways between maternal childhood trauma and maternal EA to determine whether it is mediated by antenatal and postnatal stressful life events, or childbirth experience, but it is not without its limitations. Whilst one quarter of the women recruited for this sample had experienced childhood trauma, the majority had a university education (69.2 %), were in a relationship (95.2%), and were over the age of 30 years. A sample of women with more of the psychosocial characteristics associated with increased vulnerability, such as younger and less educated mothers, might show a greater effect of different types of maternal trauma on maternal EA. Moreover, given that over 90% of our sample was a first time mother, it is possible that parity may influence the effect of maternal trauma on maternal EA in a sample comprising of more women with other children. This study also does not account for the impact of social support, a protective factor that might reduce the impact of maternal trauma on the mother-infant relationship (Schumm, Briggs-Phillips & Hobfall, 2006).

Another limitation is the possible under-reporting of maternal trauma by women in the sample. This is a common issue in trauma research (Kessler et al., 2017), or clinical practice, and may be even more prevalent in a sample that includes clinically depressed women due to recall bias (Gotlib, 1983). We attempted to address this issue in our data collection by providing women with the measures to report trauma history rather than asking the women by interview. Another way to address the under-reporting of trauma may be to consider the use of questions regarding ACEs (see, Felitti et al., 1998).

5.5.2. Conclusion. There has been an increasing focus on the transmission of trauma to infant development, and whilst research has assessed the relationship between maternal childhood trauma and the mother-infant relationship (Muzik et al., 2013; Lyons-Ruth &

Block, 1996), the assessment of the quality of the mother-infant relationship has primarily relied upon parenting self-report measures. This study broadens the understanding about the effects of trauma on the mother-infant relationship. Using observational evidence, our findings confirm that the early experience of childhood trauma can impact on a woman's EA to her infant at six months postpartum. In addition, we can see that more proximate trauma in the perinatal period from stress exposure may need further investigation, with preliminary evidence for some impact on the mother-infant relationship. In analysing the influence of distal and proximate trauma exposure, this paper highlights the effect of childhood trauma on maternal EA may not be reduced by more proximate traumas. Consequently, it is mothers with childhood trauma history, a factor present even before conception, which may need clinical support to enhance the relationship with their infant so the impact of their own childhood experiences might be minimised.

Chapter 6: Study Three

Maternal Psychosocial Predictors of Pacifier Use: Findings from the MPEWS

Pregnancy Cohort.

This chapter includes a modified version of a co-authored paper that is under review. The bibliographic details of the co-authored paper including all authors are:

MacMillan, K.K., Lewis, A.J., Watson, S., Power, J., & Galbally, M. (2020; *under review*).

Maternal psychosocial predictors of pacifier use: findings from the MPEWS pregnancy cohort. *Journal of Infant Behaviour*.

My contribution to the paper involved:

I coded 194 of the 211 mother-infant interactions that comprise the data and identified each of the mother-infant dyads for pacifier use, was involved in preparation of the data, formulated the questions, analysed the data, and drafted the manuscript.

A.J. Lewis contribution to the paper involved:

Collaboration regarding the formulation of the questions and the data analytic approach, reviewed the manuscript, suggesting edits. Chief investigator on both the grants and ethics for the study and co-designed and co-supervised the 6 month assessment data collection.

S.Watson contribution to the paper involved:

Preparation of the data, collaboration regarding the data analytic approach, reviewed the manuscript, suggesting edits.

J. Power contributon to the paper involved:

Assessed 11 of the 211 mother-infant interactions, and provided the interrater reliability for the EAS coding as well as the identification of pacifier use.

M.Galbally contribution to the paper involved:

Led the grants and ethics for the overall study data collection including the pregnancy and 6 month data used and co-designed and co-supervised the 6 month assessment data collection

with A.J.Lewis. Provided supervision regarding the assessment of the 211 mother-infant interactions as well as collaboration regarding the identification of pacifier use by mothers during the mother-infant interaction, collaborated regarding the formulation of the questions, reviewed the manuscript, suggesting edits.

The 6 month assessments were undertaken by Tina Vaiano, Brittany Watkins, Alexandra Flowers, Rebecca Knapp and Emma Austin from the Mercy Hospital, Melbourne.

6. Maternal Psychosocial Predictors of Pacifier Use: Findings from the MPEWS

Pregnancy Cohort.

6.1 Preface

This dissertation examines the psychosocial predictors of maternal EA at six months postpartum. Chapters Four and Five examined maternal depression and maternal childhood trauma as maternal psychosocial predictors of maternal EA at six months postpartum. The findings of empirical studies one and two indicate that mothers with perinatal depression might still engage in an emotionally available interaction with their infant, and that maternal childhood trauma accounted for more of the variance in maternal EA at six months postpartum. Chapter Six addresses a controversial issue for perinatal mental health: pacifier use during mother-infant interaction. Though pacifier use is documented worldwide (Nelson, Yu, Williams, 2005; Clements et al., 1997; Victora, Behague, Barros, Olinto & Wiederpass, 1997; Callaghan Kendall, Lock, Mahony, Payne & Verrier, 2005; Binns & Scott, 2002), with a substantial body of research devoted to understanding the implications of its use (Horne, Hauck, Moon, L'Hoir & Blair, 2014; Mitchell et al., 2006), there is very little understanding of whether pacifier use is more likely to occur during a mother-infant interaction if women have depression, a history of childhood trauma or are not emotionally available.

Chapter Six includes the third of the empirical studies that assesses the psychosocial predictors of pacifier use in a mother-infant interaction task at six months postpartum. Using multivariate logistic regression analyses we test the predictive ability of maternal psychosocial predictors - childhood trauma, depression and EA - to gain an insight into the maternal behavior observed in the 211 mother-infant interactions that comprise the MPEWS dissertation sample.

Whilst in the previous chapters we conceptualized the EAS as a single latent variable, maternal EA, a different approach was required for this final empirical study which was designed to produce a relevant finding for clinicians regarding pacifier use during the mother-infant interaction. Chapter Six contains a pilot study of a common maternal behavior (i.e., pacifier use; Mauch et al., 2012), however, to the best of our knowledge, it is the first time that this particular behavior has been analysed in the context of the mother-infant interaction. By applying the EA zone to classify women as emotionally available or not, the information derived from the analysis is capable of answering the question of whether women who are emotionally available to their infant at six months postpartum are more or less likely to use a pacifier during the mother-infant exchange. This could provide a starting point for the development of clinically relevant information regarding a somewhat controversial feature of the mother-infant repertoire (Jenik & Vain, 2009).

6.2 Introduction

Pacifiers are used by parents for their infants including as an aide to assist in sleep and settling. The use of pacifiers to settle infants to sleep has been investigated in relation to its impact on breastfeeding (e.g., Barros, Victora, Semer, Tonioli, Tomasi, & Weiderpass, 1995; Righard & Alade, 1997; Aarts, Hornell, Kylberg, Hofvander & Gebre; Medhin, 1999, Marques et al., 2001), child safety, (e.g., L'Hoir et al., 1999), as well as medical (e.g., middle ear infection; Niemelä, Uhari, Mottonen, 1995; pain relief; Elserafy, Alsaedi, Louwrens, Sadiq & Mersal, 2009) and immunological outcomes (e.g., Mäkinen-Kiljunen, Sorva, Juntunen-Backman, 1992). Whilst there is a substantial body of research on the use of a pacifier particularly to settle to sleep there is more limited knowledge on pacifier use outside of the sleep context. Conversely, pacifier use remains a controversial issue (Jenik & Vain, 2009), even though as an object designed to soothe an infant, it is possible that the pacifier may enhance maternal capacity to engage during the mother-infant interaction.

Understanding maternal predictors of broader pacifier use is therefore important to inform recommendations to mothers around their use. The current study examines several maternal psychosocial predictors of pacifier use within the context of a pregnancy cohort study.

Pacifiers, colloquially also known as a *dummy*, *soother*, or *comforter*, are designed to stimulate nonnutritive sucking (NNS) in order to soothe or calm the infant. Such soothing is sometimes used to facilitate the transition to sleep but may also be used to reduce infant distress. Studies suggest that pacifier use is common, with one study showing that of 670 Australian mothers, 79% had introduced the pacifier (Mauch et al., 2012). Similarly, in another population-based Australian study, of 22,202 mother-infant pairs, Ayton et al. (2015) reported pacifier use in 53.1% of the sample, with these rates reflecting that of previous studies (e.g., Binns et al., 2002). Pacifier use is also documented worldwide, in Japan (Nelson, Ly-Mee Yu, Williams, 2005), the United Kingdom (Clements et al., 1997), the Netherlands (Arnestad, Andersen & Rognum, 1997), Brazil (Victora, Behague, Barros, Olinto & Wiederpass, 1997), Sweden (Aarts et al., 1999), the Ukraine (Nelson et al., 2005), Finland (Niemela et al., 1995), and Australia (Callaghan et al., 2005; Binns et al., 2002).

There are a number of studies designed to assist women to make decisions about the use of a pacifier. Whilst some empirical evidence recommends that breastfeeding mothers consider pacifier introduction only after breastfeeding is well established (Horne, Hauck, Moon, L'Hoir & Blair, 2014), other studies document benefits of pacifier use. For example, pacifier use is recommended for sleeping periods only, with the potential to reduce the risk of Sudden Infant Death Syndrome (Mitchell, Blair & L'Hoir, 2006; Hauck, Omojoken, Siadaty, 2005); though, this might only apply to infants in adverse sleep environments (e.g., sleeping position, co-sleeping, or soft mattress; Moon, Yang, Tanabe, Young & Hauck, 2006). In addition to the role in settling an infant to sleep, the benefit of pacifier use for pain relief is

acknowledged, particularly in pre-term babies (Blass & Hoffmeyer, 1991; Carbajal, Chauvet, Couderc & Oliver-Martin, 1999; Pinelli & Symington, 2005).

Pacifiers are also used to soothe a distressed infant without the necessary aim of falling asleep. In 174 mother/infant dyads, Pansy, Zotter, Sauseng, Schneuber, Lang and Kerbl (2008) used a semi-structured questionnaire to document mothers' reasons for pacifier use after birth, at seven weeks and at five months. A reported 31% of mothers who initially refused pacifiers had later introduced a pacifier to soothe their infant. The authors speculated that this change might be driven by a reduction in the use of more traditional methods of soothing (e.g., rocking, carrying or breastfeeding; Kramer et al., 2001). It has further been questioned whether use of these other 'traditional' methods, and in particular breastfeeding, might promote the early mother-infant connection (Satter, 1990). Pacifier use for the women in this study may be an important part of their ability to respond to infant distress. Despite the complexity of the implications that pacifier use may have on the mother-infant interaction, to our knowledge, no study has examined pacifier use in the context of the mother-infant relationship, or how maternal psychosocial factors, such as history of childhood trauma and current mental health, might predict pacifier use.

The emotional availability (EA) framework can facilitate the investigation of maternal use of a pacifier within the context of the early mother-infant relationship. From the point of view of attachment theory, the ability to soothe is a core component of an EA relationship between mother and infant (Biringen & Easterbrooks, 2008; Emde, 1980). According to this theoretical model, a sensitive mother accurately interprets their infant's signals and needs, and responds appropriately and effectively (Ainsworth, Bell & Stayton, 1974). EA theorists (see, Emde, 1980; Emde & Easterbrooks, 1985; Biringen, 2004) propose that the EA framework facilitates the assessment of the quality of a mother-infant interaction (Biringen, Derscheid, Vliegen, Closson & Easterbrooks, 2014). EA is the supportive maternal presence

in the context of an infant's autonomy and exploration (Mahler, Pine and Bergman, 1975). Most importantly, the construct refers to the affective quality of the connection between the mother and her infant (Emde & Easterbrooks, 1985). A relational and inter-subjective construct, EA requires the evaluation of how each person affects the other, rather than just how the person behaves (Biringen et al., 2014). Notably, it is possible that pacifier use will interfere with the capacity of the mother or the infant to read emotional expression (see, Rychlowska et al., 2014; Niedenthal et al., 2012). Equally, however, pacifier use might reduce the maternal stress that could result from infant crying. This might be of particular importance for vulnerable mothers with mental health difficulties. With prevalence estimates in Australia that suggest as many as 16% women experience depression in the postnatal period (Buist & Bilszta, 2006), it is possible that women with maternal depression might be more likely to rely on a pacifier during a mother-infant interaction.

We located two studies that examined pacifier use in the context of maternal depression. Feldens, Ardenghi, Cruz, Scalco and Vitolo (2013) examined 375 Brazilian women and noted that those women who reported moderate-to-severe depressive symptoms at 12 months postpartum were 40% more likely to use a pacifier in the first year than other women in the sample. However, their examination of pacifier use relied on maternal self-report (Gresham, Forder, Chojenta, Byles, Loxton & Hure, 2015). Conversely, Sipsma, Kornfeind and Kair (2017) observed that pacifier use increased the likelihood of exclusive breastfeeding by over three-fold for mothers who reported seeking treatment for depression in pregnancy but decreased the likelihood of exclusive breastfeeding by 25% for mothers that did not report seeking treatment for depression in pregnancy. They concluded that pacifier use might be beneficial for women at risk of postpartum depression. However, depression was measured by asking mothers to report if they felt 'needed any of the following services' including 'treatment for depression'. Someone might be experiencing depressive symptoms

or meet the criteria for depression diagnosis and not recognise their need for treatment (Goldman, Nielsen, & Champion, 1999), or even have self-insight into their symptoms (Taylor & Brown, 1988). It is questionable whether this study even examined women at risk of depression. Taken together, this provides a basis for investigating the association between maternal depression and pacifier use.

Closely linked to depression in adulthood is childhood abuse (Norman et al., 2012). With evidence to suggest that maternal experience of child abuse might impact on parenting ability (DiLillo & Damashek, 2003; Smith, Cross, Winkler, Jovanovic, & Bradley 2014), the examination of maternal use of the pacifier during mother-infant interaction requires consideration of maternal childhood trauma as a factor. It is not known whether mothers with a history of childhood trauma are more or less likely to use a pacifier with their infant. In fact, the literature analyzing the relationship between maternal childhood trauma on the early mother-infant interaction is limited. However, evidence points to a large effect of maternal history of childhood maltreatment on the development of maternal sensitivity and non-intrusiveness when compared to mothers without an abuse history at 12 months postpartum (Fuchs, Mohler, Resch & Kaess, 2015). These findings replicated other research in which maternal physical and sexual childhood abuse showed a medium sized association towards hostile-intrusive maternal behavior to infants at 18 months (Lyons-Ruth & Block, 1996). Collectively, this research suggests that women with childhood trauma history might show dyadic differences, particularly in relation to intrusiveness. An increased likelihood of maternal intrusiveness during the mother-infant interaction is consistent with the need for interpersonal control that is documented in the context of childhood trauma experience (Lawrence, Edwards, Barraclough, Church & Hetherington, 1994). It is possible that women with childhood trauma history may be more likely to rely on pacifier use during the mother-infant interaction.

In contrast, there is a substantial body of literature examining the relationship between breastfeeding and pacifier use, although the focus is primarily on the impact of the pacifier on sustaining and establishing breastfeeding (Centuori et al., 1999). For instance, Righard and Alade (1997) reported the breastfeeding rate for non-pacifier users at four months was 91% compared to 44% in the pacifier group. The few randomized controlled trials (RCTs) conducted show a relationship between early pacifier use and breastfeeding difficulties. For example, in an RCT involving 700 newborns, Howard, Howard, Lanphear, Eberly, Oakes, & Lawrence (2003) noted that exclusive breastfeeding was 1.5 times less likely for mothers who introduced the pacifier in the first four weeks postpartum. This was replicated in an Australian longitudinal study that reported infants who had the pacifier introduced before ten weeks were 1.47 times more likely to discontinue full breastfeeding by six months (Scott, Binns, Oddy & Graham, 2006). Consequently, breastfeeding must be included as a covariate in any investigation of the psychosocial drivers of this maternal behaviour.

Ultimately to understand the maternal behavior of pacifier use it must be seen within the context of the mother-infant relationship in which it occurs. Infant distress and crying is a common source of parenting stress (Beebe, Casey, Pinto-Martin, 1993), particularly in the first year as the mother is learning how to identify and respond to the infant's cues (Ainsworth, 1979). If a mother reduces infant distress using the pacifier, the infant will provide positive feedback to the mother, which may enhance maternal self-efficacy and create a reciprocal emotional exchange between the mother and infant (Biringen & Easterbrooks, 2012). For those mothers with depression or childhood trauma history, it is possible that reliance on the pacifier during the mother-infant interaction may be an effective tool to reduce stress and increase enjoyment, both core components of an emotionally available interaction.

There may also be complex interactions between depression, breastfeeding and the use of a pacifier. Sipsma, Kornfeind and Kair (2017) recently noted that introduction of a pacifier in hospital increased the likelihood of exclusive breastfeeding by over three fold for mothers who were at high risk for postnatal depression, but decreased the likelihood of exclusive breastfeeding by 25% for those at low risk for postnatal depression. However, they measured depression by asking mothers to report if they felt ‘needed any of the following services’ including ‘treatment for depression’. Someone might be experiencing depressive symptoms or meet the criteria for depression diagnosis and not recognise their need for treatment (Goldman, Nielsen, & Champion, 1999), or even have self-insight into their symptoms (Taylor & Brown, 1988). It is questionable whether this study even examined women at risk of depression.

6.2.1. Aims and hypotheses. In this study we investigate the maternal psychosocial factors associated with pacifier use by using data from a longitudinal pregnancy cohort study, the Mercy Pregnancy and Emotional Wellbeing Study (MPEWS). With videos of mothers interacting with their babies for a minimum of 40 minutes at six month postpartum, observational data regarding pacifier use was collected by the viewing of each interaction and recording of pacifier use. Data was collected at four time points across pregnancy and the postpartum regarding maternal psychosocial predictors of pacifier use: depression, EA, and history of childhood abuse, with the covariate of breastfeeding cessation.

We hypothesized that:

1. women categorized as non-emotionally available to their infants would be more likely to use a pacifier than mothers who were EA;
2. women diagnosed with depression were more likely to use a pacifier than mothers without depression diagnosis; and,

3. women with a history of childhood trauma were more likely to use a pacifier than women without a history of childhood trauma.

Finally, we also sought to determine which of these hypothesized predictors of pacifier use would remain unique additive predictors when included together in a multivariate model.

6.3 Material and Methods

Data were drawn from the Mercy Pregnancy and Emotional Wellbeing Study, a pregnancy cohort study based in Melbourne, Australia (Galbally et al., 2017). Recruitment of women was at less than 20 weeks of pregnancy and initially occurred through antenatal bookings. The Mercy Health Human Research Ethics Committee approved the study with participants providing their written informed consent prior to participation.

6.3.1 Participants. For this study, the sample comprised of the 210 mother-infant dyads (78.44% of the full cohort) that completed the interaction task at the six-month data collection. The MPEWS cohort recruited 282 women. No differences in baseline demographics were observed between the original sample and those included in this study. The depression data used in this study was collected at two time-points: early pregnancy (less than 20 weeks) and six months postpartum. Childhood trauma data was collected retrospectively at 12 months postpartum, and the EA and pacifier data were collected at six-months postpartum. This study examines women who met the criteria for Major Depressive Disorder ($n = 59$) according to the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV, American Psychiatric Association, 2008; SCID-IV-TR, First et al., 1997), and control women who did not meet diagnostic criteria for depression or taking antidepressant medication ($n = 152$). Within those who met criteria for Major Depressive Disorder there were 40 women on antidepressant medication in pregnancy. There were only 210 women because one of the participants had

twins, so was recorded in two dyads ($N = 211$). Details of the study protocol are published (Galbally et al., 2017). Inclusion required English proficiency, with women who experienced complications in pregnancy remaining eligible. Excluded were women diagnosed with bipolar or psychotic disorder, current substance abuse disorder, intellectual disability, child protection involvement, a serious pre-existing physical illness, or a current psychiatric illness requiring inpatient admission.

6.3.2 Procedure. *Mother-infant interaction task.* At six months post-partum, maternal EA was assessed when mothers and their infants attended Mercy Hospital to be recorded in a 40 to 60 minute structured interaction task. All mother-infant interactions comprised of three parts: semi-structured free-play (10 minutes), followed by unstructured play (30 minutes), and time taken to obtain three saliva samples 15 minutes apart (this was done as part of the wider MPEWS study). Mothers were instructed to refrain from feeding throughout the interaction task, and from using any props (not specified) during the semi-structured free play. No specific instructions were provided about pacifier use. For the semi-structured play, mothers were instructed to place their infant on a baby beanbag and to engage in face-to-face interaction with them, “just as they would do at home”. A basket of toys was brought in for the unstructured play including toys such as a rattle, balls, and a spinning top. The infant’s own toys were not used and mothers were asked to refrain from feeding. The interaction was recorded from three angles: en-face to the infant and the mother, as well as another video behind a one-way screen operated by the assessor which captured both parties.

6.3.4 Measures. *Pacifier use.* A researcher certified to assess mother-infant relationships coded pacifier use dichotomously: (1) mother put pacifier in the infant's mouth during the interaction and the infant commenced NNS; or (2) no use of the pacifier. Use of the pacifier during the entry or exit to the interaction was excluded as this might have been for sleep purposes. Interrater reliability of identifying pacifier use of 83.33% was achieved by another member of the MPEWS team also certified to assess mother-infant interactions. One coding disagreement was identified, and it was resolved by the coders' joint-viewing of the interaction, with 100% reliability achieved on the interactions identified for pacifier use following discussion.

Maternal EA. The EAS is designed to evaluate EA by observing and rating parent-child interactions. The EAS are scored on the specific behaviours of the dyad captured by the seven subscales of each dimension, with a higher score indicating increased observation of that dimension, as well as the global ratings reflected by the direct and total scores. In addition, the EAS uses a 100-point scale to assign an EA zone to the adult and child side to the interaction. The EA zone provides an overview of the EA in the dyad, so we used these scores to represent maternal EA. One of the EA zones represents an emotionally available interaction (i.e., highly emotionally available), with the other zones representative of non-emotionally available interactions (i.e., complicated, detached or problematic). It is on this basis that we grouped the women into two groups creating a dichotomous categorical variable to represent maternal EA: (0) emotionally available, and (1) non-emotionally available. This study is examining a maternal behavior, so we were interested in the mother's EA to the child, though the infant's experience is still incorporated into the assessment of maternal EA as a mother cannot look 'good' without their child (Biringen et al., 2014).

Construct validity of the EAS is established by studies documenting a link between EAS scores and infant attachment classification (Biringen & Easterbrooks, 2012). For

example, in 687 mother-infant dyads recorded at 12 months, Ziv, Aviezer, Gini, Sagi and Karie (2000) reported a nine-fold increase in likelihood that infants with secure attachment classification (measured using the Strange Situation procedure) would have mothers that score high on maternal sensitivity. Test retest reliability of mothers and their five-month old infants is recorded using intra-class correlations (ICCs; Bornstein et al., 2006), with good ICCs for inter-rater reliability also noted in home versus laboratory contexts (Bornstein et al., 2006). Cross-cultural applicability is demonstrated by the scales application to dyads from a range of countries (Oyen et al., 2000; Sagi et al., 2002; Ziv et al., 2000).

Recorded mother-infant interactions were scored using the EAS by one of the two MPEWS researchers certified as reliable by Professor Biringen following completion of the formal training program. The coders were blind to the mental health history of the mother and any other individual participant study data at the time of coding. Inter-rater reliability between the MPEWS researchers of $r = .8$ was found on the EA zone in a randomly selected subsample of ten video recordings. Reliability for the direct scores of the maternal scales for the subsample of recordings was calculated using ICC two-way random effects model with absolute agreement (McGraw & Wong, 1996) as follows: sensitivity = .81, structuring = .79, non-hostility = .81, and non-intrusiveness = .89. Disagreements in scoring were minor (i.e., within 1.5 points of each other), and were resolved by the coders' joint-viewing of the interaction thereby reaching agreement on a new score.

Depression. The SCID-IV-TR was administered to assess past or present diagnosis of a depressive disorder (i.e., Major Depressive Disorder or Dysthymia) at recruitment and to screen for bipolar disorder. A modified version was re-administered at six months postpartum to capture new episodes of depression. The SCID-IV has been validated for use in the perinatal period (Gibson et al., 2009). The women who met the DSM-IV criteria for Major Depression or Dysthymia irrespective of antidepressant use at recruitment or six months

postpartum were coded as 1 (women with depression; $n = 59$), and all other women were coded as 0 (not depressed; $n = 152$).

Maternal childhood trauma. Maternal history of abuse was measured by the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1999), a self-administered 28-item questionnaire at 12 months postpartum. This occurred outside the time measurements for this study however because it is a retrospective measure, the time of collection does not change participant responses. The CTQ separately measures child abuse history on five subscales: emotional, physical and sexual abuse, and emotional and physical neglect, with a total score of childhood trauma also derived. With strong psychometric properties in clinical (Bernstein et al., 2003), community (Scher et al., 2001), and mixed samples (e.g., Spinhoven et al., 2014), the CTQ is a leading retrospective assessment tool of childhood maltreatment (Tonmyr et al., 2011). With no report of childhood trauma from many women in this study, the results were positively skewed. Consequently, we applied a severity cut-off score to create two groups: women with no-to-minimal versus moderate to severe trauma according to the total score. Severity cut off scores are set out in the CTQ manual (Bernstein & Fink, 1998), and we used these scores to create binary groups (i.e., none-to-minimal versus moderate-to-severe) for the total score. Women with a history of childhood trauma were coded as 1 (Childhood trauma; $n = 64$) and all other women were coded as 0 (No trauma; $n = 142$).

6.3.5. Covariate: breastfeeding cessation. Breastfeeding cessation was collected by maternal self-report at six months postpartum. We use a binary version of breastfeeding cessation, representing those who had ceased breastfeeding by 6 months (0) and those who reported they were still breastfeeding (1). Breastfeeding was defined as the provision of the mother's milk to her infant either directly from the mother or with expressed milk.

6.3.6. Statistical Analyses. To address the hypotheses of the individual associations with pacifier use, we calculated unadjusted odds ratio (*OR*) using cross-tabulated frequencies, associated significance tests for the *OR* and 95% confidence intervals (*C.I.*) around the *OR*. These analyses were conducted using MedCalc, version 18.11. To address the second hypothesis that each of the hypothesized predictors would remain unique additive predictors in a multivariate model, we conducted multivariate binary logistic regression. We entered our predictors of pacifier use in two blocks. In the first block, we entered only the hypothesized maternal psychosocial predictors of pacifier use: maternal childhood trauma, maternal depression and maternal EA category. In the second block, we tested the adjusted effects of the maternal psychosocial predictors after adding breastfeeding cessation. For the results of this model, we present the estimated maximum likelihood path coefficient (*B*) and associated standard error (*S.E.*), the p-value for the Wald test of significance for *B*, the adjusted *OR* (*aOR*), and a 95% *C.I.* for the *aOR*. The multivariate model was conducted using SPSS version 24 (SPSS Inc., Chicago, IL, USA). Finally, bivariate correlations of the direct scores for the maternal scales of the EAS and pacifier use were conducted to observe the differences in the individual EAS dimensions associated with pacifier use.

6.4. Results

6.4.1. Sample characteristics. Women's mean age at recruitment was 31.50 years (*SD* = 4.67), ranging from 19 to 48 years, and infants' (*n* = 114; 54.0% male) mean age at six months postpartum was 6.76 months (*SD* = 1.08; range: 4.75 – 11.25). Participant demographics and other key variables are presented at Table 10. In this sample, women tended to be married (64%), tertiary educated (69%) and employed (92%) at recruitment. More than one-quarter (28%) of women in the sample met diagnostic criteria for major depressive disorder during the two years leading up to early pregnancy and to 6 months

postpartum. Of those women who completed the CTQ, over one-quarter (31.1%) reported trauma in their childhood classified as being moderate-to-severe.

Table 10. MPEWS Cohort Demographic Characteristics, and Frequencies for Other Key Variables ($N = 210$)^a

Baseline characteristics	<i>N</i>	% ^b
<i>Relationship status</i> ^c		
Not currently in a relationship	10	4.8
In a relationship	64	30.8
Married	134	64.4
<i>Maternal education</i> ^d		
No further study after school	13	6.2
Post-secondary qualification (e.g., apprenticeship/certificate)	51	24.6
Tertiary education	144	69.2
<i>Employment status</i> ^e		
Employed	191	91.9
Unemployed	6	2.9
Other	11	5.2
<i>Depression Diagnosis</i>		
Depressed	59	28.0
Not Depressed	152	72.0
<i>Maternal EA zone</i>		
Emotionally available	86	40.8
Complicated	72	34.1
Detached	48	22.7
Problematic	5	2.4
<i>Maternal trauma</i> ^f		
None-to-minimal	142	68.9
Moderate-to-severe	64	31.1
<i>Breastfeeding</i> ^g		
Breastfeeding	78	40.6
Ceased breastfeeding at six months	114	59.4
<i>Pacifier use in a mother-infant interaction task</i>		
No Pacifier	188	89.1
Pacifier	23	10.9

^a 211 dyads were analysed - one woman had twins so was recorded separately with each infant; ^b Valid percentage shown; ^c Missing = 2; ^d Missing = 2; ^e Missing = 1; ^f Missing = 5; ^g Missing = 5

At six months postpartum, 57.8% ($n = 122$) of mothers self-reported that they had used a pacifier, though for what purpose is not known. The mean age for introducing the pacifier was 4.39 weeks ($SD = 4.71$), ranging between 0 and 27 weeks. Breastfeeding was

initiated for 96.6% of mother/infants, with 21.6% of women stopping by six months postpartum.

6.4.2 Unadjusted Predictors of Pacifier Use. The bivariate frequencies of pacifier use by maternal psychosocial predictors are presented in Table 11. The results suggest that there were more women classified as not emotionally available who used a pacifier during the mother-infant interaction compared to women classified as emotionally available. In fact, women classified as non-emotionally available to their infant were more than three-and-a-half times more likely to use a pacifier than women classified as EA during the interaction at six months postpartum. The unadjusted odds of pacifier use during the interaction task was no higher in women with a diagnosis of major depression compared to no depression diagnosis and women who reported experiencing moderate-to-severe childhood trauma compared to women who reported none-to-minimal childhood trauma. Additionally, unadjusted odds of pacifier use during the interaction for women who had ceased breastfeeding prior to 6 months postpartum were no higher compared to women who reported they were still breastfeeding.

Table 11. Unadjusted Odds Ratios for Hypodissertationed Predictors of Using a Pacifier During a Mother-Infant Interaction Task at Six Months Postpartum.

Baseline characteristics	No Pacifier	Pacifier	<i>OR</i>	<i>95% C.I.</i>
	(<i>n</i> = 188)	(<i>n</i> = 23)		
	<i>n</i> (%)	<i>n</i> (%)		
Not emotionally available	106 (56.4%)	19 (82.6)	3.67*	1.20, 11.22
Diagnosed depression	52 (27.7%)	7 (30.4%)	1.44	.45, 2.94
Ceased breastfeeding by 6 months postpartum	36 (21.2%)	5 (26.3%)	1.34	.45, 3.96
Moderate-to-severe childhood trauma	60 (32.8%)	4 (17.4%)	0.43	.14, 1.32

* $p < .05$

6.4.3 Adjusted predictors of pacifier use in a multivariate model. Descriptive statistics and bivariate correlations between all variables included in the multivariate logistic regression model are presented in Table 12 and results of the logistic regression model are presented in Table 13. In the first block of the model, maternal childhood trauma, maternal depression and maternal EA category were added to predict pacifier use. In this model, maternal EA was the only significant predictor of pacifier use ($p = .027$), such that mothers who were not emotionally available to their infants during the interaction demonstrated increased odds of using a pacifier.

In the second block, breastfeeding cessation was added to assess which of the maternal psychosocial predictors of pacifier use would remain unique additive predictors in the multivariate binary logistic model. As with the first block, Maternal EA remained the only unique predictor of pacifier use, still accounting for a significant amount of the variance ($p = .037$). Indeed, women who were classified as not EA to their infants were at a greater than 3.5-fold increase in odds of using the pacifier during the interaction, while controlling for a history of moderate-to-severe childhood trauma, maternal depression, and breastfeeding cessation. Interestingly, breastfeeding cessation was not significantly associated with pacifier use.

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 166

Table 12. Descriptive Statistics and Zero-order Bivariate Correlation Coefficients for all Variables in the Regression Model ($N = 211$).

	1	2	3	4	5
1. Pacifier use					
2. Maternal EA	.17*				
3. Maternal depression	.02	.11			
4. Maternal trauma	-.11	.18**	.15*		
5. Breastfeeding	-.06	-.24**	-.12	-.04	
Mean	0.11	0.59	0.28	.31	.59
Standard Deviation	0.31	0.49	0.45	.46	.49

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

Table 13. Results of the multivariate binary logistic regression analysis predicting pacifier use in mothers and their six month old infants ($N = 191$).

Block and Variable	<i>B</i>	<i>S.E.</i>	<i>Wald p-value</i>	<i>aOR</i>	95% (<i>C.I.</i>)
<i>Block 1</i>					
Maternal trauma	-.83	.60	.165	0.44	.13, 1.41
Maternal depression	.30	.60	.618	1.35	.41, 4.41
Maternal EA category	1.31	.59	.023	3.69	1.16, 11.75
<i>Block 2^a</i>					
Maternal trauma	-.82	.60	.169	.44	.14, 1.42
Maternal depression	.34	.61	.581	1.40	.42, 4.62
Maternal EA category	1.26	.60	.037	3.51	1.08, 11.41
Breastfeeding cessation	-.22	.50	.662	.81	.30, 2.13

6.5. Discussion

To our knowledge, this is the first time that researchers have investigated the maternal psychosocial predictors of pacifier use for non-sleep settling purposes. We found that women categorized as non-emotionally available to their infant were three and a half times more likely to use a pacifier than women categorized as EA. This effect was maintained in our final multivariate model, so that even when adjusting for the confounding effects of breastfeeding cessation, maternal EA remained a significant predictor of pacifier use. However, diagnosis of depression and childhood trauma history did not account for the difference in pacifier use that we observed in mother-infant interactions. Our data indicates that pacifier use during mother-infant interaction may be more likely to occur in more vulnerable dyads where the mother is not EA to her infant.

Our findings tentatively supported an association between women categorised as non-emotionally available and pacifier use in an interaction. We can understand the possibility of this relationship when we consider the specific behaviours the maternal EA zone captures. For example, parenting dimension ‘non-intrusiveness’ (i.e., the level of intrusion to the child’s autonomy; Biringen et al., 2014), which influences the quality of the mother-infant relationship (e.g., Garvin, Tarullo, Van Ryzin & Gunnar, 2012). In the dyads coded for pacifier use, the mother put the pacifier in the infant’s mouth, sometimes multiple times, before the infant engaged in NNS. This occurred when the researcher specifically asked the mother to interact with her infant, so those mothers identified for pacifier use are more likely to have received higher scores in intrusiveness under the EAS.

Another parenting dimension that might influence the quality of mother-infant interactions is ‘structuring’ (i.e., guidance, scaffolding or mentoring of the child’s

activities by the mother; Biringen et al., 2014). With the infant engaging in NNS, pacifier use limits the infant's ability to provide feedback to the mother about her structuring attempts. Without knowledge of whether her structuring attempts have been accepted, it is hard for a mother to structure successfully. Optimal structuring cannot occur without the child's attendance and acceptance (Biringen, Robinson, & Emde, 1998), so those mothers identified for pacifier use are more likely to have received lower scores for structuring under the EAS.

One of the components of maternal sensitivity is the acceptance of positive and negative emotions and this is a core feature of an emotionally available interaction. We observed that mothers who relied upon the pacifier did so when there was negative signaling by the infant. By putting a pacifier in the infant's mouth, the mother stopped the negative signaling and the child was prompted to engage in NNS. The opportunity to understand what the infant was signaling about was lost, and without the space for expression, there is the possibility of the mother missing other cues from the infant. Conversely, when mothers responded to negative signaling with the pacifier, the infant was soothed. It is difficult for some mothers to interact with an infant when they are distressed. One idea is that although pacifier use was associated with lower scores in sensitivity, it is possible that reliance on the object increased maternal capacity for those women who were not capable of being emotionally available to their infant. A limitation is our observations were restricted to the laboratory context, so it is unknown if this would also occur if the mother and infant were in their own home.

Another explanation for the increased likelihood of non-emotionally available mothers using the pacifier might be found in the possible impact of pacifier use on an infant's ability to facially express emotions, as well as the perceiver's ability to read

those emotions (see, Rychlowska et al., 2014; Niedenthal et al., 2012). Notably, however, the studies documenting these effects have applied experimental designs with participants responding to images of infants with a pacifier, so whether this is a more plausible explanation for our findings is not certain.

Our findings did not support an association between women diagnosed with depression and increased likelihood of pacifier use. Whilst this is different to the limited existing evidence (Feldens et al., 2013), caution is required before ruling out the possibility of an association. Of the 211 mother-infant dyads recorded interacting, we identified 23 women who used a pacifier during the interaction. Of those women in the pacifier use group, only seven were diagnosed with depression, all of which were taking antidepressant medication. Further research is required with a larger sample of women identified for pacifier use during an interaction, including women clinically diagnosed with depression with and without antidepressant medication, before any conclusion may be drawn about a relationship between the variables.

Similarly, the lack of association between maternal history of childhood trauma and increased likelihood of pacifier use is to be treated with caution. Only four women in the group identified for pacifier use had experienced moderate to severe childhood trauma. Whilst this is the first time the relationship has been tested between pacifier use and maternal history of childhood trauma, further research is required with a larger sample of women with childhood trauma history who are identified as using a pacifier before we can comment on the maternal behavior in that context.

Interestingly, the covariate breastfeeding cessation in months was not significantly associated with pacifier use in our multivariate model. This is contrary to the extensive research that documents a negative association between breastfeeding cessation and pacifier use (Buccini, Perez-Escamilla, Paulino, Araujo & Venancio,

2017; Sipsma et al., 2017). However, in trying to understand the relationship between breastfeeding and pacifier use, those studies have assessed the impact of frequency of pacifier use (Aarts et al., 1999; Victora et al., 1997), and infant age at introduction of the pacifier (e.g., Howard et al., 2003), or the type of breastfeeding (e.g., exclusive, predominant, any; Butler, Williams, Tukuitonga, & Paterson, 2004). None of the existing studies have analysed the association between breastfeeding cessation and pacifier use during the mother-infant interaction.

It is possible that pacifier use during mother-infant interaction might enhance the level of EA in the interaction. For many mothers and infants the use of the pacifier to soothe as well as sleep aide might be an important and appropriate part of their repertoire as a dyad. Winnicott (1971) believed that infant attachment to an inanimate object was evidence of a nurturing maternal relationship between a mother and her infant. He noted that without a 'good enough' relationship, the infant would not be able to transfer the mother's soothing properties to an object (Litt, 1981). According to transitional objects theory (Winnicott, 1969) infant attachment to an object facilitates an important developmental milestone as it marks the beginning of the infant establishing themselves as separate to the external environment (Elmhirst, 1980). We must consider the possibility that for mothers who are more vulnerable to the stress triggered by an infant's distress signals, that the use of the pacifier might allow the infant to self-soothe thereby creating emotional space for the mother and the infant (Nelson, 2012; Sipsma et al., 2017). A mother who is less agitated will have more capacity to emotionally connect with her infant. Conversely, an infant who is calm is more likely to provide the reciprocal feedback necessary to facilitate the opportunities for connection that underlie EA interactions (Biringen, 2004).

6.5.1. Strengths and limitations. This study is the first to examine maternal psychosocial predictors of pacifier use at six months postpartum during mother-infant interaction in a sample of clinically depressed women, as well as women with childhood trauma history. To our knowledge, no other research has tested the association between maternal history of childhood abuse and pacifier use, nor has any other research analysed the use of the pacifier in the context of the mother-infant relationship using the maternal EA framework. Whilst we identified two other studies that consider maternal depression and pacifier use (i.e., Feldens et al., 2013; Sipsma et al., 2017), our study is the first to obtain pacifier data from observational evidence that documents the maternal behavior. We were also able to account for the covariance of breastfeeding cessation in our final model, a factor consistently identified in the research as related to pacifier use (e.g., Sipsma et al., 2017). Consequently, the strength of this study lies in its methodological design and the quality of the data it analysed.

Notably, however, this study only examines the mother's side of pacifier use, with our final multivariate model containing maternal psychosocial factors that might capture or explain this observed maternal behaviour. That said, the EAS is a dyadic assessment, so the rating of the mother's EA encompasses the child's side to the interaction (Biringen et al., 2012).

What we can see in the findings provides a starting point for further investigation. Though there were 191 mother-infant dyads included in our final multivariate model, there were only 23 identified for pacifier use, and this limited our ability to investigate the relationship between pacifier use and the predictor variables. Given the controversial nature that infant attachment to objects like the pacifier can arouse in parents (e.g., Marter & Agruss, 2007; Buschs & McKnight, 1973), an

understanding of the role the pacifier might play within the dyad might help inform the position around its use.

6.5.2 Conclusion. Our data provides some basis to suggest that mothers who are not emotionally available to their infants may be more likely to use a pacifier outside of sleep settling purposes. However, if pacifiers provide scaffolding to more vulnerable mother-infant dyads to facilitate emotional connection during interaction in the first year, then use outside of sleep purposes may be encouraged.

Chapter 7. Dual Treatment in Perinatal Mental Health Services: The Translation of Mother-Infant Assessment to King Edward Memorial Hospital for Women

7.1. Preface.

This dissertation examines the maternal psychosocial predictors of maternal EA at six months postpartum. Central to the research conducted in MPEWS is the assessment of the mother-infant dyad using the EAS. The findings of empirical studies one, two and three indicate that women with childhood trauma history or exposure to current stressful life events may show reduced EA during the mother-infant interaction at six months postpartum. Whilst depression was not a strong predictor of maternal EA, there was a small association between depressive symptoms in pregnancy and EA at six months postpartum. If women are identified with risk factors for poorer quality mother-infant interaction, a clinical service requires a valid and reliable tool to assess the mother-infant dyad to ascertain whether enhancement of the relationship is required.

The findings of study one show that women with depressive symptoms in early pregnancy may show reduced EA, with study two indicating that women with childhood trauma or exposure to stress in pregnancy might also experience reduced EA. However, it is the other women who may also be struggling to emotionally connect with their infant, for reasons other than those explored in this dissertation, that still need to be captured for mother-infant assessment and treatment. That said, even for those women who may access perinatal mental health services, if clinicians target the treatment of women's mental health symptoms alone (Stein et al., 2014), there is no opportunity for enhancement of the mother-infant relationship. This may be a missed opportunity to strengthen a protective factor such as the mother-child relationship for both child (Fonagy, 1998) and maternal (Stein et al., 2014; Cohen et

al., 2002) outcomes. However, to provide comprehensive mother-infant assessment and targeted intervention, a standardized measure capable of assessing the dynamics between a mother and her child is required at a clinical service provider.

If the purpose of scientific research is for the findings and information obtained by empirical studies to improve clinical practice and health outcomes in the population (Rubio et al., 2010), the next step for this dissertation was to translate the knowledge about mother-infant assessment to clinical practice with a perinatal mental health service provider in Western Australia. In Chapter Seven we outline the process of collaboration with a service provider to promote the translation of our research knowledge. This process included the presentation of a seminar series regarding the assessment of the mother-infant interaction using the EAS to clinicians within the service. Incorporating feedback from those sessions, we conducted a systematic review of the EA literature to obtain the information required to inform the service provider's decision-making process about the incorporation of the EAS to clinical practice. Translational research study four documents the collaborative process undertaken to translate the knowledge of mother-infant assessment to a service provider, and then sets out the results of the systematic review of the literature using the EAS.

7.2. Assessment of the Mother-Infant Interaction in Clinical Practice

An issue for services that deliver treatment to women in the perinatal period is how to integrate the mother, the infant and the relationship into treatment (Stein et al., 2014). Given the dyadic nature of the mother-infant relationship, treatment of women's mental health should encompass the infant as well as the mother's adjustment and transition to her new role. However, without access to a measure that

systematically assesses the mother-infant relationship it is difficult for clinicians, and they might instead focus on treatment of the mother's mental health without addressing the context within which it occurs: the mother-infant dyad (Poobalan et al., 2007; Nylén et al., 2006). Alternatively, in the case of perinatal depression, the clinician might assume that the quality of the mother-infant exchange is comprised based on some of the literature (e.g., Murray et al., 2010). The EAS is the most widely applied measurement tool in research for the assessment of the mother-infant interaction (Biringen et al., 2014). Translation of the EA construct and application of the EAS to a clinical service setting could facilitate integration of treatment for the mother, the infant, and the relationship into practice. Before examining the translational process with the service provider, it is necessary to understand the concept of translational research.

7.3. Nature of Translational Research

Translational research might be defined as the integration of research (basic, patient-orientated, population based) for the long-term aim of improving public health (Rubio et al., 2010; Drolet & Lorenzi, 2011). There are two types of translation; the first type (also known as the process of moving 'bench to bedside' or T1 type) is the application of findings from laboratory research and in preclinical trials to create a product or procedure (Emmert-Buck, 2014). The second type (or T2 type) refers to the adoption by the public of the product or procedure when the research is translated to best practice in the community (Rubio et al., 2010). Despite the increasing role that translational research is playing in health and policy (Drolet & Lorenzi, 2011), the translation of scientific findings to clinical practice is not without its challenges (Fudge, Sadler, Fisher, Maher, Wolfe & McKevitt, 2016). That said, for clinical

psychologists the integration of research and clinical practice is integral to their training as a scientist practitioner.

The scientist practitioner model has been the dominant model of training for psychologists since its inception in 1949 (Committee on Training in Clinical Psychology, 1947; Crane, Wampler, Sprenkle, Sandberg & Hovestadt, 2002). Psychologists are trained as scientists and practitioners (Jones & Mehr, 2007) on the basis that research, and practice can and ought to be integrated (Wakefield & Kirk, 1996; Belar & Perry, 1992). Yet the model is not always successful in its application to practice (Castonguay, Youn, Xiao, Muran, & Barber, 2015), with a gap between the empirical information generated by researchers and the implementation by clinicians (Goldfried et al., 2014). Even when there is awareness of an empirically supported assessment tool or intervention, clinicians might not have access to the resources required for use of the tool or technique (e.g., training requirements or cost), or the time available to use it (Kratochwill, Shernoff & Sanetti, 2004). There can also be administrative, organisational or policy barriers around implementation of research to clinical practice, with organisations limited by their service mandate. The scientist practitioner model informs the requirement of a clinical psychologist to translate the knowledge pertaining to mother-infant assessment to a service provider. This process with service provider KEMH is documented in the following section.

7.4. Consultation and Service Context: King Edward Memorial Hospital for Women (KEMH)

KEMH is Western Australia's only stand-alone tertiary maternity, neonatal and gynaecological hospital and quaternary centre for the management of high-risk pregnancies with the largest Neonatal Intensive Care Unit (NICU) in the Southern

Hemisphere. Psychological Medicine is a department of KEMH that specialises in the assessment and treatment of mental health concerns during the perinatal period and for women accessing gynaecological or neonatal services at KEMH. Women are able to access services up to six months following the birth of their infant, or in the case where their infant has been hospitalised in the NICU, up to 12 months postpartum. In addition, the Mother Baby Unit (MBU) at KEMH is an eight-bed inpatient facility that provides for the treatment of women's mental health issues in pregnancy and the postpartum period. The MBU contains facilities for the admission of the mother with her baby, so the developing relationship can be supported and to avoid lengthy separation whilst the woman concurrently accesses services for the treatment of her mental health problems. Further information regarding the MBU at KEMH can be found at Galbally, Sved-Williams, Kristianopulos, Mercuri, Brown and Buist (2019).

Treating women's mental health in the perinatal period involves the mother, the infant, and the mother-infant relationship (Hayden et al., 2012). However, to the best of our knowledge, neither of the services at KEMH had implemented a measure for the standardised assessment of the mother-infant relationship. Clinicians' have relied upon the observed documentation of mother-crafting skills (e.g., feeding, settling to sleep, changing the baby's nappy) to evidence what is taking place between the mother and her infant. Yet a mother might physically meet the needs of her infant, but not be emotionally available to them. The EAS is extensively documented in research to assess the relationship quality of mother-infant dyads (see review; Biringen et al., 2014). Moreover, in treating maternal mental health, if the clinician does not consider the mother-infant relationship, the mother's capacity for full recovery including in her parenting role may be limited. One of the common barriers to the translation of research is interdisciplinary collaboration (Zhou, Li, Bosworth,

Ehiri, Luo, 2013; Kotarba, Wooten, Freeman, Brasier, 2013), so the collaboration with KEMH was a core component of the process undertaken in study four.

7.5. The Development of a Partnership with King Edward Memorial Hospital: Presentation Series

7.5.1. Aims and Hypotheses. To translate our knowledge of assessment of the mother-infant interaction using the EAS to the clinical setting at KEMH to assess the scope for implementation of the EAS within the service.

7.5.2. Collaboration process with KEMH. We conducted a series of presentations about observational assessment of the mother-infant interaction using the EAS to clinicians at the MBU and Psychological Medicine at KEMH. The presentations were designed to facilitate collaboration between the researcher and the clinicians, as well as explore the barriers to integration of the EAS into clinical practice within a perinatal mental health service. The presentations were delivered in January and February 2018 at the MBU, and in March 2019 at Psychological Medicine. Attendance at the presentations was organised by liaison with the Director of the MBU, and a clinician at Psychological Medicine so the sessions were scheduled during the lunch times allocated for professional development at the service. There were approximately six attendees at the MBU presentation series, and around eight at Psychological Medicine. Attendees included clinical psychologists, nurses, social workers, and psychiatrists who provide mental health services to women during the perinatal period at KEMH. The slides from the seminars are contained at Appendix Two of the Dissertation.

7.5.3. Clinician feedback from KEMH. Four themes regarding the application of the EAS to the assessment of the mother-infant interaction were identified from the feedback provided by clinicians attending the seminars.

Psychometric properties of the EAS. The first theme concerned psychometric information about the EAS. Whilst Biringen et al. (2014) conducted a review of empirical research using the EAS, there has been subsequent research published. Biringen's review also did not focus specifically on psychometric properties of the EAS, so the table prepared is not a concise summary of the relevant literature. Consequently, it was difficult to quantify during the collaborative process how many studies have reported the association between attachment and EAS dimensions, and whether those studies that reported an association had used the strange situation procedure or another measurement of attachment.

EAS Scoring. There was confusion expressed by clinicians around how best to approach the EAS scoring system. The EAS can be scored in different ways, and the literature documents each of these approaches (e.g., total score, direct score, EA z, latent factor obtained from factor analysis). To the best of our knowledge, there has been no review that captures the different methods used to score the EAS in the existing research.

Application to special populations. The third issue raised was the application of the EAS to special populations. Clinicians at KEMH might treat infants experiencing developmental delay, or medical or physical complications. Given the stress associated with having an infant with special needs, a woman might be more likely to seek mental health services through Psychological Medicine when her infant falls within this category. Application of a measure to infants with special needs is therefore a key consideration at this service. Whilst we were aware of studies in

which the EAS has been applied to infants from special populations (e.g., Dolev et al., 2009), we were not able to locate an existing review that summarised EAS application to populations with special needs.

Interaction length of sample for EAS. The final theme extracted from the collaborative discussions concerned the interaction length for application of the EAS. Therapeutic sessions at Psychological Medicine or the MBU are generally 90 minutes for an initial assessment, and 50 minutes for individual sessions thereafter. The EAS recommends a minimum of 20 minutes of mother-infant interaction for application of the scale though there are examples of studies applying the EAS to interactions of less than 15 minutes (e.g., Flykt et al., 2012). However, again, we could not locate an existing review of the studies using the EAS that captured this information.

7.6. The Development of a Response to Clinician Consultation

Following the seminar series and collaboration process with KEMH the need for an up to date systematic review of the empirical studies using the EAS was highlighted. If the EAS is to be translated from the research context of this dissertation to use as a measurement tool in clinical settings, the service provider will require comprehensive information about the scale. Unlike the only other existing review of the EA literature (see, Biringen et al., 2014), the systematic review presents a detailed overview of the EAS application including: (1) details about the sample (i.e., age, special characteristics including disabilities, recruitment used); (2) the length of interaction sample and details of the interaction recording; (3) interrater reliability of the coders of the scale; (4) the way in which the EAS was scored; and (5) covariates.

The review employed a systematic approach and included two parts. The first part of the review was designed to capture psychometric information about the EAS. This was summarised in a separate table to the rest of the review for accessibility in presentation to a service provider. The value in this document is highlighted by other researchers that suggested the inclusion of psychometrics in a scale manual (Lotzin et al., 2015). The EAS manual does not include psychometric information currently, so the first part of the systematic review is designed to address this gap. The second part of the review sets out information about the samples, the length of interactions, the interrater reliability of the coders, and the way in which the scale was scored in the existing EA studies from 1990 to 2019. We anticipated that:

1. Empirical evidence would support the validity and reliability of the EAS, particularly the link between the EAS dimensions and the attachment classification of infants and children.
2. The EAS would be scored in a variety of different ways.
3. There would be a large discrepancy in the length of interaction samples relied upon for use of the EAS.
4. There would be examples of EAS application to samples of children with special needs including physical (e.g., visual or hearing impairment), neurodevelopmental (e.g., Autism), and intellectual disability.

7.7. Methods

7.7.1. Ethics. Ethics was not required as only a review of existing research and guidelines was undertaken with no direct participant involvement in this study.

7.7.2. Search Strategy. The review was conducted by electronic literature search of all empirical studies using the EAS. Different electronic databases Google

Scholar and EBSCOHOST databases (i.e., Psych articles, Psych books, Academic Search Complete, Psych Info, Psych and Behavioural Sciences Collection, Medline Complete) were searched for English language studies initially from 1991 (i.e., the date the first EAS was published) to the present. The search terms included ‘emotional availability scales’ and ‘emotional availability’. This was followed by imputations of the measure name including: emotion* availabil* scal*.

7.7.3. Eligibility for inclusion. Exclusion criteria included: (1) no dissertations; (2) no reviews or meta-analyses; (3) no commentaries or theoretical discussion of the construct or scale; (4) caregiver-child interactions only (i.e., no adult samples); and (5) in English. The methodological quality of the studies included in this review were appraised according to the following criteria: (1) sample size; (2) study design; (3) adequacy of the description of interaction sample (i.e., characteristics of the dyad, the context of the interaction recording); (4) description of the training and reliability of the coders applying the EAS; and (5) description of the scoring of the EAS. Mother-child samples was not an exclusion criteria because application of the EAS to samples of older children still provides evidence of the utility of the scale in a perinatal setting.

7.7.4. Study selection and evaluation. The process employed for the selection of studies included in the systematic review is set out at Figure 1 and captures the Preferred Reporting Items for Systemic Reviews and MetaAnalyses (PRISMA) flow chart (Moher, Liberati, Tetzlaff, Altman & the PRISMA Group, 2009). One researcher (K.K.M) was involved in the broad identification of relevant literature. The same researcher was responsible for the presentation series at KEMH and consultation with clinicians at the service regarding the EAS. Following the initial identification of studies, clear inclusion and exclusion criteria was agreed with

another author (M.G), also with specialist training in mother-infant interactions and knowledge of the service provider. Following the initial identification of 1,350 results by the electronic searches, an existing review of the empirical studies using the EAS from 1990 to 2014 was identified (Biringen et al., 2014). Each of the studies included in that review were included in the systematic review pertaining to this study. The search on the databases was then reduced to studies from 2014 to present. After one author (K.K.M) selected the full text articles for inclusion in the review, another author (M.G) reviewed the articles selected for inclusion with disagreements resolved by discussion. One author (K.K.M) extracted information about each study in the systematic review for communication to the service provider, with another author (M.G) providing input of what information needed to be extracted based on knowledge of the service provider KEMH.

7.8. Results

The initial database search rendered 1,407 studies. The review conducted by Biringen et al. (2014) includes studies using the EAS from the EAS inception to 2014. The full text for each of these studies was obtained and they were reviewed for inclusion. The second database search limited the records to those from 2014 to present (i.e. 2019). A total of 485 studies were obtained and subjected to title and abstract review. From this process 179 studies were excluded on the basis of duplication, exclusion criteria, or for failing to meet the research quality standards. The final 306 studies were subjected to full text review. The process for the review is set out at the PRISMA flow chart at Figure 5.

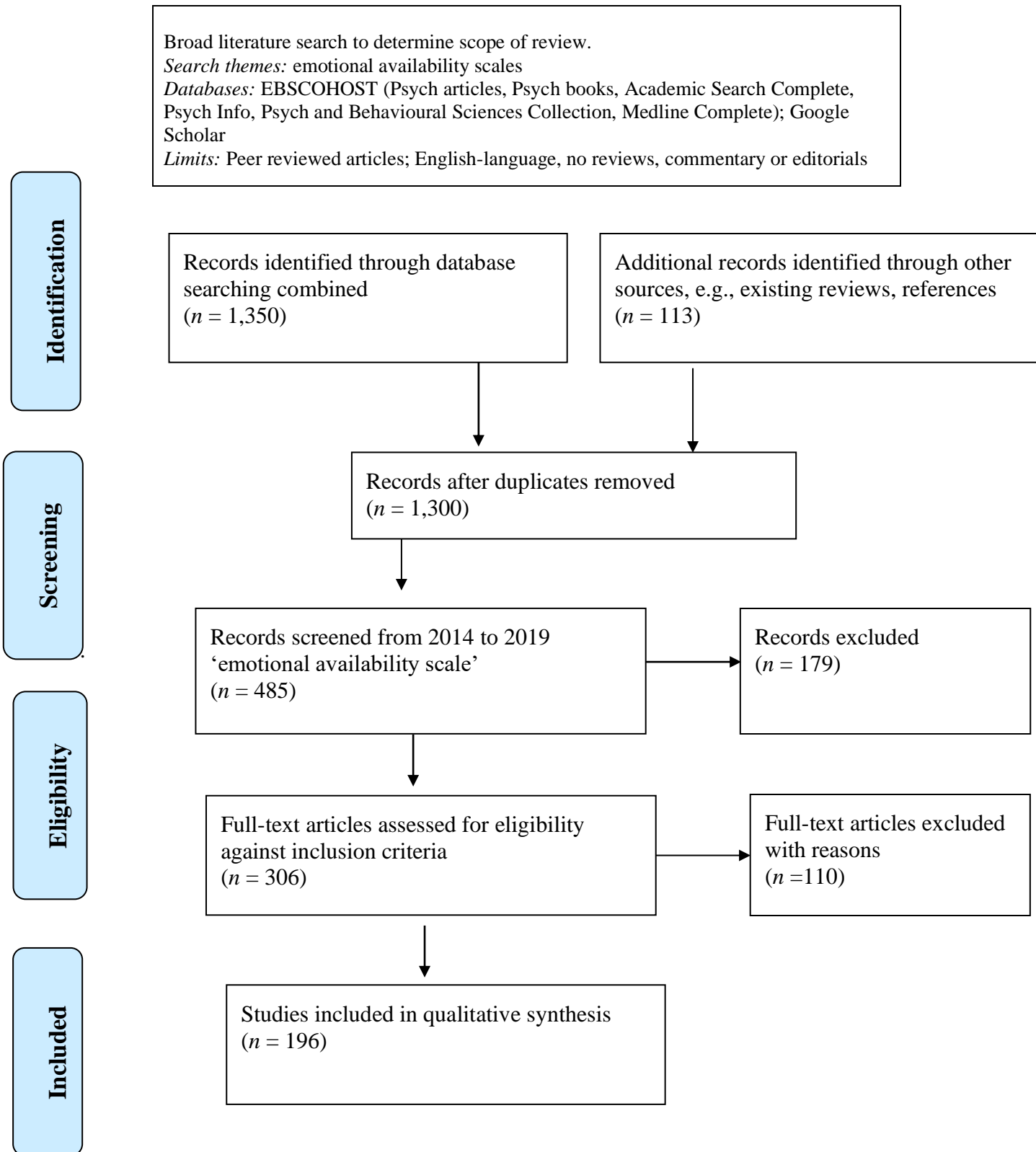


Figure 5. Flow diagram for the process for inclusion and exclusion of studies in the review.

Table 14. Characteristics of the empirical studies using the EAS identified in the systematic review ($N = 196$).

Characteristics of study	<i>N</i>	% ^b
Country ^a		
Australia	13	6.6
Africa	1	.5
UK	1	.5
Germany	17	8.7
Italy	16	8.2
Netherlands	15	7.7
Belgium	1	.5
Norway	5	2.6
Sweden	3	1.5
Portugal	2	1.0
Spain	1	.5
Singapore	1	.5
Israel	22	11.2
Turkey	1	.5
India	1	.5
Canada	19	9.7
United States	71	36.2
Brazil	1	.5
Publication (year)		
1991 – 1999	10	5.1
2000 – 2009	54	27.3
2010 – present	132	67.3

^aThe percentage total adds up to more than 100 because 3 studies included populations from more than one country; ^bCumulative percent.

Table 15. Characteristics of the samples in the empirical studies using the EAS identified as part of the systematic review ($N = 196$).

	<i>N</i>	%
Special needs ^a		
Hearing difficulties	8	4.1
Preterm, low birth weight	9	4.6
Autism Spectrum disorder	9	4.6
Fostered/adopted	12	6.1
Intellectual disability	4	2.0
Down syndrome	3	1.5
Cerebral palsy	3	1.5
Visual impairment	3	1.5
Paediatric illness	2	1.0
Child psychiatric difficulties	2	1.0
Other	3	1.5
Sample size		
1 – 10	9	4.6
11 – 20	9	4.6
21 – 49	57	29.1
50 – 100	68	34.7
101 – 199	30	15.3
200 – 299	8	4.1
300 – 399	5	2.5
400 – plus	10	5.1
Interaction length		
1 – 5 minutes	16	8.2
6 – 10 minutes	40	20.4
11 – 19 minutes	44	22.4
20 – 29 minutes*	41	20.9
30 – 45 minutes**	22	11.2
46 minutes plus	11	5.6
Not specified	22	11.2

^a The percentage total adds up to more than 100 because 1 study included populations from more than one special needs group (e.g., cerebral palsy, ASD, visual and hearing impairment); Other = feeding disorder or failure to thrive; * recommended length; ** optimal length

Table 16. Empirical studies that evidence psychometric support for the EAS.

SEE APPENDIX FOUR.

Table 17. Review of empirical studies applying the EAS from 1991 to present including special features of the sample, length of interaction, and application of the EAS scoring system ($N = 196$).

SEE APPENDIX FIVE.

7.9. Discussion

7.9.1. Summary. We aimed to assess whether the EAS could be integrated to clinical practice at KEMH for: (1) the identification of dyads at risk of a poorer quality relationship; and (2) dual treatment of the mother's mental health and the mother-infant relationship. Current practice at KEMH did not involve the integration of a valid and reliable measure capable of assessing the relationship quality of individual mother-infant dyads. However, capacity for the incorporation of the mother-infant relationship into treatment is necessary for perinatal mental health service providers given the possible role of that relationship in the woman's mental health, and infant developmental outcomes (Guedeney et al., 2014). Following the process of collaboration with KEMH, the need for a systematic review of the EAS literature was identified. One of the most difficult challenges in working with assessment of the mother-infant relationship is selection of an appropriate tool. Extensive knowledge and understanding of the EA construct, as well as providing the psychometric evidence for its application, is required to facilitate the decision-making process of a service provider. Our systematic review highlights the wide range of contexts of EAS application including to samples with special populations, the methodological differences in the length of interaction samples, and the cross-cultural application of the scale across five continents. Although 49.5% of the studies used mother-infant samples (i.e., infant less than 24 months), the application of the EAS to

older children, demonstrates the scale's potential application. Whilst time and financial constraints might limit the applicability of the EAS to a service provider, at the very least, the collaborative process may highlight to clinicians the importance of incorporating the mother-infant relationship into treatment for women's mental health in the perinatal period.

7.9.2. Link between the EAS and attachment security. We observed a link between the EA dimensions and attachment security (measured by the strange situation procedure, the Adult Attachment Interview) in 23 studies. EA theorists postulate support for the theoretical relationship between the EAS and mother-infant attachment in empirical research (e.g., see review by Biringen et al., 2014). Our psychometric review supports this position. For instance, in a sample of 687 Israeli dyads at 12 months, Ziv et al. (2000) concurrently conducted the Strange Situation Procedure and the assessment of maternal EA using the EAS. They reported a nine-fold increase that infants of mothers with higher sensitivity would show secure attachment classification. This relationship between the EAS dimension and infant security was reflected in the structuring/intrusiveness, and child responsiveness and involvement dimensions. However, the evidence is not consistent. We located six studies that did not observe the same link between attachment security and the EAS dimensions. Swanson et al. (2000) reported an association between intrusiveness and insecure attachment categorisation in a high-risk sample of 51 prenatally drug exposed toddlers and their mothers, though no link was observed between maternal sensitivity and infant attachment classification. Given the methodological differences between studies using the EAS, particularly in the length of interaction sample obtained, this lack of consistency is not surprising.

7.9.3. Interaction length for EAS sample. A possible barrier in the clinical utilisation of the EAS is the amount of time required for observation of a mother-infant interaction sample. Biringen recommends a minimum of 20 minutes with 30 minutes or longer preferable (Biringen, 2005; Biringen et al., 2012). Yet our review shows that more than 50% of the research studies rely on interaction samples of less than 20 minutes, with over one quarter of researchers using interactions of less than 10 minutes. Specifically, for perinatal service providers, of those interactions of optimal length (i.e., between 30 – 45 minutes), 54.5% used a mother-infant sample (i.e., 0 – 24 months).

The issue with reliance on ten minute or less samples is the ‘limited confidence and validity in the results.’ (Biringen, 2005). If we consider this statement, there is some risk that over one third of the empirical studies identified by our review might rely upon EAS data that is not valid because of the shortened length of observation time. This might explain inconsistencies in the findings of some of the EA literature (e.g., mixed findings of the relationship between attachment classification and EA dimensions; Baker, Biringen, Meyer-Parsons & Schneider, 2015; Biringen et al., 2000; Van den Dries Juffer, van IJzendoorn, Bakermans-Kranenburg & Alink, 2012; Van IJzendoorn et al, 2007; Swanson et al., 2000). Consideration of the reasons for longer observation times might benefit a service provider and reduce the likelihood of adoption of the scale with application to shorter interaction samples.

Biringen et al. (2005) tested the impact of interaction length on the validity of the EAS with naturalistic observation of 36 mother-infant dyads for two hours at home, scoring the interaction at 15-minute intervals. Although each of the EA dimensions correlated with attachment security (measured at 12 months using the

strange situation procedure), the association between the dimensions and attachment security increased in size from $r = .21 - .51$ at 15 minutes, to $r = .38 - .62$ at two hours. Interestingly, the largest difference between the correlations was between the second and third time segment (i.e., 30 to 45 minutes). If the biggest change in EA occurs in a particular time period this might suggest that time period is a key segment of the interaction for observational assessment. Biringen (2005) therefore recommends an optimal length of interaction sample of 30 to 45 minutes.

7.9.4. Cross cultural application of the EAS. Our systematic review demonstrated application of the EAS to over 20 countries across five continents with almost 50% of studies originating in the United States. This is evidence of the consistency and validity of the scales that despite being developed in the United States (Biringen et al., 2012), can be applied to mother-infant dyads in different cultural settings. The EAS purports to measure the emotional exchange between a parent and child, which according to EA theorists, is a universal feature of parent-child relationships (van IJzendoorn, Bakermans-Kranenburg, & Sagi-Schwartz, 2006; Scherer & Wallbott, 1994). How emotion is expressed can vary according to cultures, as can the norms around emotion being elicited, regulated and manifested (Scollon, Diener, Oishi & Biswas-Diener, 2004). It is therefore important to consider the translation of cross-cultural issues when rating the quality of the emotional exchange between a parent and child from different cultures.

Bornstein et al. (2008) tested the cross-cultural application of the EAS in 220 mother-child dyads across Argentina, Italy and the US. Whilst differences in the distribution of EA were reported between cultures (e.g., Italian mothers scored higher on sensitivity, structuring, responsiveness and child involvement), the patterns of EA were universal in rural and metropolitan settings. These findings reflect the

foundations of the EA construct in attachment theory. According to Bowlby's attachment theory (1969), the innate need of human infants to form a securely attached relationship with a secure caregiver originates from evolution and is universal irrespective of the infant's cultural origin (Mesman & van IJzendoorn, 2016). The universality of attachment is reflected in Ainsworth's early work identifying three categories of attachment classification in mother-infant relationship, which emerged following observation of 26 mother-infant dyads in Uganda from 1954 - 1955 (Ainsworth, 1977).

7.9.5. Application of the EAS to individuals with special needs. The operation of the EAS rests on the assumption that whether a child has a disability or special needs, the emotional connection that occurs in the caregiver-child interaction is universal. The scale creators propose application of the EAS to both typically developing children, as well as those with special needs (Biringen et al., 2008). Our review of the EAS research found evidence for the application of the EAS to infants and children with foster care history or adoptive backgrounds, hearing difficulties, preterm birth or low birth weight, Autism Spectrum Disorder, intellectual disability, cerebral palsy, visual impairment, child psychiatric illness, and serious paediatric illness. However, it is not sufficient that the EAS can be applied to infants or children with special needs, it requires the skill of the person using the measure to understand how to apply the scale.

When assessing a mother-infant dyad where the child may have special needs, Biringen, Fidler, Barrett and Kubicek (2005) provide three suggestions. The first is to consider the task and in particular, the task demands. If a child finds a task particularly difficult this may affect how they respond emotionally to both the task and the parent during the interaction. Consequently, in this situation it is

recommended that a number of task situations be employed (e.g., tasks that are cognitively challenging tasks to free play), that way, there is the opportunity to assess the emotional connection between the dyad without the pressure of the task completion (Kubicek, Riley, Coleman, Miller & Linder, 2013). It is also important for the coder to be mindful of the parental compensation that may be required during an interaction where a child has a disability. For example, a child with ASD may less responsiveness compared to a child that does not have ASD, and as a result, the parent of the child with ASD may employ different strategies to prompt an emotional response from the child (Dolev et al., 2009). The focus for the EA assessment is how the parent responds to the child's unresponsiveness and encourages appropriate emotional expression from their child (Biringen et al., 2005).

7.9.6. Limitations of the EAS. The time and cost of the EAS training limits the possibility of its implementation. A clinician can only use the EAS if they have completed an extensive training program with Zeynep Biringen, the scale creator, and been endorsed (Biringen, 2008). Use of the EAS without training is not acceptable (Biringen, 2005). The in vivo training includes a lecture series, reading materials, SKYPE conferences with the scale creator and the practiced application and discussion of the EAS to caregiver-child interactions (ages ranging from 0 -14 years for the version of the scale applicable to mother-infant dyads). The training culminates in a reliability exam whereby the professional is required to achieve reliability with Biringen and her laboratory on seven caregiver-child interactions of at least 20 minutes in length. As Biringen notes on her emotional availability.com website (2008), there is no guarantee that a professional who completes the training, will reach reliability. There is also the financial cost of the training of approximately

AUS\$800, an amount substantial enough to restrict the capacity of a service to train its clinicians.

Biringen has emphasized the importance of training and being certified as reliable coder in the application of the EAS (Biringen, 2005). Biringen states that researchers using the scale should specify achievement of inter-rater reliability with Biringen and her laboratory. In our review of the literature, 6% of studies do not mention inter-rater reliability. For those studies, there is some question around completion of the EAS training as well as whether the certification for reliability as a coder has been achieved, and if not, whether the scale has been validly and reliably applied.

Another difficulty with EAS is the ambiguity in some of the drafting of the manual. The importance of the assessment tool's manual was highlighted in Lotzin's (2015) review of observational mother-infant interaction assessment tools. Lotzin suggested that psychometric information be set out in the manual, along with clear scoring and interpretation guidelines. Whilst the EAS manual contains a scoring guide, it does not include adequate information about cut offs for particular behaviours. For example, in the structuring dimension, if a parent withdraws for part of the interaction, the score must be a 3 out of 7 or below. This is taught during the EAS training by Biringen and the application of this cut off is required to achieve reliability with her. However, this is not reflected in the manual. The EAS manual states what is required for a perfect structuring score, a score of 4 out of 7 (i.e., 'inconsistent in providing preventative (proactive) guidance...too little guidance'), and a score of 1 out of 7 (i.e., non-existent guidance). It does not stipulate that a score of 3 or below must be assigned if there is withdrawal of a parent. For reliability and validity in application of the scale, the detail taught during training needs to be

included in the manual otherwise there is the risk of inconsistency in application. An area for future translational research would be to re-write the EAS manual using the studies in the EA literature, to ensure the manual captures what is reported about the application of the scale as well as the psychometric evidence.

7.9.7. “What treatment works and for whom” (Fonagy, Cottrell, Phillips, Bevington, Glaser, & Allison, 2014). The comprehensive assessment of the mother-infant dyad by the EAS facilitates the identification of the areas to target in clinical intervention. The EAS enables the individual tailoring of treatment. The importance of this in psychotherapy was captured by Gordon Paul’s famous question (1967): ‘What treatment, by whom, is most effective for this individual with that specific problem, and under which set of circumstances?’ This proposition that each patient is different and requires their own version of the treatment is difficult for clinicians in busy services. The adaption of treatment to individual patients and situations entails comprehensive and thorough assessment to define the problem and ensure the treatment addresses it. With time restraints and sometimes a lack of access or training in the assessment tools required for the patient, this process may be compromised. Although the EAS might carry limitations in the level of resources it requires (i.e., time and cost), the alternative may be to treat the woman’s mental health symptoms alone, which may result in no improvement to infant outcomes (Stein et al., 2014).

7.9.8. Application of the EAS to assessment and clinical intervention. The EAS provides a basis for the identification of mother-infant dyads, as well as facilitating individualised treatment capable of improving relationship outcomes. A growing number of studies document the use of the EAS in mother-infant psychotherapy to improve the quality of the emotional connection in a dyad. For example, in adopted mother-child dyads (Barone, Ozturk & Lionetti, 2018), in child-

care settings (Biringen et al., 2008; 2012), and in the context of reunification with a biological parent (Biringen & Allender, 2011), the EAS has been applied to empirically evidence the strengthening of the EA in the caregiver-child relationship following clinical intervention. The EAS is therefore capable of informing and monitoring treatment effectiveness, thereby facilitating treatment of individual mothers and infants.

7.9.9. Model of translation of attachment measures to clinical practice.

The translation of attachment research measures into clinical practice (see, Cicchetti, Toth & Rogosch, 1999; Bakermans-Kranenburg, van IJzendoorn & Juffer, 2003), provides an example of how the EA construct and the EAS measure might be adapted to therapeutic work. Attachment measures such as the strange situation procedure, or the Manchester child attachment test, were developed for research application, so carry the same limitations as the EAS. The time required for training to conduct the assessment and the cost of that training, as well as the feasibility of attachment measures to a clinical setting, do not always translate. Consequently, there is limited use of attachment measures in clinical practice (O'Connor & Byrne, 2007). However, clinical approaches have been adapted from the research to facilitate the assessment of attachment in young children and infants. By applying the theoretical constructs of the strange situation procedure and its observational practices, some of the literature proposes that clinical work with children and infants has been improved (Zeanah, Berlin & Boris, 2011).

Zeanah et al. (2011) conducted a practitioner review of the clinical applications of attachment theory and research for infants and young children. They noted that clinicians might develop clinical skills for the assessment of attachment behaviours without applying the standardised attachment measures. For example, a

clinician might observe a parent-child interaction to assess the attachment security in the relationship. Clinicians might note behaviours that indicate avoidance, resistance or disorganisation in the infant response to the caregiver. In addition, observation of the balance between the infant's need to explore their environment but also seek proximity and physical contact with the caregiver might provide information about the mother-infant relationship. Specific behaviours may include the degree of affection shown by the infant towards the caregiver, as well as whether the infant initiates the involvement of the caregiver for assistance or cooperates with them (Boris, Aoki, & Zeanah, 1999). Other parenting behaviours may indicate a disorganised attachment style for example, withdrawal, role confusion or intrusiveness (Benoit, 2000). Observations by the clinician of the mother-infant exchange may be followed by questions to investigate the behaviours between the dyad. This illustrates how the construct of attachment has been translated to clinical practice.

7.10. Summary of Recommendations to Service Provider and Service Delivery Sector

Although the application of the EAS by clinicians throughout a service like KEMH may not be achievable, that does not mean that translation of research knowledge regarding the importance of mother-infant assessment during the perinatal period is not possible. The alternative of providing mental health services to women in pregnancy and the postpartum without the capacity to target the mother-infant relationship in treatment could result in the misallocation of resources to a broad-based interventions that may not be effective (e.g., Cassidy et al., 2017).

There are two options for clinical recommendations to KEMH. One option is for the service to have a few clinicians that are trained as EA professionals and able to provide therapeutic treatment using the EAS. This would reduce the financial and time related costs associated with the implementation of the EAS to a larger number of clinicians. However, it would require some financial investment from the service. The contents of the systematic review may facilitate this decision-making process, with comprehensive information about the EAS now readily available. Another option may be to increase the knowledge of clinicians within KEMH about the importance of comprehensive assessment to identify mother-infant dyads at risk of poorer mother-infant relationship dynamics, and the role of mother-infant psychotherapy to target relationship quality (e.g., Guedeney et al., 2014) . It may be possible to demonstrate the application of the EAS for this purpose using another seminar series. If the research regarding the mother-infant relationship and its significance to women's mental health (e.g., Lagan, Knights, Barton & Boyce, 2009) is translated to clinicians, there may be an increased demand for the integration of a standardized mother-infant observational measure to practice (e.g., the EAS; Biringen, 2008).

7.11. Conclusion

The translation of research to clinical practice is not achievable without collaboration between researchers, clinicians and across institutions. For clinical psychologists, curiosity about how the research might improve clinical practice is intrinsic to training as a scientist practitioner. Without adoption of a measure capable of mother-infant relationship assessment there remains the risk of misallocation of resources to broad-based interventions that may not be effective at strengthening the dyad (e.g., Cassidy et al., 2017). Indeed, treatment may be provided to mothers and

infants that do not necessarily need clinical intervention (i.e., false positive; Finkelhor, 2018), or alternatively, dyads that require clinical support may receive treatment that is not effective. The possibility of tailoring the treatment to individual mothers and infants is not possible without a standardised assessment measure.

Although the research is mixed regarding the long-term outcomes following mother-infant psychotherapy to maternal mental health (see, Huang et al., 2020), or infant outcomes (see, Stein et al., 2018), there is sufficient evidence to show the integral role of the mother-infant relationship in perinatal mental health treatment (Cramer, 1993; Salomonsson & Sandell, 2011; Nylén et al., 2006). Incorporation of the capacity to assess mother-infant dyads into a service provider acknowledges the occurrence of mental health in the perinatal period as the unique period of a woman's life in which the infant and the mother-infant relationship plays an intrinsic part.

Chapter 8. General Discussion of the Overall Dissertation Findings

8.1 Preface

This dissertation has examined specific psychosocial predictors of maternal EA at six months postpartum and collaborated with a service provider to undertake translational study designed to improve the knowledge of mother-infant assessment in perinatal clinical practice. Study one provided a comprehensive examination of the association between maternal EA and a psychosocial predictor, perinatal maternal depression measured diagnostically and symptomatically from pregnancy to the postpartum. Study two investigated another psychosocial predictor of maternal EA: maternal trauma, and using multiple mediation analyses tested whether the association between childhood trauma and maternal EA is mediated by more proximate trauma exposures specific to the perinatal period: stressful life events and childbirth experience. The third study investigated the maternal psychosocial predictors of pacifier use in the context of the mother-infant interaction, and the final study documented the translation of research knowledge regarding mother-infant assessment to KEMH to facilitate the assessment and dual treatment of the mother and the mother-infant relationship in clinical practice.

The findings from the three empirical studies support antenatal access to clinical services for women that might not be emotionally available to their infant because of reasons including, childhood trauma or current stressful life events exposure. However, the findings in study one demonstrate that even in the presence of perinatal depression some mothers will retain EA to their infant during an interaction. This highlights the value of comprehensive assessment to determine the quality of the mother-infant relationship (Lotzin et al., 2015), rather than identification of ‘at risk’ mothers and infants because of the presence or absence of psychosocial factors such

as maternal depression or maternal trauma alone. The emphasis on investment in individual assessment of each mother and her infant extends to both researchers investigating the mother-infant relationship, and clinicians treating women for perinatal mental health problems. The application of ‘what works and for whom’ is required (Fonagy et al., 2014), with the psychosocial predictors examined in this dissertation representing only one part of the complex interaction of factors that contribute to the quality of the mother-infant relationship.

8.2. Review of Dissertation Aims and Key Findings

8.2.1. Study one: maternal depression and maternal EA. Empirical study one indicates that perinatal maternal depression is not the robust predictor of maternal EA that some of the literature might have indicated (e.g., Rossen et al, 2018; Vliegen et al., 2009; Easterbooks et al., 2005). According to the findings maternal depression in early pregnancy may have a small negative association with maternal EA, but some mothers may still be emotionally available to their infant despite experiencing depression. This might appear contrary to some of the existing literature (e.g., Murray & Cooper, 1997; Herrera et al., 2004). However, in critically analysing the evidence relied upon in support of the assertion that perinatal maternal depression leads to non-optimal mother-infant interactions (e.g., Murray et al., 2015), the predictability of the weak association between perinatal maternal depression and maternal EA observed in study one is evident.

Of the handful of studies that assess the relationship between maternal EA and depression in mother-infant dyads (e.g., Cornish et al., 2008; Rossen et al., 2018), there are key methodological differences that might explain the difference documented in the strength of maternal depression as a predictor. There is only one

other study identified in this dissertation that conceptualized depression symptomatically and diagnostically (Cornish et al., 2008). This raises the question of whether the samples used in the existing EA studies represent women with depression. For instance, if a symptomatic measure alone is applied and the mean for the women's EPDS scores do not fall within the range for clinical depressive symptoms (e.g., Rossen et al., 2018), there is no way of knowing whether any of the women included in the sample ever reached the threshold required for clinical depression diagnosis (Matthey, Henshaw, Elliott and Barnett, 2005). That is not to say that perinatal maternal depression should be captured diagnostically. As set out in Chapter Two of this dissertation, exclusive use of a diagnostic measure can risk the exclusion of women who fall outside of the arbitrary cut off points used for diagnostic measures (Kotov et al., 2018; Carragher et al., 2015). Instead, employing diagnostic and symptomatic measurement may account for the limitations of each approach and ensure the construct aiming to be measured is captured comprehensively (e.g., Helzer, Kraemer, Krueger, Wittchen, Sirovatka, & Regier, 2009). Our examination of the relationship between maternal depression and maternal EA captured depression by diagnostic and symptomatic measurement, with depressive symptoms in early pregnancy the only significant predictor of maternal EA at six months postpartum. The small effect size of those depressive symptoms challenges the notion in other parts of the literature (e.g., Murray et al., 2010; Lovejoy et al., 2000) that maternal depression alone will lead to poorer mother-infant relationship quality.

Despite the well-known issues around exclusive use of diagnostic or symptomatic measurement set out in Chapter Two (Kotov et al., 2018), study one is the only study that we identified in the EA literature that conceptualizes depression symptomatically and diagnostically and applies longitudinal measurement of

depression from pregnancy to the postpartum. Significantly, however, the results of study one need to be placed in the context of other parenting difficulties that can arise for women with depression.

There is a separate literature to the EA studies that investigates the relationship between maternal depression and other parenting outcomes. For example, Foster, Garber, Durlak (2008) noted in a sample of 204 11-year old children, that with one standard deviation increase in mothers current depressive symptoms, maternal positivity towards children during a problem solving task reduced by .27, with a direct negative effect also recorded between current maternal depressive symptoms and children's externalizing behavioural problems (measured by the Child Behaviour Checklist). Similarly, Farmer and Lee (2011) reported that maternal depression mediated the relationship between parenting stress (measured by the Parenting Stress Index; Abidin, 1995) and parent child interaction quality (measured by the number of parent-child activities). This adverse effect of maternal depression on parenting behaviours is captured by Lovejoy et al.'s (2000) meta-analysis of 46 studies. A moderate effect size was reported between current maternal depression and studies that assessed negative parenting behaviours (e.g., disengagement or negative evaluative comments). Collectively, this indicates that women with depression may experience other parenting difficulties, even if there is EA at six months postpartum. However, given the early mother-infant relationship may be a protective factor against later adverse child outcomes (e.g., Fonagy, 1998), investment in those early dynamics may benefit both the child and the mother-child relationship in its future.

That said, the negative association between maternal EA and depressive symptoms in early pregnancy highlights the importance of perinatal services to women before the birth of their child. Given the effect of depressive symptoms in

pregnancy was only small, it is necessary to consider other additional psychosocial factors that might comprise a mother's EA. Extending the examination of factors that may influence maternal EA beyond maternal depression was the next step in this dissertation.

8.2.2. Study two: maternal trauma and maternal EA. The findings contained in study two of this dissertation confirm the existing literature (Easterbrooks & Driscoll, 2007, Fuchs et al., 2015), that maternal childhood trauma has a negative effect on maternal EA at six months postpartum. However, unlike the existing literature, the findings from study two demonstrate the effect of distal childhood trauma on maternal EA is retained even when accounting for proximate traumas specific to the perinatal period. Indeed, the association between maternal childhood trauma and maternal EA was not mediated by childbirth experience, and though evidence of a direct effect of current stressful life events and maternal EA was observed in our model, our data did not support antenatal and postnatal stressful life events as a mediator between maternal childhood trauma and maternal EA. In the context of trauma and the perinatal period, this indicates that clinicians should direct attention towards women with childhood trauma history because those women may be vulnerable to difficulties in the early mother-infant relationship regardless of whether they have experienced proximate trauma through childbirth experience or stressful life events.

These findings uniquely contribute to the EA literature. Study two is the first, to our knowledge, to examine the association between maternal childhood trauma and maternal EA using a multiple mediation model that accounts for proximate trauma specific to the perinatal period. In specifying different pathways between childhood trauma and maternal EA, the mediation model captures the increased likelihood that

women with childhood trauma history may also experience subsequent additional traumas. The importance of specifying the pathway between a type of maternal trauma and an outcome has been identified in the childbirth trauma literature. Researchers have raised the difficulty in interpreting findings that attribute the issues around maternal bonding with an infant to the experience of childbirth, where there has not been measurement of other traumatic events which may also account for the reduced parenting capacity (Lev Wiesel et al., 2009; Cigoli, Gilli, & Saita, 2006). Whilst the data in this dissertation does not support the analysis of maternal childhood trauma, childbirth experience, stressful life events and maternal EA together, the findings highlight the need for additional research studies to test the presence of proximate trauma when analyzing the relationship between maternal childhood trauma and the mother-infant relationship.

Neither of the hypothesized indirect pathways between maternal childhood trauma and maternal EA were significant, first through childbirth experience, and a second sequential indirect pathway through antenatal and postnatal stressful life events. Similarly, the indirect mediating pathway between maternal childhood trauma and maternal EA through each of the proximate traumas in the order of their occurrence was also not significant. However, relative to the total indirect effect, the direct effect of moderate-to-severe childhood trauma accounted for more than three-quarters of the total effect on maternal EA. This suggests the significance of childhood trauma in its capacity to influence an individual's parenting capacity. When considering the possible impact that childhood trauma may have on the development of the individual (e.g., emotional-regulation, emotional tolerance, development of a cohesive identity, interpersonal relationships functioning), it is not surprising that the experience of childhood trauma might also impact on the capacity as a parent.

Additionally, study two contained direct associations between distal childhood trauma and each of the proximate traumas thereby supporting the cumulative effects theory. This is useful information particularly for clinicians working with women during the perinatal period, as it suggests an increased vulnerability to negative childbirth experience as well as stressful life events for women with childhood trauma history. Awareness of this information might facilitate clinical intervention to reduce the impact of traumatic events on the woman's functioning in the perinatal period.

For example, in the case of childbirth, if a woman with childhood trauma is more likely to experience childbirth as negative there might be therapeutic exploration of how to improve the childbirth experience for that woman. Research cites some predictors of childbirth trauma including uncaring or hostile medical care (Ballard et al., 1995; Menage, 1993), sense of powerlessness (Menage, 1993), lack of adequate information (Menage, 1993), as well as patient consent (Menage, 1993). It might be possible for a clinician to draft a 'Sensitive Care Plan' for the patient that is placed on the patient's medical file to advise medical staff how best to approach childbirth to minimize the likelihood of adverse psychological consequences for the woman. The Sensitive Birth Care Plan might include suggestions that target some of the predictors of negative childbirth experience. For example, the Plan may request that where possible, medical staff communicate to the patient the rationale for medical treatment. This could reduce the woman's sense of powerlessness, as well as increase her notion of patient consent to her treatment and facilitate a collaborative relationship between medical staff and the patient. Evidence of the relationship between childhood trauma and childbirth experience shown in our final model has clinical implications for the treatment of some women perinatally.

The finding that childbirth experience was not associated with reduced maternal EA is the first to our knowledge to test the association between the two variables. Though evidence cites a link between adverse childbirth experience and the mother-infant relationship quality, those existing studies generally rely upon measures of maternal self-report of the mother-infant relationship (Dekel et al., 2019), or qualitative data (Allen, 1998; Davies et al., 2008). Maternal self-report is subject to maternal bias, and for those women experiencing trauma from childbirth, their perception and representations of the dyad may be distorted or negative, and not accurately reflect the quality of the interaction with their infant (Schechter et al., 2005). Quantitatively testing the association between childbirth experience and the mother-infant interaction, with an observational measure like the EAS to represent the quality of the dyad, provides a valuable insight into the relationship between childbirth experience and the mother-infant relationship at six months postpartum.

Study two is also the first to our knowledge to examine the direct association between antenatal and postnatal stressful life events and maternal EA. A direct negative association between postnatal stressful life events and maternal EA was observed, though there was no direct association between antenatal stressful life events and maternal EA. The latter association highlights the impact of maternal exposure to stress on infant outcomes including the mother-infant relationship. The lack of association between maternal EA and the earlier stress exposure might reflect resolution of the stress that was associated with the antenatal experience by six months postpartum when the interaction was recorded. The impact of prenatal stress exposure has received increasing attention in the developmental literature (e.g., Robinson et al., 2011). Linked to prenatal stress exposure are adverse effects including to child motor development (Huizink, Robles de Medina, Mulder, Visser &

Buitelaar, 2003), adolescent psychopathology (Spauwen, Krabbendam, Lieb, Wittchen & Van Os, 2004), child behavioural outcomes (Robinson et al., 2011), and infant temperament (Austin, Hadzi-Pavlovic, Leader, Saint & Parker, 2005). Interestingly, despite the relevance of the mother-infant relationship in relation to each of those developmental outcomes (Papoušek & von Hofacker, 1998; Olson, Bates, & Bayles, 1984; Cerezo, Pons-Salvador, & Trenado, 2008), study two of this dissertation is the first to examine perinatal stressful life events and the development of the early mother-infant relationship conceptualized using maternal EA.

Overall the findings from study two suggest that women with childhood trauma history may be vulnerable to poorer quality mother-infant interaction. However, given the final model accounted for 13.3% of the variance in maternal EA observed in the sample, there are other factors contributing to the quality of the mother-infant exchange, with maternal childhood trauma and stressful life events in the postpartum only a part of what is influencing maternal EA.

8.2.3. Study three: psychosocial predictors of pacifier use. The findings contained in study three of this dissertation suggest that mothers who are not emotionally available to their infants at six months postpartum are more likely to use a pacifier during the mother-infant interaction. Whilst the dissertation data did not support maternal depression and maternal childhood trauma as predictors of pacifier use, the sample of women diagnosed with depression or childhood trauma and identified for pacifier use was very limited, so caution needs to be exercised to not draw firm conclusions until further research is conducted.

To the best of our knowledge study two is the first in the literature to test the association between maternal EA and maternal childhood trauma as predictors of pacifier use during the mother-infant interaction. Whilst the link between maternal

depression and pacifier use is recorded in existing research (Feldens et al., 2013), study three uniquely relies upon observational data to capture pacifier use, which is arguably more accurate in assessing the frequency of a maternal behavior.

Understanding a maternal behavior like pacifier use may provide information about which women are more likely to rely on an inanimate object like the pacifier during the mother-infant interaction. However, further research is required before recommendations regarding pacifier use can be translated to women and clinicians.

According to Winnicott's transitional object theory (1969), infant attachment to an inanimate object supports the development of a nurturing maternal relationship between mother and infant, as the existing relationship allows the infant to transfer the soothing properties of the mother to the object (Litt, 1981). Given the centrality of the mother-infant interaction to child development outcomes (Magill-Evans & Harrison, 2001), it is necessary to understand maternal behaviours like pacifier use, particularly with such widespread use documented (Arnestad et al., 1997; Aarts et al., 1999; Binns et al., 2002). Though our findings did not indicate an association between maternal depression or maternal childhood trauma and pacifier use, it is possible that provision of a pacifier with its capacity for the infant to self-soothe, may enhance the relationship by reducing maternal stress and increasing the emotional space for the dyad.

8.2.4. Summary of the three empirical studies. The findings of the three empirical studies that comprise this dissertation highlight the central role of mother-infant assessment to identify mother-infant dyads with poorer quality relationships. Indeed, the findings of study one showed that perinatal maternal depression is not a strong predictor of maternal EA. Although maternal childhood trauma and current exposure to stressful life events were negatively associated with maternal EA at six

months postpartum, the final model only explained 13.3% of the variance in mother infant-interaction quality. Consequently, it cannot be concluded that women with perinatal depression or maternal trauma from childhood or current stress necessarily require clinical intervention for the relationship quality with their infant.

The findings of this dissertation are not designed to promote the use of screening tools (e.g., perinatal depression or childhood trauma) for mother-infant relationship intervention. Although screening procedures can facilitate the earlier identification of individuals in need of treatment, a high degree of specificity is required to reduce the likelihood of treatment to false positives (Kagee, Tsai, Lund & Tomlinson, 2013). Caution is also required to avoid screeners being used as a diagnostic tool (e.g., EPDS; Milgrom, Mendelsohn, & Gemmill, 2011). In fact, meta-analysis of 16 studies showed little to no impact of the use of screening on clinician's identification and treatment of adults with depression (Gilbody, Sheldon & House, 2008).

That said, screening can enable entry to services with identification of individuals at risk facilitating the possibility of comprehensive assessment, and access to treatment resources (Cauffman, 2003). This issue has also been explored in perinatal mental health services (e.g., Schmied, Langdon, Matthey, Kemp, Austin, & Johnson, 2016; Kingston et al., 2017). Kalra, Reilly and Austin (2018) conducted an RCT in an Australian private maternity hospital using routine screening of depression and psychosocial risk to all women in pregnancy and concluded that routine screening should be conducted antenatally and postnatally. The issue is that even if screening measures were applied to identify women with depression or trauma, this would still fail to capture all of the women that are at risk, because we can see that outside of perinatal depression and maternal trauma, there are other women who are not

emotionally available at six months postpartum. The question for future research is how those other women can be identified and captured for comprehensive mother-infant assessment and treatment intervention capable of targeting the specific relationship dynamics.

The complexity in understanding the mother-infant dyad was further highlighted by study three, where although findings indicated that women not emotionally available were more likely to rely on a pacifier during mother-infant interaction, given that reliance on the pacifier may increase maternal capacity to connect with an infant, pacifier use may be encouraged for some mothers and infants. The knowledge about mother-infant assessment documented in this dissertation required translation to perinatal mental health services to avoid either a broad-based approach to mother-infant relationship intervention, or the alternative of treating the mother's mental health symptoms alone without the inclusion of the dyad in treatment.

8.2.5. Study four: translational research. Study four of this dissertation highlighted the importance of collaboration between researchers and clinicians for the effective translation of research knowledge to practice. Following the presentation of a series of seminars to clinicians at KEMH regarding mother-infant assessment, further information was required about the EAS to inform the decision-making process. With a substantial body of literature applying the EAS, and wide-ranging application of the scale in relation to the scoring, interaction length, as well as the reliability of the coders using the scale, the collaborative process highlighted the need for a systematic review of the existing literature in which the EAS is applied.

The systematic review of the EA literature set out in study four extracted information from 196 peer-reviewed studies regarding the EAS scoring, sample

characteristics (including differentiating or special features of the sample), the psychometric support for the scale, and the required length for mother-infant interaction samples. The value in study four is that it is the only up to date systematic review that captures the existing application of the EAS in empirical studies. The review highlights the wide-ranging application of the EAS to research, with the differences in methodological approach likely to influence the findings reported in the literature. When considering investigation of the psychosocial predictors of the mother-infant relationship, study four highlights the need for more rigorous research standards in the assessment of the mother-infant relationship. This might facilitate the compilation of more compelling evidence regarding the factors that compromise mother-infant relationship dynamics, and ultimately enable the enhancement of the relationship for the mother, the infant and the wider family.

8.3. Timing of clinical intervention for the mother-infant relationship

One of the questions for this dissertation was to assess the optimal timing for clinical intervention for the mother-infant relationship. This consideration was one of the factors that informed the longitudinal design of MPEWS in measuring perinatal depression from pregnancy to the postpartum. The findings in study one showed the strongest predictor of maternal EA was depressive symptoms in early pregnancy. Similarly, in study two, it was childhood trauma, a factor present before conception that explained three quarters of the variance in our final model. Taken together, this dissertation supports access to comprehensive assessment and treatment capable of targeting the mother-infant dyad, so those women in pregnancy who may be more likely to struggle to emotionally with their infant, can be provided with resources and support.

The proposition that the optimal time for clinical intervention for the mother-infant relationship is in the antenatal period is further supported by evidence that a woman's relationship with her child begins in pregnancy. Maternal fetal attachment is the bond between the woman and the fetus that occurs during pregnancy (Cranley, 1981; Condon & Corkindale, 1997). Maternal fetal attachment incorporates the maternal emotions, behaviours and perceptions towards the fetus during pregnancy (Brandon, Pitts, Denton, Stringer & Evans, 2009). If maternal fetal attachment is the precursor to the later observable mother-infant relationship, then understanding the literature regarding the factors that might influence the formation of that attachment could provide a valuable insight into our own findings regarding the small effect of depressive symptoms in early pregnancy on maternal EA.

Alhusen (2008) conducted a meta-analytic review of 22 studies to identify the factors related to lower maternal fetal attachment. Interestingly, maternal depression was reported to be one of the factors that may influence the early mother-infant bond. Yet Hart and McMahon (2006) measured depressive symptoms in pregnancy (using the EPDS) and reported no association between maternal fetal attachment and antenatal depression, with this replicating other research findings (Condon & Corkindale, 1997). Conversely, Müller (1996) reported a moderate association between prenatal attachment and the postnatal mother-infant relationship. However, Müller's evidence was correlational with the prenatal and postnatal attachment measured by maternal self-report. Taken together, the mixed findings in the research regarding antenatal depression and maternal fetal attachment reflect those of our dissertation, that some mother-infant dyads will continue to form a maternal fetal attachment despite the presence of perinatal depression. For clinicians the approach requires assessment of each individual woman and her infant rather than the

underlying assumption based on some of the literature (e.g., Murray et al., 2015), that because of the presence of antenatal depression, the mother-infant relationship will be comprised. That said, the evidence consistently points to the need for clinical intervention in pregnancy, because for those women who are struggling to form a prenatal attachment, this lack of connection might be a precursor for the later observable relationship between the mother and her infant.

8.4. Prenatal Clinical Intervention

There are very limited examples of prenatal clinical interventions to strengthen the beginnings of the mother-infant dyad, largely because the focus in the developmental literature and clinical practice has been on intervention in the postpartum. However, those that exist demonstrate the effectiveness at improving the mother-infant interaction with antenatal intervention. For example, ‘Growing as a Couple and Family’, is a three-class series provided to mothers and fathers in pregnancy. The program targets the parental role, infant interaction skills (e.g., identify cues and respond in a timely and effective way), and psychoeducation about what to expect in the first three months of the infant’s life. Interestingly, Bryan (2001) observed a significant difference in the quality of the mother-infant interaction at 10.5 months (measured using the Nursing Child Assessment Teaching Scale) for 48 parent-infant dyads that received the intervention, compared to the 85 dyads that did not.

Another example of prenatal clinical intervention is the Limerick Lullaby Project (Carolan, Barry, Gamble, Turner & Mascareñas, 2010), in which pregnant women were taught to sing lullabies over four group sessions. Interestingly, the themes that emerged from women’s experience included the facilitation of connection

with their infant through song, the development of ways to communicate and soothe the infant in the postpartum, as well as the provision of a tool to reduce the mother's own stress and promote relaxation. Participants also provided examples of singing the lullabies during mother-infant interactions, thereby enhancing the quality of the interaction with the infant. The limitation of this study is that it only included six participants with no valid or reliable measure of the mother-infant interaction, and only qualitative evidence to support the program's effectiveness. That said, both prenatal clinical interventions – Growing as a Couple and Family and the Limerick Lullaby Project - demonstrate the possibility of strengthening the mother-infant relationship in pregnancy.

In addition to considering the optimal time for clinical intervention, this dissertation raises the issue of treatment approach for perinatal mental health. There are two possible focus areas for psychotherapy interventions for women with perinatal mental health disorders; interventions that primarily target maternal mental health (e.g., O'Hara, Stuart, Gorman & Wenzel, 2000; Cooper, Murray, Wilson & Romaniuk, 2003), and interventions that predominantly target the mother-infant relationship (e.g., Slade, Grienenberger, Bernbach, Levy & Locker, 2005; Gelfand, Teti, Seiner, & Jameson, 1996). Given that perinatal mental health occurs in the context of the mother-infant relationship, treatment should involve the mother's mental health symptoms, as well as the mother-infant relationship. Evidence of reduced depressive symptoms after the dual treatment of the mother and the mother-infant dyad (e.g., Cohen, Lojkasek, Muir, Muir, & Parker, 2002; but also see e.g., Huang et al., 2020), highlights the possibility of the mother-infant relationship as a construct capable of clinical intervention for improved outcomes for the mother, and

the child. The next section examines the literature regarding child outcomes following dual treatment of perinatal mental health and the mother-infant dyad.

8.5. Dual Treatment of Perinatal Maternal Mental Health and the Mother-Infant Relationship

Empirical research suggests that improvements in relationship outcomes for women with perinatal mental health issues and their children requires treatment that targets the mother-infant relationship in addition to their own mental health. Using 193 mother-child dyads, Cooper et al. (2003) compared the treatment outcomes for women with depression who received primary care versus psychotherapy (i.e., cognitive behavioural therapy, psychodynamic therapy or nondirective counseling), with no inclusion of the mother-infant dyad into the therapy groups. Cooper's findings showed a reduction in depressive symptoms and an increase in maternal sensitivity as well as the perception of the mother-infant relationship, for all three treatment groups. However, the changes were not maintained, with no differences in behavioural problems or cognitive functioning recorded at five years between any of the groups.

Cooper's findings were replicated by Forman, O'Hara, Stuart, Gorman, Larsen and Coy's (2007) comparison of maternal and child outcomes for 120 women with depression and without depression who received interpersonal therapy versus no treatment. At 18-month follow up no differences between the groups were recorded apart from in relation to parenting stress, as women with depression who received interpersonal therapy recorded lower levels of parenting stress than women with depression who received no therapy. One possible explanation for the findings observed in these studies is that for child outcomes to be positively impacted by

treatment, the mother-infant relationship needs to be directly targeted. This notion was recently tested by Stein et al.'s (2018) RCT. Using 144 mother-infant dyads with diagnosed depression, Stein and colleagues compared the impact on child outcomes of treatment for depression alone versus the dual treatment of depression and the mother-infant dyad. Results did not support compromised child outcomes in either of the treatment groups, with no differences between the groups. However, this is the only RCT that we are aware of that has made this comparison so further research is required before any conclusion regarding the importance of dual treatment in the context of child outcomes. Without experience, it can be difficult for a clinician to consider how to incorporate the mother-infant dyad into treatment for perinatal mental health. Examples of mother-infant psychotherapy provide insight into the way this may be done therapeutically.

8.5.1. Mother-infant psychotherapy. There are mother-infant psychotherapy programs that have improved the long-term treatment outcomes for women with perinatal mental health conditions. The first example is mother-infant psychotherapy program is 'Watch, Wait, Wonder', which encourages the development of securely attached behaviours in a dyad (Cohen et al., 1999). The infant is positioned as the initiator of the interaction, with the mother encouraged to follow the infant's lead (or watch and wait) and respond to the infant's cues with sensitivity and responsiveness. The other example of mother-infant psychotherapy is Fraiberg's therapy. Directed towards women with unprocessed trauma experiences, Fraiberg's therapy addresses unresolved conflicts that might play out in the mother-infant dyad, providing space for the mother to identify her own experiences and explore how these might impact on her own behaviours and attachment.

What is interesting is unlike the examples of clinical interventions that only target the mother's mental health to the exclusion of the dyad, the treatment gains documented for both Fraiberg's psychotherapy and the Watch, Wait, Wonder intervention were maintained at six month follow up (Cohen et al., 2002). This suggests that mother-infant psychotherapy can lead to positive outcomes for the mother, the infant and the relationship.

Paris et al.'s (2011) Early Connections Program captures a more recent example of dual treatment of maternal perinatal depression and the mother-infant dyad. In this intervention home-based visits enable the naturalistic observation of the mother-infant interaction as the clinician works with the mother, the infant and their relationship. Depressive symptoms are treated with psychotherapy and the enhancement of self-care, as the clinician fosters awareness of positive mother-infant exchanges to increase maternal insight and reduce depressive symptoms. By supporting the mother in her understanding of infant signals and sensitive responses, maternal self-efficacy is promoted, which enhances the mother's ability to connect with her infant during interactions. Though a reduction in depressive symptoms (measured by the postpartum depression screening scale) was recorded from pre to post treatment, the study reported a *t*-test with no measure of the size of the effect to tell us how meaningful the observed change was. Similarly, parenting stress (measured by the parental self-report inventory; Abidin & Abidin, 1990), maternal sensitivity and responsiveness, infant positive affect, and infant involvement (measured by the coding of mother-infant interactions manual), are all documented as improving from pre to post, though again the study reported a *t*-test comparison without an effect size. Taken together, the researchers concluded that treatment of

perinatal mental health should incorporate dyadic work with the mother-infant relationship.

The effectiveness of mother-infant psychotherapy in the treatment of perinatal depression was tested by recent meta-analytic review. Huang et al. (2020) reviewed the RCTs testing the effectiveness of mother-infant psychotherapy in the treatment of perinatal depression. A concurrent reduction in depressive symptoms was observed short term though this effect was small, and it was not maintained at follow up. There were however only four studies that followed the long-term outcomes of women (Cooper et al., 2003; Goodman et al., 2015; Salomonsson, 2015; Peltz et al., 2015), and given the complex interaction of psychosocial factors that contribute to the relationship between perinatal depression and the mother-infant relationship, it is possible that for some groups of women, mother-infant psychotherapy may have a longer term impact. This needs to be empirically tested. The meta-analysis provides support for the inclusion of the mother-infant dyad in treatment, even if the only effect is more effective short-term reduction of depressive symptoms.

One of the motivators for examining specific psychosocial predictors of the mother-infant relationship is the conceptualization of the dyad as a vehicle by which maternal and child outcomes may be influenced (Lewis et al., 2014). A growing body of research has documented the association between maternal EA and child developmental cognitive, socio-emotional and psychological outcomes (Biringen et al., 2014; Saunders, Kraus, Barone, & Biringen, 2015). To highlight the possible benefit to child outcomes of strengthening the EA in a mother-child relationship, evidence of the association between maternal EA and child developmental outcomes is documented below.

8.6. Maternal Emotional Availability and Child Developmental Outcomes

Research indicates that maternal EA may influence infant sleep outcomes. Infant sleep impacts on cognitive, psychological and emotional outcomes for both the mother and child and can be associated with the EA in a relationship (Teti, 2016). Sleep issues in early life are associated with emotional and behavioural difficulties, neurological functioning in adolescence, aggression and mental health problems (e.g., Gregory & Sadeh, 2012), as well as disruption to parent-infant relationship (Tikotzky, Chambers, Kent, Gaylor & Manber, 2012). Sleep difficulties can place the mother and child at risk of poorer health and developmental outcomes. Teti et al. (2010), observed that mothers who were emotionally available at bedtime experienced fewer disruptions in settling their infants to sleep, and had less frequent night waking than infants of mothers with lower EA. Jian and Teti (2016) replicated these findings in 72 mother-infant dyads. They observed that with one standard deviation increase in maternal EA at bedtime, infant sleep minutes at one to six months increases by .21 standard deviations. This suggests that if we are able to identify mother-infant dyads at increased risk of reduced EA, which according to our research findings may include women with childhood trauma history or current stressful life events exposure, and enhance the emotional connection in the dyad, there may be improvement in infant sleep. However, it is important to remember the complexity of factors that contribute to infant sleep outcomes, with maternal EA only explaining a proportion of the variance observed in the above study findings. In addition to infant sleep, empirical research suggests that child socio-emotional development may be associated with the EA in a mother-child relationship.

It has been suggested that an emotionally available mother helps an infant to organise their emotional competence (Field, 1994). This is reflected in empirical

studies that record the relationship between maternal EA and a child's emotional functioning. Although our research is focused on the mother-infant relationship, evidence of an association between maternal EA and child outcomes is relevant because unless there is clinical intervention mother-infant dyads with lower EA are likely to develop into mother-child dyads with lower EA (O'Hara et al., 2000; Nylen et al., 2006; Murray et al., 2003). Consequently, evidence of an association between socio-emotional outcomes and EA in mother-child dyads supports our proposition that enhancement of the mother-infant interaction might improve the likelihood of positive child outcomes.

In a sample of 62 mother-infant dyads Volling, McElwain, Notaro and Herrera (2002) observed a small association between maternal EA at 12 months and infant self-regulation at 16 months, though the evidence was correlational. Similarly, in a sample of 37 mother-infant dyads, Licata et al. (2013) noted that maternal EA predicted infant's goal directed behavior at seven months, and when included with infant temperament, explained 30.2% of the variance in infant behavior. Additionally, child responsiveness at 12 months was reported to moderately predict child self-recognition in a mirror task at 20 months in 54 mother-infant dyads (Harel, Eshel, Ganor & Scher, 2002). EA has also been identified as protective when infants are faced with a challenging situation. Little and Carter (2005) noted in 45 mother-infant dyads at 12 months postpartum that with every increase of one standard deviation in emotional regulation, maternal EA also increased by .20. The relationship between maternal EA and child emotional outcomes is also not limited to infants or toddlerhood but has been observed in primary school children (e.g., Kertes et al., 2009). Taken together, these studies evidence an association between maternal EA and child socio-emotional outcomes. In addition to infant sleep and socio-emotional

outcomes, there is evidence to suggest that maternal EA might influence child cognitive outcomes.

Language development has been implicated in maternal EA outcomes. Moreno, Klute and Robinson's (2008) data showed with each one standard deviation increase in maternal EA at 15 months, cognition and language development at aged two years (measured by the Bayley Scales of Infant Development II) increased by .36 standard deviations. In related research, Pressman, Pipp-Siegel, Yoshinaga-Itano, and Deas (1999) recorded in their sample of 24 mother-infant dyads, that maternal sensitivity (measured by the EAS) at aged two years accounted for 10% of the variance in expressive language at two to three years (measured by the Minnesota Child Development Inventory) in children with hearing difficulties. Finally, there is some evidence to suggest an association between EA in a mother-child relationship and child outcomes at school.

Empirical studies indicate that children of mothers with higher EA may show reduced internalising and externalising behavioural difficulties than children of lower EA relationships (Biringen, Skillern, Mone & Pianta, 2005), though the effect size of this relationship is small. Biringen and colleagues (2005) reported that maternal EA (not including maternal sensitivity) explained 15% of the variance in problem behaviours reported by teachers in kindergarten children. Similarly, in a United States study, Howes and Hong (2008) observed in 53 mother-child dyads aged three years that maternal structuring and child involvement had a small association with complex peer play, and children's pretend play was moderately associated with maternal sensitivity and structuring. Whilst these studies suggest that EA in the mother-child relationship might increase positive school outcomes for children, the association between the variables is only small. It is therefore more accurate to suggest maternal

EA may be a protective factor that when combined with other protective factors might reduce the likelihood of adverse child outcomes at school. These findings highlight the importance of seeing the EA construct as one of the constructs that is capable of capturing the mother-child relationship quality, with a variety of parenting skills required during other developmental stages from infancy to adolescence.

8.7. Issues Translating the Emotional Availability Scales to a Clinical Setting

In clinical practice an assessment measure may be applied for the purposes of diagnosis, case formulation, treatment planning and monitoring, as well as treatment effectiveness (Hunsley & Meyer, 2003). The EAS is not a diagnostic tool, however, it is capable of comprehensive assessment of mother-infant relationship dynamics that can inform treatment intervention (Biringen et al., 2014). First, however, a service provider must determine the circumstances in which the EAS might be applied, and whether the human resources and financial costs associated with the measure are outweighed by its benefits (Yates & Taub, 2003). The EAS requires specific training that incurs a financial and time related cost, and that is not including the time required for application of the scale. It is also possible that other assessments in addition to the EAS would be required to inform a mother-infant intervention, and there remains the question of whether a service is even mandated to provide mother-infant interventions (Mathews, Emerson, Moore, Fial & Hanna, 2019).

In addition to these challenges, there are specific difficulties involved in the translation of a research measure like the EAS to clinical practice. Differences between the characteristics of research studies and the reality of clinical practice, may cause difficulties in the application of a research tool (Kazdin, 2008). Even the process of recruiting participants for research, and then obtaining their consent for

involvement, is markedly different to the individuals that might present for perinatal mental health services (e.g., Westen & Morrison, 2001). Moreover, caution is required so that assumptions are not made by clinicians about the construct (e.g., EA), without application of the psychometric tool to assess it (Sonkin, 2005). An example of this is seen in the translation of attachment measures to clinical practice. The research tools used to assess attachment (e.g., Strange Situation Procedure or the Attachment Story Completion Task), may not be feasible in clinical settings where clinicians do not have the time or money required for training (Cooke, Racine, Plamondon, Tough & Madigan, 2019; Cadman, Belsky, Fearon, 2018). This has led to some clinicians making determinations about children's attachment classification without application of a standardised assessment measure, with implications for treatment planning and outcomes where those attachment categories are misapplied (Granqvist et al., 2017). That said, there are an increasing number of studies that document the application of the EAS to clinical treatment (see section 8.7.1 below). Consequently, the potential utility of the EAS to provide comprehensive assessment of mother-infant dyads and inform targeted mother-infant treatment requires further investigation.

8.7.1. Use of the EAS in clinical intervention. A growing number of studies document the use of the EAS in treatment intervention. For example, an RCT was conducted to compare the difference in EA before and after video feedback intervention in 80 mother-child adopted dyads, with a moderate effect on the EA in the dyad reported (Barone et al., 2018). Similarly, Baker et al. (2015) evaluated the in vivo EA2 Intervention (Biringen et al., 2010) on 15 mother-child adopted dyads. The EA2 Intervention is a six-week program that provides video feedback as well as information on attachment and EA to parents. A large effect of the EA2 Intervention

was observed for both the parent and child side of the dyad, indicating that participation in the intervention increased the emotional quality of the relationship. The EA2 Intervention has also been applied to childcare groups for instance in an RCT of 57 professional caregiver-child dyads a small effect of caregiver structuring improvement was noted for the intervention group (Biringen et al., 2012). Most recently, Benton, Coatsworth and Biringen (2019) tested the association between EA, mindful parenting and adolescent outcomes in 30 mother-adolescent dyads, with the EAS applied pre and post observation. Interestingly, with each one standard deviation increase in non-hostility, a reduction of .37 in parent reported externalizing problems was observed. Similarly, with each one standard deviation increase in adolescent responsiveness, there was a .38 reduction in parent reported internalizing problems reported.

Collectively, these studies evidence the possibility of using a valid and reliable measure such as the EAS to assess the quality of the mother-infant relationship and the effectiveness of the clinical intervention at improving the quality of that emotional connection. Application of a valid and reliable tool like the EAS might avoid investment in interventions designed to improve the quality of the mother-infant relationship which may not be effective. For instance, the Circle of Security (Cooper, Hoffman & Powell, 2009), an attachment intervention applied worldwide (e.g., Pazzagli, Laghezza, Manaresi, Mazzeschi & Powell, 2014), for which RCT showed no significant effect on child attachment or behavioural problems (Cassidy et al., 2017).

8.8. Dissertation Limitations

8.8.1. Inclusion of fathers. Whilst this dissertation contributes to the EA and developmental literature, it is not without its limitations. First, the research only included mothers. There is a paucity of child development research including fathers, though that is starting to change (e.g., Hallers-Haalboom, Mesman, Groeneveld, Endendijk, van Berkel, van der Pol, Bakermans-Kranenburg, 2014; Rossen et al., 2018). Paternal depression has been associated with child development, with empirical studies suggesting that paternal depression might further reduce a child's socio-emotional development in the context of maternal depression (Kahn, Brandt & Whitaker, 2004). Conversely, there is evidence to suggest that treatment outcomes for maternal depression might be enhanced where there is positive father involvement (Misri, Jostaras, Fox & Mostaras, 2000), with paternal involvement associated with a later reduction in child behavioural issues (Mezulis, Hyde, Clarke, 2004; Chang, Halpern & Kaufman, 2007). Researchers have called for the incorporation of fathers to clinical interventions that aim to strengthen the mother-infant relationship (Olds, Sadler & Kitzman, 2007). In the context of this research, it would be interesting to see what impact fathers' involvement had on the EA of the women in the sample, particularly women with risk factors identified by studies one and two; early depressive symptoms, maternal childhood trauma or current stressful life events exposure. One might hypothesize that positive paternal involvement may reduce the impact of maternal mental health on the mother-infant relationship, but this would need to be empirically tested in future research.

8.8.2. EAS Limitations. The EAS is not without its limitations. Ambiguity in the drafting of some of the subscales has been noted, with an overlap in some of the dimensions (i.e., sensitivity and non-intrusiveness), causing difficulties in the

application of the scale (e.g., Hallers-Haalboom et al., 2014). Some researchers have documented amendments made to the EAS coding criteria to achieve interrater reliability (Endendijk et al., 2019; Hallers-Haalboom et al., 2014). However, our systematic review of the EA literature contained in study four shows over 150 studies that have applied the EAS with interrater reliability achieved. Even though there are some difficulties documented in relation to the EAS, the findings of our systematic review conducted in study four demonstrates the EAS is supported by psychometric evidence, as well as valid and reliable application worldwide.

8.8.3. Other parenting constructs. As highlighted in Chapter One, this dissertation conceptualises the quality of the mother-infant relationship using the EA construct. There are other constructs that inform the quality of the mother-child relationship including for example, the Parenting Stress Index (Abidin, 1995); the Parenting Sense of Competence Scale (Gibaud-Wallston & Wandersman, 1978); the Authoritative Parenting Measure (Steinberg et al., 1994); and the Parenting and Family Adjustment Scales (Sanders, Morawska, Haslam, Filus, & Fletcher, 2014; see review of parenting measures by Hurley et al., 2014). Moreover, infancy is a unique developmental stage characterised by high dependency on the parent, with children estimated to spend more than twice the amount of time with their parent than they do in middle childhood (Bornstein, 2002). Assessment of the EA construct at six months postpartum therefore provides an insight into the quality of the mother-infant relationship at that specific developmental stage only.

8.8.4. Comorbid disorders. This dissertation focuses on maternal depression, and maternal trauma, without capturing other commonly comorbid disorders. Anxiety disorders (e.g., generalized anxiety disorder, panic disorder, obsessive compulsive disorder) are often comorbid with perinatal maternal depression. In a large

population-based study in the United States of 10,000 women, Wisner et al. (2013) noted that of the 566 women with postpartum depressive disorder, 66.1% had a comorbid disorder, and 82.9% of the comorbid disorders were anxiety related. However, identification of other disorders is important to inform treatment planning with increased accuracy in diagnosis improving the likelihood of treatment efficacy. For women with depressive symptoms, or childhood trauma, if there is another comorbid disorder present this information can be used to inform treatment.

There are some studies in the EA literature that suggest a link between maternal anxiety and reduced maternal EA. For instance, Zelkowitz, Papageorgiou, Bardin and Wang (2009) noted that maternal anxiety measured (measured by the State Trait Anxiety Inventory; Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983), explained 17% of the variance in maternal EA at 24 months in 56 mother-infant dyads. Zelkowitz only included maternal sensitivity, maternal structuring and child involvement in their analysis. With only two of the parental EAS dimensions used, the study has not tested maternal EA but rather maternal sensitivity and structuring. It appears that the maternal anxiety and EA studies reflect a similar pattern to the maternal depression and EA studies, whereby deficits to some of the dimensions that comprise the EA construct are recorded in women with anxiety, rather than the overall EA in the relationship.

In thinking about how to explain the variance in mother-infant interaction quality, it is possible that other comorbid maternal anxiety coupled with depression could result in a more significant reduction in maternal EA, then maternal depression alone. For the women diagnosed with depression in our sample, it would be interesting to test whether those women with higher levels of anxiety showed lower

levels of maternal EA, compared to the women with depression only. Future empirical research is required to test this hypothesis.

8.8.5. Infant characteristics. Each of the empirical studies may benefit from the inclusion of infant characteristics in the study variables. For example, gestational age or infant gender may influence the relationship between the psychosocial predictors of maternal EA at six months postpartum. The relevance of infant characteristics on the mother-infant relationship quality is highlighted by the example of interactional differences between mothers of pre-term and mothers of full-term infants (see review, Bozzette, 2007). Indeed, these findings led to the development of interventions targeted specifically to improve the relationship outcomes for pre-term infants (e.g., Holditch-Davis, White-Traut, Levy, O'Shea, Geraldo, & David, 2014). Future research studies may incorporate infant characteristics into the investigation of psychosocial predictors of maternal EA at six months postpartum.

8.9. Next Steps in the Emotional Availability Research

8.9.1. Extension to women with severe mental disorders. Where there is an accruing body of EA literature examining the association between nonpsychotic depression, anxiety, trauma and maternal EA, there is a lack of investigation into the impact of severe psychiatric disorders on the mother-infant relationship. This is concerning given psychosis following childbirth is estimated to occur in as many as one to two women per 1000 births (Kendell, Chalmers, Platz, 1987). This estimate is reflected in a recent review of the epidemiological studies which documented postpartum psychosis rates between .89 to 2.6 per 1,000 births (VanderKruik, Barreix, Chou, Allen, Say & Cohen, 2017). Of those postpartum psychotic episodes, it is estimated that approximately 25 - 50% of cases are occur in the context of bipolar

disorder (Jones & Craddock, 2002). The perinatal period is one of high risk for women with a history of bipolar disorder, with as many as 37% experiencing relapse following childbirth, with this rate increasing to 66% where women are unmedicated (Wesseloo, Kamperman, Munk-Olsen, Pop, Kushner, Bergink, 2015). The research has identified risk factors associated with the likelihood of psychosis or an episode of bipolar disorder (Jones & Craddock, 2005), with recommendations for the pharmacological and psychosocial management of women at risk from pre-conception to the postpartum (Galbally, Snellen, Walker & Permezel, 2010). However, it is surprising how little examination there is of the impact of bipolar disorder on the mother-infant interaction.

There is some evidence that documents reduced quality mother-infant interaction for women with bipolar disorder, though the methodological approach to assessing the mother-infant interaction is varied. Hipwell, Goossens, Melhuish & Kumar (2000) noted that women with postpartum bipolar disorder showed less infant praise, affection, and encouragement (measured using the Play Observation Scheme and Emotion Rating) during play with their infants at 12 months than women without bipolar disorder. There is a preliminary basis for investigation of a reduction in the quality of mother-infant interaction for women with bipolar disorder. Use of a comprehensive measure like the EAS could provide information about more parenting dimensions that might be compromised by bipolar disorder symptoms in the mother.

Just as there is a need for research regarding bipolar disorder, much of the evidence regarding the impact of schizophrenia on the mother-infant interaction is derived from observed interactive deficits (Hipwell et al., 2000). For instance, mothers with schizophrenia have been reported as showing reduced touch and play with their infants (Garmezy & Streitman, 1974), with their infants documented to be

more avoidant (Riordan, Appleby & Faragher, 1999). The level of risk to the mother-infant dyad posed by schizophrenia was highlighted by Riordan et al.'s (1999) comparison of the quality of mother-infant interactions for women with schizophrenia compared to women with affective disorders (i.e., depression and bipolar disorder). Riordan and colleagues observed that schizophrenic mothers showed reduced sensitivity, lower affect, increased intrusiveness, less engagement, as well as reduced infant involvement and reciprocity compared to women in the affective disorders group. Given the higher numbers of women with schizophrenia who are discharged from psychiatric mother-baby units or hospital under formal supervision from social services or with their infant removed to institutional care (Abel, Webb, Salmon, Wan, & Appleby, 2005; Salmon, Abel, Cordingley, Friedman, & Appleby, 2003), women with schizophrenia form an extremely vulnerable group of mothers. The examination of mother-infant dyads using the EAS could provide valuable information to inform clinical interventions to reduce the impact of schizophrenic symptoms on the mother-infant dyad.

8.9.2. The measurement of other parenting constructs: maternal representations. In the last twenty years significant attention has been paid to the address the parent's representation of the interaction to effect change for the dyad (Fraiberg & Fraiberg, 1980; Zeanah & Barton, 1989). An example of this might be an intrusive mother-infant interaction. This level of maternal control might represent a mother's desire for her child to achieve and be independent, or conversely, it could be driven by a maternal need to prove the mother is wanted by her child and show the child's dependence. These two maternal representations of the same interaction require different approaches therapeutically. However, without knowledge of the maternal representation of the interaction, the clinician targets what is observable; the

interactive intrusiveness. Numerous researchers have theorized about the impact of the subjective experience of the interaction for each party and proposed that what is experienced in the interaction for the self, the relationship and the other is of equal importance to the observable interactive behavior (Zeanah & Anders, 1987; Sroufe & Fleeson, 1985). According to these researchers, mother-infant intervention must be aimed at two components to the relationship: the external and internal. This requires mother-infant assessment to include both the interactive behaviours as well as the internal representations of the mother and the infant.

The studies that comprise this dissertation did not include the measurement of the mother's subjective internal experience of the interaction. Although assessment of the EA in a dyad can incorporate some of the history of interactions between the parties, an interesting next step for the research in this dissertation would be to conceptualise the mother-infant interaction using the observable data from the EAS, as well as a measure to capture the mother's meaning of the interaction.

8.9.3. Childbirth research. As highlighted by study two of this dissertation, the literature exploring the trauma that some women experience from childbirth is still in its infancy. A key issue is how maternal trauma from childbirth is conceptualized. Whilst the measure that we used in empirical study two assessed childbirth experience with women rating whether their childbirth was more or less positive, other studies have utilised measures that assess PTSD (e.g., Seng et al., 2013; Zambaldi, Cantilino, & Sougey, 2011). The benefit of a measure of clinical trauma symptoms is to reduce the likelihood that symptoms of another disorder are not incorrectly captured as childbirth trauma (Grekin & O'Hara, 2014). Moreover, measuring an adverse childbirth experience versus clinical trauma symptoms capture different constructs in childbirth trauma. For instance, a woman might record a negative birth experience,

but not be clinically traumatised and still able to emotionally connect with her infant. This might explain the lack of association that our study two findings recorded between childbirth experience and maternal EA. However, another woman who records a negative birth experience but has confounding PTSD symptoms might have difficulty interacting with her infant as they are impacted by their psychopathology. The methodological approach to measuring childbirth trauma in future studies needs to consider this issue.

An approach that reflects the conceptualization of depression in study one of this dissertation may be required for the analysis of the relationship between childbirth experience and maternal EA. That is, conceptualizing childbirth trauma by measuring PTSD symptoms, as well as maternal self-report of childbirth experience, to ensure the sample of women experiencing trauma from childbirth reflect a clinically traumatised sample. Also, of particular interest is the timing of the measurement of childbirth trauma and the mother-infant interaction. Given the lack of association we observed at six months postpartum, it is possible that for most women the trauma associated with childbirth had resolved by this time, thereby not influencing their EA. It would be interesting to obtain longitudinal data that captures maternal trauma symptoms from childbirth as well as the mother-infant interaction at different times to test whether there is any pattern of the association between adverse childbirth experience and maternal EA over time. If we test the cumulative risk model, the next question would be for those women who continue to experience trauma symptoms from childbirth, whether they also have a history of childhood trauma.

8.9.4. Future research regarding pacifier use. One of the primary limitations of the third empirical study was the small sample of women that used the

pacifier during the mother-infant interaction and had depression or childhood trauma history. A next step for the research would be to test the findings of the third study in a larger sample of women using the pacifier during the mother-infant interaction. Moreover, whilst the findings from this study documented an association between reduced maternal EA and pacifier use during the mother-infant interaction, it is difficult to translate this information to recommendations for women. Whether pacifier use during the mother-infant exchange is to be endorsed or not remains a question for future research.

Future research could also observe pacifier use during a mother-infant interaction task where women were not asked to refrain from feeding their infant. It is possible that some of the women in our sample that relied upon the pacifier did so because they were trying to respond to the infant's cue to feed. Also, of interest is the context in which the pacifier is used by the mother. For example, whether the pacifier use occurs before or after infant negative signaling could contribute to our understanding of this maternal behavior in the context of the mother-infant exchange. This detail could be recorded in future mother-infant interactions designed to capture pacifier use.

8.9.5. Consultation with another service provider. The experience collaborating with a service provider for perinatal mental health resulted in the identification of a gap in the available information regarding the EAS. With the contents of the systematic review completed in translational research study, the next step would be to collaborate with another service provider. Even if the EAS cannot be implemented into clinical practice, it might be possible to increase the incorporation of the mother, the infant and the relationship into treatment for perinatal mental health. There was no measurement of the influence that attendance at the

seminar series had on clinicians' approach to incorporation of the mother-infant dyad into treatment. Collecting this information could highlight the effectiveness of the collaborative process in translating research knowledge to clinical practice. Future research might re-run the same seminar series and measure at the start of the series clinicians that would consider the incorporation of the dyad into treatment and compare that to how many clinicians would consider incorporation of the dyad into treatment at the end of the series.

8.9.6 Psychometric Paper for the EAS. As set out in Chapter Two of this dissertation, and highlighted by the systematic review of the EAS literature conducted in study four and detailed in Appendix Five, an issue with the EAS is the range of methodological approaches applied by researchers (see, Special Editions on the EAS; Oppenheim, 2012; Bornstein et al., 2012). How the EAS is applied has a critical effect on the results of a study as well as their interpretation. A next step in the EA research is for a psychometric paper. This could create increased precision and consistency in the way the EAS is conceptualized and interpreted by researchers and may contribute to our understanding of the complexities around the EA construct.

8.10. Conclusion

The aim of this dissertation was to examine specific psychosocial predictors of maternal EA at six months postpartum using the MPEWS pregnancy cohort. The notion of intervention in pregnancy is supported by the findings in Chapters Four and Five. To maximise both child and maternal outcomes, women with perinatal depression or maternal trauma that seek mental health services during the perinatal period, should be provided with access to comprehensive assessment that is capable of facilitating the dual treatment of their mental health and the mother-infant

relationship (Stein et al., 2014; Spielman, 2002). Whether that assessment involves application of the EAS or another measure, will depend on the capability of the service provider. This approach is necessary to avoid the application of broad-based interventions to all women at perinatal mental health services (e.g., Circle of Security; Cassidy et al., 2017). Given the mother-infant relationship is a targetable construct for treatment intervention (Lewis et al., 2014), the quality of which may be capable of influencing outcomes for the mother, the infant and the wider family context (Poobalan et al., 2007; Goodman & Gotlib, 1999), the investment required for comprehensive mother-infant assessment may be justified and necessary.

The issue that remains is how to identify those other women who may not present for mental health, or by reason of maternal trauma history, to perinatal mental health services but who for other reasons struggle to engage in an emotionally available interaction with their child. Future research is required to examine the additional maternal psychosocial predictors of maternal EA, as well as other parenting constructs of the mother-infant relationship, to obtain more information about which women need further assessment and treatment to improve the quality of the relationship with their infant. Maternal EA is associated with improved child cognitive and socio-emotional outcomes (e.g., Volling et al., 2002; Moreno et al., 2008; Biringen et al., 2005), and with increasing examples of clinical application of the EAS (e.g., Baker et al., 2015; Biringen et al., 2010), it is possible that improving maternal EA in the first year of a child's life, may be a protective factor against adverse child outcomes, whilst strengthening the mother-child relationship for its future.

Appendix 1

Three of the four parental EAS dimensions. Given the factor loading for the non-intrusiveness scale were .57, comparatively lower than the other scales (< .81), though still over .40, the recommended cut off (Stevens, 2002), we conducted a measurement model using only three of the four EAS parental scales: sensitivity, structuring and non-hostility. The fit indices did not support the model. Moreover, it is contrary to the existing literature that supports a one factor model of the EAS parental dimensions (see, Garvin et al., 2012), as well as the theoretical basis of the construct of EA which includes maternal sensitivity, structuring, non-intrusiveness and non-hostility.

Table 1. Measurement Model using only Three of the Four Parental Dimensions of the EAS.

Chi-squared model of fit	RSMEA	CFI	TLI	SRMR
$\chi^2 (df = 3) = 464.89, p = .000$	.00	1.00	1.00	.00

ESEM. We also investigated the possibility of using an ESEM in *MPlus*, however the model did not converge.

One factor and two factor model of the parenting dimensions of the EAS.

Based on Garvin et al.'s one factor model (2012) and the two factor model reported by Biringen and Robinson (unpublished personal correspondence, 1995), we ran a one factor model using the four EAS parenting dimensions, and a two factor model using the sensitivity and structuring dimensions comprising one factor, and the non-intrusiveness and non-hostility dimensions comprising the other factor. The results are described in the Table 2.

Table 2. Measurement model for the parental dimensions of the EAS using a one factor and a two factor solution.

	Chi-squared model of fit	RSMEA	CFI	TLI	SRMR
One factor	$\chi^2 (df = 2) = 2.194,$ $p = .334$	.02	1.00	.99	.007
Two factor	$\chi^2 (df = 1) = 1.85,$ $p = .174$	.06	.99	.99	.006

Exploratory Factor Analysis. Finally, we conducted Factor Analysis in SPSS using Principal Component Analysis extraction method and the results supported a one factor model. The eigenvalue for factor one was 3.22, with the eigenvalues for the other three factors $> .4$ (i.e., below the criteria to support a factor; Field, 2009). The one factor model accounted for 80.43% of the variance. The loading of each dimension onto factor one is set out in Table 2

Table 3. Factor One Loadings for EAS.

EAS Dimension	Factor 1
Sensitivity	.94
Structuring	.93
Non-intrusiveness	.85
Non-hostility	.87

Appendix 2

Table 1. The association between maternal depression variables and maternal sensitivity only as the outcome, compared to maternal depression variables and latent variable maternal EA.



		B	S.E.	P
Maternal sensitivity only as the outcome	Depressive symptoms T1	-.18	.09	.044
	Depressive symptoms T2	-.047	.11	.659
	Depressive symptoms T3	.055	.10	.564
	Depression diagnosis	-.616	.31	.044
Latent variable maternal EA as the outcome	Depressive symptoms T1	-.18	.09	.046
	Depressive symptoms T2	-.05	.10	.590
	Depressive symptoms T3	.05	.10	.570
	Depression diagnosis	-.52	.29	.075

Table 2. The fit indices for the maternal sensitivity model and the latent variable maternal EA model including the AIC and the BIC for comparison of model fit.

	Chi-squared model of fit	RSME A	CFI	TLI	SRM R	AIC	BIC
Sensitivity	$\chi^2 (df = 6) = 25.01, p = .000$	.139	.000	-.244	.110	4535.59	4592.16
Maternal EA	$\chi^2 (df = 2) = 2.92, p = .23$	.05	.99	.98	.01	7336.06	7425.91

Appendix 3

Slides from the Two-Part Presentation Series presented by researcher (K.K.M) at King Edward Memorial Hospital for Women conducted as part of the consultation process for study four; the translational research study.

Part 1
How to assess a mother/baby interaction: the Emotional Availability Scale

Kelli K MacMillan
Provisional Psychologist, Doctoral Candidate of Clinical Psychology
Prof. Megan Galbally & Assoc. Prof. Andrew Lewis

What we are doing: Mercy Hospital Pregnancy & Well-being Study: MPEWS.

Mother/baby interactions at six months postpartum:

- ◊ 218 interactions: 165 coded to date.
- ◊ Coded using the Emotional Availability Scale.
- ◊ Around one hour to two hours in length.
 - ◊ 10 minutes structured face to face.
 - ◊ 30 minutes free play with toys.
 - ◊ Time observing during interview.

Relationship between maternal depression, trauma, and social support and the mother/baby relationship.

What is the purpose of assessing the mother/baby interaction?

1. **What is the problem?**
 - a. Prioritise.
 - b. What you target depends on:
 - I. length of treatment;
 - II. capacity of parent;
 - III. interventions available.
2. **What are you targeting in your intervention?**
 - a. emotional (e.g., sensitivity); or
 - b. behavioural (e.g., structuring).
3. **What is the best intervention for this mother and baby?**



Emotional availability

EA provides the framework to assess the quality of a parent/child interaction.

- ◊ More than physical presence or meeting physical needs (e.g., clothed, fed, clean).
- ◊ Level of attunement and responsiveness to emotional cues.
- ◊ Acceptance of negative and positive emotions.
 - ◊ Mutual exchange between the caregiver and the child.



Emotional Availability Scales, 4th Edition: Biringen, 2008

- ◊ Valid and reliable for infants/children 0 – 14 years.
- ◊ Applied to any caregiver/child interaction.
- ◊ Applicable in range of settings:
 - ◊ Naturalistic, observational, structured, unstructured, separation/reunion, teaching.
- ◊ 15 – 20 minutes recommended.
- ◊ Research supports optimal: 40 minutes.



Conceptualisation of the EA Scales



Based in attachment and systematic theories.

Maternal sensitivity:

- Awareness of signals;
- Accurate interpretation;
- Appropriate and prompt response;
- Understanding and empathy.

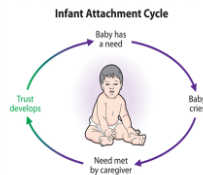
Is only one aspect of the mother/baby relationship.



The EA Scales captures four components to the formation of the relationship - sensitivity, structuring, intrusiveness and hostility.

EA Scales: assess both parties to the interaction.

- o Assess both parties perspective with two scales.
- o Caregiver - 4 scales.
- o Child - 2 scales.
- o *Dyadic exchange: parent cannot look good without the child.*
- o Overall clinical screener provided to rate the interaction.
- o EA = Secure.
- o Complicated = Ambivalent.
- o Detached = Avoidant.
- o Problematic = Disorganised.



Maternal EA Scales

Sensitivity.

- Maternal affect.
- Clarity of perception.
- Awareness of timing, acceptance, flexibility, management of conflict, amount of interaction.



Maternal EA Scales

Structuring.

- Provision of guidance.
- Success of attempts.
- Limit setting, firmness, verbal and non-verbal, peer vs adult.



Maternal EA Scales

Non-intrusiveness.

- Follow the child's lead.
- Ports of entry.
- Commands, adult talking, didactic teaching, physical interferences, feels intrusive.



Maternal EA Scales

Non-hostility.

- Negativity.
- Ridicule/mocking/disrespect towards the child.
- Threats of separation, losing one's cool, frightening behaviour, silence, play themes.



Child EA Scales

Child responsiveness.

- Affect.
- Responsiveness to the mother.
- Autonomy, positive physical positioning, lack of role reversal, lack of avoidance, task orientated.




Child EA Scales

Child involvement.

- Simple initiative – physical needs.
- Elaborative initiative – emotional needs.
 - Use of adult, lack of over-involvement, eye-contact, body positioning, verbal involvement.



*Show recorded mother/baby
interaction.*

Part 2
How to assess a mother/baby interaction: the Emotional Availability Scale

Kelli K MacMillan
 Provisional Psychologist, Doctoral Candidate of Clinical Psychology
 Prof. Megan Galbally & Assoc. Prof. Andrew Lewis

What do we remember from last week

- o Emotional availability framework.
- o What we are assessing with the EA Scales:
 - o Maternal scales:
 - o Sensitivity.
 - o Structuring.
 - o Non-intrusiveness.
 - o Non-hostility.
 - o Child scales:
 - o Responsiveness.
 - o Involvement.
 - o Overall rating of the relationship:
 - o EA, Complicated, Detached or Problematic.



Questions that have arisen

Conceptualisation.

- Attachment theory.
- Systematic theories.
- Emotional perspectives.



Psychometric properties:

- Reliability and validity.
- Higher scores on EA Scale associated with attachment security (measured by the Strange Situation).
- Cross cultural application:
 - Israeli mother/infant dyads.
 - Cross cultural sample in US (i.e., Latin American, African American mothers).

Show interaction between mother and baby.

What would you rate this interaction?

Is it *Emotionally Available*?

- Maternal sensitivity – accurate, prompt and understanding response to child's cues.
- Affectively positive – mutuality and reciprocity – genuine and authentic.

Is it *Complicated*?

- Given where signs of sensitivity, but problems in these areas.
- Inconsistent sensitivity, over-connectedness, one sided interactional style.
- Must be genuine warmth towards the child.

Is it *Detached*?

- Mother not sensitive but competent in some ways – some provision of positive engagement.
- Businesslike approach, affectively flat/depressed or harsh style.
- Mother might withdraw for periods.

Is it *Problematic*?

- Extreme insensitivity – difficult to watch.
- Child not physically safe – might be ignored with minimal interaction.
- Signs of trauma, fear or confusion.



What would you recommend for *this* mother and baby?

Focus on the maternal side.

1. Intrusiveness:

- Moving the baby around too frequently.
- Use of the pacifier.
- Impact of providing a verbal explanation – reduce intrusiveness.



2. Structuring:

- Strength: Trying parent (e.g., talks to the baby, *tries* to engage face-to-face, *tries* to pick up and soothe).
- How to facilitate mutual enjoyment.

What would you recommend for *this* mother and baby?

3. Non-hostility:

- Build awareness of the mother's negative comments to her child.
- Misattribution of child's motives.

4. Sensitivity:

- Accuracy of reading child's cues:
 - Understanding of communication provided by distress signals.
 - Build tolerance for positive and negative emotions.
- Therapy to address mother's own attachment experience, to reduce her fear of a repeated cycle with her own child.



Clinical application of the EA Scales

Application of video-based feedback.

- Parent child interaction therapy (Dombrowski, Timmer, Blacker, & Urquiza, 2005).
 - Specificity of the scales provided feedback to parents on areas for improvement.

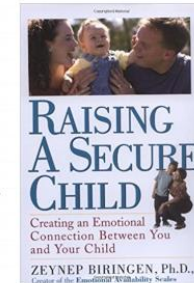
Measure the effectiveness of intervention.

- Application of EA Scales to attachment based intervention with adolescent mothers and infants to assess therapeutic change (Nicolson et al., 2013).



How to qualify as a certified EA Professional

- ◊ Extensive training with Professor Biringen.
- ◊ Strong familiarity with the Manual.
- ◊ Understanding of the theoretical framework (e.g., attachment - EA conceptualisation).
- ◊ Complete training – example cases.
- ◊ Achieve 80% reliability with Professor Biringen on seven cases.
- ◊ www.emotionalavailability.com



To the brave mother and her baby who participated in this workshop, and to all of the mothers and babies who may benefit from this training.



Appendix 4

Table 16. Empirical studies that evidence psychometric support for the EAS.

Author	Investigation	EAS Version	Sample qualities	Age	Context	Reliability	Psychometric information	Measurement of attachment
Altenhofen et al. (2013)	Attachment in infants who entered care in infancy	4	104 foster mother-child dyads; foster children; US	3 years	17 minutes of free play episodes	Inter rater reliability	Convergent validity: Association between EA scales and mother-reported attachment	Attachment Q Sort
Altenhofen et al. (2010)	Predictors of infant attachment for families experiencing divorce	3	24 mother-child dyads; community sample; US	12 – 73 months	30 minutes free play in the laboratory	Inter rater reliability	Convergent validity: EA child involvement predicted mother-reported attachment	Attachment Q Sort
Aviezer et al. (1999)	EA and attachment in kibbutz infants	2	48 mother-infant dyads; Israel	14 – 22 months	Teaching task no duration provided	Inter-rater reliability	Convergent validity: positive association between EA and attachment Cross cultural validity; Israel Divergent validity: No relationship with temperament and EA	Attachment: SSP; Adult attachment interview
Aviezer et al. (2003)	Comparison of attachment in different types of care: mother, relative, nanny or day care centre		704 mother-infant dyads; community; Israel		Strange situation	Inter-rater reliability	Convergent validity: Association between attachment and EA for those in individual care.	Attachment: SSP
Baker et al. (2015)	EA and attachment for adoptive families	4	15 adopted parents and children; Israel	1.5 – 5 years	20 minutes of free play at home	Inter-rater reliability and reliability with Biringen	Following intervention, the EA scores increased for dyads in the intervention group, but there was no change in child attachment behaviours	Attachment Q Sort
Biringen et al. (2008)	Childcare-based intervention – used EA to assess pre	3	57 providers; community; US	18 – 23 months	30 minutes observations at childcare centre	Convergent validity: EA positively associated	Convergent validity: EA associated with attachment	Attachment Q Sort

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 245

	and post effectiveness					with attachment		
Biringen et al. (2012)	EA and attachment in childcare based intervention	3	57 providers; community; US	11 – 36 months	30 minutes observations in childcare centres	Inter-rater reliability	Convergent validity: correlations between EA and attachment	Attachment Q Sort
Biringen et al. (2000)	Adult attachment interview links with EA dimensions	3	35 mother-child dyads; community; US	Pre-kindegarten – 5 years	15 minutes free play; 5 minutes structured (etcha-sketch)	Inter-rater reliability	Partial evidence of convergent validity: Attachment (i.e., adult) predicted EA dimensions except non-intrusiveness and non-hostility	Adult attachment interview
Biringen et al. (2005)	Prediction of attachment with EA according to time and context	3	36 mother-infant dyads; community; US	11 – 13 months	One hour naturalistic observation at home	Inter-rater reliability	Convergent validity: EA positively associated with attachment	Attachment: SSP
Bornstein et al. (2006)	Short term stability and continuity in EA	3	52 mother-baby dyads; community; US	5 – 6 months	Two naturalistic home observations of daily activities (one hour)	Interrater reliability; test-retest reliability; observed twice in home one week apart	Reliability: Short term stability and continuity in EA	
Bornstein et al. (2006).	Testing the short term stability of EA scores	3	34 mother-child dyads; community sample (middle to upper SES); US	2 years	Home versus lab – 8 minutes of free play during a one week period	Interrater reliability; test-retest reliability between home and laboratory	Reliability: Cross context and continuity with EA assessed across three visits.	
Carter et al. (2001)	Maternal depression and early parenting, attachment and toddler outcomes		69 mother-child dyads	4, 14, 30 months	Laboratory play	Interrater reliability	Convergent validity: EA and attachment positive associated	Attachment: SSP
Cassibba et al. (2012)	EA and attachment across generations	4	40 mother-infant dyads; premature infants; infants with dermatitis;	14 months	3 minutes free play following strange situation	Interrater reliability	Lack of convergent validity: Attachment and EA not associated in group with health difficulties	Attachment: SSP

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 246

			full term infants; Italy					
Cheung et al. (2016)	Cultural variations in measurement of EA	4	Study 1: 30 mother-child dyads; range ethnic groups; Study 2: 164 mother-child dyads; Singapore	43 – 71 months	30 minutes of free play at home with toys provided	Interrater reliability and reliability with Biringen	Convergent validity: scores on EA sensitivity maternal behaviour Q-set were highly correlated; Lack of criterion validity: EA sensitivity negatively correlated with likeability with female peers – different findings to Western samples	MBQS
Coppola et al. (2006)	The association between attachment script representations and maternal sensitivity	3	31 mother-infant dyads; community sample (middle class SES); Italy	4 – 6 months	3 minutes free play at home	Interrater reliability	Convergent validity: attachment predicts EA sensitivity	Adult Attachment Interview
Derscheid et al. (2019)	EA among three US ethnic groups	4	50 mother-child dyads; community sample; USA	2 – 4 years	21 – 25 minute sessions: 15 minutes of free play with new toys introduced for an extra 5 minutes of play; 5 minutes of clean up	Interrater reliability and reliability with Biringen	Tested cross cultural validity of scales across three ethnic groups: Hispanic, African American, European American – no significant differences between groups in 6 EAS dimensions (internal consistency of EAS for each ethnicity high with Cronbach's .95)	
Easterbrooks et al. (2000)	Infancy predictors of EA in middle childhood – role of attachment and maternal depression	2	45 mother-child dyads; low SES, US	18 months – 7 years	5 – 10 minute mother-child reunion	Interrater reliability	Convergent validity – attachment predicted EA in middle childhood	Attachment: SSP
Easterbrooks et al. (2012)	Association between maternal EA and disorganized attachment in middle childhood – examination of correlates of	2	43 mother-child dyads	Middle childhood: 7 – 8 years	5 minute reunion following one hour separation	Interrater reliability	Convergent validity: Association between EA and middle childhood disorganised attachment; maternal sensitivity associated with infant attachment security	Disorganised attachment: Middle Childhood Disorganisation and Control Scales; Attachment at 18 months: SSP

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 247

	maternal EA in middle-childhood							
Eldenstein et al. (2004)	Adult attachment style and parental responsiveness during stressful life event	3	39 caregiver-child dyads; community sample; US	3 – 7 years	Immunisations	Interrater reliability	Convergent validity: avoidant mothers scored lower EAS	
Endendijk et al. (2019)	Short term test-retest reliability of EAS in parent-child dyads	4	62 mother-infant dyads		Two observation sessions 7.5 days apart: 15 minute interactions consisting of 3 minute episodes: (1) free play; (2) structuring play (3) book reading (4) free play (5) toys taken away.	Interrater reliability; reliability with Biringen	Moderate to strong test retest reliability found on three parent dimensions: sensitivity, structuring and non-intrusiveness. Test retest reliability not found for child dimensions – EA child involvement not reliable over a one week period and responsiveness only reliable for boys not girls	
Feniger-Schall et al. (2018)	Attachment quality of children with ID and link to maternal sensitivity and structuring	4	40 mother-child dyads; children with non-specific ID; Israel		7 minute free play session without toys; 5 minutes free play	Interrater reliability; reliability with trained coder	Evidence of relationship between EAS and attachment categories assessed using the SSP. Mean score for sensitivity and structuring was significantly higher for the securely attached group than the mean score for the disorganised attachment group but not the insecure (insecure-avoidant and insecure-ambivalent) groups	Attachment: SSP
Flykt et al. (2012)	Maternal representation and EA among drug abusing mothers	4	101 mother-infant dyads; drug abusing mothers; Finland	4 and 12 months	Free play for 7 – 10 minutes	Interrater reliability	Convergent validity: Negative change in maternal representation was harmful to EA for drug abusing and control mothers	Maternal representations measured by the Interview of Maternal Representations

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 248

John et al. (2012)	Mother-child correlates of attachment security	4	47 mother-child dyads; ID; India	3 – 6 years	Free play at laboratory for 8 – 14 minutes	Interrater reliability	Convergent validity: Child EA predicts attachment in children with ID; severity of the disorder was relevant	Attachment Q-List
Kim et al. (2017)	Infant temperament predicting attachment security	4	128 mother-baby dyads	0 – 6 months	Home visit at bedtime provided naturalistic observation	Interrater reliability; reliability with Biringen	Mothers overall EA was predictive of attachment security at 12 months. Maternal EA (composite score) predicted 12 month infant attachment security (i.e., higher EA scores at 3 months predicted higher AQS scores at 12 months ($p < .01$).	Attachment security measured using the Attachment Q-Set procedure
Koren-Karie et al. (2009)	Comparing sensitivity in mothers of children with ASD and mothers of insecurely attached children	2	45 mother-child dyads; clinical sample – high risk: ASD; Israel	Pre-school	In laboratory – 8 minute free play, clean up, 5 minute structured, 5 minute social play.	Interrater reliability between 3 coders: only one trained by Biringen.	Convergent validity: Mothers of children classified as securely attached rated higher in sensitivity, even where controlling for ASD	Attachment measured using the SSP
Oyen et al. (2000)	Maternal attachment and sensitivity in at risk sample	2	30 mother-child dyads; low SES, single mothers (majority; Canada	18 – 42 months	30 minutes play at home with toys.	Interrater reliability	Mothers with less sensitivity showed insecure attachment representations; mothers with more anxiety in attachment were less sensitive.	Adult attachment Interview
Nicolson et al. (2013)	Examining effectiveness of early attachment intervention for adolescent mothers and babies	4	73 mother-infant dyads; adolescent mothers; Australia	4 months	Free play for 20 minutes; separation/reunion	Interrater reliability	EA higher in the intervention group	Attachment: SSP
Racine et al. (2012)	Verbal reassurance during infant immunization and caregiver EA	4	606 mother-infant dyads; community; Canada	2, 4, 6, 12 months	Immunisations – few minutes	Interrater reliability	Convergent validity: Negative association between EA and verbal reassurance at 12 months when attachment is consolidated	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 249

Sagi et al (2002)	Examining the effect of the quality of early childcare on the mother-infant attachment relationship	3	758 mother-child dyads; community sample; Israel		15 minutes free play at home at 6 months; 6 minutes free play in lab at 12 months	Interrater reliability and reliability for one trainer with J.A. Robinson	Convergent validity: Maternal sensitivity predicts child attachment	Attachment: SSP
Susman-Stillman et al. (2013)	Attitudes and beliefs of child-based care providers predicts caregiving behaviour over time	4	98 caregiver-infant dyads; community sample; US	Under 12 months – 30 months	Three observations approximately 6 months apart for 30 – 45 minutes naturalistic observation.	Interrater reliability and reliability with Biringen.	Reliability – measurement of EAS at 3 time points; no difference in any EAS measurements.	
Shivers (2008)	Using the EAS on the childcare continuum	3	(1) 48 providers; (2) 17 providers; (3) 9 providers with 13 ASD children; (4) 46 providers; African American; US	Infant to preschool	(1) childcare homes 1 – 2 hours (2) child care homes 3 hours (4) 3 – 4 hours	Interrater reliability	Convergent validity: EA associated with attachment	
Stack et al (2012)	Effects of birth status on EA and child EA trajectories	2	Study 1: 109 mother-child dyads; low SES; Canada	Infancy – preschool, middle childhood	15 minutes of free play at home (time one); play with jenga (time two)	Interrater reliability; reliability with Biringen	Reliability: consistency across measurement points	
Swanson et al. (2000)	Intrusiveness and quality of attachment	2	51 mother-child dyads; prenatal substance abuse (drugs); USA	1 month, 3 month, 18 months	10 minutes play	Interrater reliability only	Convergent validity: Negative association between non-intrusiveness and disorganised attachment	Attachment: SSP
Van den Dries et al. (2012)	Infant responsiveness, attachment and indiscriminate friendliness following adoption	3	92 mother-infant dyads; internationally adopted children; Holland	Two time points: 2 and 6 months post adoption	Free play of 8 minutes at home	Interrater reliability only	Poor convergent validity: No association between EA sensitivity and attachment or disorganised attachment	Attachment: SSP
Van IJzendoorn et al. (2007)	Parental sensitivity and attachment in children with ASD	4	55 parent-child dyads (49 were mother-child); ASD; Netherlands	14/15 months – 4 years	10 minutes free play	Interrater reliability only	Convergent validity: Sensitivity associated with attachment but only for the control group (i.e., no ASD diagnosis).	Attachment: SSP

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 250

Ziv et al. (2000)	Efficacy of attachment intervention program	3	687 mother-infant dyads; Isreal	12 months	6 minutes of free play	Interrater reliability only	Convergent validity: EA and attachment associated	Attachment: SSP
-------------------	---	---	---------------------------------	-----------	------------------------	-----------------------------	---	-----------------

Appendix 5

Table 17. Review of empirical studies applying the EAS from 1991 to present including special features of the sample, length of interaction, and application of the EAS scoring system ($N = 196$).

Author	Investigation	Sample	EAS edition 1 - 4	Age of infants/children; type of sample; country of origin of research	Context – interaction and duration	Differentiating feature of sample	EAS Reliability of coders	Outcome EAS	How EAS used	Additional variables	Covariate
Altenhofen et al. (2010)	Predictors of infant attachment for families experiencing divorce	24 mother-child dyads; families in divorce process; US	3	12 – 73 months	30 minutes free play in lab		Not specified	EA child involvement	Direct scores for each subscale	Interparental communication; interparental conflict; attachment security; age of onset of overnight stays	Child gender, mothers education, birth order, time elapsed since physical separation of parents, current age of child, child care involvement
Altenhofen et al. (2013)	Attachment in infants who entered care in infancy	104 foster mother child dyads; infants in court ordered care; US	4	3 years	17 minutes: caregiver/child play; clean up of toys; caregivers give child snack; caregiver fills out questionnaire.		Not specified	Sensitivity, child responsiveness, and child involvement	Total scores (29 point scale) for each of the six subscales	Attachment security using AQS, charts of child out of home placements	Child gender, type of maltreatment, length of time in placement, substitute caregiver type
Van Andel et al. (2015)	Developing relationship between foster infants and carers	123 foster families; Netherlands	4	6 weeks – 42 months	20 minutes naturalistic observation at home	Foster families	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness, and child involvement	Total scores sensitivity, structuring, non-intrusiveness, non-hostility,	Parenting stress; salivary cortisol	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 252

									child responsiveness, and child involvement		
Atkinson et al. (2015)	EA, caregiver soothing and infant pain during immunisations	262 parent-infant dyads; community sample; Canada	4	2, 4, 6, and 12 months – cross sectional	Recorded from dyads entry to examination room to five minutes following immunization		Interrater reliability and reliability with Birngren	Sensitivity, structuring, nonintrusiveness, nonhostility	Created high and low EA groups using cut offs of 1SD below above or below the mean	Infant pain related distress; parent soothing behaviours	
Menashe-Grinberg et al. (2010)	Father-child and mother-child interaction in families with feeding disorder	56 children and mothers and fathers; children with non-organic failure to thrive; Israel	4	1 – 3 years	24 minutes total: 12 minutes of one on one feeding with child. 12 minutes of play - structured and clean up	Children with non-organic failure to thrive	Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-hostility; child responsiveness and child involvement	Direct scores for sensitivity, structuring, nonintrusiveness, nonhostility; child responsiveness and child involvement	Parental involvement	
Aviezer et al. (1999)	EA and attachment in kibbutz infants	48 mother-infant dyads; Israel	2	Infants 14 – 22 months	Teaching task (no exact duration)		Interrater reliability and reliability with Robinson	Sensitivity, structuring, non-intrusiveness, non-hostility; child responsiveness and child involvement	Direct scores for sensitivity, structuring, non-intrusiveness, non-hostility; child responsiveness and child involvement	Infant attachment; infant characteristics; mothers representation of own attachment	
Aviezer et al. (2003)	Ecological restrains on mother-infant attachment – when maternal	704 mother-infant dyads;	2	Infants	6 minute free play interaction at laboratory		Interrater reliability only	Sensitivity	Direct score for sensitivity	SES, childcare measures (individual care/centre care),	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 253

	sensitivity is not effective	community; Israel								infant attachment (i.e., strange situation)	
Austin et al. (2017)	Moderating effects of maternal EA on language, cognitive development in toddlers of mothers exposed to Qld flood	131 mother-child dyads; women who were pregnant during Qld flood; Australia	4	16 months	15 minutes of joint play at the laboratory with toys; ten minute maternal separation; 5 minute joint free play after mother-child reunion	Natural disaster exposure	Interrater reliability and reliability with Biringen	Sensitivity and structuring	Total scores for sensitivity, structuring, non-intrusiveness, non-hostility (i.e., 7 – 29)	Infant development; language abilities	Maternal anxiety, stress and depression, SES, maternal education level, maternal age, infant gender, gestation at birth, birth weight
Baker et al. (2015)	EA and attachment for adoptive families	15 adopted parents and children; Israel	4	1.5 – 5 years	20 minute free play at home	Adoptive parents and children	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement; Clinical Screener	Direct scores for sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement; Clinical Screener score out of 100.	Parenting stress; reported EA; attachment security; child behaviour	
Barfoot et al. (2017)	EA and children with cerebral palsy	23 mother-child dyads; Australia	4	3.3 years – 4.9 years	20 minute interaction: free play for 2 – 3 minute; discussion with therapist for 5 minutes with child playing on their own and	Children with cerebral palsy	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement; EA2 Clinical Screener	Total scores for sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness	Maternal depressive and anxious symptoms, stress, child functioning abilities, hyperactivity/inattention; gross	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 254

					parent managing interruptions as would at home; compliance task with child 5 minutes; 2-3 minutes free play; second compliance task of 5 minutes; packing up for 5 minutes				s and child involvement	motor function; child behavioural difficulties	
Barone et al. (2018)	Role of positive parenting and child temperament in children's adjustment post adoption	83 mother-baby dyads; adopted children; Italy	4	14 – 75 months	15 minute infant/play session: 10 minutes with toys, 5 minutes of free play no toys at home	Adopted children	Interrater reliability and reliability with Biringen	Sensitivity, structuring, nonhostility, nonintrusiveness, child responsiveness and child involvement	Summary scores by computing mean for parental EA dimensions ('maternal EA') and child scales ('children's EA')	Child behavioural problems, indiscriminate friendliness, child temperament	Child gender and age
Barone, Barone, Dellagiulia & Lionetti (2018)	Testing an attachment parenting intervention	80 adopted mother-child dyads; Italy	4	1 – 68 months	15 minute infant/play session: 10 minutes with toys, 5 minutes of free play no toys at home	Adopted children	Interrater reliability	Sensitivity, structuring, nonhostility, nonintrusiveness, child responsiveness and child involvement.	Summary scores by computing mean for parental EA dimensions ('maternal EA') and child scales ('children's EA'). Also supported by factor analysis	Parenting intervention, biological markers	Gender and age

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 255

									indicating one factor model fit the data.		
Barone, Carta & Ozturk (2018)	Socio emotional functioning in planned lesbian families – whether biological status matters	40 mother-child dyads; Italy	4	30.5 months	5 minutes with toys; 10 minutes with free play		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement	Summary score for maternal EA and child EA by computing the mean value among the EA scales	Maternal attachment; maternal state of mind; parenting stress; parenting alliance	Child gender
Behrendt et al. (2018)	Maternal determinants of children's early social emotional development	66 mother-child dyads; community sample; Germany	4	6 – 8 months	15 minutes of free play in playroom setting		Interrater reliability and reliability with Biringen	Sensitivity	Direct score for sensitivity	Maternal depressive symptoms; maternal emotion regulation difficulties; child social-emotional development; postnatal maternal bonding	
Belt et al. (2013)	Intergenerational maternal trauma through mother-infant dyad	One dyad – case study; substance abusing mothers; Finland.	4	One month	7 – 10 minutes of play interaction		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement	Direct scores sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement	Adult attachment, infant attachment	
Belt et al. (2012)	Impact of psychotherapy for mothers	101 mother-child dyads;	4	4 months	7 – 10 minutes of play interaction		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child	Direct scores on each of the dimensions separately.	Substance abuse characteristics, psychoanalytic	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 256

	with substance abuse history	Substance abuse; Finland						responsiveness and child involvement		intervention, psychosocial support; depression	
Benton et al. (2019)	Association between EA and mindful parenting	30 mother-child dyads; US	4	Adolescent – 12.4 years	15 minute structured interaction task		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement; EA Clinical Screener	Direct scores sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement; EA Mother Clinical Screener and EA Child Clinical Screener	Mindful parenting, behavioural problems and adolescent well-being	Sex, age, education
Bergmann et al. (2016)	EA, facial emotions in obese women	146 mother-child dyads; 73 obese women and 73 control; Germany	4	6 – 47 months	16 minutes free play with toys in the laboratory		Interrater reliability and reliability with Biringen	Sensitivity, structuring, nonhostility, nonintrusiveness, child responsiveness and child involvement	Total scores sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement; EA composite score by summing the total scores for each dimension	Recognition of facial emotions, understanding emotions, weight status	Depressive symptoms
Biringen & Allender	Evidence based assessments to	1 mother, twins; in	4	Biological mother and foster	Home several hours	Foster care	Not provided	Not provided	Not provided		

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 257

(2011)	evaluate parent-child relationship quality	foster care; US		mother and twin girls aged 2 years							
Biringen et al. (2012)	EA and attachment in childcare based intervention	57 providers ; US	3	11 – 36 months	30 minutes observation at childcare centre		Interrater reliability and reliability with Biringen	Sensitivity, structuring, nonhostility, nonintrusiveness, child responsiveness and child involvement	Direct scores for each of the EA Scales	Attachment scales, caregiver style	Child age, father's age, child gender, intact family structure
Biringen et al. (2000)	Adult attachment interview links with EA dimensions	35 mother-child dyads; community sample; US	3	Pre-kindergarten – 4/5 year olds	20 minute mother-child play session, 15 minute free/fantasy play, 5 minutes structured		Interrater reliability and reliability with Biringen	Sensitivity, structuring, nonhostility, nonintrusiveness, child responsiveness and child involvement	Direct scores for each of the EA scales	Adult attachment interview	Maternal education
Biringen et al. (2005)	Prediction of attachment with EA according to time and context	36 mothers-infant dyads; community; US	3	11 – 12 months	1 hour naturalistic home observation.		Interrater reliability	Sensitivity, structuring, nonhostility, nonintrusiveness, child responsiveness and child involvement	Direct scores of each EAS scale	Mother-infant attachment – strange situation	No covariates significantly correlated – e.g., tested maternal education, birth order of child (i.e., parity)
Biringen et al. (1999)	EA and emotion communications and gender relations	46 mother-infant dyads; community; US	2	9, 12, 14 months	1 hour naturalistic observation		Interrater reliability and reliability with Biringen	Sensitivity, structuring, nonhostility, nonintrusiveness, child responsiveness and child involvement	Direct scores of each EAS scale	EAS and gender	
Biringen et al. (1995)	Relationship between walking onset and emotional	57 mother-infant dyads;	1	9, 12, 14 months	1 hour at home naturalistic observation		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child	Direct score for maternal sensitivity only	Maternal perceptions of infant emotions, praise interaction	Maternal age, paternal age, years of marriage, family income,

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 258

	expression of the infant	community; US						responsiveness and child involvement		bouts, infant affect, testing of wills, Bayley's scale of infant development, criteria for walking onset	maternal and paternal education, hours mother worked, hours of daycare per week, walker experience and ethnicity
Biringen et al. (2010)	Assessment and intervention for global parent-child relational quality	32 mother-child dyads; community; US	4	0 – 14 years.	20 minutes of free play at home		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness; child responsiveness and child involvement	Direct scores of each EAS scale	Parenting stress	
Biringen et al. (2000)	Connection between maternal representations of self as parent and EA	40 mother-child dyads; community; US	2	18, 24, 39 months	16 – 20 minutes		Interrater reliability and reliability with Biringen	Sensitivity and structuring	Direct scores for sensitivity and structuring	Maternal representations, parent attachment interview and peer r/ship interview	Maternal age, maternal education and parity checked as covariates
Biringen et al. (2008)	Childcare-based intervention – used EA to assess pre and post effectiveness	57 providers ; US	4	Infants 18 – 23 months	30 minutes play based interaction at centre		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement	Scoring application not specified	AQS – attachment styles	
Biringen, Skillern, et al. (2005)	School readiness and EA dimensions	57 mother-child dyads; US	3	4 – 5 year olds	20 minutes observation in the lab		Interrater reliability and reliability with Biringen	Structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement	Direct scores used to create EA composite score created by sum of each dimension except sensitivity,	Child observations – child aggression and victimization; teacher report of classroom behavior; student teacher	Child gender, age, preschool experience, maternal education and expressive language competence

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 259

									sensitivity used separately	relationship scale; loneliness and social dissatisfaction questionnaire; and language assessments	
Bödeker et al. (2019)	History of maternal maltreatment and depression on child psychopathology – sensitivity as a mediator	194 mother-child dyads; history of maltreatment and/or depression; Germany	4	5 – 12 years	15 minutes of free play and 6 minutes of a structured task in the laboratory		Interrater reliability; reliability with Biringen	Sensitivity	Direct score for sensitivity	Child psychopathology, child behaviour, maternal abuse history, maternal depression	Gender and age of children
Bohr et al. (2018)	Evaluating caregiver sensitivity to infants	50 mother-infant dyads; community sample; Canada	3	5.38 months	One hour naturalistic observation in the home – coded at 15 minute intervals and for the full hour		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility	Only used the EAS scores from the first 15 minutes of the recorded interaction; standardized and averaged the four EAS scores to create a total scale	Feeding scale; maternal sensitivity	Infant birth weight and age, maternal age and education
Bornstein, Gini, Putnick, Haynes et al. (2006)	Testing the short term reliability of EA across contexts	34 mother-child dyads; community; US	3	2 years	Two free play sessions of 8 minutes each – one in home and one in laboratory		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Direct scores for each scale	Compared EA assessment across three visits	
Bornstein, Gini,	Short term stability and	52 mother-	3	5 months old	Two one hour naturalistic		Interrater reliability;	Sensitivity, structuring,	Direct scores on each EA		

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 260

Suwalsky et al. (2006)	continuity in EA	baby dyads; community; US			observations at home one week apart		reliability with Biringen	nonintrusiveness, nonhostility, child responsiveness and child involvement	scale to form three groups: (1) low EA, (2) medium EA and (3) high EA. Compared mother's cluster membership (i.e., low, medium or high EA) across two visits		
Bornstein et al (2008)	Differences in EA across three countries	220 mother-child dyads; recruited from Argentina, Italy and US	3	5 - 20 months	10 minutes at home naturalistic observation		Interrater reliability; reliability with Biringen	Sensitivity, structuring, child responsiveness and child involvement	Direct scores sensitivity, structuring, child responsiveness and child involvement	Gender of child	Maternal education and age, typicality of child's play
Bornstein et al (2010)	Developmental continuity of EA in three countries	220 mother-child dyads; recruited from Argentina, Italy and US	3	5 - 20 months	15 - 20 minutes free play at home		Interrater reliability; reliability with Biringen	Sensitivity, structuring, child responsiveness and child involvement	Direct scores for sensitivity, structuring, child responsiveness and child involvement		Maternal education and age
Bornstein et al. (2016)	EA in first born and second born dyads	61 mother-child dyads (first and second	3	5 months	One hour naturalistic observation of mother and infant at home		Not specified	Sensitivity, structuring, nonintrusiveness and nonhostility, child responsiveness and child involvement	Direct scores for sensitivity, structuring, nonintrusiveness and nonhostility,	EA only	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 261

		born); communi- ty sample; US							child responsiveness and child involvement		
Bornstein et al. (2016)	Mother-infant and caregiver-infant EA in different caregiver arrangements	245 mother-infant dyads; community sample US	3	5 months	One hour naturalistic observation at home of mother-infant interactions		Interrater reliability; reliability with Biringen	Sensitivity, structuring, infant responsiveness, infant involvement	Overall score was assigned for each EA scale		Maternal age, education, family SES
Bornstein et al. (2019)	Continuity, stability and concordance of socioemotional functioning in mothers and their sibling children	55 families – mother-child dyads with 2 children; US	3	20 month old first born, 20 month old second born	Ten minute play session		Not specified	Sensitivity	Direct score for sensitivity	Self-perception of parenting; self-reports of parenting style; parenting knowledge; locus of control in parenting; maternal socioemotional parenting practices; expressions of affection	Child age, gender, alertness, age between siblings, maternal age, education, hours of employment outside the home
Caiozzo et al. (2018)	Caregiver behaviours associated with emotion regulation in high risk pre-schoolers	124 caregiver-child dyads; low income and SES families; US	4	3 – 6 years	7 minutes of free play between caregiver and child		Interrater reliability; reliability with Biringen	Sensitivity	Total score for sensitivity	Caregiver response to emotions; caregiver emotion regulation; child emotion regulation; inter-parental aggression	Gender, child age
Campbell (2007)	Impact of blindness on the EA in two	4 mother-child	3	18 – 19 months	20 minutes of free play in the home	Visual impairment	Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-	Qualitative description of sensitivity,		

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 262

	mother-child dyads	dyads; infants blind; Australia						hostility, child responsiveness and child involvement	structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement		
Campbell et al. (2009)	Application of EAS to 4 mother-child dyads with blindness in children	4 mother-infant dyads – infants blind; Australia	3	18 – 19 months	20 minutes of free play in the home	Visual impairment	Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility	Direct scores for parental scales of EAS	Maternal language input	
Carter et al. (2001)	Maternal depression and early parenting, attachment and toddler outcomes	69 mother-child dyads.	2	4, 14 and 30 months.	Play at 4 and 14 months		Interrater reliability and reliability with Biringen	Sensitivity, structuring/intrusiveness, hostility, child responsiveness	Created EA composite by summing the standardised direct scores for each of the scales	Maternal depression, attachment status, infant/toddler emotional assessment, child behaviour	Comorbid diagnosis; infant gender, maternal age and income
Célia et al. (2018)	Developmental patterns of change in EA from infancy to 4 years	56 mother-infant dyads; community sample; Canada	2	6, 12, 18, 55 months	15 minutes of free play with standardized toys at home		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, child responsiveness and child involvement.	Direct scores for sensitivity, structuring, non-hostility, child responsiveness and child involvement	Parenting social support index	Maternal social support and education, child gender
Cassibba et al. (2012)	EA and attachment across generations	40 mother-child dyads; premature infants; Italy	4	14 months	3 minutes of free play after the Strange Situation Procedure	Clinical infants – 10 premature, 10 affected by atopic dermatitis, and 20 healthy full	Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-hostility	Created a maternal EA scale by aggregating the four parental EA scores	Adult attachment, strange situation procedure	Parity, maternal EA, infant gender

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 263

						term controls					
Cassiba et al. (2015)	Enhancing maternal sensitivity and infant attachment using video feedback	32 mother-child dyads; community; Italy	4	6 months	30 minutes of free play at laboratory at six months		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Created a maternal EA scale by aggregating the four parental EA scores as well as the two child scales	Adult attachment; child attachment (strange situation)	
Chaudhuri et al. (2009)	EA and parenting style in young mothers	313 mother-child dyads; young mothers; US	3	Young mothers (< 21 years) and infants (14 and 20 months)	Free play and structured teaching task (5 minutes each – 10 minutes in total)		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Averaged EA direct scores on each scale into one single score	Parenting attitudes, parenting behaviours, mother's childrearing history	Maternal ethnicity, maternal age, financial stress, maternal education
Cheung et al. (2016)	Cultural variations in EA	Study 1: 30 mother-child dyads; range ethnic groups; Study 2: 164 mother-child dyads; Singapore	4		30 minutes of free play at home with toys provided		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Direct score for sensitivity	Study 1: Maternal behaviour Q set with Singaporean criterion Study 2: non-verbal ability; teacher rated likeability; vocabulary; likeability with peers	Gender
Chirico et al. (2019)	Focal play therapy designed to address child eating and	17 parent-child dyads; children with	4	Children with eating or evacuation problems	Two 10 minute free play sessions using toys provided at the Centre where the	Children with eating and evacuation disorders	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Direct scores sensitivity, structuring, child responsiveness	Parenting stress	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 264

	evacuation disorders	eating and evacuation problems; Italy			parent and child were seeking treatment				s and child involvement		
Cohen et al. (2019)	Mothers and toddlers exposed to political violence and EA	54 mother-child dyads; exposure to political violence; Israel	4	28.2 months	30 minutes of free play with play materials provided	Exposed to political violence	Reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	EA Total score using mean of each of the six scales total scores	Child exposure to trauma; child behavior; parenting stress; Israeli trauma exposure	Family income
Coppola et al. (2006)	The association between attachment script representations and maternal sensitivity	31 mother-infant dyads; exposure to political violence; Israel	3	Infants recorded interacting between 4 – 6 months	3 minutes of free play in the home	Exposure to political violence		Sensitivity	Constructed a new scale using the sensitivity scale (i.e., direct score of 9 points), and Ainsworth's (1974) sensitivity scale	Adult attachment representations	Maternal education
Cornish et al. (2008)	Postnatal depression and mother-infant interaction quality in the second year of life	112 mother-infant dyads; women diagnosed with depression; Australia	3	15 months	Two segments of five minutes of free play with toys	Women diagnosed with depression at 4 and 12 months postpartum	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility	Direct scores	Maternal language	Infant gender, maternal education
de Falco et al. (2009)	EA levels in mothers and fathers of child	44 parent-child	3.	Toddlers: 18 – 50 months	10 minute play observation	Children with down syndrome	Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-	Cluster analyses separated		Child age and developmental age, maternal

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 265

	with down syndrome	dyads; children with down syndrome; Italy						hostility, child responsiveness and child involvement	dyads into three clusters – lower, medium and higher EA – and presented the mean of each of the six scales within each of those clusters		age, SES, father age.
Derscheid et al. (2019)	EA among three US ethnic groups	50 mother-child dyads; community sample; US	4	2 – 4 years	21 – 25 minute sessions: 15 minutes of free play with new toys introduced for an extra 5 minutes of play; 5 minutes of clean up	Children with moderate hearing loss	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	EA only	Maternal age, SES, education, child gender
Dirks et al. (2019)	Joint engagement in parent-child interaction with children with moderate hearing loss	51 mother-child dyads;	4	29 to 45 months	10 minutes of free play at home	Children with moderate hearing loss	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, child responsiveness and child involvement	Direct scores sensitivity, structuring, non-intrusiveness, child responsiveness and child involvement	Receptive and expressive language ability; joint engagement	Child age and degree of hearing loss
Din et al. (2009)	Maternal EA and infant pain related distress	73 mother-infant dyads; community; Canada	4	3 – 20 months	Naturalistic observation of mother and baby during immunisations in one of three clinics		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility	Combined the direct scores for the four parenting dimensions to form a composite EA score – summed together the	Infant pain measures	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 266

									direct scores (1 – 9 sensitivity, and 1 – 5 for the other three scales). EA scores were between 4 – 24		
Dittrich et al. (2017)	Impact of stress on maternal EA in mothers with history of child abuse and depression	140 mother-child dyads; mothers with history of child abuse and depression; Germany	4	5 – 12 years	15 minute play task with standardized toys; structured play of 6 minutes		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and involvement	Direct scores for sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and involvement	Child behavior; maternal psychopathology and history of abuse	Dyadic stress
Dolev et al. (2009)	Understanding maternal EA in context of ASD in mother-child dyads	45 mother-child dyads; boys with AD or PDD-NOS; Israel	3	32 – 69 months	Three play situations: 8 minutes of free play; clean up/ structured play: 5 minutes; social play: 5 minutes	ASD or PDD-NOS	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Formed aggregate EA scores by averaging each EA scale across the three play situations (i.e., average of 4 parental EA scales and average of two child EA scales)	Autism Diagnostic Observation Schedule, Autism Diagnostic Interview, Vineland Adaptive Behaviours Scales, Bayley Scales of Infant Development, Kaufman Battery for Children,	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 267

										Family Impact Questionnaire	
Dombrowski et al. (2005)	Assessing the effectiveness of parent child interaction therapy	1 mother-child; US	3	23 months	5 minute child directed play	Child removed from parent's care; possible drug exposure		Direct scores from each of the EA Scales to compare pre-treatment and post-treatment	Used mean scores for pre and post treatment	Child standard checklist, dyadic parent-child coding system, parenting stress index and EAS	
Easterbrooks et al. (2000)	Infancy predictors of EA in middle childhood – role of attachment and maternal depression	45 mother-child dyads; low income; US	2	18 months – 7 years	5 – 10 minute mother-child reunion		Interrater reliability	Sensitivity, structuring, non-hostility, child responsiveness and child involvement	Recalculated scores to represent distance from optimal EA score	Maternal depression, infant attachment in strange situation	Infant gender
Easterbrooks et al. (2012)	Association between maternal EA and disorganized attachment in middle childhood – examination of correlates of maternal EA in middle-childhood	43 mother-child dyads; low income; US	2	Seen in infancy (12 – 18 months) and middle childhood (7 – 8 years)	5 minute reunion following one hour separation in laboratory setting		Interrater reliability	Sensitivity, non-hostility and non-intrusiveness	Recalculated scores to represent distance from optimal EA score	Maternal depressive symptoms and child depressive symptoms, attachment security, child behaviour, maternal EA, maternal disrupted communication; infant attachment security; quality of mother-infant interaction	
Easterbrooks et al. (2005)	Patterns of EA among young mothers (> 21	80 mother-infant	3	10 months	5 minutes of free play		Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-	Direct scores for each of the six EA	Maternal perception of childhood	Maternal age, baby age, neighbourhood

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 268

	years) and their infants	dyads; US						hostility, child responsiveness and child involvement	dimensions. Combined the two child scales. Used cut off score of 4 for each of the EA Scales to create subgroups – optimal and suboptimal EA	relationships; maternal depression, health risk behaviour	conditions, involvement of grandmother, maternal education
Ekmekci et al. (2016)	Sensitivity beliefs and sensitive parent behaviours of ethnic majority and ethnic minority mothers	60 mother-child dyads; Turkish minority of immigrants with lower education levels; Netherlands	4 th edition	2 – 5 years	Ten minutes of free play using toys provided	Externalizing behavioural difficulties in children	Interrater reliability and reliability with Biringen	Sensitivity, non-intrusiveness	Total scores for sensitivity, non-intrusiveness (removed subscale 'the adult is made to feel or seem intrusive')	Maternal behaviour	Age of the child
Edelstein et al (2004)	Adult attachment style and parental responsiveness during stressful life event	39 caregiver-child dyads; community; US	3	3 – 7 years	Observation during child standardized (time not specified)		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness and non-hostility	Composite score – parental responsiveness created based on standardized scores on parental EAS scales	Child distress, parental attachment style, personality inventory, child temperament	Child age and gender, parental gender
Enns et al.	Verbal and nonverbal	63 mother-	3	9 – 13 years	Mother and child played the		Interrater reliability; and	Sensitivity, structuring, non-	Direct scores sensitivity,	Verbal communication;	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 269

(2016)	communication in at mother-child dyads	child dyads; Canada			game of Jenga for 240 seconds		reliability with Biringen	hostility, child responsiveness, child involvement	structuring, non-hostility, child responsiveness, child involvement	non-verbal communication, child nonverbal cues; maternal childhood history of aggression	
Endendijk et al., (2019)	Short term test-retest reliability of EAS in parent-child dyads	62 mother-infant dyads; community; Netherlands	4	9 – 12 months	Two observation sessions 7.5 days apart: 15 minute interactions consisting of 3 minute episodes: (1) free play; (2) structuring play (3) book reading (4) free play (5) toys taken away		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, child responsiveness and child involvement	Total scores for sensitivity, structuring, non-intrusiveness (excluded subscale – ‘adult made to feel or seem intrusive), child responsiveness and child involvement (excluded subscale ‘elaborative initiatives such as creating a story line’)		Differences between session recordings: time of day, time since infant had slept or eaten; gender of infants; parent gender, coder; parent behaviour difference; observation setting; time difference between observation sessions
Espinet et al. (2013)	Comparison of ratings of mother-child r/ship quality in substance abusing mothers	34 mothers; high risk with substance abuse; Canada	4	12 – 40 months	20 minutes of free play in clinic (recorded)		Interrater reliability: 2 coders, reliability with Biringen following training.	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and involvement. Clinical screener (i.e., score between 0 – 100)	Direct scores on each EA scale; Clinical Screener represented numerically	Substance abuse measure, parenting stress index, diagnostic information about infant and early childhood mental health	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 270

Evans et al. (2017)	Mother preterm infant rship quality	120 mother-infant dyads; preterm infants; Australia	4	6 and 12 months	6 months engaged in 15 minute face to face interaction and act as normally would (e.g., feeding); 12 months: series of five activities of 2 minutes, 3 minutes, 4 minutes, 4 minutes and 6 minutes respectively (20 minute total interaction)	Preterm infants	Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and involvement	Direct scores for sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and involvement	Maternal postnatal attachment; maternal infant responsiveness	
Feniger-Schaal et al. (2019)	Parenting children with ID	38 mother-child dyads; ID diagnosis; Israel	4	2.5 – 5.5 years	5 minutes of mother-child free play	Children with ID	Interrater reliability; reliability with Biringen	Sensitivity	Direct scores for sensitivity	Child development and adaptive behaviour; maternal insightfulness; child ID	Maternal education
Feniger-Schaal et al. (2018)	Attachment quality of children with ID and link to maternal sensitivity and structuring	40 mother-child dyads; children with non specific ID; Israel	4	26 – 75 months	7 minute free play session without toys; 5 minutes free play	Children with non specific ID	Interrater reliability; reliability with trained coder	Sensitivity and structuring	Direct scores for sensitivity and structuring	Attachment using SSP; assessment of ID	
Flierman et al. (2016)	Feasibility of parenting intervention for preterm children at 18	60 mother-child dyads; preterm	4	24 months	Free play at home	Preterm birth infants	Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child	Sensitivity, structuring, non-hostility, non-intrusiveness,	Toddler social and emotional assessment; receptive language	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 271

	months corrected age	infants; Netherlands						responsiveness and involvement	child responsiveness and involvement		
Flykt et al. (2012)	Maternal representation and EA among drug abusing mothers	51 drug abusing mothers; 51 control mothers. One group included mothers in outpatient care; Finland	4	4 and 12 months	Mother infant free play: 7 – 10 minutes		Interrater reliability: reliability with Biringen	Direct scores for sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and involvement	Sensitivity, structuring, nonhostility, child responsiveness	Substance abuse information, maternal representations, maternal perinatal depression.	Maternal education, marital status, prenatal maternal depression, financial difficulties
Fonseca et al. (2010)	Relationship between postpartum depression and maternal EA	131 postpartum depressed mothers and infants; Brazil	4	4 – 36 months	14 minutes of free play in the laboratory		Interrater reliability with each other only	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness	Structuring; sensitivity separated into low (>5), medium (5 – 6) and high (6>) groups	Social support, adult attachment and maternal depressive symptoms	Maternal age and maternal education, number of people in the household, parity
Fonagy et al. (2016)	RCT for parent-infant psychotherapy	76 mother-baby dyads; clinical sample; England	2	6 – 10 months	10 minutes of parent-infant free play at home	Women with mental health/emotional difficulties; mother baby bonding issues, DV, trauma-past or present,	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness	Summed each of the subscales (i.e., total scores) to form an EA summary score	Infant development; interactive behavior; parent development; parent reflective functioning; parent representational risk; maternal symptomology; parenting stress;	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 272

						substance use				self-mastery scale; strange situation procedure – attachment	
Frigerio et al. (2019)	EA in mothers with high risk of depression and substance use disorder	68 mother-child dyads; mothers with substance use disorder; Italy	4	2 months	15 minutes of free play in laboratory		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness; clinical screener on 100 point scale	First two subscales of each parental dimension included: sensitivity (affect and clarity of perception); structuring (provision of guidance and success of attempts); non-intrusiveness (follow child's lead and non-interruptive ports of entry); and non-hostility (lack of negativity and lack of mocking, ridiculing or other disrespect). Clinical screener categories		Maternal age and education

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 273

Fuchs et al. (2017)	Effect of maternal history of childhood abuse on attunement in mothers and toddlers	82 mother-child dyads; history of child abuse; Germany	3	12 months	20 minute free play		Interrater reliability within laboratory; reliability with Biringen	Sensitivity, structuring, non-hostility and non-intrusiveness, child responsiveness and child involvement	Direct scores sensitivity, structuring, non-hostility and non-intrusiveness, child responsiveness and child involvement	Maternal history of childhood trauma; maternal and infant cortisol	Maternal psychopathological symptoms
Fuchs et al. (2015)	Impact of maternal childhood abuse on mother-baby interaction in the first year	119 mother-baby dyads; history of child abuse; Germany	3	Recorded at 5 and 12 months	20 minute free play		Interrater reliability within laboratory; reliability with Biringen.	Sensitivity, structuring, non-hostility and non-intrusiveness, child responsiveness and child involvement	Direct scores for sensitivity, structuring, non-hostility and non-intrusiveness, child responsiveness and child involvement	Maternal history of abuse; maternal symptomology	Maternal age and maternal education
Garvin et al. (2012)	Postadoption parenting and socio-development in institutionalized children	119 mother-child dyads: post-institutionalized children; US	3	Post institutionalized children – 12 months, post-foster care children – 7 months	10 minute free play interaction	Institutionalized children	Interrater reliability within laboratory; reliability with Biringen	Sensitivity, structuring, non-hostility and non-intrusiveness	Factor analysis yielded one factor: parental EA; comprised of four parenting EA scales. Correlated child scales to provide internal validity	Emotion knowledge, parent attachment interview, motor ability	Sex differences
Goldman-Fraser et al. (2010)	EA and psychosocial correlates for substance	48 mother-infant dyads;	2	2 – 5 months	10 minutes of free play		Reliability with Biringen (no interrater reliability)	Sensitivity, structuring, non-hostility/non-	Separated scores into three categories; (1)	Life stressors; maternal depression	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 274

	abusing mothers and their infants	low SES, substance abuse treatment; US					within laboratory)	intrusiveness and child responsiveness	adequate to optimal; (2) moderate; (3) non-optimal. Created composite EA variable by averaging standardized scores for sensitivity, structuring/non-intrusiveness		
Greve et al. (2018)	Early home visit intervention to support early parent-infant interaction for those at risk of postpartum depression	15 mother-infant dyads; at risk of depression; Norway	4	4 months	25 minutes of naturalistic mother-infant interaction			Sensitivity, structuring, non-hostility/non-intrusiveness and child responsiveness	Direct scores for sensitivity, structuring, non-hostility/non-intrusiveness and child responsiveness	Maternal depression; parental satisfaction	
Gul et al. (2016)	EA in early mother-child interactions for children with ASD, developmental delay and other psychiatric disorders	345 mother-infant dyads; clinical sample – children with ASD and developmental delay; Turkey	3	31.97 months	10 minutes of free play; 5 minutes of clean up	Children with ASD and developmental delay; and other psychiatric disorders	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-hostility, and non-intrusiveness, child responsiveness and child involvement	Direct scores for sensitivity, structuring, non-hostility, and non-intrusiveness, child responsiveness and child involvement	Level of child's functioning; diagnosis of child psychiatric disorders	Infant age and maternal education
Gueron-Sela et al. (2011)	Child feeding disorders and maternal EA	55 mother-infant	3	1.85 years (feeding disorder)	12 minute feeding interaction	Feeding disorder	Interrater reliability;	Structuring and non-intrusiveness	Summed direct scores for structuring	Maternal worry about infant eating	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 275

		dyads; non-organic feeding disorder infants; Israel		group) and 2.03 control group			reliability with Biringen		and non-intrusiveness to create: composite score for mother-child interaction		
Hallers-Haalboom et al. (2014)	Mothers and fathers and parental sensitivity in families with two children	389 parent-child dyads; community; Netherlands	4	Sibling one: 12 months; sibling two 2.5 – 3.6 years	8 minutes of free play at home with toys		Interrater reliability	Sensitivity and non-intrusiveness with three alterations made to the subscales	Total score for sensitivity and non-intrusiveness		Child gender
Hallers-Haalboom et al. (2017)	Mothers and fathers sensitivity with their two children: longitudinal study	364 families with 2 children; community sample; Netherlands	4	Second children: 12, 24, 36 months and older siblings 2 years older	8 minutes of play with a bag of toys		Interrater reliability; one coder had reliability with Biringen and then they trained the team of coders	Sensitivity	Total score sensitivity	Child age and birth order	
Harel et al. (2002)	Antecedents to self-recognition in toddlers	54 mother-child dyads; community sample; Israel	3	12 – 20 months	3 minutes free play; 3 minutes structured play; 6 minutes in total		Interrater reliability within laboratory; no mention of Biringen	Sensitivity, non-intrusiveness, non-hostility, child responsiveness, involvement	Direct scores for sensitivity, non-intrusiveness, child responsiveness, child involvement	Mirror: self-recognition	Birth order, gender
Harden et al. (2017)	Emotional regulation of preschool children in foster care – influence of maternal	50 foster mother-child dyads; children in foster care with	3	4 – 6 years	Ten minute semi-structured parent-child interaction in the home using standardized toys	Foster children and foster parents; high rates of child neglect	Interrater reliability within laboratory; no mention of Biringen	Sensitivity structuring, hostility	Direct score sensitivity, structuring, hostility	Child regulation; maternal mental health	Child age

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 276

	depression and parenting	history of emotional neglect; US									
Hawk & Timmer (2018)	Dyadic intervention for child with mild behavioural problems	One parent-child dyad; US	3	5 years	Three semi-structured play situations of 4 minutes each (i.e., child directed play, parent directed play, child clean up) – 12 minutes total: pre and post intervention at the clinic	Child with mild externalizing problems	Interrater reliability; 'expert coder'	Parenting scales and child scales	Overall EA score – percentage of total score for parent EA (parent scales) and child EA (child scales) pre and post treatment	Parent report measures; child externalizing behaviour; parenting stress; therapy attitude	
Hoivik et al. (2018)	Maternal PD symptoms and mother-child interaction at one year	112 mother-child dyads; interactional difficulties in dyads; Norway	4	11.5 months	30 minute naturalistic observation of mother-child interaction at home		Interrater reliability; reliability with Biringer	Sensitivity, structuring, non-hostility, non-intrusiveness; child responsiveness, child involvement	Total scores sensitivity, structuring, non-hostility, non-intrusiveness; child responsiveness, child involvement	Personality Disorder symptoms	Child age
Howes and Hong (2008)	Early EA predictive of relationships in pre-kindergarten Mexican-heritage children	53 mother-child dyads; low income sample Mexican heritage; US	2	Pre-kindergarten: 36 months	Home observation: 25 minutes free play; 5 minutes structured		No interrater reliability (only one rater mentioned)	Sensitivity, structuring, non-hostility, child responsiveness, child involvement	Direct scores for sensitivity, structuring	Child's care type, child behaviour, adult involvement, childcare provider language, peer play, student teacher relationship	Gender, sibling status, maternal education

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 277

Howes & Obregon (2009)	EA in Mexican low income mothers and children from infancy to kindergarten	78 mother-child dyads; low income sample of Mexican heritage; US	4	Infancy to pre-school	30 minute free play recorded on four occasions 8, 14, 24 and 36 months		Interrater reliability; reliability with Biringen	Sensitivity, structuring, hostility, child responsiveness, child involvement	Direct scores for sensitivity, structuring, hostility. Created a single measure of child EA by combining child responsiveness and child involvement	Readiness for kindergarten, social competence, play	Child adaptive behaviour, child gender
John et al. (2012)	Link between children's EA and attachment in sample of children with a disability	47 mother-child dyads; clinical sample: diagnosed ID; India	4	3 – 6 years	8 – 14 minutes free play in laboratory	Children with an intellectual disability, cerebral palsy	Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness, child involvement	Average of direct scores for parenting scales to create maternal EA and child scales to create child EA	Attachment security, child adaptive behaviour	Child gender
Kaplan et al. (2008)	Effect of maternal psychiatric status on postnatal caregiving	47 mother-infant dyads; community sample; US	3	Pregnant mothers; infants at 4 months	10 minutes of free play		Interrater reliability; reliability with Biringen	Sensitivity and child responsiveness	Classified into two groups according to direct scores – high sensitivity (above mean) and low sensitivity (equal to or below the mean)	Antenatal psychiatric history, infant temperament, cortisol, heart rate	Infant birth weight and age
Kertes et al. (2009)	Parenting EA and cortisol in infants	274 mother-child	3	Pre-schoolers	10 minutes of free play; 20		Interrater reliability;	Sensitivity, non-intrusiveness, non-hostility, structuring	Factor analysis of direct scores	Child cortisol and child temperament;	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 278

		dyads; community sample; US			minutes of structured play		reliability with Biringen		for parental scales (one factor accounted for 69.3% variance) – labelled this factor ‘parenting quality’	non-social and social inhibition	
Kim et al. (2017)	Maternal EA at bedtime	128 mother-baby dyads; community; US	4	3, 6, 9, 12 months; longitudinal	Home visit at bedtime provided naturalistic observation		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-hostility, and non-intrusiveness	Combined the direct scores of parental dimensions and standardized to z scores to form composite EA score	Attachment; infant temperament, infant sleep arrangements	Gender
Kim et al. (2017)	SES disadvantage, neural responses to infant emotions and EA in new mothers	39 mother-infant dyads; community sample; Canada	4	0 – 6 months	15 minute free play without any toys at home		Interrater reliability; reliability with Biringen	Sensitivity and non-intrusiveness	Direct score for sensitivity and non-intrusiveness	Neural responses to infants emotional expressions, SES; behavioural ratings of infant emotions; maternal distress	
Killeen and Teti (2012)	EEG recordings and maternal EA	27 mother-infant dyads; community sample;		5 – 8 months	30 minute free play interaction at home		Interrater reliability; reliability with Biringen	Sensitivity, non-intrusiveness, non-hostility, structuring, child responsiveness, child involvement	Direct scores: sensitivity, non-intrusiveness, structuring, child responsiveness	EEG recordings, self-report of maternal emotional response to watching infant video	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 279

		US							s, child involvement	recordings, maternal internalizing symptoms	
Kogan & Carter (1996)	Infant gaze and maternal EA	29 mother-infant dyads; low SES; US	3	4 months	5 minute natural play segment		Interrater reliability; reliability with Biringen	Sensitivity, structuring/intrusiveness, maternal hostility, infant responsiveness	Direct scores sensitivity and maternal intrusiveness	Infant affect regulation; infant gaze, attachment	Maternal age, infant gender
Kluczniok et al. (2016)	EA in mother-child interaction: effects of depression and childhood abuse	188 mother-child dyads; mothers with remitted depression and healthy controls; Germany	4	5 – 12 years	15 minutes of free play, 6 minutes of structured task in laboratory		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Direct scores sensitivity, structuring, non-intrusiveness, non-hostility, infant responsiveness and infant involvement	Maternal depression; maternal history of childhood abuse	Partnership status, depressive symptoms
Kluczniok et al. (2018)	EA in mothers with Borderline PD and remitted depression (MDD) and EA in school age children	178 mother-child dyads; mothers with history of BPD and MDD; Germany	4	5 – 12 years	15 minutes of free play; 6 minutes of structured task in laboratory		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Direct scores sensitivity and non-hostility.	Assessment for diagnosis of Borderline Personality Disorder and maternal depression in remission; child psychiatric diagnoses	Maternal IQ and child age
Koren-Karie et al. (2009)	Comparing sensitivity in mothers of children with	45 mother-child dyads;	2	Pre-school	In laboratory – 8 minute free play, clean up, 5 minute	Autism spectrum disorders	Interrater reliability between 3 coders: only	Sensitivity and responsiveness	Formed aggregate score of sensitivity	Attachment, level of functioning, ASD diagnosis	Children's age, birth order, maternal age,

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 280

	ASD and mothers of	clinical sample – high risk: ASD; Israel			structured, 5 minute social play		one trained by Biringen		and responsiveness by averaging the direct scores for each dimension across three play episodes		and maternal education
Kristen-Antonow et al. (2017)	Maternal cognition talk in mother-toddler dyad mediates influence of maternal EA	83 mother-child dyads; community sample; Germany	4	7 and 50 months	10 minutes of free play interaction with toys provided		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement; EA2 Clinical Screener	EA2 Clinical Screener score between 1 – 100 only	Maternal mental state language; children’s false belief understanding	Children’s language; child verbal and performance IQ; maternal verbal IQ
Kubicek et al. (2013)	EA of parent child relationship with children with special needs	38 mother-child dyads; children with special needs; Canada	3	6 – 34 months	25 minutes of parent-child interaction at home	Children with developmental delay or disabilities (e.g., down syndrome, cerebral palsy, ASD, visual and hearing impairment).	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Direct scores for sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Parents feelings and attitudes about his or her child	
Lam et al. (2010)	Speech input, language production and interaction quality in context of hearing loss	Mother-fraternal twin dyad; one twin with hearing impairment	3	Recorded at adjusted ages 12.5 months and 22 months – 2 time points.	20 minute interaction at each time point at home	One twin had hearing impairment	Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness only for time one; sensitivity, structuring, non-	Calculated average score for each dimension from direct scores provided by two coders	Language measures; word production; acoustic and phonetic analyses	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 281

		nt; Australia						intrusiveness, non-hostility, child responsiveness and child involvement for time two			
Lam-Cassettari (2015)	Enhancing parent-child communication with video feedback intervention	14 parent-child dyads; children with hearing difficulties; England	4	6 months - 6 years	20 minute free play at laboratory	Children with hearing difficulties	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness; child involvement	Direct scores for sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness	Self-esteem; intervention	
Lawler (2008)	Comparison of maternal EA between kinship foster and non-foster mothers	106 mother-child dyads; kinship foster mothers and non-kin foster mothers; US	3	2 – 8 years	15 minute semi-structured play sessions in laboratory	Foster mother-child dyads	Interrater reliability between two coders; training by 'master coder'	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Combined direct scores for sensitivity and structuring to form – 'maternal sensitivity structuring'; combined direct scores for child responsiveness and child involvement to form 'child EA'; direct scores for intrusiveness and non-hostility		Foster mother education, age, placement duration and marital status, and child age

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 282

Lehman et al. (2002)	Predictors of compliance in toddlers	51 mother-toddler dyads; community; US	2	15 – 31 months	20 minutes free play in laboratory plus clean up		Interrater reliability and with Biringen	Sensitivity, structuring/intrusiveness, non-hostility, child responsiveness and child involvement	Direct scores sensitivity, structuring-intrusiveness, non-hostility, child responsiveness and child involvement	Maternal personality, child temperament and compliance	Child age
Lerardi et al. (2017)	Reflective functioning, maternal attachment, mind mindedness and EA in adolescent mothers	85 mother-infant dyads; adolescent mothers; Italy	4	3 months	5 minute free play in laboratory with a small mattress for infant to sit/lie on and toys provided		Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-hostility	Sensitivity, structuring, non-intrusiveness, non-hostility	Adult attachment; infant attachment; mind mindedness; reflective functioning	Maternal age, SES and marital status
Licata et al. (2014)	Maternal EA and infant ability to encode actions as goal directed	37 mother-infant dyads; community; Germany	4	7 months	10 minutes free play in the laboratory		Interrater reliability and reliability with Biringen	Sensitivity, structuring, intrusiveness, non-hostility, child responsiveness and child involvement	Sum score of maternal EA using direct scores for each of the parental dimensions	Infant goal encoding	Maternal mind mindedness, and infant temperament
Licata et al. (2015)	Infant frontal symmetry and EA	28 mother-child dyads; community; Germany	4	7, 14, 50 months	10 minutes of play with age appropriate toys		Interrater reliability and reliability with Biringen.	Sensitivity, structuring, child responsiveness, child involvement	Direct scores for sensitivity, structuring, child responsiveness, child involvement	Infant asymmetric frontal brain activity;	
Licata et al. (2016)	Maternal EA and maternal psychopathology (depression and anxiety),	56 mother-child dyads; women	4	3 – 6 years			Interrater reliability and with Biringen.	Sensitivity, structuring, non-intrusiveness and non-hostility	Direct scores sensitivity, structuring, non-intrusiveness	Maternal depression and anxiety diagnosis; theory of mind;	Child gender; maternal education

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 283

	attachment insecurity and theory of mind	diagnosed with depression and anxiety; Germany							and non-hostility	maternal attachment security	
Little and Carter (2005)	Emotional reactivity and maternal EA in 12 month olds	45 mother-child dyads; higher risk; US	2	12 months	10 minute play interaction		Interrater reliability and with Biringen	Sensitivity, structuring/intrusiveness, non-hostility, child responsiveness and child involvement	Created EA composite score by standardizing the direct scores for the EA dimensions, except non-hostility, and summing them. Examined EA composite score and non-hostility separately	Negative emotional reactivity and emotional regulation	Child age, birth order
Lok and McMahon (2006)	Link between mothers thoughts about their children and maternal EA	89 mother-child dyads; parents experiencing infant difficulties (feeding, sleeping, settling);	3	4 – 5 years	20 minutes unstructured play with props (e.g., etcha sketch and hospital set) at home		Interrater reliability	Sensitivity, structuring, non-intrusiveness and non-hostility	Non-intrusiveness and non-hostility transformed into categorical variables (i.e., >4.5 = non-optimal; <4.5 = optimal)	Mind mindedness	Child gender, maternal education; maternal depressive symptoms

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 284

		Australia									
Lovas (2003)	Gender development in context of parent/child interactions and language development	113 mother-child and father-child dyads; community; US	3	19 and 24 months	7 minute free play with each parent and clean up		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and child involvement	Direct scores sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and child involvement	Gender differences; language development	
Mackinnon et al. (2018)	Theory of mind as link between oxytocin and maternal behaviour	189 mother-infant dyads; community; Canada		2 – 3 years	5 minutes of free play with toys at home		Interrater reliability	Sensitivity, structuring, non-intrusiveness and non-hostility	Direct scores sensitivity, structuring, non-intrusiveness and non-hostility	Maternal mind mindedness, oxytocin	
Mantis et al. (2018)	Function of mutual touch in low birthweight and preterm infants: associations with EA and infant affect	40 mother-infant dyads; low birthweight/preterm infants; Canada	3	5.5 months	Home visit – three 2 minute face to face interaction periods with interaction between each period	Low birthweight/preterm infants	Interrater reliability and reliability with Biringen	Sensitivity and child responsiveness	Direct scores for sensitivity and child responsiveness	Mother-infant touch; infant affect	Maternal education
Martins et al. (2012)	Emotion over-regulation and avoidant attachment, EA and temperament	52 mother-infant dyads; community sample;	3	10 months	20 minute naturalistic interaction and 10 minutes of free play; in home		Interrater reliability	Sensitivity, child responsiveness and child involvement	Composite variable combining – maternal sensitivity, child responsiveness	Emotion over-regulation, attachment, infant temperament	SES and infant gender

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 285

		Portugal							s and child involvement was created by summing scale scores, labelled variable 'dyadic emotional interaction'		
Mingo & Easterbrooks (2015)	EA patterns in mother-infant dyads	226 mother-infant dyads; high risk sample: adolescent mothers; US	3	12 months	5 minutes free play and 5 minute teaching task		Interrater reliability and reliability with Biringen	Sensitivity, non-hostility, child responsiveness	Low functioning; high functioning; low functioning with hostility; and inconsistently sensitive and responsive to child – direct scores for sensitivity, non-hostility, child responsiveness	Maternal parenting attitudes; tactics to resolve conflict; maternal history of child abuse in own childhood; conflict resolution with own partner; quality of r/ship with father of child	
McCarthy et al. (2003)	Prediction of resource use during acute paediatric illness	243 mother-child dyads; community sample; US	Not specified	2 weeks, 6, 15, 24 months	Child healthcare visits coded two minutes of mother-child playing – non-videotaped	Acute paediatric illness	No training in the EAS – reference to another article by the same author (McCarthy et al., 2002) as evidence of EAS reliability; interrater	No detail provided on scoring	No detail provided on how 'mother-child interaction' variable was created		Maternal depression, SES, ethnicity

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 286

							reliability established using method of Bornstein et al. 1992				
McMahon & Newey (2018)	Non-attuned min mindedness, infant negative affect and EA	76 mother-infant dyads; community; Australia	4	7 months	10 minute episode: 6 minutes of play episode and two 2 minute still face segments		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness, child involvement	Total scores sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness, child involvement; Global EA – average of EA dimensions	Mind mindedness; infant negative affect	Maternal education; concurrent depressive symptoms; infant age and gender
McMahon et al. (2019)	Influence of father's early parenting on child development in pre term and full term infants	81 pre term and 39 full term father-infant dyads; Australia	4	12 months corrected age	15 minutes semi-structured play with free play using age appropriate toys (10 minutes); pack up (1 minute); play with a puzzle chosen to challenge child (4 minutes)	Pre-term infants	Interrater reliability	Sensitivity, structuring, non-intrusiveness and non-hostility	Direct scores for sensitivity, structuring, non-intrusiveness and non-hostility	Child development; social risk; medical risk	Gender; familial social risk
Mielke et al. (2016)	Maternal sensitivity and the empathic brain influence of early childhood maltreatment	53 mother-infant dyads; mother with history of maternal childhood	3	5 – 12 years	15 minutes of free play with age appropriate toys; 6 minutes of problem solving task in laboratory		Interrater and reliability with Biringen.	Sensitivity	Direct score for sensitivity	Maternal early life maltreatment; MRI to assess maternal brain imaging	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 287

		d maltreatment; Germany									
Moehler et al. (2007)	EA in sample of mothers with abuse history	119 mother-infant dyads; mothers with history of sexual and/or abuse; Sweden	4	5 months	10 minutes of free play in laboratory		Interrater and reliability with trainer	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement	Direct scores for sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement.	Maternal history of sexual and/or physical abuse (CTQ)	Maternal age, education, infant gender or parity matched in control group with abuse history group
Moller et al. (2017)	Reflective functioning, limit setting and Maternal EA	40 mother-child dyads; community sample; Sweden	3	3 – 10 years	20 – 25 minutes of free play with an activity of choice		Interrater reliability, and reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement	Direct scores sensitivity, structuring, non-hostility, non-intrusiveness, child responsiveness and child involvement; classified into risk; non-risk and optimal interaction categories	Parental mentalising ability; reflective functioning; parent development	Child age
Moreno et al. (2008)	Predictors of empathy in childhood	661 mother-child dyads; low SES; US	2	15, 21 and 24 months	Laboratory and home based free play with basket of toys provided		Interrater reliability, and reliability with Robinson	Sensitivity, structuring/intrusiveness and hostility, child responsiveness, child involvement	Maternal EA construct comprised of direct scores for sensitivity, structuring/int	Maternal empathy, child cognitive-language development, child social	Ethnicity and child gender, maternal psychological resources, birthweight,

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 288

									rusiveness and hostility	engagement of mother	and difficult temperament
Murray-Kolb et al. (2009)	Iron deficiency and maternal and infant health	95 mother-child dyads; low SES from Khayelitsha, South Africa; women classified as iron deficient; South Africa	Not specified	10 weeks maternal scales; 9 months child scales	20 minutes free play in health clinic mothers provided with basket of toys		Interrater reliability	Sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness, child involvement	Direct scores sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness, child involvement	Maternal iron deficiency	Age, parity, maternal education – matched for control group.
Naber et al. (2013)	Oxytocin and parental sensitivity for child with ASD	32 father-child dyads; clinical sample; toddlers with ASD; Netherlands	3	1.5 – 6 years	15 minutes free play across two sessions	ASD	Interrater reliability	Sensitivity, structuring, non-intrusiveness and non-hostility, child involvement.	Direct scores sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness, child involvement.	Oxytocin and ASD	Gender
Naber et al. (2010)	Father's oxytocin during play	17 father-child dyads; community; Netherla	3	1.5 – 5 years	15 minutes free play		Interrater reliability of two 'trained' coders.	Sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and involvement.	Direct scores maternal sensitivity, structuring, non-intrusiveness and non-hostility,	Oxytocin	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 289

		nds							child responsiveness and involvement.		
Negrao et al. (2016)	Attachment representations and parenting	37 mother-child dyads; low SES; Portugal	4	28.19 months	10 minutes of free play at home with toys provided by researchers		Interrater reliability	Sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and involvement	Composite score reflecting the mean of the direct scores of the four parenting EAS dimensions	Attachment, maternal discipline, supportive control, family psychosocial risk, daily stress	
Newland et al. (2016)	Association between maternal depression and sensitivity: child direct effects on parenting	167 parent-child dyads; mothers with history of depression; US	3	15 months	45 minutes interaction consisting of eight semi-structured ten minute home observations of at least 10 minutes each including mother in close proximity of child, child alone and mother engaging in caretaking duties (e.g., diaper change).		Not specified	Sensitivity	Direct scores for sensitivity averaged for each of the 8 observations to compute an aggregate score	Maternal depression; infant negative and positive interactive behaviours	SES
Neukel et al. (2018)	The maternal brain in those with a history of childhood maltreatment: brain activity during	47 mother-baby dyads; maternal history of maternal	4	7 – 11 years	Standardised mother-child interaction – duration not specified		Not specified	Sensitivity	Sensitivity – scoring not specified	Activation of areas of the brain using fMRI; Childhood abuse; maternal depression	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 290

	interactions with their children	childhood abuse; Germany									
Nicolson et al. (2013)	Examining effectiveness of early attachment intervention for adolescent mothers and babies	73 mother-infant dyads; adolescent mothers; Australia	4	4 months	20 minutes of free play with toys provided followed by 5 minute separation/reunion context; free play coded separately and together with separation/reunion		Interrater reliability; trained EAS expert in USA	Direct scores maternal sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and involvement	Direct scores maternal sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and involvement	Attachment intervention	
Merras-Salmio et al. (2013)	Mother-infant interaction in context of suspected milk allergy	24 mother-infant; community sample; Finland dyads	4	10.1 months	15 – 20 minutes of free play with toys	Children with suspected milk allergy	Interrater reliability	Sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and involvement	Direct scores maternal sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and involvement	Suspected cow's milk allergy – infant on dairy free diet	
Olds et al. (2002)	Examining effectiveness of home visiting health professionals in context of maternal and child health outcomes	735 mother-infant dyads; low SES, no private health insurance or qualifies	Unknown	Pregnancy, birth to two years	10 minutes free play in laboratory or at home		Unknown	Unknown	Factor analysis of subscale scores supported one latent factor, labeled 'responsive interaction' – standardized at each	Maternal health related measures	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 291

		for Medicaid ; US							assessment to a mean of 100 and SD of 10		
O'Neill et al. (2016)	Caregiver behaviour as a mediator of the relationship between cultural individualism and infant pain	393 mother-infant dyads; community sample; Canada		12 months	Recording of 12 month immunisation		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness and non-hostility	Sum of the four dimensions to represent overall caregiver EA throughout immunization appointment	Infant pain; acculturation	
Oyen et al. (2000)	Maternal attachment and sensitivity in at risk sample	30 mother-child dyads; low SES, single mothers (majority ; Canada	2	18 – 42 months	30 minutes play at home with toys		Interrater reliability	Sensitivity	Direct score for sensitivity	Adult attachment, risk factor checklist	Maternal and child age
Paradis & Koester (2015)	EA and touch in deaf and hearing dyads	60 mother-child dyads; US	3	18 months	10 minutes of free play in laboratory with standard set of toys	Hearing impairment	Interrater reliability	Sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and involvement.	Direct scores sensitivity, structuring, non-intrusiveness and non-hostility, child responsiveness and involvement	Caregiver touch	
Paulus et al. (2018)	Impact of EA on child cognitive abilities, self-	7 months 85 mother-child dyads; 4	4	7 months and 4 years	Not specified – duration or interaction		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness and non-hostility,	Direct score sensitivity, non-intrusiveness,	Child self-concept; child IQ	Maternal verbal IQ

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 292

	esteem and self -concept	years 115 mother-child dyads; community; Germany						child responsiveness and involvement	non-hostility, structuring		
Philbrook & Teti (2016)	Bedtime parenting and infant sleep	109 mother-infant dyads; community sample; US	3	6 months	Infant bedtime – ended after 5 minutes of consecutive infant sleep		Interrater reliability	Sensitivity, structuring, non-intrusiveness and non-hostility	Bedtime practices, maternal sleep quality, night time infant sleep	Composite maternal EA score created by converting the scores for each scale to z-scores and taking the mean	Infant age
Piermattei et al. (2017)	Late adoptions: attachment security and EA	20 mother-father dyads; adopted families; Italy	4	4.5 – 8.5 years	Play in family home – mother-child and father-child interactions – duration not specified	Adopted families	Interrater reliability and reliability with Biringen	Sensitivity, non-intrusiveness, non-hostility, structuring, child responsiveness and child involvement	Direct score sensitivity, non-intrusiveness, non-hostility, structuring, child responsiveness and child involvement	Child attachment, adult attachment	Parent’s psychiatric symptomology and child’s Italian language comprehension, gender, age, adoption related variables
Pinchover & Shulman (2018)	Behavioural problems and playfulness in children with ASD – moderating role of teacher’s EA	63 child-teacher dyads; children with ASD and control children; Israel	4	3 – 6 years	30 minute play interaction at school between child and teacher with toys	Children with ASD	Interrater reliability, reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility.	Direct scores for sensitivity, structuring, non-intrusiveness, non-hostility	Child behavior, playfulness; Autism diagnosis assessment	Mental age
Pipp-Siegel et	Assessing quality of	48 mother-	2	18 – 29 months	10 minutes of free play	Deaf or hearing	Interrater reliability,	Sensitivity, structuring/intrusiven	Direct scores for sensitivity,	Parent touch, child touch,	Child age.

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 293

al. (1998)	relationship between children and parents: hearing impairment	child dyads; high risk: hearing impaired; US				impaired children	reliability with Biringen	ess, non-hostility, child responsiveness, child involvement, child hostility.	structuring/int rusiveness, non-hostility, child responsiveness, child involvement, child hostility.	emotional openness.	
Porreca et al. (2018)	EA, neuropsychological functioning and psychopathology	29 mother-child dyads; clinical sample with substance use disorder; Italy	4	22.97 months	15 minutes of free play		Not specified	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Direct scores sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Maternal psychopathology; maternal neuropsychological functioning	
Porreca et al. (2016)	Attachment representations and early interactions in substance using mothers	4 mother-child dyads; Mothers inpatients at rehabilitation facility for substance abuse; Italy	4	9 – 14 months	Seven 20 minute play sessions each three months during 21 months stay at facility		Interrater reliability;	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Direct and subscale scores for sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Maternal attachment	
Pressman et al. (1999)	Maternal sensitivity predicts	24 mother-child	3	21 – 30 months	30 minutes of free play at home	Deaf or hearing	Interrater reliability; trained by	Sensitivity	Direct score for sensitivity	Language measures	Maternal education; child's degree

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 294

	language gain in children with hearing difficulties	dyads; high risk: hearing impaired; US				impaired children	Robinson in EAS				of hearing loss; dyadic form of communication at assessment.
Pressman et al. (1999)	Links between EA and language gain in children with hearing loss	42 mother-child dyads; high risk: hearing impaired; US	1	15 – 21 months	30 minutes of free play at home	Deaf or hearing impaired children	Interrater reliability; trained by Robinson in EAS	Sensitivity and structuring/intrusiveness, child responsiveness and child involvement	Combined direct scores for sensitivity and structuring/int intrusiveness to create 'maternal EA', and combined child responsiveness and child involvement to create 'child EA'.	Language measures	
Racine et al. (2012)	Verbal reassurance during infant immunization and caregiver EA	606 mother-infant dyads; paediatric health clinic, community sample; Canada	4	2, 4, 6 and 12 month immunisations	Recording of immunization appointment – specific time not specified		Interrater reliability, and reliability with Birngen	Sensitivity, structuring, non-intrusiveness and non-hostility.	Summed the subscales scores for each dimension to get total score, then summed those total scores to get EAS composite score (i.e., 28 – 116).	Verbal reassurance; infant pain.	Number of needles the infant received.
Rickmeyer et al. (2017)	Negative association between Maternal EA	24 mother-child dyads;	4	37.2 months (shortly after	30 minutes of mother-child interaction during home		Interrater reliability, and reliability with Birngen	Sensitivity, structuring/intrusiveness and non-hostility, child responsiveness	Each EA dimension divided into two groups –	Cortisol levels using hair analysis	Children's age and maternal education

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 295

	and elevated cortisol in children from immigrant background	immigrant and refugee backgrounds; Germany		Kindy commencement)	visits or in social institutions where participants attended for project participation			and child involvement	a high and a low group: group 1: high – dyads with scores of 5 – 7; group 2: low – dyads with scores of > 5		
Riddell et al. (2011)	Relationship between caregiver sensitivity and pain in infants during the first year	731 mother-infant dyads; community sample; Canada	4	2, 4, 6, 12 month immunisations	< 5 minutes of mother-infant from time entered room for immunization, to up to five minutes afterwards		Interrater reliability, reliability with Biringen	Sensitivity, structuring, non-hostility, non-intrusiveness	EAS total score by combining the four subscales to form a composite score (i.e., 28 – 116) – ‘caregiver sensitivity’	Infant pain behaviour	
Risholm-Mothander et al. (2018)	Effect of adding circle of security to quality of mother-child interaction	52 parent-infant dyads; recruited from child psychiatry clinics; Sweden	4	0 – 4 years	Naturalistic – free play interaction and structured tasks	Recruited from child psychiatry clinics	Interrater reliability, and reliability with Robinson	Sensitivity, structuring/intrusiveness and hostility, child responsiveness, child involvement; clinical Screener	Global Clinical Screener	Depressive symptoms; parental stress; anxiety; child mental state; representations of the infant	
Robinson et al. (1994)	EA in mother-twin dyads	150 pairs of twins and mothers; community sample; US	1	36 months	Ten minutes of semi-structured play at home	Same-sex monozygotic and dizygotic twins	Interrater reliability	Sensitivity, intrusiveness, child responsiveness and involvement	Direct scores sensitivity, intrusiveness, child responsiveness and involvement	Empathy measures, cognitive/language	Gender

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 296

Robinson et al. (1993)	Relationship between EA and affect display	70 mother-child dyads; community sample; US	1	18 – 24 months	16 – 20 minutes of semi-structured play at home		Interrater reliability	Sensitivity, intrusiveness	Direct scores for maternal sensitivity, intrusiveness	Affect display and exchange	
Rodrigo et al. (2016)	Brain activity in neglectful mothers with history of childhood maltreatment	44 mother child dyads; children with substantial neglect; Spain	4	2 years	Mother-child free play at home	Children with substantial neglect	Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement	Factor analysis of 6 dimensions supported single factor – accounted for 72% of the variance: labelled ‘EA’	Mini mental state examination; brain activity	
Rossen et al. (2018)	Mother-infant and partner-infant EA at 12 months postpartum	191 mother and partner-infant dyads; community sample; Australia	4	12 months	20 minutes of free play		Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement; Clinical Screener Score	Used the EA Clinical Screener Global Score out of 100	Infant bonding, maternal depression, stress, anxiety, substance use	Maternal age, country of birth, employment status, infant gender
Sadeh-Sharvit et al. (2016)	Interactions of mothers with eating disorders and toddlers	29 mother-child dyads; mothers with eating disorders	4	18 – 42 months	10 minutes of semi-structured play in home with age appropriate toys		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness, child involvement	Total EAS score comprised of the average scores of the six EA subscales; and direct scores	Maternal psychiatric symptoms; child behaviour	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 297

		; Israel							for sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness, child involvement		
Sagi et al (2010)	Examining the effect of the quality of early childcare on the mother-infant attachment relationship	758 mother-child dyads; community sample; Israel	3	6 and 12 months – separate observations.	15 minutes free play at home at 6 months; 6 minutes free play in lab at 12 months		Interrater reliability; and reliability with Robinson	Sensitivity	Separated maternal sensitivity direct score into low (1 – 3); moderate (3 – 6) and high (< 6)	Attachment; child care arrangements	Marital relations; maternal depression; child temperament; child gender
Salo et al. (2009)	EA, parental self-efficacy and child development in 3 year olds with drug exposure	13 mother-child dyads; high risk; drug exposed; Finland	3	3 years	5 minutes free play in the clinic with toys provided	Drug exposed infants	Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child-responsiveness and child involvement	Direct scores for sensitivity, structuring, non-intrusiveness, non-hostility	Cognitive development; self-efficacy	Infant birth weight; height; gestational age; maternal age, maternal SES; number of placements
Samuelson et al. (2016)	Maternal PTSD and child adjustment: EA as mediator	52 mother-child dyads; maternal trauma exposure ; Canada	4	7 – 12 years	40 minute collaborative task which included child led play, parent led play and clean up; 5 minute problem solving task		Interrater reliability and reliability with Biringen	Sensitivity, non-intrusiveness, non-hostility	Not specified which score used in analyses	PTSD symptoms and trauma exposure; parenting stress; child regulation; child internalising and externalising behaviours	Maternal age, education and income; child's trauma history

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 298

Scher (2001)	Mother child interaction and sleep regulation in one year olds	37 mother-infant dyads; community; Israel	2	One year old	5 minutes free play and 5 minutes structured play in the laboratory		Reliability with Biringen	Sensitivity, structuring/intrusiveness, hostility; and child responsiveness and involvement	Direct scores maternal sensitivity, structuring/int intrusiveness, hostility; and child responsiveness and involvement	Child sleep regulation; parent-child early relational assessment	
Shachar-Dadon et al. (2017)	Pre conception war exposure and mother-child interaction quality	107 mother-baby dyads; maternal war exposure ; Israel	3	3 years	30 minute filmed play session at the hospital with age appropriate toys; 15 minutes unstructured; 5 minute clean up; 10 minute structured play with playdough		Interrater reliability and reliability with Biringen	Sensitivity, structuring/intrusiveness, hostility; and child responsiveness and involvement.	Direct scores for sensitivity, structuring/int intrusiveness, hostility; and child responsiveness and involvement	Emotional distress during the war; mother's separation anxiety; child adaptive behaviours	Maternal education; child age; pre-war exposure
Sher-Censor et al. (2017)	Child Diagnosis and EA: Arab-Israeli mothers and children with ASD	46 mother-child dyads; children with ASD; Israel	4	2 – 8 years	10 minutes of free play with toys; 5 minutes social play without toys	Children with ASD diagnosis	Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-hostility	Standardised scores and combined to form: (1) maternal EAS Z score in free play; and (2) maternal EAS Z score in social play	Maternal coherence of speech; child adaptive behaviour	Maternal age, education, parity, child birth order
Shivers (2008)	Using the EAS on the childcare continuum	48 providers ; 17 providers ; 9 providers with 13 ASD	3	Infant to preschool	4 studies: (1) One to two hours in childcare homes; (2) 3 hour naturalistic observation in child care	ASD	Not specified	Direct scores for maternal sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement.	Not provided with results	Depression and environment quality	Unknown

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 299

		children; 46 providers ; high risk sample in study 3 with ASD children; US			centres; (3) 4 hours observation in child care classrooms at preschool with children on Autism spectrum; (4) 3 – 4 hour naturalistic observations in providers homes						
Steinsbekk et al. (2017)	Child and parent predictors of picky eating	795 parent-child dyads; community; Norway	4	6 years	20 minutes (5 minute segments) – free play; parent led play; child led play; clean up		Interrater reliability; reliability with Biringen	Sensitivity and structuring	Total score for sensitivity and structuring (sum of seven subscale scores)	Preschool Age Psychiatric Assessment; Sensory sensitivity; temperament	SES
Skaug et al. (2018)	Young children’s TV watching and quality of interaction with parents	737 mother-child dyads; community, Norway	4	Time one: 4.4 years; time two: 6.7 years	25 minutes free play; child initiated play; parent initiated play; clean up at university clinic; retested two years later following same procedures		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-hostility, child responsiveness and child involvement	Total scores for child responsiveness and child involvement	TV viewing	Gender, SES
Stack et al. (2018)	Effects of birth status on EA and child EA trajectories	109 mother-child dyads; preterm infants; Canada	2	6; 12; 18; 57 months	Home based conversation – face to face and free play	Pre-term infants	Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-hostility, child responsiveness and child involvement	Aggregated maternal sensitivity and structuring; separate model for child		Maternal education; gender; preterm status

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 300

									responsiveness and child involvement		
Stack et al. (2012)	Quality of mother-child rship in high risk dyads – intergenerational longitudinal study	Study 1: 109 mother-child dyads; low SES; Canada	3	Infancy – preschool, middle childhood	15 minutes of free play at home (time one); play with jenga (time two)		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-hostility, child responsiveness and child involvement	Direct scores maternal sensitivity, structuring, hostility, child responsiveness and child involvement	Parenting stress, home environment; parenting social support	Maternal education, child gender, current support and stress
Steier & Brauch-Lehman (2000)	Origins of soft object attachments	50 mother-child dyads; community; US	2	15 – 31 months	20 minutes of free play in the laboratory		Interrater reliability; reliability with Biringen	Sensitivity, maternal structuring/intrusiveness, child responsiveness and child involvement	Direct score for maternal sensitivity, maternal structuring/int rusiveness, child responsiveness and child involvement	Soft object attachment; toddler behaviour and temperament	Maternal personality; child rearing variables (i.e, breastfeeding, nonparental care), child temperament
Steinsbekk et al. (2017)	Child and parent predictors of picky eating from preschool to school age	795 mother-child dyads; community; Norway	4	4 - 6 years	Four 5 minute sequences – free play, child lead play, parent lead play, clean up task		Interrater reliability; reliability with Biringen	Sensitivity and structuring	Sensitivity and structuring	Pickiness in eating and sensory sensitivity; child temperament	Gender
Susman-Stillman et al. (2013)	Role of childcare and caregiver attitudes and beliefs in predicting caregiving behavior over time	59 family childcare providers and 39 center based providers each with a focal			Recorded in childcare setting for 30 – 45 minutes at two or three time points.		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility, child responsiveness and child involvement; overall EA	Summed direct scores from each of the six subscales to create a total score ranging from 42 – 174; 120 and	Attitudes and beliefs	Demographic variables

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 301

		child; community; US							above considered 'good enough' EA, 162 and above considered very high quality EA		
Sutherland et al. (2012)	EA during mother-child interactions divorcing and intact married families	47 mother-child dyads; community-divorced versus intact families; US		1 – 8 years	20 minutes semi-structured play at university laboratory		Reliability with Biringen; interrater reliability	Sensitivity, structuring, non-intrusiveness, non-hostility	Combined direct scores on EA scales to form composite variables: EA composite variables: EA mother composite (maternal scales); child composite (child scales); EA control composite (structuring, non-intrusiveness, non-hostility) EA total; Direct score of EA sensitivity	Only EA scores were compared and analysed in groups	
Swanson et al. (2000)	Intrusiveness and quality of attachment	51 mother child dyads; maternal prenatal	2	1 month; 6 months; 18 months	10 minutes of play	prenatal drug abuse	Reliability with Biringen; interrater reliability	Sensitivity, non-intrusiveness, non-hostility; structuring	Transformed intrusiveness scores (which only ranged from 5 – 7) to categorical	Attachment; strange situation	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 302

		drug abuse; US							scores; 5 = non-intrusive, 6 = intrusive; 7 = high intrusiveness. Transformed sensitivity scores to categorical scores; 1 – 4.5 = insensitive and 5 – 9 = sensitive. Transformed hostility into categorical scores; 1 = non-hostile; 2 – 5 = hostile.		
Taylor-Colls & Fearon (2015)	Effect of parental behaviour on infant neural processing of emotion	40 mother-child dyads; community; UK	3	7 months	3 minutes of free play without toys; 3 minutes of structured interaction at laboratory		Interrater reliability	Sensitivity, structuring, non-hostility, non-intrusiveness	Standardised and summed the four EA parental dimensions – labelled variable ‘sensitivity’	EEG; infant temperament	Gender
Teti et al. (2010)	Maternal EA at bedtime predicts infant sleep quality	45 mother-infant dyads; community; US	4	5 weeks – 25 months	6 – 123 minutes of bedtime routine recorded		Reliability with Biringen; interrater reliability	Direct scores sensitivity, structuring; non-intrusiveness; non-hostility	Composite maternal EA score calculated by converting EAS scores on sensitivity, non-intrusiveness and non-hostility scales into z	Infant sleep; parenting practices	Infant age.

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 303

									scores and summing across the three standardized dimensions.		
Thomas et al. (2011)	Parent child interaction therapy in prevention of child maltreatment	150 mother-child dyads; high risk for maltreatment; Australia	4	2.5 – 7 years	10 minutes of child directed free play in laboratory		Interrater reliability	Sensitivity	Direct scores for sensitivity	Child behavioural problems; child abuse; parent stress	
Timmer et al (2011)	Impact of mothers' physical abusiveness on quality of parent-child relationship	54 mother-infant dyads; clinical sample; US	3	2 – 7 years	15 minutes semi-structured play at university clinic		Interrater reliability, and one of the coders achieved reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility; child responsiveness and child involvement	Raw scores and standardized z scores used	Parent verbalisation patterns; child behavioural problems	Interparental violence
Trapolini et al (2008)	Maternal depression and EA in preschool years	92 mother-child dyads; clinical sample of depressed mothers; Australia	3	4, 12, 15 months; 4 years;	20 minutes unstructured play at home		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility. Child responsiveness and child involvement	Categorised direct scores as – optimal 6 – 9 or sub-optimal < 6	Maternal depression; attachment; perspective taking	Marital status and maternal education
Trupe (2010)	Borderline PD and maternal EA	84 mother-infant	3	4 – 7 year olds	20 minute interaction task		Interrater reliability and	Sensitivity, structuring, non-intrusiveness, non-	Direct score sensitivity, structuring,	Borderline Personality Disorder	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 304

		dyads; clinical sample with Borderline Personality Disorder and control; US					reliability with Biringen	hostility. Child responsiveness and child involvement	non-intrusiveness, non-hostility. Child responsiveness and child involvement	Measure; negative relationships; self-harm; affective instability	
Trupe (2018)	EA in mothers with BPD and children	70 mother-child dyads; high risk recruited from mental health facilities – low SES, maternal BPD diagnosis and MDD; US	3	4 – 7 years	10 minute story telling task		Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility. Child responsiveness and child involvement; included two separate categorical variables: child over-responsiveness and child over-involvement (yes/no)	Cluster comparisons: high functioning; low functioning; asynchronous; low average for sensitivity, structuring, non-intrusiveness, non-hostility. Child responsiveness and child involvement	Borderline features assessed, lifetime MDD assessment; social support; psychosocial child risk; child maltreatment or separation from caregiver	Child gender, mother partnered, child age, income
Van den Dries (2012)	Application of EAS to adoptive families from China	92 mother-infant dyads; adoptive families; post		2 – 6 months post adoption	Home visits – 8 minutes free play at time one and time two	Adopted mother-infant dyads	Interrater reliability and at least one ‘expert coder’ reliable with Biringen	Sensitivity and child responsiveness	Direct scores on sensitivity and child responsiveness	Attachment measured by Strange Situation Procedure	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 305

		institutionalised families; former foster care children; Netherlands									
Van Doesum et al. (2007)	Correlates of depressed mothers' sensitivity towards their infants	84 mother-child dyads; mothers with depression; Netherlands	3	1 month to one year	15 minutes of mothers bathing their infants		Interrater reliability; reliability with Robinson	Sensitivity	Direct score for sensitivity	Depression (diagnostic and symptomatic); parental incompetence	Maternal education, maternal age, child characteristics (birth weight and perinatal complications), contextual characteristics (e.g., social support, family income, stressful life events)
Van Ee et al. (2013)	Father involvement in refugee sample: association between PTSD and caregiving	80 father-child dyads; refugee and asylum seekers; Netherlands	4	18 – 42 months	15 minute free play	Refugee and asylum seekers	Interrater reliability; reliability with Biringer	Sensitivity, structuring, non-hostility, non-intrusiveness	Direct scores for sensitivity, structuring, non-hostility, non-intrusiveness	Perception of parent child relationship; quality of caregiving; traumatic events and stress; PTSD symptoms	Parental age and gender
Van Ee et al. (2017)	Attachment representation and sensitivity	53 mother-child	4	28.04 months	15 minutes free play in the laboratory	Refugee sample with	Interrater reliability and	Sensitivity	Direct score for sensitivity	PTSD symptoms;	Parental gender and age

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 306

		dyads; asylum seekers and refugees; the Netherlands				PTSD	reliability with Biringen			Attachment script	
Van Ilzendoorn et al. (2007)	Parental sensitivity and attachment in children with ASD	55 parent child dyads; Autism Spectrum Disorder; Netherlands	4	14 – 15 months; 4 years	10 minutes of free play	ASD	Interrater reliability	Sensitivity and child involvement	Direct score maternal sensitivity and child involvement	Autism; attachment using the Strange Situation Procedure	Developmental level;
Venuti et al. (2008)	Play and EA in children with down syndrome	28 mother-child dyads; Down syndrome; Italy	4	Toddlers; 3 years	20 minutes play session in laboratory (divided into two 10 minute play sessions).	Down Syndrome	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility; child responsiveness and child involvement	Categorised sensitivity direct scores into two subsamples: 7 or more = high sensitivity, rest of sample mean = 5.3 = intermediate sensitivity	Symbolic play	
Vinall et al. (2013)	Parent behaviours moderate the relationship between neonatal pain and internalising behaviours	145 parent-child dyads; preterm infants; Canada	4	18 months	5 minute semi-structured teaching situation	Premature infants	Interrater reliability and reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility; child responsiveness and child involvement	Total scores for sensitivity, structuring, non-intrusiveness, non-hostility; child responsiveness	Neonate medical information; parenting stress; cognitive development; child internalising behaviour	Parent age, gender, neonatal medical factors;

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 307

Vliegen et al. (2009)	EA in postpartum period	49 mother-child dyads; postpartum clinically depressed mother; Belgium	4	4 months	30 minutes free play observation		Interrater reliability and reliability with Biringer	Sensitivity, structuring, non-intrusiveness, non-hostility. Child responsiveness and child involvement	s and child involvement Created subgroups of mother-infant dyads based on direct score for each scale = sensitivity risk: 1 – 5, no risk 5.5 – 6.5, optimal: 7 – 9; non-intrusiveness risk: 1 – 2.5, no risk: 3 – 3.5, optimal: 4 – 5; structuring risk: 1 – 3, no risk: 3 – 3.5, optimal 4 – 5; non-hostility risk: 1 – 3, no risk: 3.5 – 4.5, optimal: 5; child responsiveness risk: 1-3, no risk: 3.5 – 4.5, optimal: 5 – 7; child involvement risk: 1 – 3, no risk: 3.5 – 4.5, optimal 5 – 7	Maternal depression	Birth weight, age of child, maternal education
-----------------------	-------------------------	--	---	----------	----------------------------------	--	--	--	---	---------------------	--

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 308

Whitesell et al. (2018)	Family sleep and household chaos	144 mother-child dyads; US	4	12 months	Infant bedtime		Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility.	Created a mean composite EA score per family	Household chaos; infant sleep; bedtime, sleep onset	Maternal EA; marital adjustment
Wiefel et al. (2005)	EA in infant psychiatry	68 mother child; 40 father-child dyads; child psychiatric population; Germany	4	6 weeks – 3 years 10 months	5 – 10 minutes of free play with each parent	Infants with psychiatric disorders	Interrater reliability; reliability with Biringen	Sensitivity, structuring, non-intrusiveness, non-hostility. Child responsiveness and child involvement.	Factor analysis using direct scores on each of the scales explained 66.02% of variance – EA summary score calculated by summing direct scores for six scales	ICD Classifications – externalising, attachment, regulation and feeding disorders	Gender, age,
Zelkowitz et al. (2009)	Maternal anxiety and maternal EA	56 mother infant dyads; families with low birth weight newborns in the NICU; Canada		Newborn to 24 months (adjusted age)	15 minutes of free play with toys at home	NICU babies	Interrater reliability	Sensitivity, structuring, non-intrusiveness, non-hostility. Child responsiveness and child involvement.	Direct score for sensitivity, structuring, non-intrusiveness, and child involvement	Maternal trait anxiety in the NICU (measure from NICU), neurobiological risk score	Maternal education and birthweight
Zelkowitz et al. (2011)	Maternal anxiety predicts cognitive and behavioural outcomes of	88 mother-infant dyads; low birth weight		Newborn to 24 months (adjusted age)	15 minutes of free play with toys at home	NICU babies	Not specified	Sensitivity	Not specified	Child behavioural problems, psychomotor and cognitive development;	Maternal education

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 309

	low birth weight children	newborns in the NICU; Canada								maternal anxiety	
Zimmerman & Fassler (2003)	Dynamics of EA in childcare how infants involve and respond to teen mothers and childcare teachers	7 mother/teacher-child dyads; adolescent and young mothers; US	1	3 – 4 months at the start and 9 – 11 months at the end	90 minutes recorded each 3 months with mother, longitudinal for 9 months		Interrater and reliability with Biringen	Sensitivity, intrusiveness/structuring, child responsiveness and child involvement	Direct score sensitivity, intrusiveness-structuring; child responsiveness and child involvement	Case studies	
Zimmerman & McDonald (1995)	EA in infant relationships with multiple caregivers	6 children and their child care providers ; community; US	1	3 – 6 months at the start	10 hours per week of naturalistic observations (i.e., feed time, play, diaper changes) of infant at day care with parents, teachers, other infants; longitudinal; alternate months		Interrater reliability	Sensitivity, intrusiveness, child responsiveness and child involvement	Direct score sensitivity, intrusiveness, child responsiveness and child involvement	Case studies	
Ziv et al. (2000)	EAS and attachment security in infants at 12 months in large sample	687 mother-infant dyads; diverse SES community sample;	2	12 months	6 minutes of free play (longer observation was not possible due to sample size)		Interrater reliability	Sensitivity, intrusiveness/structuring, non-hostility, child responsiveness and child involvement	Direct score sensitivity, intrusiveness/structuring, non-hostility, child responsiveness and child involvement	Attachment using Strange Situation Procedure	Maternal education, SES, infant gender

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 310

		Israel									
Ziv et al. (2016)	Efficacy of attachment intervention program	32 mother-child dyads; clinical sample recruited from clinic for early childhood mental health services; Israel	3	3 – 6 years	Free play 10 minutes, structured play 5 minutes in observation room		Interrater reliability; reliability with Biringen	Sensitivity, intrusiveness/structuring, non-hostility, child responsiveness and child involvement	Direct score sensitivity, intrusiveness/structuring, non-hostility, child responsiveness and child involvement	Attachment; insightfulness	Gender
Ziv et al. (2016)	Associations among maternal negative control; child information processing and teacher perception of child behaviour	218 mother-child dyads; community sample; Israel	3	46 – 70 months	Mother-child play sessions		Interrater reliability and reliability with Biringen	Sensitivity, non-intrusiveness, structuring, non-hostility, child responsiveness and child involvement	Non-intrusiveness, non-hostility, structuring	Social information processing; child behaviour	Household income; marital status; parental education; child expressive vocabulary
Ziv et al. (2018)	Early childhood trauma and EA	15 caregiver-child dyads; high risk - children attending therapeutic nursery	4	43 to 61 months	Three play episodes: 10 minutes of free play; 10 minutes of structured play; 10 minutes of eating a snack	Children attending Therapeutic Nursery Program due to disrupted social, emotional and	Not specified	Sensitivity, non-intrusiveness, structuring, non-hostility, child responsiveness and child involvement	Use composite scores for three play episodes	Insightfulness, exposure to adverse childhood experiences; social information processing; child behaviour;	

PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AVAILABILITY 311

		program; US				behavioural regulation				learning behaviours	
--	--	----------------	--	--	--	---------------------------	--	--	--	------------------------	--

References

- Aarts, C., Hörnell, A., Kylberg, E., Hofvander, Y., & Gebre-Medhin, M. (1999).
Breastfeeding patterns in relation to thumb sucking and pacifier use.
Pediatrics, *104*(4), e50-e50.
<https://pediatrics.aappublications.org/content/104/4/e50.abstract>
- Abel, K. M., Webb, R. T., Salmon, M. P., Wan, M. W., & Appleby, L. (2005).
Prevalence and predictors of parenting outcomes in a cohort of mothers with
schizophrenia admitted for joint mother and baby psychiatric care in England.
J Clin Psychiatry, *66*(6), 781-789.
<https://pdfs.semanticscholar.org/d445/e4674fdca89f6dd0fff098e8962c68c6cbde.pdf>
- Abidin, R. R., & Abidin, R. R. (1990). *Parenting Stress Index (PSI)* Charlottesville,
VA: Paediatric Psychology Press.
- Abidin, R.R. (1995). *Parenting Stress Index* (3rd ed.). Odessa, FL: Psychology
Assessment Resources Inc.
- Adouard, F., Glangeaud-Freudenthal, N. M. C., & Golse, B. (2005). Validation of the
Edinburgh postnatal depression scale (EPDS) in a sample of women with
high-risk pregnancies in France. *Archives of Women's Mental Health*, *8*(2),
89-95. Doi: 10.1007/s00737-005-0077-9
- Agaibi, C. E., & Wilson, J. P. (2005). Trauma, PTSD, and resilience: A review of the
literature. *Trauma, Violence, & Abuse*, *6*(3), 195-216.
<https://doi.org/10.1177%2F1524838005277438>
- Ainsworth, M. D. S. (1969). Object relations, dependency, and attachment: A
theoretical review of the infant-mother relationship. *Child development*, 969-
1025.

- Ainsworth, M. D. S. (1969). Maternal sensitivity scales. *Power*, 6, 1379-1388.
- Ainsworth, M. D. S. (1977). Infant development and mother-infant interaction among Ghanda and American families. *Culture and infancy*, 119-150.
- Ainsworth, M. S. (1979). Infant–mother attachment. *American psychologist*, 34(10), 932.
- Ainsworth, M.D.S., Bell, S.M., & Stayton, D.F. (1974). Infant-mother attachment and social development: Socialization as a product of reciprocal responsiveness to signals. Taylor and Francis, New York
- Ainsworth, M. D. S., Bell, S. M., Stayton, D. J., & Richards, M. P. (1974). *The introduction of the child into a social world*. London: Cambridge University Press.
- Ainsworth, M.D.S., Blehar, M.C., & Waters, E. (1978). *Patterns of attachment: A psychological study of the strange situation*. Taylor and Francis, New York
- Ainsworth, M. D., & Marvin, R. S. (1995). On the shaping of attachment theory and research: An interview with Mary DS Ainsworth (Fall 1994). *Monographs of the society for research in child development*, 3-21. Retrieved from <https://www.jstor.org/stable/1166167?seq=1>
- Allen, J.P., McElhaney, K.B., Land, D.J., Kuperminc, G.P., Moore, C.W., O’Beirne-Kelly, H., & Kilmer, S.L. (2003). A secure base in adolescence: Markers of attachment security in the mother-adolescent relationship. *Child development*, 74(1), 292 – 307. <http://doi.org/10.1111/1476-8624.t01-1-00536>
- Altenhofen, S., Clyman, R., Little, C., Baker, M., & Biringen, Z. (2013). Attachment security in three year olds who entered substitute care in infancy. *Infant mental health journal*, 34(5), 435-445. <https://doi.org/10.1002/imhj.21401>

- Altenhofen, S., Sutherland, K., & Biringen, Z. (2010). Families experiencing divorce: Age at onset of overnight stays, conflict, and emotional availability as predictors of child attachment. *Journal of Divorce & Remarriage*, *51*(3), 141-156. <https://doi.org/10.1080/10502551003597782>
- Alhusen, J. L. (2008). A literature update on maternal-fetal attachment. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, *37*(3), 315-328. <https://doi.org/10.1111/j.1552-6909.2008.00241.x>
- Allen, S. (1998). A qualitative analysis of the process, mediating variables and impact of traumatic childbirth. *Journal of Reproductive and Infant Psychology*, *16*(2-3), 107-131. doi: 10.1080/02646839808404563
- American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*. Arlington, VA: American Psychiatric Association, 2013.
- Armstrong, D. S., Hutti, M. H., & Myers, J. (2009). The influence of prior perinatal loss on parents' psychological distress after the birth of a subsequent healthy infant. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, *38*(6), 654-666. Doi: [pdf/10.1111/j.1552-6909.2009.01069.x?](https://doi.org/10.1111/j.1552-6909.2009.01069.x)
- Arnestad, M., Andersen, M., & Rognum, T. O. (1997). Is the use of dummy or carry-cot of importance for sudden infant death?. *European journal of pediatrics*, *156*(12), 968-970. <https://link.springer.com/article/10.1007/s004310050753>
- Ashman, S.B., Dawson, G. and Panagiotides, H., 2008. Trajectories of maternal depression over 7 years: Relations with child psychophysiology and behavior and role of contextual risks. *Development and psychopathology*, *20*(1),55-77. <https://doi.org/10.1017/S0954579408000035>

- Atkinson, N. H., Gennis, H., Racine, N. M., & Pillai-Riddell, R. (2015). Caregiver emotional availability, caregiver soothing behaviours, and infant pain during immunization. *Journal of pediatric psychology, 40*(10), 1105-1114. <https://doi.org/10.1093/jpepsy/jsv067>
- Atkinson, L., Paglia, A., Coolbear, J., Niccols, A., Parker, K. C., & Guger, S. (2000). Attachment security: A meta-analysis of maternal mental health correlates. *Clinical psychology review, 20*(8), 1019-1040. [https://doi.org/10.1016/S0272-7358\(99\)00023-9](https://doi.org/10.1016/S0272-7358(99)00023-9)
- Austin, M. P., & Lumley, J. (2003). Antenatal screening for postnatal depression: a systematic review. *Acta Psychiatrica Scandinavica, 107*(1), 10-17. <https://doi.org/10.1034/j.1600-0447.2003.02024.x>
- Austin, M. P., Christl, B., McMahon, C., Kildea, S., Reilly, N., Yin, C., ... & King, S. (2017). Moderating effects of maternal emotional availability on language and cognitive development in toddlers of mothers exposed to a natural disaster in pregnancy: The QF2011 Queensland Flood Study. *Infant behaviour and development, 49*, 296-309. <https://doi.org/10.1016/j.infbeh.2017.10.005>
- Austin, M. P., Hadzi-Pavlovic, D., Leader, L., Saint, K., & Parker, G. (2005). Maternal trait anxiety, depression and life event stress in pregnancy: relationships with infant temperament. *Early human development, 81*(2), 183-190. <https://doi.org/10.1016/j.earlhumdev.2004.07.001>
- Aviezer, O., Sagi, A., Joels, T., & Ziv, Y. (1999). Emotional availability and attachment representations in kibbutz infants and their mothers. *Developmental psychology, 35*(3), 811. doi:10.1037/0012-1649.35.3.811

- Aviezer, O., Sagi-Schwartz, A., & Koren-Karie, N. (2003). Ecological constraints on the formation of infant–mother attachment relations: When maternal sensitivity becomes ineffective. *Infant Behavior and Development*, *26*(3), 285-299. [https://doi.org/10.1016/S0163-6383\(03\)00032-8](https://doi.org/10.1016/S0163-6383(03)00032-8)
- Ayers, S. (2004). Delivery as a traumatic event: prevalence, risk factors, and treatment for postnatal posttraumatic stress disorder. *Clinical obstetrics and Gynecology*, *47*(3), 552-567. doi: 10.1097/01.grf.0000129919.00756.9c
- Ayton, J., van der Mei, I., Wills, K., Hansen, E., & Nelson, M. (2015). Cumulative risks and cessation of exclusive breastfeeding: Australian cross-sectional survey. *Archives of disease in childhood*, *100*(9), 863-868. Retrieved from https://www.researchgate.net/profile/Jennifer_Ayton/publication/277893148_Cumulative_risks_and_cessation_of_exclusive_breast_feeding_Australian_cross-sectional_survey/links/55767c0008aeb6d8c01af097.pdf
- Bailey, H. N., De Oliveira, C. A., Wolfe, V. V., Evans, E. M., & Hartwick, C. (2012). The impact of childhood maltreatment history on parenting: A comparison of maltreatment types and assessment methods. *Child abuse & neglect*, *36*(3), 236-246. doi:10.1016/j.chiabu.2011.11.005
- Baker, M., Biringen, Z., Meyer-Parsons, B., & Schneider, A. (2015). Emotional attachment and emotional availability tele-intervention for adoptive families. *Infant mental health journal*, *36*(2), 179-192. <https://doi.org/10.1002/imhj.21498>
- Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2003). Less is more: meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological bulletin*, *129*(2), 195. Doi:10.1037/0033-2909.129.2.195

- Ballard, C. G., Stanley, A. K., & Brockington, I. F. (1995). Post-traumatic stress disorder (PTSD) after childbirth. *The British Journal of Psychiatry*, *166*(4), 525-528. <https://doi.org/10.1192/bjp.166.4.525>
- Baker, M., Biringen, Z., Meyer-Parsons, B., & Schneider, A. (2015). Emotional attachment and emotional availability tele-intervention for adoptive families. *Infant mental health journal*, *36*(2), 179-192. <https://doi.org/10.1002/imhj.21498>
- Banyard, V. L. (1997). The impact of childhood sexual abuse and family functioning on four dimensions of women's later parenting. *Child abuse & neglect*, *21*(11), 1095-1107. [https://doi.org/10.1016/S0145-2134\(97\)00068-9](https://doi.org/10.1016/S0145-2134(97)00068-9)
- Barfoot, J., Meredith, P., Ziviani, J., & Whittingham, K. (2017). Parent-child interactions and children with cerebral palsy: An exploratory study investigating emotional availability, functional ability, and parent distress. *Child: care, health and development*, *43*(6), 812-822. <https://doi.org/10.1111/cch.12493>
- Barker, E. D., Jaffee, S. R., Uher, R., & Maughan, B. (2011). The contribution of prenatal and postnatal maternal anxiety and depression to child maladjustment. *Depression and anxiety*, *28*(8), 696-702. <https://doi.org/10.1002/da.20856>
- Baumrind, D. (1967). Child care practices anteceding three patterns of preschool behavior. *Genetic Psychology Monographs*, *75*(1), 43-88.
- Baumrind, D. (1971). Current patterns of parental authority. *Developmental Psychology*, *4*(1, Pt.2), 1-103. <https://doi.org/10.1037/h0030372>
- Bornstein, M. (2002). *Handbook of Parenting Volume 1: Children and Parenting*, Mahwah, New Jersey, Lawrence Erlbaum Associates, Publishers

- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, *51*(6), 1173.
Doi: -13085-001
- Barone, L., Barone, V., Dellagiulia, A., & Lionetti, F. (2018). Testing an attachment-based parenting intervention-VIPP-FC/A in adoptive families with post-institutionalized children: do maternal sensitivity and genetic markers count?. *Frontiers in psychology*, *9*, 156. <https://doi.org/10.3389/fpsyg.2018.00156>
- Barone, L., Carta, A., & Ozturk, Y. (2018). Social-emotional functioning in planned lesbian families: does biological versus non-biological mother status matter? An Italian pilot study. *Attachment & human development*, 1-14.
<https://doi.org/10.1080/14616734.2018.1528620>
- Barone, L., Ozturk, Y., & Lionetti, F. (2019). The key role of positive parenting and children's temperament in post-institutionalized children's socio-emotional adjustment after adoption placement. A RCT study. *Social Development*, *28*(1), 136-151. <https://doi.org/10.1111/sode.12329>
- Barros, F. C., Victora, C. G., Semer, T. C., Tonioli Filho, S., Tomasi, E., & Weiderpass, E. (1995). Use of pacifiers is associated with decreased breast-feeding duration. *Pediatrics*, *95*(4), 497-499. Retrieved from <http://link.galegroup.com/apps/doc/A16899126/ITOF?u=murdoch&sid=ITOF&xid=cb8469dc>.
- Bateson, G. (1972) *Steps to an ecology of mind: Collected essays in anthropology, psychiatry, evolution, and epistemology*. Chicago, IL: University of Chicago Press.

- Bateson, G. (1979). *Mind and nature: A necessary unity (Advances in systems theory, complexity and the human sciences)*. New York: NY: Hampton Press.
- Beck, C. T. (1995). The effects of postpartum depression on maternal-infant interaction: a meta-analysis. *Nursing research, 44*(5), 298-304.
<http://dx.doi.org/10.1097/00006199-199509000-00007>
- Beck, J. G., Grant, D. M., Clapp, J. D., & Palyo, S. A. (2009). Understanding the interpersonal impact of trauma: Contributions of PTSD and depression. *Journal of anxiety disorders, 23*(4), 443-450.
<https://doi.org/10.1016/j.janxdis.2008.09.001>
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of general psychiatry, 4*(6), 561-571.
- Beebe, B. (2003). Brief mother–infant treatment: Psychoanalytically informed video feedback. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health, 24*(1), 24-52.
<https://doi.org/10.1002/imhj.10042>
- Beebe, S. A., Casey, R., & Pinto-Martin, J. (1993). Association of reported infant crying and maternal parenting stress. *Clinical Pediatrics, 32*(1), 15-19. Doi: 10.1177/000992289303200103
- Behrendt, H. F., Scharke, W., Herpertz-Dahlmann, B., Konrad, K., & Firk, C. (2019). Like mother, like child? Maternal determinants of children's early social-emotional development. *Infant mental health journal, 40*(2), 234-247.
<https://doi.org/10.1002/imhj.21765>

- Belar, C. D., & Perry, N. W. (1992). The national conference on scientist-practitioner education and training for the professional practice of psychology. *American Psychologist*, *47*(1), 71. <http://dx.doi.org/10.1037/0003-066X.47.1.71>
- Belfer, M. L. (2008). Child and adolescent mental disorders: the magnitude of the problem across the globe. *Journal of child psychology and psychiatry*, *49*(3), 226-236. <https://doi.org/10.1111/j.1469-7610.2007.01855.x>
- Belar, C. D., & Perry, N. W. (1992). The National Conference on Scientist-Practitioner Education and Training for the Professional Practice of Psychology. *American Psychologist*, *47*(1), 71.
- Belsky, J., & Isabella, R. A. (1985). Marital and parent-child relationships in family of origin and marital change following the birth of a baby: A retrospective analysis. *Child development*, 342-349. Retrieved from <https://www.jstor.org/stable/1129724>
- Belsky, J., Spritz, B., & Crnic, K. (1996). Infant attachment security and affective-cognitive information processing at age 3. *Psychological Science*, *7*(2), 111-114. <https://doi.org/10.1111/j.1467-9280.1996.tb00339.x>
- Belt, R. H., Kouvo, A., Flykt, M., Punamäki, R. L., Haltigan, J. D., Biringen, Z., & Tamminen, T. (2013). Intercepting the intergenerational cycle of maternal trauma and loss through mother–infant psychotherapy: A case study using attachment-derived methods. *Clinical child psychology and psychiatry*, *18*(1), 100-120. <https://doi.org/10.1177%2F1359104512444116>
- Belt, R. H., Flykt, M., Punamäki, R. L., Pajulo, M., Posa, T., & Tamminen, T. (2012). Psychotherapy groups and individual support to enhance mental health and early dyadic interaction among drug-abusing mothers. *Infant mental health journal*, *33*(5), 520-534. <https://doi.org/10.1002/imhj.21348>

- Bennett, H.A., Einarson, A., Taddio, A., Koren, G., & Einarson, T.R. (2004).
 Prevalence of depression during pregnancy: systematic review. *Obstetrics & Gynecology*, 103(4), 698-709. doi: 10.1097/01.AOG.0000116689.75396.5f
- Bennett, I. M., Palmer, S., Marcus, S., Nicholson, J. M., Hantsoo, L., Bellamy, S., ... & Coyne, J. C. (2009). One end has nothing to do with the other: Patient attitudes regarding help seeking intention for depression in gynecologic and obstetric settings. *Archives of women's mental health*, 12(5), 301.
<https://link.springer.com/article/10.1007/s00737-009-0103-4>
- Benton, J., Coatsworth, D., & Biringen, Z. (2019). Examining the Association Between Emotional Availability and Mindful Parenting. *Journal of Child and Family Studies*, 28(6), 1650-1663.
<https://link.springer.com/article/10.1007/s10826-019-01384-x>
- Bergmann, S., von Klitzing, K., Keitel-Korndörfer, A., Wendt, V., Grube, M., Herpertz, S., ... & Klein, A. M. (2016). Emotional availability, understanding emotions, and recognition of facial emotions in obese mothers with young children. *Journal of psychosomatic research*, 80, 44-52.
<https://doi.org/10.1016/j.jpsychores.2015.11.005>
- Bernard, K., Nissim, G., Vaccaro, S., Harris, J.L. & Lindhiem, O. (2018). Association between maternal depression and maternal sensitivity from birth to 12 months: a meta-analysis. *Attachment & human development*, 20(6), 578-599.
<https://doi.org/10.1080/14616734.2018.1430839>
- Bernstein, D. P., & Fink, L. F. (1999). *Childhood trauma questionnaire (CTQ)*. San Antonio, Psychological Corporation.
- Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., ... & Zule, W. (2003). Development and validation of a brief screening version

- of the Childhood Trauma Questionnaire. *Child abuse & neglect*, 27(2), 169-190. [https://doi.org/10.1016/S0145-2134\(02\)00541-0](https://doi.org/10.1016/S0145-2134(02)00541-0)
- Binns, C. W., & Scott, J. A. (2002). Using pacifiers: what are breastfeeding mothers doing?. *Breastfeeding Review*, 10(2), 21. Retrieved from <https://search.informit.com.au/documentSummary;dn=441477655824687>
- Biringen, Z. (2000). Emotional availability: Conceptualization and research findings. *American Journal of Orthopsychiatry*, 70(1), 104-114. <https://doi.org/10.1037/h0087711>
- Biringen, Z. (2004). *Raising a secure child: creating emotional availability between you and your child*. New York: Perigee/Putnam Press.
- Biringen, Z. (2008). The Emotional availability Scales (4th ed.). Boulder, CO: emotionalavailability.com
- Biringen, Z. (2005). Training and Reliability Issues with the Emotional Availability Scales. *Infant Mental Health Journal*, 26(4), 404-405. <https://psycnet.apa.org/doi/10.1002/imhj.20060>
- Biringen, Z., & Allender, T. (2011). Using Evidence-Based Assessments to Evaluate Parent-Child Relationship Quality. *Zero to Three (J)*, 31(6), 36-39.
- Biringen, Z., Altenhofen, S., Aberle, J., Baker, M., Brosal, A., Bennett, S., ... & Swaim, R. (2012). Emotional availability, attachment, and intervention in center-based child care for infants and toddlers. *Development and Psychopathology*, 24(1), 23-34. <https://doi.org/10.1017/S0954579411000630>
- Biringen, Z., Batten, R., Neelan, P., Altenhofen, S., Swaim, R., Bruce, A., ... & Zachary, V. (2010). Emotional availability (EA): The assessment of and intervention for global parent-child relational quality. *Journal of Experiential Psychotherapy*, 49(1).

- Biringen, Z., Damon, J., Grigg, W., Mone, J., Pipp-Siegel, S., Skillern, S., & Stratton, J. (2005). Emotional availability: Differential predictions to infant attachment and kindergarten adjustment based on observation time and context. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 26(4), 295-308. <https://doi.org/10.1002/imhj.20054>
- Biringen, Z., Derscheid, D., Vliegen, N., Closson, L., & Easterbrooks, M. A. (2014). Emotional availability (EA): Theoretical background, empirical research using the EA Scales, and clinical applications. *Developmental review*, 34(2), 114-167. <https://doi.org/10.1016/j.dr.2014.01.002>
- Biringen, Z., & Easterbrooks, A. (2008). Child-care and relationships: Understanding relationships and relationship interventions. *Journal of Early Childhood and Infant Psychology*, 4, 1-4. Retrieved from https://www.researchgate.net/profile/M_Easterbrooks/publication/285299070_Understanding_relationships_and_relationship_interventions/links/56c625bb08ae0d3b1b6036c0/Understanding-relationships-and-relationship-interventions.pdf
- Biringen, Z., & Easterbrooks, M. A. (2012). Emotional availability: concept, research, and window on developmental psychopathology. *Development and psychopathology*, 24(1), 1-8. <https://doi.org/10.1017/S0954579411000617>
- Biringen, Z., Emde, R. N., Brown, D., Lowe, L., Myers, S., & Nelson, D. (1999). Emotional availability and emotion communication in naturalistic mother-infant interactions: Evidence for gender relations. *Journal of Social Behavior and Personality*, 14(4), 463. <https://search.proquest.com/openview/6b5282239be26ba14471037aeb1f42a2/1?cbl=1819046&pq-origsite=gscholar>

- Biringen, Z., Emde, R. N., Campos, J. J., & Appelbaum, M. I. (1995). Affective reorganization in the infant, the mother, and the dyad: The role of upright locomotion and its timing. *Child development, 66*(2), 499-514.
<https://doi.org/10.1111/j.1467-8624.1995.tb00886.x>
- Biringen, Z., Fidler, D. J., Barrett, K. C., & Kubicek, L. (2005). Applying the Emotional Availability Scales to children with disabilities. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health, 26*(4), 369-391.
- Biringen, Z., Matheny, A., Bretherton, I., Renouf, A., & Sherman, M. (2000). Maternal representation of the self as parent: Connections with maternal sensitivity and maternal structuring. *Attachment & Human Development, 2*(2), 218-232. <https://doi.org/10.1080/14616730050085572>
- Biringen, Z., Moorlag, A., Meyer, B., Wood, J., Aberle, J., Altenhofen, S., & Bennett, S. (2008). The emotional availability (EA) intervention with child care professionals. *Journal of Early Childhood and Infant Psychology, 4*, 39-52.
<https://go.galegroup.com/ps/anonymous?id=GALE%7CA220640570&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=15546144&p=AONE&sw=w>
- Biringen, Z., & Robinson, J. (1991). Emotional availability in mother child interactions: A reconceptualization for research. *American journal of Orthopsychiatry, 61*(2), 258-271. Doi: 10.1037/h0079238
- Biringen, Z., Robinson, J. (1991). Emotional availability in mother child interactions: A reconceptualization for research. *American Journal of Orthopsychiatry 61*(2). 258-271. <https://doi.org/10.1037/h0079238>
- Biringen, Z., Skillern, S., Mone, J., & Pianta, R. (2005). Emotional availability is predictive of the emotional aspects of children's " school readiness". *Journal of*

Early Childhood and Infant Psychology, 1, 81-98.

<https://go.galegroup.com/ps/anonymous?id=GALE%7CA220766552&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=15546144&p=AONE&sw=w>

Blass, E. M., & Hoffmeyer, L. B. (1991). Sucrose as an analgesic for newborn infants. *Pediatrics*, 87(2), 215-218. Retrieved from http://pediatrics.aappublications.org/content/pediatrics/87/2/215.full.pdf?casa_token=ngsdrnX33w0AAAAA:U4M8JHglhtB4YhiCsO_vYkU8r67CJ8IEIZxqeQEp8h6bki7iCzV36ubL-U1kn0TqQx9LfuZSLjY5

Bödeker, K., Fuchs, A., Führer, D., Kluczniok, D., Dittrich, K., Reichl, C., ... & Neukel, C. (2019). Impact of maternal early life maltreatment and maternal history of depression on child psychopathology: mediating role of maternal sensitivity?. *Child psychiatry & human development*, 50(2), 278-290. <https://link.springer.com/article/10.1007/s10578-018-0839-z>

Bohr, Y., Putnick, D. L., Lee, Y., & Bornstein, M. H. (2018). Evaluating caregiver sensitivity to infants: measures matter. *Infancy*, 23(5), 730-747. <https://doi.org/10.1111/infa.12248>

Boris, N. W., Aoki, Y., & Zeanah, C. H. (1999). The development of infant-parent attachment: Considerations for assessment. *Infants & Young Children*, 11(4), 1-10.

Bornstein, M. H., Gini, M., Putnick, D. L., Haynes, O. M., Painter, K. M., & Suwalsky, A. J. T. (2006). Short-term reliability and continuity of emotional availability in mother-child dyads across contexts of observation. *Infancy*, 10(1), 1-16. doi: 10.1207/s15327078in1001_1

Bornstein, M. H., Leach, D. B., Heslington, M., Gini, M., Suwalsky, J. T. D., & Venuti, P. (2006). Mother-child emotional availability in cultural ecological

developmental perspective: Three cultures, two regions, two ages, two genders. *Unpublished manuscript, National Institute of Child Health and Human Development, Bethesda, MD.*

Bornstein, M. H., Putnick, D. L., Heslington, M., Gini, M., Suwalsky, J. T., Venuti, P., ... & Zingman de Galperín, C. (2008). Mother-child emotional availability in ecological perspective: Three countries, two regions, two genders.

Developmental Psychology, 44(3), 666.

<https://psycnet.apa.org/doi/10.1037/0012-1649.44.3.666>

Bornstein, M. H., Putnick, D. L., & Suwalsky, J. T. (2016). Infant–mother and infant–caregiver emotional relationships: Process analyses of interactions in three contemporary childcare arrangements. *Infancy, 21*(1), 8-36.

<https://doi.org/10.1111/infa.12097>

Bornstein, M. H., Putnick, D. L., & Suwalsky, J. T. (2016). Emotional interactions in European American mother–infant firstborn and second born dyads: A within-family study. *Developmental psychology, 52*(9), 1363.

<https://psycnet.apa.org/doi/10.1037/dev0000158>

Bornstein, M. H., Putnick, D. L., & Suwalsky, J. T. (2019). Continuity, stability, and concordance of socio-emotional functioning in mothers and their sibling children. *Social Development, 28*(1), 90-105.

<https://doi.org/10.1111/sode.12319>

Bornstein, M. H., Suwalsky, J. T., & Breakstone, D. A. (2012). Emotional relationships between mothers and infants: Knowns, unknowns, and unknown unknowns. *Development and psychopathology, 24*(1), 113-123.

Doi: <https://doi.org/10.1017/S0954579411000708>

Bornstein, M. H., Suwalsky, J. T., Putnick, D. L., Gini, M., Venuti, P., de Falco, S., ...

& Zingman de Galperín, C. (2010). Developmental continuity and stability of emotional availability in the family: Two ages and two genders in child-mother dyads from two regions in three countries. *International Journal of Behavioral Development*, 34(5), 385-397.

<https://doi.org/10.1177%2F0165025409339080>

Bosmans, G., Braet, C., & Van Vlierberghe, L. (2010). Attachment and symptoms of psychopathology: Early maladaptive schemas as a cognitive link?. *Clinical Psychology & Psychotherapy*, 17(5), 374-385. <https://doi.org/10.1002/cpp.667>

Bowlby, J. (1969). *Attachment and loss: Volume One*. New York, NY: Basic Books.

Bowlby, J. (1973). *Attachment and loss: Volume Two: Separation*. New York, NY: Basic Books.

Bowlby, J. (1982). Attachment and loss: retrospect and prospect. *American journal of Orthopsychiatry*, 52(4), 664.

Boyce, P., Stubbs, J. and Todd, A. (1993). The Edinburgh postnatal depression scale: validation for an Australian sample. *Australian and New Zealand Journal of Psychiatry* 27(3), 472-476. [doi/abs/10.1207/s15327078in1001_1](https://doi.org/10.1207/s15327078in1001_1)

Bozzette, M. (2007). A review of research on premature infant-mother interaction. *Newborn and Infant Nursing Reviews*, 7(1), 49-55.

<https://doi.org/10.1053/j.nainr.2006.12.002>

Baraitser, L. (2006). Oi mother, keep ye'hair on! Impossible transformations of maternal subjectivity. *Studies in gender and sexuality*, 7(3), 217-238. Doi: [10.2513/s15240657sgs0703_1](https://doi.org/10.2513/s15240657sgs0703_1)

Brandon, A. R., Pitts, S., Denton, W. H., Stringer, C. A., & Evans, H. M. (2009). A history of the theory of prenatal attachment. *Journal of prenatal & perinatal*

psychology & health: APPPAH, 23(4), 201.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3083029/>

Breslau, N. (2002). Epidemiologic studies of trauma, posttraumatic stress disorder, and other psychiatric disorders.

<https://doi.org/10.1177%2F070674370204701003>

Breslau, N., Kessler, R. C., Chilcoat, H. D., Schultz, L. R., Davis, G. C., & Andreski, P. (1998). Trauma and posttraumatic stress disorder in the community: the 1996 Detroit Area Survey of Trauma. *Archives of general psychiatry*, 55(7), 626-632. <https://jamanetwork.com/journals/jamapsychiatry/article-abstract/204066>

Breslau, N., Davis, G. C., Andreski, P., & Peterson, E. (1991). Traumatic events and posttraumatic stress disorder in an urban population of young adults. *Archives of general psychiatry*, 48(3), 216-222.

doi:10.1001/archpsyc.1991.01810270028003

Bretherton, I. (1987). New perspectives on attachment relations: Security, communication, and internal working models.

Bretherton, I. (2000). Emotional availability: An attachment perspective. *Attachment & Human Development*, 2(2), 233-241. Retrieved from

https://www.tandfonline.com/doi/pdf/10.1080/14616730050085581?casa_token=cnbF6eYaaw4AAAAA:2AhmxwMGBykL3Q-

OmFKPTx2o0zFPMenhzcbmvz8yo89xUUjM_ZOxWIR2moNhmeBEkYw8N
BIBYZIU8A

Briere, J., & Rickards, S. (2007). Self-awareness, affect regulation, and relatedness: Differential sequels of childhood versus adult victimization experiences. *The*

Journal of Nervous and Mental Disease, 195(6), 497-503. Doi:

10.1097/NMD.0b013e31803044e2

Briere, J., & Elliott, D. M. (2003). Prevalence and psychological sequelae of self-reported childhood physical and sexual abuse in a general population sample of men and women. *Child abuse & neglect*, 27(10), 1205-1222.

<https://doi.org/10.1016/j.chiabu.2003.09.008>

Brown, S. J., Yelland, J. S., Sutherland, G. A., Baghurst, P. A., & Robinson, J. S.

(2011). Stressful life events, social health issues and low birthweight in an Australian population-based birth cohort: challenges and opportunities in antenatal care. *BMC public health*, 11(1), 196. doi:10.1186/1471-2458-11-196

BMC public health, 11(1), 196. doi:10.1186/1471-2458-11-196

Buccini, G. D. S., Pérez Escamilla, R., Paulino, L. M., Araujo, C. L., & Venancio, S.

I. (2017). Pacifier use and interruption of exclusive breastfeeding: systematic review and meta-analysis. *Maternal & child nutrition*, 13(3), e12384.

<https://doi.org/10.1111/mcn.12384>

Buist AE, Barnett BE, Milgrom J, Sherryl J, Pope S, Condon JT, Ellwood D, Boyce

PM, Austin M-PV, Hayes BA (2002) To screen or not to screen – that is the question in perinatal depression. *Med J Aust* 177(suppl): S101–

105. <https://doi.org/10.5694/j.1326-5377.2002.tb04866.x>

Buist, A., Bilszta, J., Milgrom, J., Barnett, B., Hayes, B., & Austin, M. P. (2006).

Health professional's knowledge and awareness of perinatal depression:

Results of a national survey. *Women and Birth*, 19(1), 11-16.

<https://doi.org/10.1016/j.wombi.2005.12.001>

Busch, F., & McKnight, J. (1973). Parental attitudes and the development of the

primary transitional object. *Child psychiatry and human development*, 4(1),

12-20. Retrieved from <https://link.springer.com/article/10.1007/BF01434180>

- Butler, S., Williams, M., Tukuitonga, C., & Paterson, J. (2004). Factors associated with not breastfeeding exclusively among mothers of a cohort of Pacific infants in New Zealand. Retrieved from https://researchspace.auckland.ac.nz/bitstream/handle/2292/4730/15282622.pdf?sequence=1&origin=publication_detail
- Buultjens, M., & Liamputtong, P. (2007). When giving life starts to take the life out of you: women's experiences of depression after childbirth. *Midwifery*, 23(1), 77-91. <https://doi.org/10.1016/j.midw.2006.04.002>
- Bryan, A. A. (2001). Enhancing parent-child interaction with a prenatal couple intervention. *MCN: The American Journal of Maternal/Child Nursing*, 25(3), 139-145. <https://oce-ovid-com.libproxy.murdoch.edu.au/article/00005721-200005000-00007/HTML>
- Cadman, T., Belsky, J., & Pasco Fearon, R. M. (2018). The Brief Attachment Scale (BAS-16): A short measure of infant attachment. *Child: Care, Health and Development*, 44(5), 766–775. <https://doi.org/10.1111/cch.12599>
- Calkins, S. D., & Hill, A. (2007). Caregiver influences on emerging emotion regulation. *Handbook of emotion regulation*, 22(9), 248.
- Callaghan, A., Kendall, G., Lock, C., Mahony, A., Payne, J., & Verrier, L. (2005). Association between pacifier use and breastfeeding, sudden infant death syndrome, infection and dental malocclusion. *International Journal of Evidence Based Healthcare*, 3(6), 147-167. <https://doi.org/10.1111/j.1479-6988.2005.00024.x>
- Callaghan, A., Kendall, G., Lock, C., Mahony, A., Payne, J., & Verrier, L. (2005). Association between pacifier use and breastfeeding, sudden infant death syndrome, infection and dental malocclusion. *International Journal of*

EvidenceBased Healthcare, 3(6), 147-167. <https://doi.org/10.1111/j.1479-6988.2005.00024.x>

Campbell, J. (2007). Understanding the emotional needs of children who are blind.

Journal of Visual Impairment & Blindness, 101(6), 351-355.

<https://journals.sagepub.com/doi/pdf/10.1177/0145482X0710100605>

Campbell, S. B., Cohn, J. F., & Meyers, T. (1995). Depression in first-time mothers:

mother-infant interaction and depression chronicity. *Developmental*

Psychology, 31(3), 349.

Carr, A. (2014). The evidence base for family therapy and systemic interventions for

child-focused problems. *Journal of family therapy*, 36(2), 107-157.

<https://doi.org/10.1111/1467-6427.12032>

Cauffman, E. (2004). A statewide screening of mental health symptoms among

juvenile offenders in detention. *Journal of the American Academy of Child &*

Adolescent Psychiatry, 43(4), 430-439. [https://doi.org/10.1097/00004583-](https://doi.org/10.1097/00004583-200404000-00009)

[200404000-00009](https://doi.org/10.1097/00004583-200404000-00009)

Campbell, J., & Johnston, C. (2009). Emotional availability in parent–child dyads

where children are blind. *Parenting: Science and Practice*, 9(3-4), 216-227.

<https://doi.org/10.1080/15295190902844456>

Carbajal, R., Chauvet, X., Couderc, S., & Olivier-Martin, M. (1999). Randomised

trial of analgesic effects of sucrose, glucose, and pacifiers in term

neonates. *Bmj*, 319(7222), 1393-1397. doi: :10.1136/bmj.319.7222.1393

Carolan, M., Barry, M., Gamble, M., Turner, K., & Mascareñas, Ó. (2012). The

limerick lullaby project: an intervention to relieve prenatal stress. *Midwifery*,

28(2), 173-180. <https://doi->

[org.libproxy.murdoch.edu.au/10.1016/j.midw.2010.12.006](https://doi-org.libproxy.murdoch.edu.au/10.1016/j.midw.2010.12.006)

- Carr, A. (2009). The effectiveness of family therapy and systemic interventions for child-focused problems. *Journal of family therapy*, 31(1), 3-45. Retrieved from <https://doi.org/10.1111/j.1467-6427.2008.00451.x>
- Carragher, N., Krueger, R. F., Eaton, N. R., & Slade, T. (2015). Disorders without borders: current and future directions in the meta-structure of mental disorders. *Social psychiatry and psychiatric epidemiology*, 50(3), 339-350. <https://link.springer.com/article/10.1007/s00127-014-1004-z>
- Carter, A. S., Garrity-Rokous, F. E., Chazan-Cohen, R., Little, C., & Briggs-Gowan, M. J. (2001). Maternal depression and comorbidity: predicting early parenting, attachment security, and toddler social-emotional problems and competencies. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40(1), 18-26. <https://doi.org/10.1097/00004583-200101000-00012>
- Castonguay, L. G., Youn, S. J., Xiao, H., Muran, J. C., & Barber, J. P. (2015). Building clinicians-researchers partnerships: Lessons from diverse natural settings and practice-oriented initiatives. *Psychotherapy Research*, 25(1), 166-184. Doi: 10.1080/10503307.2014.973923
- Cassibba, R., Castoro, G., Costantino, E., Sette, G., & van IJzendoorn, M. H. (2015). Enhancing maternal sensitivity and infant attachment security with video feedback: An exploratory study in Italy. *Infant mental health journal*, 36(1), 53-61. <https://doi.org/10.1002/imhj.21486>
- Cassibba, R., Van IJzendoorn, M. H., & Coppola, G. (2012). Emotional availability and attachment across generations: Variations in patterns associated with infant health risk status. *Child: care, health and development*, 38(4), 538-544. <https://doi.org/10.1111/j.1365-2214.2011.01274.x>

- Cassidy, J., Brett, B. E., Gross, J. T., Stern, J. A., Martin, D. R., Mohr, J. J., & Woodhouse, S. S. (2017). Circle of security–parenting: A randomized controlled trial in head start. *Development and psychopathology*, *29*(2), 651-673. <https://doi.org/10.1017/S0954579417000244>
- Catalano, R. F., Fagan, A. A., Gavin, L. E., Greenberg, M. T., Irwin Jr, C. E., Ross, D. A., & Shek, D. T. (2012). Worldwide application of prevention science in adolescent health. *The Lancet*, *379*(9826), 1653-1664. [https://doi.org/10.1016/S0140-6736\(12\)60238-4](https://doi.org/10.1016/S0140-6736(12)60238-4)
- Célia, M. G., Stack, D. M., & Serbin, L. A. (2018). Developmental patterns of change in mother and child emotional availability from infancy to the end of the preschool years: A four-wave longitudinal study. *Infant Behavior and Development*, *52*, 76-88. <https://doi.org/10.1016/j.infbeh.2018.05.005>
- Centuori, S., Burmaz, T., Ronfani, L., Fragiacomò, M., Quintero, S., Pavan, C., ... & Cattaneo, A. (1999). Nipple care, sore nipples, and breastfeeding: a randomized trial. *Journal of Human Lactation*, *15*(2), 125-130. doi: 10.1177/089033449901500210
- Cerezo, M. A., Pons-Salvador, G., & Trenado, R. M. (2008). Mother–infant interaction and children’s socio-emotional development with high-and low-risk mothers. *Infant Behavior and Development*, *31*(4), 578-589. <https://doi.org/10.1016/j.infbeh.2008.07.010>
- Chang, J. J., Halpern, C. T., & Kaufman, J. S. (2007). Maternal depressive symptoms, father's involvement, and the trajectories of child problem behaviors in a US national sample. *Archives of Pediatrics & Adolescent Medicine*, *161*(7), 697-703. doi:10.1001/archpedi.161.7.697

- Chaudhuri, J. H., Easterbrooks, M. A., & Davis, C. R. (2009). The relation between emotional availability and parenting style: Cultural and economic factors in a diverse sample of young mothers. *Parenting: Science and Practice, 9*(3-4), 277-299. <https://doi.org/10.1080/15295190902844613>
- Cheung, H. S., & Elliott, J. M. (2016). Measuring maternal sensitivity: Cultural variations in the measurement of emotional availability. *Child development, 87*(3), 898-915. <https://doi.org/10.1111/cdev.12519>
- Chirico, I., Andrei, F., Salvatori, P., Malaguti, I., & Trombini, E. (2019). The focal play therapy: A clinical approach to promote child health and family well-being. *Frontiers in public health, 7*, 77. <https://doi.org/10.3389/fpubh.2019.00077>
- Chung, T. K., Lau, T. K., Yip, A. S., Chiu, H. F., & Lee, D. T. (2001). Antepartum depressive symptomatology is associated with adverse obstetric and neonatal outcomes. *Psychosomatic Medicine, 63*(5), 830-834. Retrieved from https://journals.lww.com/psychosomaticmedicine/Fulltext/2001/09000/Antepartum_Depressive_Symptomatology_Is_Associated.17.aspx?casa_token=JMdkSQ-DHZoAAAAA:J9ksXvNvNkh5a-A4KGZF9Pw1yuT7GnCffTuRZJCbgchPpgfAzu38jfinhs4SWY2YOOaWqDY0YamjpyHF0XvVLcs
- Cicchetti, D., & Toth, S. L. (2009). The past achievements and future promises of developmental psychopathology: The coming of age of a discipline. *Journal of Child Psychology and Psychiatry, 50*(12), 16-25. <https://doi.org/10.1111/j.1469-7610.2008.01979.x>
- Cicchetti, D., Toth, S. L., & Rogosch, F. A. (1999). The efficacy of toddler-parent psychotherapy to increase attachment security in offspring of depressed

mothers. *Attachment & Human Development*, 1(1), 34-66.

<https://doi.org/10.1080/14616739900134021>

Cicchetti, D., Toth, S. L., & Rogosch, F. A. (2004). Toddler-parent psychotherapy for depressed mothers and their offspring: Implications for attachment theory. *Attachment issues in psychopathology and intervention*, 229. Retrieved from <http://www.al-edu.com/wp-content/uploads/2014/05/AtkinsonGoldbergs-Attachment-Issues-in-Psychopathology-and-Intervention.pdf#page=238>

Cierpka, M., & Cierpka, A. (1997). Violent behaviour in successive generations.

Identification of an abused child. *Psychotherapeutic*, 42(2), 98-105.

<https://elibrary.ru/item.asp?id=1033604>

Cigoli, V., Gilli, G., & Saita, E. (2006). Relational factors in psychopathological responses to childbirth. *Journal of Psychosomatic Obstetrics & Gynecology*, 27(2), 91-97. <https://doi.org/10.1080/01674820600714566>

Claussen, A. H., & Crittenden, P. M. (1991). Physical and psychological maltreatment: Relations among types of maltreatment. *Child abuse & neglect*, 15(1-2), 5-18. Doi: 10.1016/0145-2134(91)90085-R

Clément, M. È., Bérubé, A., & Chamberland, C. (2016). Prevalence and risk factors of child neglect in the general population. *Public health*, 138, 86-92.

<https://doi.org/10.1016/j.puhe.2016.03.018>

Clements, M. S., Mitchell, E. A., Wright, S. P., Esmail, A., Jones, D. R., & Ford, R.

P. K. (1997). Influences on breastfeeding in southeast England. *Acta*

paediatrica, 86(1), 51-56. doi: 10.1111/j.1651-2227.1997.tb08831.x

Cloitre, M., Stolbach, B. C., Herman, J. L., Kolk, B. V. D., Pynoos, R., Wang, J., &

Petkova, E. (2009). A developmental approach to complex PTSD: Childhood

and adult cumulative trauma as predictors of symptom complexity. *Journal of traumatic stress*, 22(5), 399-408. <https://doi.org/10.1002/jts.20444>

- Cluxton-Keller, F., & Bruce, M. L. (2018). Clinical effectiveness of family therapeutic interventions in the prevention and treatment of perinatal depression: A systematic review and meta-analysis. *PloS one*, 13(6), e0198730. <https://doi.org/10.1371/journal.pone.0198730>
- Cohen, N. J., Muir, E., Lojkasek, M., Muir, R., Parker, C. J., Barwick, M., & Brown, M. (1999). Watch, wait, and wonder: Testing the effectiveness of a new approach to mother–infant psychotherapy. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 20(4), 429-451. [https://doi.org/10.1002/\(SICI\)1097-0355\(199924\)20:4<429::AID-IMHJ5>3.0.CO;2-Q](https://doi.org/10.1002/(SICI)1097-0355(199924)20:4<429::AID-IMHJ5>3.0.CO;2-Q)
- Cohen, N. J., Lojkasek, M., Muir, E., Muir, R., & Parker, C. J. (2002). Six-month follow-up of two mother–infant psychotherapies: Convergence of therapeutic outcomes. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 23(4), 361-380. <https://doi-org.libproxy.murdoch.edu.au/10.1002/imhj.10023>
- Cohen, E., & Shulman, C. (2019). Mothers and toddlers exposed to political violence: Severity of exposure, emotional availability, parenting stress, and toddlers' behavior problems. *Journal of Child & Adolescent Trauma*, 12(1), 131-140. <https://link.springer.com/article/10.1007/s40653-017-0197-1>
- Cohn, J. F., Campbell, S. B., Matias, R., & Hopkins, J. (1990). Face-to-face interactions of postpartum depressed and non-depressed mother-infant pairs at 2 months. *Developmental psychology*, 26(1), 15. DOI:10.1037/0012-1649.26.1.15

- Cohn, J.F., Matias, R., Tronick, E.Z., Connell, D., & Lyons-Ruth, K. (1986). Face to face interactions of depressed mothers and their infants. *New Directions for Child and Adolescent Development*, 34, 31-45.
<https://doi.org/10.1002/cd.23219863405>
- Colonnesi, C., Draijer, E. M., Jan JM Stams, G., Van der Bruggen, C. O., Bögels, S. M., & Noom, M. J. (2011). The relation between insecure attachment and child anxiety: A meta-analytic review. *Journal of Clinical Child & Adolescent Psychology*, 40(4), 630-645. <https://doi.org/10.1080/15374416.2011.581623>
- Condon, J. T., & Corkindale, C. (1997). The correlates of antenatal attachment in pregnant women. *British Journal of Medical Psychology*, 70(4), 359-372.
<https://doi.org/10.1111/j.2044-8341.1997.tb01912.x>
- Cooke, J. E., Racine, N., Plamondon, A., Tough, S., & Madigan, S. (2019). Maternal adverse childhood experiences, attachment style, and mental health: Pathways of transmission to child behavior problems. *Child abuse & neglect*, 93, 27-37.
<https://doi.org/10.1016/j.chiabu.2019.04.011>
- Cooper, P. J., Murray, L., Wilson, A., & Romaniuk, H. (2003). Controlled trial of the short-and long-term effect of psychological treatment of post-partum depression: I. Impact on maternal mood. *The British Journal of Psychiatry*, 182(5), 412-419. <https://doi-org.libproxy.murdoch.edu.au/10.1192/bjp.182.5.412>
- Coppola, G., Vaughn, B. E., Cassibba, R., & Costantini, A. (2006). The attachment script representation procedure in an Italian sample: Associations with Adult Attachment Interview scales and with maternal sensitivity. *Attachment & Human Development*, 8(3), 209-219.
<https://doi.org/10.1080/14616730600856065>

- Corcoran, K., & Fisher, J. (2013). *Measures for clinical practice and research* (Vol.2). New York, NY: Oxford University Press.
- Cornish, A. M., McMahon, C., & Ungerer, J. A. (2008). Postnatal depression and the quality of mother–infant interactions during the second year of life. *Australian Journal of Psychology*, 60(3), 142-151. doi:10.1080/00049530701477738
- Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression: development of the 10-item Edinburgh Postnatal Depression Scale. *The British journal of psychiatry*, 150(6), 782-786.
- Cramer, B. (1993). Are postpartum depressions a mother-infant relationship disorder?. *Infant Mental Health Journal*, 14(4), 283-297. Retrieved from [https://onlinelibrary.wiley.com/doi/pdf/10.1002/1097-0355\(199324\)14:4%3C283::AID-IMHJ2280140404%3E3.0.CO;2-I?casa_token=1llwFv-8Y7wAAAAA:_BUMIBfPTT1hEmjjzHpMbg4gCFgQUauTFfWW_sBcqo03s0MuKsruMmfT0HEWohZOrNAoHNZkqU0kGw0](https://onlinelibrary.wiley.com/doi/pdf/10.1002/1097-0355(199324)14:4%3C283::AID-IMHJ2280140404%3E3.0.CO;2-I?casa_token=1llwFv-8Y7wAAAAA:_BUMIBfPTT1hEmjjzHpMbg4gCFgQUauTFfWW_sBcqo03s0MuKsruMmfT0HEWohZOrNAoHNZkqU0kGw0)
- Cramer, B., & Stern, D. N. (1988). Evaluation of changes in mother-infant brief psychotherapy: A single case study. *Infant Mental Health Journal*, 9(1), 20-45. Retrieved from https://onlinelibrary.wiley.com/doi/pdf/10.1002/1097-0355%28198821%299%3A1%3C20%3A%3AAID-IMHJ2280090105%3E3.0.CO%3B2-E?casa_token=8z05mhKbU7kAAAAA:2tc4Kaccb529IUBPI0EWfg-ZcdL1TBxFbzQaN1luqpIAggEOLX68HSbSHESvMXtxToUlhFV3WQbcHOM
- Crane, D. R., Wampler, K. S., Sprenkle, D. H., Sandberg, J. G., & Hovestadt, A. J. (2002). The scientist-practitioner model in marriage and family therapy

doctoral programs: Current status. *Journal of Marital and Family*

Therapy, 28(1), 75-83. Doi:

10.1111/j.1752-0606.2002.tb01175.x

Cranley, M. S. (1981). Development of a tool for the measurement of maternal attachment during pregnancy. *Nursing research*.

<https://psycnet.apa.org/record/1983-09386-001>

Cross, D., Fani, N., Powers, A., & Bradley, B. (2017). Neurobiological development in the context of childhood trauma. *Clinical psychology: science and practice*, 24(2), 111-124. <https://doi.org/10.1111/cpsp.12198>

Cummings, E. M. (1987). Coping with background anger in early childhood. *Child development*, 976-984. <https://www.jstor.org/stable/pdf/1130538.pdf>

Cummings, E. M., & Davies, P. T. (1994). Maternal depression and child development. *Journal of child psychology and psychiatry*, 35(1), 73-122. <https://doi.org/10.1111/j.1469-7610.1994.tb01133>.

Czarnocka, J., & Slade, P. (2000). Prevalence and predictors of post-traumatic stress symptoms following childbirth. *British Journal of Clinical Psychology*, 39(1), 35-51. doi:10.1348/014466500163095

Dadds, M. R., & Roth, J. H. (2001). Family processes in the development of anxiety problems. *The developmental psychopathology of anxiety*, 278-303. https://books.google.com.au/books?hl=en&lr=&id=2IASDAAAQBAJ&oi=fnd&pg=PA278&dq=Dadds+%26+Roth,+2001&ots=faypl3Ygyz&sig=tkh18iT xg_TfvhRE7qpKObmHpuE#v=onepage&q=Dadds%20%26%20Roth%2C%202001&f=false

Davies, J., Slade, P., Wright, I., & Stewart, P. (2008). Posttraumatic stress symptoms following childbirth and mothers' perceptions of their infants. *Infant Mental*

Health Journal: Official Publication of The World Association for Infant

Mental Health, 29(6), 537-554. <https://doi.org/10.1002/imhj.20197>

de Falco, S., Venuti, P., Esposito, G., & Bornstein, M. H. (2009). Mother–child and father–child emotional availability in families of children with Down syndrome. *Parenting: science and practice*, 9(3-4), 198-215.

<https://doi.org/10.1080/15295190902844381>

Dekel, S., Stuebe, C., & Dishy, G. (2017). Childbirth induced posttraumatic stress syndrome: a systematic review of prevalence and risk factors. *Frontiers in psychology*, 8, 560. doi:10.3389/fpsyg.2017.00560

Dekel, S., Thiel, F., Dishy, G., & Ashenfarb, A. L. (2019). Is childbirth-induced PTSD associated with low maternal attachment?. *Archives of women's mental health*, 22(1), 119-122. Retrieved from

<https://link.springer.com/article/10.1007/s00737-018-0853-y>

Dencker, A., Taft, C., Bergqvist, L., Lilja, H., & Berg, M. (2010). Childbirth experience questionnaire (CEQ): development and evaluation of a multidimensional instrument. *BMC pregnancy and childbirth*, 10(1), 81. doi: 10.1186/1471-2393-10-81

Derscheid, D. J., Fogg, L. F., Julion, W., Johnson, M. E., Tucker, S., & Delaney, K. R. (2019). Emotional Availability Scale Among Three US Race/Ethnic Groups. *Western journal of nursing research*, 41(3), 409-430.

<https://doi.org/10.1177%2F0193945918776617>

De Wolff, M. S., & Van IJzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child development*, 68(4), 571-591. doi.org/10.1111/j.1467-8624.1997.tb04218.x

- DiLillo, D., & Damashek, A. (2003). Parenting characteristics of women reporting a history of childhood sexual abuse. *Child Maltreatment*, 8(4), 319-333.
<https://doi.org/10.1177/1077559503257104>
- Din, L., Pillai-Riddell, R., & Gordner, S. (2008). Brief report: maternal emotional availability and infant pain-related distress. *Journal of pediatric psychology*, 34(7), 722-726. <https://doi.org/10.1093/jpepsy/jsn110>
- Dirks, E., & Rieffe, C. (2019). Are you there for me? Joint engagement and emotional availability in parent–child interactions for toddlers with moderate hearing loss. *Ear and hearing*, 40(1), 18-26. doi: 10.1097/AUD.0000000000000596
- Dittrich, K., Fuchs, A., Führer, D., Bermpohl, F., Kluczniok, D., Attar, C. H., ... & Herpertz, S. C. (2017). Observational context of mother-child interaction: Impact of a stress context on emotional availability. *Journal of Child and Family Studies*, 26(6), 1583-1591.
<https://link.springer.com/article/10.1007/s10826-017-0678-8>
- Dolev, S., Oppenheim, D., Koren-Karie, N., & Yirmiya, N. (2009). Emotional availability in mother-child interaction: The case of children with autism spectrum disorders. *Parenting: Science and Practice*, 9(3-4), 183-197.
<https://doi.org/10.1080/15295190902844332>
- Dombrowski, S. C., Timmer, S. G., Blacker, D. M., & Urquiza, A. J. (2005). A positive behavioural intervention for toddlers: parent–child attunement therapy. *Child Abuse Review: Journal of the British Association for the Study and Prevention of Child Abuse and Neglect*, 14(2), 132-151.
<https://doi.org/10.1002/car.888>
- Donovan, W. L., Leavitt, L. A., & Balling, J. D. (1978). Maternal physiological response to infant signals. *Psychophysiology*, 15(1), 68-74. Retrieved from

https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1469-8986.1978.tb01337.x?casa_token=VTY6M7xqunYAAAAA:JgD8m0Q9f9_J1yNOCBCxXW_pdNpB7tGWiU_kYBivk1hC8zqDORkYNWuONBnbqDOeNbMS7BkTkN_fSkg

- Driscoll, J. R., & Easterbrooks, M. A. (2007). Young mothers' play with their toddlers: Individual variability as a function of psychosocial factors. *Infant and Child Development: An International Journal of Research and Practice*, 16(6), 649-670. doi:10.1002/icd.515
- Drolet, B. C., & Lorenzi, N. M. (2011). Translational research: understanding the continuum from bench to bedside. *Translational Research*, 157(1), 1-5. <https://doi.org/10.1016/j.trsl.2010.10.002>
- Dulin, P. L., & Passmore, T. (2010). Avoidance of potentially traumatic stimuli mediates the relationship between accumulated lifetime trauma and late life depression and anxiety. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, 23(2), 296-299. <https://doi.org/10.1002/jts.20512>
- Easterbrooks, M., Biesecker, G., & Lyons-Ruth, K. (2000). Infancy predictors of emotional availability in middle childhood: The roles of attachment security and maternal depressive symptomatology. *Attachment & Human Development*, 2(2), 170-187. <https://doi.org/10.1080/14616730050085545>
- Easterbrooks, M., & Biringen, Z. (2000). Guest editors' introduction to the special issue: Mapping the terrain of emotional availability and attachment. *Attachment & Human Development*, 2(2), 123-129. <https://doi-org.libproxy.murdoch.edu.au/10.1080/14616730050085518>

- Easterbrooks, M. A., & Biringen, Z. (2005). The Emotional Availability Scales: Methodological refinements of the construct and clinical implications related to gender and at risk interactions. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 26(4), 291-294. Doi: 10.1002/imhj.20053
- Easterbrooks, M. A., Bureau, J. F., & Lyons-Ruth, K. (2012). Developmental correlates and predictors of emotional availability in mother–child interaction: A longitudinal study from infancy to middle childhood. *Development and psychopathology*, 24(1), 65-78. <https://doi.org/10.1017/S0954579411000666>
- Easterbrooks, M. A., Chaudhuri, J. H., & Gestsdottir, S. (2005). Patterns of emotional availability among young mothers and their infants: A dyadic, contextual analysis. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 26(4), 309-326. <https://doi.org/10.1002/imhj.20057>
- Edelstein, R. S., Alexander, K. W., Shaver, P. R., Schaaf, J. M., Quas, J. A., Lovas, G. S., & Goodman, G. S. (2004). Adult attachment style and parental responsiveness during a stressful event. *Attachment & Human Development*, 6(1), 31-52. <https://doi.org/10.1080/146167303100001659584>
- Ekmekci, H., Malda, M., Yagmur, S., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Mesman, J. (2016). The discrepancy between sensitivity beliefs and sensitive parenting behaviors of ethnic majority and ethnic minority mothers. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 48(1), 60. <https://psycnet.apa.org/buy/2016-01736-007>

- Elder, G. , & Clipp, E. (1988). Combat experiences, comradeship, and psychological health. In J. P. Wilson, Z. Harel, & B. Kahana (Eds.), *Human adaptation to extreme stress* (pp. 131-157). New York: Plenum.
- Elmhirst, S. I. (1980). Transitional objects in transition. *International Journal of Psycho-Analysis*, *61*, 367-373. Retrieved from <https://www.pep-web.org/document.php?id=IJP.061.0367A>
- Elserafy, F. A., Alsaedi, S. A., Louwrens, J., Sadiq, B. B., & Mersal, A. Y. (2009). Oral sucrose and a pacifier for pain relief during simple procedures in preterm infants: a randomized controlled trial. *Annals of Saudi medicine*, *29*(3), 184. doi: 10.5144/0256-4947.52821
- Emde, R. N. (1980). Emotional availability: A reciprocal reward system for infants and parents with implications for prevention of psychosocial disorders. In PM Taylor (Ed.), *Parent-infant relationships* (pp. 87 – 115), Orlando: FL: Grune & Stratton.
- Emde, R. N., & Easterbrooks, M. A. (1985). Assessing emotional availability in early development. In *Early identification of children at risk* (pp. 79-101). Springer, Boston, MA.
- Emmert-Buck, M. R. (2014). Translational research: From biological discovery to public benefit (or not). *Advances in Biology*, *2014*.
<http://dx.doi.org/10.1155/2014/278789>
- Endendijk, J. J., Groeneveld, M. G., Deković, M., & van den Boomen, C. (2019). Short-term test–retest reliability and continuity of emotional availability in parent–child dyads. *International Journal of Behavioral Development*, *43*(3), 271–277. <https://doi.org/10.1177%2F0165025419830256>

- Enns, L. N., Barrieau, L. E., Stack, D. M., Serbin, L. A., Ledingham, J. E., & Schwartzman, A. E. (2016). Verbal and nonverbal communication in at-risk mother-child dyads: Implications for relationship quality and developing positive social behaviours in middle-childhood. *European Journal of Developmental Psychology, 13*(1), 1-19.
<https://doi.org/10.1080/17405629.2015.1049153>
- Espinet, S. D., Jeong, J. J., Motz, M., Racine, N., Major, D., & Pepler, D. (2013). Multimodal assessment of the mother-child relationship in a substanceexposed sample: Divergent associations with the emotional Availability Scales. *Infant Mental Health Journal, 34*(6), 496-507.
<https://doi.org/10.1002/imhj.21409>
- Evans, T., Boyd, R. N., Colditz, P., Sanders, M., & Whittingham, K. (2017). Mother-very preterm infant relationship quality: RCT of Baby Triple P. *Journal of Child and Family Studies, 26*(1), 284-295.
<https://link.springer.com/article/10.1007/s10826-016-0555-x>
- Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological methods, 4*(3), 272. <https://doi.org/10.1037/1082-989X.4.3.272>
- Fagot, B. I. (1995). Development of a pleasure in parenting scale. *Early development and parenting, 4*(2), 75-82. <https://doi.org/10.1002/edp.2430040204>
- Farmer, A. Y., & Lee, S. K. (2011). The effects of parenting stress, perceived mastery, and maternal depression on parent-child interaction. *Journal of Social Service Research, 37*(5), 516-525. <https://doi-org.libproxy.murdoch.edu.au/10.1080/01488376.2011.607367>

- Fearon, R. P., & Roisman, G. I. (2017). Attachment theory: Progress and future directions. *Current Opinion in Psychology, 15*, 131–136.
<https://doi.org/10.1016/j.copsyc.2017.03.002>
- Fearon, R. P., Bakermans Kranenburg, M. J., Van IJzendoorn, M. H., Lapsley, A. M., & Roisman, G. I. (2010). The significance of insecure attachment and disorganization in the development of children's externalizing behavior: a meta-analytic study. *Child development, 81*(2), 435-456.
<https://doi.org/10.1111/j.1467-8624.2009.01405.x>
- Feinberg, M. E. (2003). The internal structure and ecological context of coparenting: A framework for research and intervention. *Parenting: Science and Practice, 3*(2), 95-131. https://doi.org/10.1207/S15327922PAR0302_01
- Feldens, C. A., Ardenghi, T. M., Cruz, L. N., Cunha-Scalco, G. P. D., & Vítolo, M. R. (2013). Advising mothers about breastfeeding and weaning reduced pacifier use in the first year of life: a randomized trial. *Community dentistry and oral epidemiology, 41*(4), 317-326. <https://doi.org/10.1111/cdoe.12030>
- Feniger-Schaal, R., & Joels, T. (2018). Attachment quality of children with Intellectual Disability and its link to maternal sensitivity and structuring. *Research in developmental disabilities, 76*, 56-64.
 doi:10.1016/j.ridd.2018.03.004
- Feniger-Schaal, R., Oppenheim, D., & Koren-Karie, N. (2019). Parenting children with intellectual disability: linking maternal insightfulness to sensitivity. *Journal of Intellectual Disability Research*. <https://doi.org/10.1111/jir.12614>
- Field, T. (1994). The effects of mother's physical and emotional unavailability on emotion regulation. *Monographs of the society for research in child development, 59*(2), 208-227. <https://www.jstor.org/stable/1166147>

- Field, T. (1998). Maternal depression effects on infants and early interventions. *Preventive medicine, 27*(2), 200-203. <https://doi.org/10.1006/pmed.1998.0293>
- Field, A. (2009) *Discovering Statistics Using SPSS*. 3rd Edition, Sage Publications Ltd., London.
- Field, T. (2011). Prenatal depression effects on early development: a review. *Infant behavior and development, 34*(1), 1-14. <https://doi.org/10.1016/j.infbeh.2010.09.008>
- Field, T., Diego, M., & Hernandez-Reif, M. (2010). Preterm infant massage therapy research: a review. *Infant behavior and development, 33*(2), 115-124. <https://doi.org/10.1016/j.infbeh.2009.12.004>
- Field, T., Healy, B., Goldstein, S., Perry, S., Bendell, D., Schanberg, S., Zimmerman, E.A., Kuhn, C. (1988). Infants of depressed mothers show "depressed" behavior even with non-depressed adults. *Child development, 59*, 1569-1579.
- Field, T., Sandberg, D., Garcia, R., Vega-Lahr, N., Goldstein, S., & Guy, L. (1985). Pregnancy problems, postpartum depression, and early mother–infant interactions. *Developmental psychology, 21*(6), 1152. Doi:10.1037/0012-1649.21.6.1152
- Felitti, V., Anda, R., Nordenberg, D., Williamson, D., Spitz, A., Edwards, V., & Marks, J. (1998). Childhood trauma tied to adult illness. *American Journal of Preventative Medicine, 14*(6), 245-258.
- Finch, J. F., & West, S. G. (1997). The investigation of personality structure: Statistical models. *Journal of Research in Personality, 31*(4), 439-485. <https://doi.org/10.1006/jrpe.1997.2194>

- Finkelhor, D. (2018). Screening for adverse childhood experiences (ACEs): Cautions and suggestions. *Child Abuse & Neglect*, 85, 174-179.
<https://doi.org/10.1016/j.chiabu.2017.07.016>
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. (1997). *User's guide for the Structured clinical interview for DSM-IV axis I disorders SCID-I: clinician version*. American Psychiatric Pub.
- Fisher, J. R., Feekery, C. J., & Rowe-Murray, H. J. (2002). Nature, severity and correlates of psychological distress in women admitted to a private mother-baby unit. *Journal of paediatrics and child health*, 38(2), 140-145.
<https://doi.org/10.1046/j.1440-1754.2002.00723.x>
- Fisher, J., Mello, M. C. D., Patel, V., Rahman, A., Tran, T., Holton, S., & Holmes, W. (2012). Prevalence and determinants of common perinatal mental disorders in women in low-and lower-middle-income countries: a systematic review. *Bulletin of the World Health Organization*, 90, 139-149. Retrieved from https://www.scielo.org/scielo.php?script=sci_arttext&pid=S0042-96862012000200014
- Flach, C., Leese, M., Heron, J., Evans, J., Feder, G., Sharp, D., & Howard, L. M. (2011). Antenatal domestic violence, maternal mental health and subsequent child behaviour: a cohort study. *BJOG: An International Journal of Obstetrics & Gynaecology*, 118(11), 1383-1391. <https://doi.org/10.1111/j.1471-0528.2011.03040.x>
- Flierman, M., Koldewijn, K., Meijssen, D., van Wassenaer-Leemhuis, A., Aarnoudse-Moens, C., van Schie, P., & Jeukens-Visser, M. (2016). Feasibility of a preventive parenting intervention for very preterm children at 18 months

corrected age: A randomized pilot trial. *The Journal of pediatrics*, 176, 79-85.

<https://doi.org/10.1016/j.jpeds.2016.05.071>

Flykt, M., Kanninen, K., Sinkkonen, J., & Punamäki, R. L. (2010). Maternal depression and dyadic interaction: the role of maternal attachment style. *Infant and Child Development*, 19(5), 530-550. <https://doi.org/10.1002/icd.679>

Flykt, M., Punamäki, R. L., Belt, R., Biringen, Z., Salo, S., Posa, T., & Pajulo, M. (2012). Maternal representations and emotional availability among drug-abusing and nonusing mothers and their infants. *Infant Mental Health Journal*, 33(2), 123-138. <https://doi.org/10.1002/imhj.21313>

Fonagy, P. (1998). Prevention, the appropriate target of infant psychotherapy. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 19(2), 124-150. Doi: 10.1002/(SICI)1097-0355(199822)19:2<124::AID-IMHJ4>3.0.CO;2-O

Fonagy, P., Cottrell, D., Phillips, J., Bevington, D., Glaser, D., & Allison, E. (2014). *What works for whom?: a critical review of treatments for children and adolescents*. New York, NY: Guilford Publications.

Fonagy, P., Sled, M., & Baradon, T. (2016). Randomized controlled trial of parent–infant psychotherapy for parents with mental health problems and young infants. *Infant mental health journal*, 37(2), 97-114. <https://doi.org/10.1002/imhj.21553>

Fonagy, P. S., & Steele, H. H., Moran, G., Steel, M., & Higgitt, A. (1991). The capacity for understanding mental states: The reflective self in parent and child and its significance for security of attachment. *Infant Mental Health J*, 13, 200-217

- Fonagy, P., Steele, H., & Steele, M. (1991). Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child development*, 62(5), 891-905.
<https://doi.org/10.1111/j.1467-8624.1991.tb01578.x>
- Fonseca, V.R.J., Silva, G.A.D., Otta, E. (2010). The relationship between postpartum depression and maternal emotional availability. *Cadernos de saude publica*. 26(4). 738-746. <http://dx.doi.org/10.1590/S0102-311X2010000400016>
- Forman, D. R., O'Hara, M. W., Stuart, S., Gorman, L. L., Larsen, K. E., & Coy, K. C. (2007). Effective treatment for postpartum depression is not sufficient to improve the developing mother-child relationship. *Development and psychopathology*, 19(2), 585-602. <https://doi-org.libproxy.murdoch.edu.au/10.1017/S0954579407070289>
- Foster, C. J. E., Garber, J., & Durlak, J. A. (2008). Current and past maternal depression, maternal interaction behaviors, and children's externalizing and internalizing symptoms. *Journal of abnormal child psychology*, 36(4), 527-537. Doi: 10.1007/s10802-007-9197-1
- Fraiberg, S., & Fraiberg, L. (1980). *Clinical studies in infant mental health: The first year of life*. New York: NY: Basic Books.
- Fraiberg, S., Adelson, E., & Shapiro, V. (1975). Ghosts in the nursery: A psychoanalytic approach to the problems of impaired infant-mother relationships. *Parent-infant psychodynamics: Wild things, mirrors and ghosts*, 87, 117. <http://www.dvrcv.org.au/sites/default/files/Fraiberg-Ghosts-in-Nursery.pdf>
- Frigerio, A., Porreca, A., Simonelli, A., & Nazzari, S. (2019). Emotional Availability in samples of mothers at high risk for depression and with substance use

disorder. *Frontiers in psychology*, *10*, 577.

<https://doi.org/10.3389/fpsyg.2019.00577>

Fuchs, A., Möhler, E., Resch, F., & Kaess, M. (2015). Impact of a maternal history of childhood abuse on the development of mother–infant interaction during the first year of life. *Child abuse & neglect*, *48*, 179-189.

<https://doi.org/10.1016/j.chiabu.2015.05.023>

Fuchs, A., Moehler, E., Resch, F., & Kaess, M. (2017). The effect of a maternal history of childhood abuse on adrenocortical attunement in mothers and their toddlers. *Developmental psychobiology*, *59*(5), 639-652.

<https://doi.org/10.1002/dev.21531>

Fudge, N., Sadler, E., Fisher, H. R., Maher, J., Wolfe, C. D., & McKeivitt, C. (2016). Optimising translational research opportunities: a systematic review and narrative synthesis of basic and clinician Scientists' perspectives of factors which enable or hinder translational research. *PLoS One*, *11*(8), e0160475.

<https://doi.org/10.1371/journal.pone.0160475>

Gaddini, R. (1970). Transitional objects and the process of individuation: A study in three different social groups. *Journal of the American Academy of Child Psychiatry*, *9*(2), 347-365. [http://dx.doi.org/10.1016/S0002-7138\(09\)61842-2](http://dx.doi.org/10.1016/S0002-7138(09)61842-2)

Galbally, M., & Lewis, A. J. (2017). Depression and parenting: the need for improved intervention models. *Current opinion in psychology*, *15*, 61-65.

<https://doi.org/10.1016/j.copsyc.2017.02.008>

Galbally, M., Ryan, J., van IJzendoorn, M., Watson, S.J., Spigset, O., Lappas, M., Saffery, R., de Kloet, R. and Lewis, A.J. (2018). Maternal depression, antidepressant use and placental oxytocin receptor DNA methylation: Findings

from the MPEWS study. *Psychoneuroendocrinology*, *90*, 1-8.

<https://doi.org/10.1016/j.psyneuen.2018.01.004>

Galbally, M., Snellen, M., & Power, J. (2014). Antipsychotic drugs in pregnancy: a review of their maternal and fetal effects. *Therapeutic advances in drug safety*, *5*(2), 100-109. <https://doi.org/10.1177/2042098614522682>

Galbally, M., Snellen, M., Walker, S., & Permezel, M. (2010). Management of antipsychotic and mood stabilizer medication in pregnancy: recommendations for antenatal care. *Australian and New Zealand Journal of Psychiatry*, *44*(2), 99-108. <https://www.tandfonline.com/doi/abs/10.3109/00048670903487217>

Galbally, M., Sved-Williams, A., Kristianopulos, D., Mercuri, K., Brown, P., & Buist, A. (2019). Comparison of public mother–baby psychiatric units in Australia: similarities, strengths and recommendations. *Australasian Psychiatry*, *27*(2), 112-116. <https://doi.org/10.1177/1039856218810165>

Galbally, M., van IJzendoorn, M., Permezel, M., Saffery, R., Lappas, M., Ryan, J., ... & Lewis, A. J. (2017). Mercy Pregnancy and Emotional Wellbeing Study (MPEWS): Understanding maternal mental health, fetal programming and child development. Study design and cohort profile. *International journal of methods in psychiatric research*, *26*(4), e1558. doi:10.1002/mpr.1558

Gardner, F. (2000). Methodological issues in the direct observation of parent–child interaction: Do observational findings reflect the natural behaviour of participants?. *Clinical child and family psychology review*, *3*(3), 185-198.

Doi:10.1023/A:1009503409699

Garnezy, N., & Streitman, S. (1974). Children at risk: The search for the antecedents of schizophrenia: I. Conceptual models and research methods. *Schizophrenia Bulletin*, *1*(8), 14. Doi: 10.1093/schbul/1.8.14

- Gartstein, M. A., & Sheeber, L. (2004). Child behavior problems and maternal symptoms of depression: A mediational model. *Journal of Child and Adolescent Psychiatric Nursing, 17*(4), 141-150.
<https://doi.org/10.1111/j.1744-6171.2004.tb00011.x>
- Garthus-Niegel, S., von Soest, T., Vollrath, M. E., & Eberhard-Gran, M. (2013). The impact of subjective birth experiences on post-traumatic stress symptoms: a longitudinal study. *Archives of women's mental health, 16*(1), 1-10. Retrieved from: <https://link.springer.com/article/10.1007/s00737-012-0301-3>
- Garvin, M. C., Tarullo, A. R., Van Ryzin, M., & Gunnar, M. R. (2012). Post-adoption parenting and socio-emotional development in post-institutionalized children. *Development and psychopathology, 24*(01), 35-48.
 doi:10.1017/S0954579411000642
- Gavin, N. I., Gaynes, B. N., Lohr, K. N., Meltzer-Brody, S., Gartlehner, G., & Swinson, T. (2005). Perinatal depression: a systematic review of prevalence and incidence. *Obstetrics & Gynecology, 106*(5), 1071-1083. Doi: 10.1097/01.AOG.0000183597.31630.db
- Gaynes, B. N., Gavin, N., Meltzer-Brody, S., Lohr, K. N., Swinson, T., Gartlehner, G., ... & Miller, W. C. (2005). Perinatal depression: Prevalence, screening accuracy, and screening outcomes: Summary. In *AHRQ evidence report summaries*. Agency for Healthcare Research and Quality (US).
<https://www.ncbi.nlm.nih.gov/books/NBK11838/>
- Gelfand, D. M., Teti, D. M., & Radin Fox, C. E. (1992). Sources of parenting stress for depressed and nondepressed mothers of infants. *Journal of Clinical Child and Adolescent Psychology, 21*(3), 262-272.
https://doi.org/10.1207/s15374424jccp2103_8

- George, C., Kaplan, N., & Main, M. (1996). Adult attachment interview. Retrieved from <http://library.allanschore.com/docs/AAIProtocol.pdf>
- Gibaud-Wallston, J., & Wandersman, L.P. (1978). Development and utility of the Parenting Sense of Competence Scale. Paper presented at the meeting of the American Psychological Association: Toronto.
- Gibb, B. E., Schofield, C. A., & Coles, M. E. (2009). Reported history of childhood abuse and young adults' information-processing biases for facial displays of emotion. *Child maltreatment, 14*(2), 148-156.
<https://doi.org/10.1177/1077559508326358>
- Gibson, J., McKenzie, McHarg, K., Shakespeare, J., Price, J., Gray, R., 2009. A systematic review of studies validating the Edinburgh Postnatal Depression Scale in antepartum and postpartum women. *Acta Psychiatrica Scandinavica. 119*(5). 350-364. <https://doi.org/10.1111/j.1600-0447.2009.01363.x>
- Gilbody, S., Sheldon. T., House. A. (2008). Screening and case-finding instruments for depression: a meta-analysis. *CMAJ, 178* (8):997-1003. doi: 10.1503/cmaj.070281.
- Ginzburg, K., Ein-Dor, T., & Solomon, Z. (2010). Comorbidity of posttraumatic stress disorder, anxiety and depression: a 20-year longitudinal study of war veterans. *Journal of affective disorders, 123*(1-3), 249-257.
<https://doi.org/10.1016/j.jad.2009.08.006>
- Gobin, R. L., & Freyd, J. J. (2014). The impact of betrayal trauma on the tendency to trust. *Psychological Trauma: Theory, Research, Practice, and Policy, 6*(5), 505. Doi: 10.1037/a0032452

- Goldfried, M. R., Newman, M. G., Castonguay, L. G., Fuertes, J. N., Magnavita, J. J., Sobell, L., & Wolf, A. W. (2014). On the dissemination of clinical experiences in using empirically supported treatments.
<https://doi.org/10.1016/j.beth.2013.09.007>
- Goldman-Fraser, J., Harris-Britt, A., Leone Thakkallapalli, E., Kurtz Costes, B., & Martin, S. (2010). Emotional availability and psychosocial correlates among mothers in substance abuse treatment and their young infants. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 31(1), 1-15. <https://doi.org/10.1002/imhj.20239>
- Goldman, L. S., Nielsen, N. H., Champion, H. C., & Council on Scientific Affairs, American Medical Association. (1999). Awareness, diagnosis, and treatment of depression. *Journal of general internal medicine*, 14(9), 569-580. Doi: 10.1046/j.1525-1497.1999.03478.x
- Goldsmith, H. H., & Alansky, J. A. (1987). Maternal and infant temperamental predictors of attachment: A meta-analytic review. *Journal of consulting and Clinical Psychology*, 55(6), 805. <http://dx.doi.org/10.1037/0022-006X.55.6.805>
- Goodman, J. H. (2009). Women's attitudes, preferences, and perceived barriers to treatment for perinatal depression. *Birth*, 36(1), 60-69.
<https://doi.org/10.1111/j.1523-536X.2008.00296.x>
- Goodman, S.H., Gotlib, I.H. (1999). Risk for psychopathology in the children of depressed mothers: a developmental model for understanding mechanisms of transmission. *Psychological review*. 106(3). 458. doi: 10.1037/0033-295X.106.3.458

- Goodman, S.H., Rouse, M.H., Connell, A.M., Broth, M.R., Hall, C.M. and Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. *Clinical child and family psychology review*. 14(1). 1-27.
Doi:10.1007/s10567-010-0080-1
- Goodman, G. S., Quas, J. A., & Ogle, C. M. (2010). Child maltreatment and memory. *Annual review of psychology*, 61, 325-351. Doi: 10.1146/annurev.psych.093008.100403
- Goodman, J. H., Prager, J., Goldstein, R., & Freeman, M. (2015). Perinatal dyadic psychotherapy for postpartum depression: a randomized controlled pilot trial. *Archives of women's mental health*, 18(3), 493-506. Doi; 10.1007/s00737-014-0483-y
- Gotlib, I. H., Lewinsohn, P. M., & Seeley, J. R. (1995). Symptoms versus a diagnosis of depression: differences in psychosocial functioning. *Journal of consulting and clinical psychology*, 63(1), 90.
- Gotlib, I. H., Whiffen, V. E., Mount, J. H., Milne, K., & Cordy, N. I. (1989). Prevalence rates and demographic characteristics associated with depression in pregnancy and the postpartum. *Journal of consulting and clinical psychology*, 57(2), 269. <http://dx.doi.org/10.1037/0022-006X.57.2.269>
- Granqvist, P., Sroufe, L. A., Dozier, M., Hesse, E., Steele, M., van Ijzendoorn, M., ... Steele, H. (2017). Disorganised attachment in infancy: A review of the phenomenon and its implications for clinicians and policy- makers. *Attachment & Human Development*, 19(6), 534–558.
<https://doi.org/10.1080/14616734.2017.1354040>
- Gresham, E., Forder, P., Chojenta, C. L., Byles, J. E., Loxton, D. J., & Hure, A. J. (2015). Agreement between self-reported perinatal outcomes and

administrative data in New South Wales, Australia. *BMC pregnancy and childbirth*, *15*(1), 161. doi: 10.1186/s12884-015-0597-x

Gregory, A. M., & Sadeh, A. (2012). Sleep, emotional and behavioral difficulties in children and adolescents. *Sleep medicine reviews*, *16*(2), 129-136.
<https://doi.org/10.1016/j.smrv.2011.03.007>

Grekin, R., & O'Hara, M. W. (2014). Prevalence and risk factors of postpartum posttraumatic stress disorder: a meta-analysis. *Clinical psychology review*, *34*(5), 389-401. <https://doi-org.libproxy.murdoch.edu.au/10.1016/j.cpr.2014.05.003>

Greve, R. A., Braarud, H. C., Skotheim, S., & Slinning, K. (2018). Feasibility and acceptability of an early home visit intervention aimed at supporting a positive mother–infant relationship for mothers at risk of postpartum depression. *Scandinavian journal of caring sciences*, *32*(4), 1437-1446.
<https://doi.org/10.1111/scs.12589>

Groh, A. M., Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Steele, R. D., & Roisman, G. I. (2014). The significance of attachment security for children's social competence with peers: A meta-analytic study. *Attachment & human development*, *16*(2), 103-136.
<https://doi.org/10.1080/14616734.2014.883636>

Groh, A. M., Fearon, R. P., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Roisman, G. I. (2017). Attachment in the early life course: Meta-analytic evidence for its role in socioemotional development. *Child Development Perspectives*, *11*(1), 70-76. <https://doi.org/10.1111/cdep.12213>

Groh, A. M., Roisman, G. I., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Fearon, R. P. (2012). The significance of insecure and disorganized

attachment for children's internalizing symptoms: A meta-analytic study.

Child development, 83(2), 591-610. <https://doi.org/10.1111/j.1467->

8624.2011.01711.x

Grote, N. K., Bridge, J. A., Gavin, A. R., Melville, J. L., Iyengar, S., & Katon, W. J.

(2010). A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Archives of general psychiatry*, 67(10), 1012-1024.

doi:10.1001/archgenpsychiatry.2010.111

Gueron-Sela, N., Atzaba-Poria, N., Meiri, G., & Yerushalmi, B. (2011). Maternal

worries about child underweight mediate and moderate the relationship between child feeding disorders and mother-child feeding interactions.

Journal of Pediatric Psychology, 36(7), 827-836.

<https://doi.org/10.1093/jpepsy/jsr001>

Guedeney, A., Guedeney, N., Wendland, J., & Burtchen, N. (2014). Treatment-

Mother-infant relationship psychotherapy. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 28(1), 135-145.

<https://doi.org/10.1016/j.bpobgyn.2013.08.011>

Gul, H., Erol, N., Pamir Akin, D., Ustun Gullu, B., Akcakin, M., Alpas, B., & Öner,

Ö. (2016). Emotional availability in early mother-child interactions for children with autism spectrum disorders, other psychiatric disorders, and developmental delay. *Infant mental health journal*, 37(2), 151-159.

<https://doi.org/10.1002/imhj.21558>

Halonen, J. S., & Passman, R. H. (1978). Pacifiers' effects upon play and separations

from the mother for the one-year-old in a novel environment. *Infant Behavior and Development*, 1, 70-78. [https://doi.org/10.1016/S0163-6383\(78\)80010-1](https://doi.org/10.1016/S0163-6383(78)80010-1)

- Hallers-Haalboom, E. T., Groeneveld, M. G., van Berkel, S. R., Endendijk, J. J., van der Pol, L. D., Linting, M., ... & Mesman, J. (2017). Mothers' and fathers' sensitivity with their two children: A longitudinal study from infancy to early childhood. *Developmental Psychology*, *53*(5), 860.
<https://psycnet.apa.org/doi/10.1037/dev0000293>
- Hallers-Haalboom, E. T., Mesman, J., Groeneveld, M. G., Endendijk, J. J., van Berkel, S. R., van der Pol, L. D., & Bakermans-Kranenburg, M. J. (2014). Mothers, fathers, sons and daughters: Parental sensitivity in families with two children. *Journal of Family Psychology*, *28*(2), 138.
<http://libproxy.murdoch.edu.au/login?url=https://search-proquest-com.libproxy.murdoch.edu.au/docview/1542000337?accountid=12629>
- Hamilton, M. (1967). Development of a psychiatric rating scale for primary depression. *Brit Soc Cli Psychol*, *6*, 278-296.
- Harden, B. J., Panlilio, C., Morrison, C., Duncan, A. D., Duchene, M., & Clyman, R. B. (2017). Emotion regulation of preschool children in foster care: the influence of maternal depression and parenting. *Journal of child and family studies*, *26*(4), 1124-1134. <https://link.springer.com/article/10.1007/s10826-016-0636-x>
- Harel, J., Eshel, Y., Ganor, O., & Scher, A. (2002). Antecedents of mirror self recognition of toddlers: Emotional availability, birth order, and gender. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, *23*(3), 293-309. <https://doi.org/10.1002/imhj.10016>
- Hart, R., & McMahon, C. A. (2006). Mood state and psychological adjustment to pregnancy. *Archives of women's mental health*, *9*(6), 329-337.
<https://link.springer.com/article/10.1007/s00737-006-0141-0>

Hauck, F. R., Omojokun, O. O., & Siadaty, M. S. (2005). Do pacifiers reduce the risk of sudden infant death syndrome? A meta-analysis. *Pediatrics*, 116(5), e716-e723. doi: 10.1542/peds.2004-2631

Hawk, B. N., & Timmer, S. G. (2018). Parent–Child Care as a Brief Dyadic Intervention for Children With Mild to Moderate Externalizing Problems: A Case Study. *Clinical Case Studies*, 17(5), 263-279.
<https://doi.org/10.1177%2F1534650118774417>

Hay, D. F., Pawlby, S., Waters, C. S., & Sharp, D. (2008). Antepartum and postpartum exposure to maternal depression: different effects on different adolescent outcomes. *Journal of Child Psychology and Psychiatry*, 49(10), 1079-1088. Doi:
 10.1111/j.1469-7610.2008.01959.x

Hayes, L. J., Goodman, S. H., & Carlson, E. (2013). Maternal antenatal depression and infant disorganized attachment at 12 months. *Attachment & human development*, 15(2), 133-153. Doi:
 10.1080/14616734.2013.743256

Heinicke, C. M., Fineman, N. R., Ruth, G., Recchia, S. L., Guthrie, D., & Rodning, C. (1999). Relationship-based intervention with at risk mothers: Outcome in the first year of life. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 20(4), 349-374. Doi:
 10.1002/(SICI)1097-0355(199924)20:4<349::AID-IMHJ1>3.0.CO;2-X

Helzer, J. E., Kraemer, H. C., Krueger, R. F., Wittchen, H. U., Sirovatka, P. J., & Regier, D. A. (Eds.). (2009). *Dimensional approaches in diagnostic classification: Refining the research agenda for DSM-V*. American Psychiatric Pub.

- Herrera, E., Reissland, N., & Shepherd, J. (2004). Maternal touch and maternal child-directed speech: effects of depressed mood in the postnatal period. *Journal of Affective Disorders, 81*(1), 29-39. <https://doi.org/10.1016/j.jad.2003.07.001>
- Hinde, R. A. (1981). Animal signals: Ethological and games-theory approaches are not incompatible. *Animal Behaviour, 29*(2), 535-542.
- Hinde, R. A., & McGinnis, L. (1977). Some factors influencing the effects of temporary mother-infant separation: Some experiments with rhesus monkeys. *Psychological Medicine, 7*(2), 197-212.
- Hipwell, A. E., Goossens, F. A., Melhuish, E. C., & Kumar, R. (2000). Severe maternal psychopathology and infant–mother attachment. *Development and psychopathology, 12*(2), 157-175.
<https://doi.org/10.1017/S0954579400002030>
- Høivik, M. S., Lydersen, S., Ranøyen, I., & Berg-Nielsen, T. S. (2018). Maternal personality disorder symptoms in primary health care: associations with mother–toddler interactions at one-year follow-up. *BMC psychiatry, 18*(1), 198. <https://bmcp psychiatry.biomedcentral.com/articles/10.1186/s12888-018-1789-5>
- Holditch-Davis, D., White-Traut, R. C., Levy, J. A., O'Shea, T. M., Geraldo, V., & David, R. J. (2014). Maternally administered interventions for preterm infants in the NICU: Effects on maternal psychological distress and mother–infant relationship. *Infant Behavior and Development, 37*(4), 695-710.
<https://doi.org/10.1016/j.infbeh.2014.08.005>
- Horne, R. S., Hauck, F. R., Moon, R. Y., L'hoir, M. P., Blair, P. S., & Physiology and Epidemiology Working Groups of the International Society for the Study and Prevention of Perinatal and Infant Death. (2014). Dummy (pacifier) use and

sudden infant death syndrome: potential advantages and disadvantages. *Journal of paediatrics and child health*, 50(3), 170-174. doi: 10.1111/jpc.12402

Howard, C. R., Howard, F. M., Lanphear, B., Eberly, S., Oakes, D., & Lawrence, R. A. (2003). Randomized clinical trial of pacifier use and bottle-feeding or cup feeding and their effect on breastfeeding. *Pediatrics*, 111(3), 511-518. doi: 10.1542/peds.111.3.511

Howard, L. M., Molyneaux, E., Dennis, C. L., Rochat, T., Stein, A., & Milgrom, J. (2014). Non-psychotic mental disorders in the perinatal period. *The Lancet*, 384(9956), 1775-1788. Doi: 10.1016/S0140-6736(14)61276-9

Howard, L. M., Piot, P., & Stein, A. (2014). No health without perinatal mental health. *The Lancet*, 384(9956), 1723-1724. Doi: 10.1016/S0140-6736(14)62040-7

Howard, L. M., Thornicroft, G., Salmon, M., & Appleby, L. (2003). Predictors of parenting outcome in women with psychotic disorders discharged from mother and baby units. *Acta Psychiatrica Scandinavica*, 110(5), 347-355. <https://doi.org/10.1111/j.1600-0447.2004.00375.x>

Howes, C., & Hong, S. S. (2008). Early emotional availability: predictive of pre-kindergarten relationships among Mexican-heritage children?. *Journal of Early Childhood and Infant Psychology*, 4, 4-26. Retrieved from <https://go.galegroup.com/ps/anonymous?id=GALE%7CA220640568&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=15546144&p=AONE&sw=w>

Howes, C., & Obregon, N. B. (2009). Emotional availability in Mexican-heritage low-income mothers and children: Infancy through preschool. *Parenting: Science and Practice*, 9(3-4), 260-276. <https://doi.org/10.1080/15295190902844589>

- Hu, L. T., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modelling: a multidisciplinary journal*, 6(1), 1-55.
doi:10.1080/10705519909540118
- Huang, R., Yang, D., Lei, B., Yan, C., Tian, Y., Huang, X., & Lei, J. (2020). The short term and long term effectiveness of mother-infant psychotherapy on postpartum depression: A systematic review and meta-analysis. *Journal of Affective Disorders*, 260, 670 – 679. Retrieved from
<https://reader.elsevier.com/reader/sd/pii/S0165032719305750?token=FD1DC A572B9EB7E748E145064078437F1C59840C8F1DCB939FE2427587EF8751C57BB09D27A0368B9D4D02B2AABA9FEC>
- Huizink, A. C., Robles de Medina, P. G., Mulder, E. J., Visser, G. H., & Buitelaar, J. K. (2003). Stress during pregnancy is associated with developmental outcome in infancy. *Journal of Child Psychology and Psychiatry*, 44(6), 810-818.
<https://doi.org/10.1111/1469-7610.00166>
- Hunsley, J., & Meyer, G. J. (2003). The incremental validity of psychological testing and assessment: conceptual, methodological, and statistical issues. *Psychological assessment*, 15(4), 446. <https://doi.org/10.1037/1040-3590.15.4.446>
- Hurley, K. D., Huscroft-D'Angelo, J., Trout, A., Griffith, A., & Epstein, M. (2014). Assessing parenting skills and attitudes: A review of the psychometrics of parenting measures. *Journal of Child and Family Studies*, 23(5), 812-823. Doi; 10.1007/s10826-013-9733-2
- IBM Corp., 2016. IBM SPSS Statistics: Version 23. 0.

- Isabella, R. A., Belsky, J., & von Eye, A. (1989). Origins of infant-mother attachment: An examination of interactional synchrony during the infant's first year. *Developmental Psychology, 25*(1), 12. Doi: 10.1037/0012-1649.25.1.12
- Jacka, F. N., Ystrom, E., Brantsaeter, A. L., Karevold, E., Roth, C., Haugen, M., ... & Berk, M. (2013). Maternal and early postnatal nutrition and mental health of offspring by age 5 years: a prospective cohort study. *Journal of the American Academy of Child & Adolescent Psychiatry, 52*(10), 1038-1047.
<https://doi.org/10.1016/j.jaac.2013.07.002>
- Jevitt, C., Zapata, L., Harrington, M., & Berry, E. (2005). Screening for perinatal depression with limited psychiatric resources. *Journal of the American Psychiatric Nurses Association, 11*(6), 359-363.
<https://doi.org/10.1177/1078390305284530>
- Jian, N., & Teti, D. M. (2016). Emotional availability at bedtime, infant temperament, and infant sleep development from one to six months. *Sleep medicine, 23*, 49-58. <https://doi.org/10.1016/j.sleep.2016.07.001>
- Jones, I., & Craddock, N. (2002). Do puerperal psychotic episodes identify a more familial subtype of bipolar disorder? Results of a family history study. *Psychiatric genetics, 12*(3), 177-180. Retrieved from https://journals.lww.com/psychgenetics/Fulltext/2002/09000/Do_puerperal_psychotic_episodes_identify_a_more.11.aspx?casa_token=cIQxUk_DdcYAAA AA:DhmDPzpE0cpdj-nCLd_H63B0ZGCilpS1topua_op8JR6TBa9KIeHzOk_7g9bANGeyMRcY7Ls0NhAU10mhYLDt6s

- Jones, J. L., & Mehr, S. L. (2007). Foundations and assumptions of the scientist-practitioner model. *American Behavioral Scientist*, 50(6), 766-771. Doi; 10.1177/0002764206296454
- Jose, P. E. (2013). *Doing statistical mediation and moderation*. New York, NY: Guilford Press.
- John, A., Morris, A. S., & Halliburton, A. L. (2012). Looking beyond maternal sensitivity: Mother-child correlates of attachment security among children with intellectual disabilities in urban India. *Journal of autism and developmental disorders*, 42(11), 2335-2345.
<https://link.springer.com/article/10.1007/s10803-012-1479-y>
- Jöreskog, K.G. and Sörbom, D. (1993). LISREL 8: Structural equation modeling with the SIMPLIS command language. Scientific Software International.
- Kadir, A. A., Nordin, R., Ismail, S. B., Yaacob, M. J., Mustapha, W., & Rushidi, W. M. (2004). Validation of the Malay Version of Edinburgh Postnatal Depression Scale for Postnatal Women in Kelantan, Malaysia. *Asia Pacific Family Medicine*, 3. Retrieved from https://www.researchgate.net/profile/Azidah_Abdul_Kadir/publication/285744171_Validation_of_the_Malay_version_of_Edinburgh_Postnatal_Depression_Scale/links/567608e308aebcdda0e47126/Validation-of-the-Malay-version-of-Edinburgh-Postnatal-Depression-Scale.pdf
- Kagee, A., Tsai, A. C., Lund, C., & Tomlinson, M. (2013). Screening for common mental disorders in low resource settings: reasons for caution and a way forward. *International health*, 5(1), 11-14. <https://doi.org/10.1093/inthealth/ihs004>

- Kahn, R. S., Brandt, D., & Whitaker, R. C. (2004). Combined effect of mothers' and fathers' mental health symptoms on children's behavioural and emotional well-being. *Archives of Pediatrics & Adolescent Medicine, 158*(8), 721-729.
doi:10.1001/archpedi.158.8.721
- Kalra, H., Reilly, N., & Austin, M. P. (2018). An evaluation of routine antenatal depression screening and psychosocial assessment in a regional private maternity setting in Australia. *Australian and New Zealand Journal of Obstetrics and Gynaecology, 58*(6), 629-635.
<https://doi.org/10.1111/ajo.12777>
- Kaplan, L. A., Evans, L., & Monk, C. (2008). Effects of mothers' prenatal psychiatric status and postnatal caregiving on infant bio-behavioural regulation: can prenatal programming be modified?. *Early human development, 84*(4), 249-256. <https://doi.org/10.1016/j.earlhumdev.2007.06.004>
- Kazdin, A. E. (2008). Evidence-based treatment and practice: new opportunities to bridge clinical research and practice, enhance the knowledge base, and improve patient care. *American psychologist, 63*(3), 146.
<https://doi.org/10.1037/0003-066X.63.3.146>
- Kazdin, A. E., & Nock, M. K. (2003). Delineating mechanisms of change in child and adolescent therapy: Methodological issues and research recommendations. *Journal of Child Psychology and Psychiatry, 44*(8), 1116-1129.
<https://doi.org/10.1111/1469-7610.00195>
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of general psychiatry, 52*(12), 1048-1060.
doi:10.1001/archpsyc.1995.03950240066012

- Kessler, R. C. (2000). Posttraumatic stress disorder: the burden to the individual and to society. *The Journal of clinical psychiatry*, 61 (5), 4 – 12. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/10761674>
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Benjet, C., Bromet, E. J., Cardoso, G., ... & Florescu, S. (2017). Trauma and PTSD in the WHO world mental health surveys. *European Journal of Psychotraumatology*, 8(sup5), 1353383. <https://doi.org/10.1080/20008198.2017.1353383>
- Kieling, C., Baker-Henningham, H., Belfer, M., Conti, G., Ertem, I., Omigbodun, O., ... & Rahman, A. (2011). Child and adolescent mental health worldwide: evidence for action. *The Lancet*, 378(9801), 1515-1525. [https://doi.org/10.1016/S0140-6736\(11\)60827-1](https://doi.org/10.1016/S0140-6736(11)60827-1)
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of general psychiatry*, 52(12), 1048-1060. [doi:10.1001/archpsyc.1995.03950240066012](https://doi.org/10.1001/archpsyc.1995.03950240066012)
- Killeen, L. A., & Teti, D. M. (2012). Mothers' frontal EEG asymmetry in response to infant emotion states and mother–infant emotional availability, emotional experience, and internalizing symptoms. *Development and psychopathology*, 24(1), 9-21. <https://doi.org/10.1017/S0954579411000629>
- Kim, P., Capistrano, C. G., Erhart, A., Gray-Schiff, R., & Xu, N. (2017). Socioeconomic disadvantage, neural responses to infant emotions, and emotional availability among first-time new mothers. *Behavioural brain research*, 325, 188-196. <https://doi.org/10.1016/j.bbr.2017.02.001>
- Kim, B. R., Chow, S. M., Bray, B., & Teti, D. M. (2017). Trajectories of mothers' emotional availability: Relations with infant temperament in predicting

attachment security. *Attachment & human development*, 19(1), 38-57.

<https://doi.org/10.1080/14616734.2016.1252780>

Kingston, D., Austin, M. P., van Zanten, S. V., Harvalik, P., Giallo, R., McDonald, S.

D., ... & Biringer, A. (2017). Pregnant women's views on the feasibility and acceptability of web-based mental health e-screening versus paper-based

screening: a randomized controlled trial. *Journal of medical Internet*

research, 19(4), e88. Retrieved from <https://www.jmir.org/2017/4/e88/>

Kingston, D., Tough, S., & Whitfield, H. (2012). Prenatal and postpartum maternal

psychological distress and infant development: a systematic review. *Child*

Psychiatry & Human Development, 43(5), 683-714. Doi: 10.1007/s10578-

012-0291-4

Kirsh, S. J., & Cassidy, J. (1997). Preschoolers' attention to and memory for

attachment relevant information. *Child Development*, 68(6), 1143-1153.

<https://doi.org/10.1111/j.1467-8624.1997.tb01990.x>

Klein, D. N. (2008). Classification of depressive disorders in the DSM-V: Proposal

for a two-dimension system. *Journal of abnormal psychology*, 117(3), 552.

<https://psycnet.apa.org/doi/10.1037/0021-843X.117.3.552>

Kluczniok, D., Boedeker, K., Attar, C. H., Jaite, C., Bierbaum, A. L., Fuehrer, D., ...

& Winter, S. (2018). Emotional availability in mothers with borderline

personality disorder and mothers with remitted major depression is differently

associated with psychopathology among school-aged children. *Journal of*

affective disorders, 231, 63-73. <https://doi.org/10.1016/j.jad.2018.02.001>

Kluczniok, D., Boedeker, K., Fuchs, A., Hindi Attar, C., Fydrich, T., Fuehrer, D., ...

& Herpertz, S. C. (2016). Emotional availability in mother-child interaction:

The effects of maternal depression in remission and additional history of

childhood abuse. *Depression and anxiety*, 33(7), 648-657.

<https://doi.org/10.1002/da.22462>

Knudson-Martin, C., & Silverstein, R. (2009). Suffering in Silence: A qualitative meta-data analysis of postpartum depression. *Journal of Marital and Family Therapy*, 35(2), 145-158. <https://doi.org/10.1111/j.1752-0606.2009.00112.x>

Kogan, N., & Carter, A. S. (1996). Mother-infant reengagement following the still-face: The role of maternal emotional availability an infant affect regulation. *Infant Behavior and Development*, 19(3), 359-370.

[https://doi.org/10.1016/S0163-6383\(96\)90034-X](https://doi.org/10.1016/S0163-6383(96)90034-X)

Koren-Karie, N., Oppenheim, D., Dolev, S., & Yirmiya, N. (2009). Mothers of securely attached children with autism spectrum disorder are more sensitive than mothers of insecurely attached children. *Journal of Child Psychology and Psychiatry*, 50(5), 643-650. <https://doi.org/10.1111/j.1469-7610.2008.02043.x>

Kotarba, J. A., Wooten, K., Freeman, J., & Brasier, A. R. (2013). The culture of translational science research: participants' stories. *International Review of Qualitative Research*, 6(1), 127-142. Doi: 10.1525/irqr.2013.6.1.127

Kotov, R., Krueger, R. F., & Watson, D. (2018). A paradigm shift in psychiatric classification: the hierarchical taxonomy of psychopathology (HiTOP). *World Psychiatry*, 17(1), 24. <https://dx.doi.org/10.1002%2Fwps.20478>

Kramer, M. S., Barr, R. G., Dagenais, S., Yang, H., Jones, P., Ciofani, L., & Jané, F. (2001). Pacifier use, early weaning, and cry/fuss behavior: a randomized controlled trial. *Jama*, 286(3), 322-326. doi: 10.1001/jama.286.3.322

Kratochwill, T. R., Shernoff, E. S., & Sanetti, L. (2004). Promotion of Academic Careers in School Psychology: A Conceptual Framework of Impact Points,

- Recommended Strategies, and Hopeful Outcomes. *School Psychology Quarterly*, 19(4), 342. <http://dx.doi.org/10.1521/scpq.19.4.342.53499>
- Kreisler, L., & Cramer, B. (1981). Clinical bases of infant psychiatry. *La Psychiatrie de l'enfant*, 24(1), 223. <https://www.ncbi.nlm.nih.gov/pubmed/7335836>
- Kristen-Antonow, S., Licata, Dandel, M., Müller, M., & Sodian, B. (2018). Maternal cognition talk in the mother–toddler dyad mediates the influence of early maternal emotional availability on pre-schoolers' belief reasoning. *Social Development*, 27(4), 841-857. <https://doi.org/10.1111/sode.12301>
- Kubicek, L. F., Riley, K., Coleman, J., Miller, G., & Linder, T. (2013). Assessing the emotional quality of parent–child relationships involving young children with special needs: Applying the constructs of emotional availability and expressed emotion. *Infant Mental Health Journal*, 34(3), 242-256. <https://doi.org/10.1002/imhj.21384>
- Kumar, R., & Hipwell, A. E. (1996). Development of a clinical rating scale to assess mother-infant interaction in a psychiatric mother and baby unit. *The British Journal of Psychiatry*, 169(1), 18-26. Doi:10.1192/bjp.169.1.18
- Kendell, R. E., Chalmers, J. C., & Platz, C. (1987). Epidemiology of puerperal psychoses. *The British Journal of Psychiatry*, 150(5), 662-673. <https://doi.org/10.1192/bjp.150.5.662>
- Kertes, D. A., Donzella, B., Talge, N. M., Garvin, M. C., Van Ryzin, M. J., & Gunnar, M. R. (2009). Inhibited temperament and parent emotional availability differentially predict young children's cortisol responses to novel social and nonsocial events. *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology*, 51(7), 521-532. <https://doi.org/10.1002/dev.20390>

- Lagan, M., Knights, K., Barton, J., & Boyce, P. M. (2009). Advocacy for mothers with psychiatric illness: a clinical perspective. *International Journal of Mental Health Nursing, 18*(1), 53-61. <https://doi.org/10.1111/j.1447-0349.2008.00576.x>
- Läge, D., Egli, S., Riedel, M., Strauss, A., & Möller, H. J. (2011). Combining the categorical and the dimensional perspective in a diagnostic map of psychotic disorders. *European archives of psychiatry and clinical neuroscience, 261*(1), 3-10. Doi: 0.1007/s00406-010-0125-y
- Lam-Cassettari, C., Wadnerkar-Kamble, M. B., & James, D. M. (2015). Enhancing parent-child communication and parental self-esteem with a video-feedback intervention: outcomes with pre-lingual deaf and hard-of-hearing children. *Journal of deaf studies and deaf education, 20*(3), 266-274. <https://doi.org/10.1093/deafed/env008>
- Lam, C., & Kitamura, C. (2010). Maternal interactions with a hearing and hearing-impaired twin: Similarities and differences in speech input, interaction quality, and word production. *Journal of Speech, Language, and Hearing Research. https://doi.org/10.1044/1092-4388(2010/09-0126)*
- Laney, E. K., Hall, M. E. L., Anderson, T. L., & Willingham, M. M. (2015). Becoming a mother: The influence of motherhood on women's identity development. *Identity, 15*(2), 126-145. Doi: 10.1080/15283488.2015.1023440
- Lang, F. R., Reschke, F. S., & Neyer, F. J. (2006). Social relationships, transitions, and personality development across the life span. *Handbook of personality development, 445-466. https://www.researchgate.net/profile/Frieder_Lang/publication/235733650_So*

cial_relationships_transitions_and_personality_development_across_the_life_
span/links/56c5f3fc08ae408dfe4ca2a4.pdf

- Laplante, D. P., Brunet, A., Schmitz, N., Ciampi, A., & King, S. (2008). Project Ice Storm: prenatal maternal stress affects cognitive and linguistic functioning in 5½-year-old children. *Journal of the American Academy of Child & Adolescent Psychiatry*, 47(9), 1063-1072.
<https://doi.org/10.1097/CHI.0b013e31817eec80>
- Laurent, H. K., Ablow, J. C., & Measelle, J. (2011). Risky shifts: How the timing and course of mothers' depressive symptoms across the perinatal period shape their own and infant's stress response profiles. *Development and psychopathology*, 23(2), 521-538. <https://doi.org/10.1017/S0954579411000083>
- Lawrence, T., Edwards, C., Barraclough, N., Church, S., & Hetherington, F. (1995). Modelling childhood causes of paranormal belief and experience: Childhood trauma and childhood fantasy. *Personality and Individual Differences*, 19(2), 209-215. Doi:
10.1016/0191-8869(95)00034-4
- Lawler, M. J. (2008). Maltreated children's emotional availability with kin and non-kin foster mothers: A sociobiological perspective. *Children and Youth Services Review*, 30(10), 1131-1143.
<https://doi.org/10.1016/j.chilyouth.2008.02.007>
- Lefkowitz, D. S., Baxt, C., & Evans, J. R. (2010). Prevalence and correlates of posttraumatic stress and postpartum depression in parents of infants in the Neonatal Intensive Care Unit (NICU). *Journal of clinical psychology in medical settings*, 17(3), 230-237.
<https://link.springer.com/article/10.1007/s10880-010-9202-7>

- Leis, J. A., Heron, J., Stuart, E. A., & Mendelson, T. (2014). Associations between maternal mental health and child emotional and behavioral problems: does prenatal mental health matter?. *Journal of abnormal child psychology*, 42(1), 161-171. 10.1007/s10802-013-9766-4
- Lewis, S. E., & Nicolson, P. (1998). Talking about early motherhood: Recognizing loss and reconstructing depression. *Journal of Reproductive and Infant Psychology*, 16(2-3), 177-197. Doi: 10.1080/02646839808404567
- Lehman, E. B., Steier, A. J., Guidash, K. M., & Wanna, S. Y. (2002). Predictors of compliance in toddlers: child temperament, maternal personality, and emotional availability. Portions of the research were presented at the Conference on Human Development, Mobile, AL, March 6, 1998. *Early Child Development and Care*, 172(3), 301-310.
<https://doi.org/10.1080/03004430212124>
- Letourneau, N. L., Tramonte, L., & Willms, J. D. (2013). Maternal depression, family functioning and children's longitudinal development. *Journal of Pediatric Nursing*, 28(3), 223-234. Doi: 10.1016/j.pedn.2012.07.014
- Lerardi, E., Albizzati, A., & Crugnola, R.C. (2017). Reflective functioning and mind-mindedness in adolescent and adult mothers: their impact on infant-mother emotional availability. In *AIP XIX Sezione Psicologia Clinica e Dinamica 29 settembre-1 ottobre* (Vol. 5, No. 2, pp. 184-185).
<https://boa.unimib.it/handle/10281/171422>
- Lev-Wiesel, R., Daphna-Tekoah, S., & Hallack, M. (2009). Childbirth as retraumatization: prenatal and postnatal posttraumatic stress symptomatology

- among women, survivors of childhood sexual abuse. *Child Abuse & Neglect*, 33, 877-887. <https://doi.org/10.1016/j.chiabu.2009.05.004>
- Lewis, A. J., Galbally, M., Gannon, T., & Symeonides, C. (2014). Early life programming as a target for prevention of child and adolescent mental disorders. *BMC medicine*, 12(1), 33.
<https://bmcmmedicine.biomedcentral.com/articles/10.1186/1741-7015-12-33>
- L'Hoir, M. P., Engelberts, A. C., Van Well, G. T. J., Damste, P. H., Idema, N. K., Westers, P., Mellenbergh, J.G., Wolters, W.H.G., & Huber, J. (1999). Dummy use, thumb sucking, mouth breathing and cot death. *European journal of pediatrics*, 158(11), 896-901. doi: 10.1007/s004310051237
- Licata, M., Kristen, S., & Sodian, B. (2016). Mother–child interaction as a cradle of theory of mind: the role of maternal emotional availability. *Social Development*, 25(1), 139-156. <https://doi.org/10.1111/sode.12131>
- Licata, M., Paulus, M., Kühn-Popp, N., Meinhardt, J., & Sodian, B. (2015). Infant frontal asymmetry predicts child emotional availability. *International Journal of Behavioral Development*, 39(6), 492-496.
<https://doi.org/10.1177/0165025415576816>
- Lieberman, A. F., Weston, D. R., & Pawl, J. H. (1991). Preventive intervention and outcome with anxiously attached dyads. *Child development*, 62(1), 199-209.
Doi: 10.1111/j.1467-8624.1991.tb01525.x
- Lillo, D. (2000). Linking childhood sexual abuse and abusive parenting. *Child Abuse & Neglect*, 24(7), 667-679.
- Lim, L., Radua, J., & Rubia, K. (2014). Gray matter abnormalities in childhood maltreatment: a voxel-wise meta-analysis. *American Journal of Psychiatry*, 171(8), 854-863. <https://doi.org/10.1176/appi.ajp.2014.13101427>

- Litt, C. J. (1981). Children's attachment to transitional objects: A study of two pediatric populations. *American Journal of Orthopsychiatry*, 51(1), 131.
- Little, C., & Carter, A. S. (2005). Negative emotional reactivity and regulation in 12-month olds following emotional challenge: Contributions of maternal–infant emotional availability in a low-income sample. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 26(4), 354-368. <https://doi.org/10.1002/imhj.20055>
- Logsdon, M. C., & Usui, W. (2001). Psychosocial predictors of postpartum depression in diverse groups of women. *Western Journal of Nursing Research*, 23(6), 563-574. Doi: 10.1177/019394590102300603
- Lok, S. M., & McMahon, C. A. (2006). Mothers' thoughts about their children: Links between mind-mindedness and emotional availability. *British Journal of Developmental Psychology*, 24(3), 477-488. <https://doi.org/10.1348/026151005X49854>
- Lotzin, A., Lu, X., Kriston, L., Schiborr, J., Musal, T., Romer, G., & Ramsauer, B. (2015). Observational tools for measuring parent–infant interaction: a systematic review. *Clinical child and family psychology review*, 18(2), 99-132. Doi: 10.1007/s10567-015-0180-z
- Lovas, G. S. (2003). Early gender development in the context of parent/toddler interactions: Emotional availability and language development. <https://elibrary.ru/item.asp?id=5288506>
- Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical psychology review*, 20(5), 561-592. [https://doi.org/10.1016/S0272-7358\(98\)00100-7](https://doi.org/10.1016/S0272-7358(98)00100-7)

- Lyons-Ruth, K., & Block, D. (1996). The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal: Official Publication of the World Association for Infant Mental Health*, 17(3), 257-275. doi: 10.1002/(SICI)1097-0355(199623)17:3<257::AID-IMHJ5>3.0.CO;2-L
- Lyons-Ruth, K., Easterbrooks, M., & Cibelli, C. D. (1997). Infant attachment strategies, infant mental lag, and maternal depressive symptoms: predictors of internalizing and externalizing problems at age 7. *Developmental psychology*, 33(4), 681. <https://psycnet.apa.org/doi/10.1037/0012-1649.33.4.681>
- Lyons-Ruth, K., Lyubchik, A., Wolfe, R., & Bronfman, E. (2002). Parental depression and child attachment: Hostile and helpless profiles of parent and child behavior among families at risk. <https://psycnet.apa.org/doi/10.1037/10449-004>
- Maccoby, E. E., & Martin, J. A. (1983). Socialization in the Context of the Family: Parent-Child Interaction. In P. H. Mussen, & E. M. Hetherington (Eds.), *Handbook of Child Psychology: Vol. 4. Socialization, Personality, and Social Development* (pp. 1-101). New York: Wiley.
- MacKinnon, A. L., Carter, C. S., Feeley, N., Gold, I., Hayton, B., Santhakumaran, S., & Zelkowitz, P. (2018). Theory of mind as a link between oxytocin and maternal behavior. *Psychoneuroendocrinology*, 92, 87-94. <https://doi.org/10.1016/j.psyneuen.2018.03.018>
- MacKinnon, A. L., Houazene, S., Robins, S., Feeley, N., & Zelkowitz, P. (2018). Maternal attachment style, interpersonal trauma history, and childbirth-related post-traumatic stress. *Frontiers in psychology*, 9. doi: 10.3389/fpsyg.2018.02379

- MacMillan, K.K., Lewis, A.J., Watson, S., & Galbally, M. (2020). Maternal Depression and the emotional availability of mothers at six months postpartum: findings from the Mercy Pregnancy and Emotional Wellbeing Study (MPEWS) pregnancy cohort. *Journal of Affective Disorders*, 266, 678 – 685. <https://doi.org/10.1016/j.jad.2020.01.109>
- Magill-Evans, J., & Harrison, M. J. (2001). Parent-child interactions, parenting stress, and developmental outcomes at 4 years. *Children's Health Care*, 30(2), 135-150. Doi: 10.1207/S15326888CHC3002_4
- Mahler, M. S., Pine, F., & Bergman, A. (1975). *The psychological birth of the human infant: Symbiosis and individuation*, New York, NY: Basic books.
- Mäkinen-Kiljunen, S., Sorva, R., & Juntunen-Backman, K. (1992). Latex dummies as allergens. *The Lancet*, 339(8809), 1608-1609. [doi.org/10.1016/0140-6736\(92\)91872-6](https://doi.org/10.1016/0140-6736(92)91872-6)
- Main, M., & Hesse, E. (1990). Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism?. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *The John D. and Catherine T. MacArthur Foundation series on mental health and development. Attachment in the preschool years: Theory, research, and intervention* (pp. 161-182). Chicago, IL, US: University of Chicago Press.
- Main, M. (1994). A move to the level of representation in the study of attachment organization: Implications for psychoanalysis. *Annual research lecture to the British psychoanalysis society*.

- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. *Monographs of the society for research in child development*. Doi: 10.2307/3333827
- Mantis, I., & Stack, D. M. (2018). The functions of mutual touch in full-term and very low-birthweight/preterm infant-mother dyads: Associations with infant affect and emotional availability during face-to-face interactions. *International Journal of Comparative Psychology*, 31.
<https://escholarship.org/uc/item/62x2k310>
- Mäntymaa, M., Puura, K., Luoma, I., Vihtonen, V., Salmelin, R. K., & Tamminen, T. (2009). Child's behaviour in mother–child interaction predicts later emotional and behavioural problems. *Infant and Child Development: An International Journal of Research and Practice*, 18(5), 455-467.
<https://doi.org/10.1002/icd.633>
- Marques, N. M., Lira, P. I., Lima, M. C., da Silva, N. L., Batista Filho, M., Huttly, S. R., & Ashworth, A. (2001). Breastfeeding and early weaning practices in northeast Brazil: a longitudinal study. *Pediatrics*, 108(4), e66-e66. Retrieved from
http://pediatrics.aappublications.org/content/pediatrics/104/4/e50.full.pdf?casa_token=IO-jV3AAeMUAAAAA:Ks6cDBbmJblS597bh_zyT9b6_fqBCJ5ODDBDc3wh1JMQzyvfcGjAabJMjU9C56hMFDbs44God_wG
- Marchesi, C., Bertoni, S., & Maggini, C. (2009). Major and minor depression in pregnancy. *Obstetrics & Gynecology*, 113(6), 1292-1298. doi: 10.1097/AOG.0b013e3181a45e90

- Marler, P., Evans, C. S., & Hauser, M. D. (1992). Animal signals: motivational, referential, or both. *Nonverbal vocal communication: Comparative and developmental approaches*, 66-86.
- Marter, A., & Agruss, J. C. (2007). Pacifiers: an update on use and misuse. *Journal for Specialists in Pediatric Nursing*, 12(4), 278-285. doi: 10.1111/j.1744-6155.2007.00126.x
- Marvin, R., Cooper, G., Hoffman, K., & Powell, B. (2002). The Circle of Security project: Attachment-based intervention with caregiver-pre-school child dyads. *Attachment & human development*, 4(1), 107-124.
<https://doi.org/10.1080/14616730252982491>
- Martins, E. C., Soares, I., Martins, C., Tereno, S., & Osório, A. (2012). Can we identify emotion overregulation in infancy? Associations with avoidant attachment, dyadic emotional interaction and temperament. *Infant and Child Development*, 21(6), 579-595. <https://doi.org/10.1002/icd.1760>
- Marx, B. P., & Sloan, D. M. (2002). The role of emotion in the psychological functioning of adult survivors of childhood sexual abuse. *Behavior Therapy*, 33(4), 563-577. Doi: 10.1016/S0005-7894(02)80017-X
- Martins, C., & Gaffan, E. A. (2000). Effects of early maternal depression on patterns of infant–mother attachment: A meta-analytic investigation. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41(6), 737-746.
<https://doi.org/10.1111/1469-7610.00661>
- Mathews, T. L., Emerson, M. R., Moore, T. A., Fial, A., & Hanna, K. M. (2019). Systematic Review: Feasibility, Reliability, and Validity of Maternal/Caregiver Attachment and Bonding Screening Tools for Clinical

Use. *Journal of Pediatric Health Care*.

<https://doi.org/10.1016/j.pedhc.2019.04.018>

- Matthey, S., Henshaw, C., Elliott, S., & Barnett, B. (2006). Variability in use of cut-off scores and formats on the Edinburgh Postnatal Depression Scale—implications for clinical and research practice. *Archives of women's mental health*, 9(6), 309-315. Doi: 10.1007/s00737-006-0152-x
- Mauch, C. E., Scott, J. A., Magarey, A. M., & Daniels, L. A. (2012). Predictors of and reasons for pacifier use in first-time mothers: an observational study. *BMC pediatrics*, 12(1), 7. doi:org/10.1186/1471-2431-12-7
- McCarthy, P., Walls, T., Cicchetti, D., Mayes, L., Rizzo, J., Lopez-Benitez, J., ... & Little, T. (2003). Prediction of resource use during acute pediatric illnesses. *Archives of pediatrics & adolescent medicine*, 157(10), 990-996. doi:10.1001/archpedi.157.10.990
- McGraw, K. O., & Wong, S. P. (1996). Forming inferences about some intraclass correlation coefficients. *Psychological methods*, 1(1), 30. <https://doi.org/10.1037/1082-989X.1.1.30>
- McLaughlin, K. A., Conron, K. J., Koenen, K. C., & Gilman, S. E. (2010). Childhood adversity, adult stressful life events, and risk of past-year psychiatric disorder: a test of the stress sensitization hypothesis in a population-based sample of adults. *Psychological medicine*, 40(10), 1647-1658. Doi: 10.1017/S0033291709992121
- McMahon, G. E., Spencer-Smith, M. M., Pace, C. C., Spittle, A. J., Stedall, P., Richardson, K., ... & Treyvaud, K. (2019). Influence of fathers' early parenting on the development of children born very preterm and full term. *The Journal of pediatrics*, 205, 195-201. <https://doi.org/10.1016/j.jpeds.2018.09.073>

- McMahon, C., & Newey, B. (2018). Non-Attuned Mind-Mindedness, Infant Negative Affect, and Emotional Availability: Assessing Mind-Mindedness during the Still-Face Paradigm. *Infancy*, 23(6), 873-892.
<https://doi.org/10.1111/infa.12245>
- Menage, J. (1993). Post-traumatic stress disorder in women who have undergone obstetric and/or gynaecological procedures: a consecutive series of 30 cases of PTSD. *Journal of Reproductive and Infant psychology*, 11(4), 221-228.
<https://doi.org/10.1080/02646839308403222>
- Menashe-Grinberg, A., & Atzaba-Poria, N. (2017). Mother–child and father–child play interaction: The importance of parental playfulness as a moderator of the links between parental behaviour and child negativity. *Infant mental health journal*, 38(6), 772-784. <https://doi.org/10.1002/imhj.21678>
- Merras-Salmio, L., Salo, S., Pelkonen, A. S., Kuitunen, M., Aronen, E. T., Mäkelä, M. J., & Kolho, K. L. (2013). How mothers interact with children with suspected cow's milk allergy symptoms. *Acta Paediatrica*, 102(12), 1180-1185. <https://doi.org/10.1111/apa.12408>
- Merrick, M. T., Ports, K. A., Ford, D. C., Afifi, T. O., Gershoff, E. T., & Grogan-Kaylor, A. (2017). Unpacking the impact of adverse childhood experiences on adult mental health. *Child abuse & neglect*, 69, 10-19.
<https://doi.org/10.1016/j.chiabu.2017.03.016>
- Mesman, J., Van Ijzendoorn, M. H., & Sagi-Schwartz, A. (2016). Cross-cultural patterns of attachment. *The handbook of attachment: Theory, research, and clinical applications*, 852-877. Accessed by
https://s3.amazonaws.com/academia.edu.documents/49637071/chapter_handbook_2016.pdf?response-content-

disposition=inline%3B%20filename%3DCross-cultural_patterns_of_attachment_Un.pdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWOWYYGZ2Y53UL3A%2F20191029%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20191029T140302Z&X-Amz-Expires=3600&X-Amz-SignedHeaders=host&X-Amz-Signature=c4078eaeda288c8a5aedb5492d7b78b81f0bfc20a4a0ac2b104472e9afa2fe3c

Mezulis, A.H., Hyde, J.S. and Clark, R., 2004. Father involvement moderates the effect of maternal depression during a child's infancy on child behavior problems in kindergarten. *Journal of Family Psychology*, 18(4), 575.
<http://dx.doi.org/10.1037/0893-3200.18.4.575>

Meyer, B., & Pilkonis, P. A. (2005). An attachment model of personality disorders. *Major theories of personality disorder*, 2, 231-281.
<https://books.google.com.au/books?hl=en&lr=&id=Ht8wJUfrSNMC&oi=fnd&pg=PA231&dq=attachment+and+Meyer+%26+Pilkonis,+2005&ots=8bVSp y21Xx&sig=I6F0nSbL-iMw-lugiGgyNadtVVY#v=onepage&q=attachment%20and%20Meyer%20%26%20Pilkonis%2C%202005&f=false>

Mielke, E. L., Neukel, C., Bertsch, K., Reck, C., Möhler, E., & Herpertz, S. C. (2016). Maternal sensitivity and the empathic brain: Influences of early life maltreatment. *Journal of psychiatric research*, 77, 59-66.
<https://doi.org/10.1016/j.jpsychires.2016.02.013>

Milgrom, J., Gemmill, A. W., Bilszta, J. L., Hayes, B., Barnett, B., Brooks, J., ... & Buist, A. (2008). Antenatal risk factors for postnatal depression: a large

prospective study. *Journal of affective disorders*, 108(1-2), 147-157.

<https://doi.org/10.1016/j.jad.2007.10.014>

Milgrom, J., Mendelsohn, J., Gemmill, A.W. (2011). Does postnatal depression screening work? Throwing out the bathwater, keeping the baby. *Journal of Affective Disorders*. 132(3). 301-310.

<https://doi.org/10.1016/j.jad.2010.09.031>

Milgrom, J., Westley, D. T., & Gemmill, A. W. (2004). The mediating role of maternal responsiveness in some longer term effects of postnatal depression on infant development. *Infant Behavior and Development*, 27(4), 443-454.

<https://doi.org/10.1016/j.infbeh.2004.03.003>

Mingo, M. V., & Easterbrooks, M. A. (2015). Patterns of emotional availability in mother–infant dyads: Associations with multiple levels of context. *Infant mental health journal*, 36(5), 469-482. <https://doi.org/10.1002/imhj.21529>

Misri, S., Kostaras, X., Fox, D., & Kostaras, D. (2000). The impact of partner support in the treatment of postpartum depression. *The Canadian Journal of Psychiatry*, 45(6), 554-558. [https://doi-](https://doi-org.libproxy.murdoch.edu.au/10.1177%2F070674370004500607)

[org.libproxy.murdoch.edu.au/10.1177%2F070674370004500607](https://doi-org.libproxy.murdoch.edu.au/10.1177%2F070674370004500607)

Mitchell, E. A., Blair, P. S., & L’Hoir, M. P. (2006). Should pacifiers be recommended to prevent sudden infant death syndrome?. *Pediatrics*, 117(5), 1755-1758. doi:

10.1542/peds.2005-1625

Moehler, E., Kagan, J., Parzer, P., Brunner, R., Reck, C., Wiebel, A., Poustka, L., Resch, F. (2007). Childhood behavioral inhibition and maternal symptoms of depression. *Psychopathology*. 40(6). 446-452.

<https://doi.org/10.1159/000107429>

- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009).
 Reprint—preferred reporting items for systematic reviews and meta-analyses:
 the PRISMA statement. *Physical therapy*, 89(9), 873-880.
<https://doi.org/10.1093/ptj/89.9.873>
- Möller, C., Odersjö, C., Pilesjö, F., Terpening, K., Österberg, M., & Holmqvist, R.
 (2017). Reflective functioning, limit setting, and emotional availability in
 mother–child dyads. *Parenting*, 17(4), 225-241.
<https://doi.org/10.1080/15295192.2017.1369311>
- Moehler, E., Biringen, Z., & Poustka, L. (2007). Emotional availability in a sample of
 mothers with a history of abuse. *American Journal of Orthopsychiatry*, 77(4),
 624-628. doi: 10.1037/0002-9432.77.4.624
- Moon, R. Y., Tanabe, K. O., Yang, D. C., Young, H. A., & Hauck, F. R. (2012).
 Pacifier use and SIDS: evidence for a consistently reduced risk. *Maternal and
 child health journal*, 16(3), 609-614. doi: 10.1007/s10995-011-0793-x
- Moreno, A. J., Klute, M. M., & Robinson, J. L. (2008). Relational and individual
 resources as predictors of empathy in early childhood. *Social Development*,
 17(3), 613-637. <https://doi.org/10.1111/j.1467-9507.2007.00441.x>
- Morgan, J., Robinson, D., & Aldridge, J. (2002). Parenting stress and externalizing
 child behaviour. *Child & Family Social Work*, 7(3), 219-225. Doi:
 10.1046/j.1365-2206.2002.00242.x
- Morse, C. A., Buist, A., & Durkin, S. (2000). First-time parenthood: influences on
 pre-and postnatal adjustment in fathers and mothers. *Journal of psychosomatic
 obstetrics & gynecology*, 21(2), 109-120.
<https://doi.org/10.3109/016748200009075616>

- Mulvihill, D. (2005). The health impact of childhood trauma: An interdisciplinary review, 1997-2003. *Issues in comprehensive pediatric nursing*, 28(2), 115-136. <https://doi.org/10.1080/01460860590950890>
- Müller, M. E. (1996). Prenatal and postnatal attachment: A modest correlation. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 25(2), 161-166. <https://doi.org/10.1111/j.1552-6909.1996.tb02420.x>
- Muller-Nix, C., Forcada-Guex, M., Pierrehumbert, B., Jaunin, L., Borghini, A., & Ansermet, F. (2004). Prematurity, maternal stress and mother-child interactions. *Early human development*, 79(2), 145-158. <https://doi.org/10.1016/j.earlhumdev.2004.05.002>
- Murphy, A., Steele, M., Dube, S. R., Bate, J., Bonuck, K., Meissner, P., ... & Steele, H. (2014). Adverse childhood experiences (ACEs) questionnaire and adult attachment interview (AAI): Implications for parent child relationships. *Child abuse & neglect*, 38(2), 224-233. <https://doi.org/10.1016/j.chiabu.2013.09.004>
- Murray, L. and Cooper, P.J. (1996). The impact of postpartum depression on child development. *International review of Psychiatry*, 8(1), 55-63. <https://doi.org/10.3109/09540269609037817>
- Murray, L., & Cooper, P. J. (1997). Postpartum depression and child development. *Psychological medicine*, 27(2), 253-260. <https://doi.org/10.1017/S0033291796004564>
- Murray, L., Cooper, P. J., Wilson, A., & Romaniuk, H. (2003). Controlled trial of the short-and long-term effect of psychological treatment of post-partum depression: 2. Impact on the mother-child relationship and child outcome. *The British Journal of Psychiatry*, 182(5), 420-427. <https://doi-org.libproxy.murdoch.edu.au/10.1192/bjp.182.5.420>

- Murray, L., Fiori-Cowley, A., Hooper, R., & Cooper, P. (1996). The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcome. *Child development, 67*(5), 2512-2526. <https://doi.org/10.1111/j.1467-8624.1996.tb01871.x>
- Murray, L., Fearon, P., & Cooper, P. (2015). Postnatal depression, mother–infant interactions, and child development. *Identifying perinatal depression and anxiety: Evidence-based practice in screening, psychosocial assessment, and management*, 139-164. <https://onlinelibrary.wiley.com/doi/pdf/10.1002/9781118509722#page=155>
- Murray, L., Halligan, S., & Cooper, P. (2010). Effects of postnatal depression on mother–infant interactions and child development. *The Wiley Blackwell handbook of infant development, 2*, 192-220. <https://doi.org/10.1002/9781444327588.ch8>
- Murray-Kolb, L. E., & Beard, J. L. (2009). Iron deficiency and child and maternal health. *The American journal of clinical nutrition, 89*(3), 946S-950S. <https://doi.org/10.3945/ajcn.2008.26692D>
- Muthén, B. (2004). Latent variable analysis. *The Sage handbook of quantitative methodology for the social sciences, 345*(368), 106-109.
- Muthén, L.K., Muthén, B.O., 2012. MPlus: statistical analysis with latent variables-- User's guide.
- Muzik, M., Ads, M., Bonham, C., Rosenblum, K. L., Broderick, A., & Kirk, R. (2013). Perspectives on trauma-informed care from mothers with a history of childhood maltreatment: A qualitative study. *Child abuse & neglect, 37*(12), 1215-1224. <https://doi.org/10.1016/j.chiabu.2013.07.014>

- Naber, F. B., Poslawsky, I. E., van IJzendoorn, M. H., Van Engeland, H., & Bakermans-Kranenburg, M. J. (2013). Brief report: oxytocin enhances paternal sensitivity to a child with autism: a double-blind within-subject experiment with intranasally administered oxytocin. *Journal of autism and developmental disorders*, *43*(1), 224-229.
<https://link.springer.com/article/10.1007/s10803-012-1536-6>
- Naber, F., van IJzendoorn, M. H., Deschamps, P., van Engeland, H., & Bakermans-Kranenburg, M. J. (2010). Intranasal oxytocin increases fathers' observed responsiveness during play with their children: a double-blind within-subject experiment. *Psychoneuroendocrinology*, *35*(10), 1583-1586.
<https://doi.org/10.1016/j.psyneuen.2010.04.007>
- Negrão, M., Pereira, M., Soares, I., & Mesman, J. (2014). Enhancing positive parent-child interactions and family functioning in a poverty sample: a randomized control trial. *Attachment & human development*, *16*(4), 315-328.
<https://doi.org/10.1080/14616734.2014.912485>
- Negrão, M., Pereira, M., Soares, I., & Mesman, J. (2016). Maternal attachment representations in relation to emotional availability and discipline behaviour. *European Journal of Developmental Psychology*, *13*(1), 121-137.
<https://doi.org/10.1080/17405629.2015.1071254>
- Nelson, A. M. (2012). A comprehensive review of evidence and current recommendations related to pacifier usage. *Journal of pediatric nursing*, *27*(6), 690-699. doi: 10.1016/j.pedn.2012.01.004
- Nelson, E. A. S., Yu, L. M., Williams, S., & International Child Care Practices Study Group Members. (2005). International Child Care Practices study:

breastfeeding and pacifier use. *Journal of Human Lactation*, 21(3), 289-295.

<https://doi.org/10.1177%2F0890334405278489>

Neukel, C., Bertsch, K., Fuchs, A., Zietlow, A. L., Reck, C., Moehler, E., ... & Herpertz, S. C. (2018). The maternal brain in women with a history of early-life maltreatment: an imagination-based fMRI study of conflictual versus pleasant interactions with children. *Journal of psychiatry & neuroscience: JPN*, 43(4), 273. <https://dx.doi.org/10.1503%2Fjpn.170026>

Newland, R. P., Parade, S. H., Dickstein, S., & Seifer, R. (2016). Goodness of fit between prenatal maternal sleep and infant sleep: Associations with maternal depression and attachment security. *Infant Behavior and Development*, 44, 179-188. <https://doi.org/10.1016/j.infbeh.2016.06.010>

Newland, R. P., Parade, S. H., Dickstein, S., & Seifer, R. (2016). The association between maternal depression and sensitivity: Child-directed effects on parenting during infancy. *Infant Behavior and Development*, 45, 47-50. <https://doi.org/10.1016/j.infbeh.2016.09.001>

Ney, P. G., Fung, T., & Wickett, A. R. (1994). The worst combinations of child abuse and neglect. *Child abuse & neglect*, 18(9), 705-714. Doi: 10.1016/0145-2134(94)00037-9

Nicolson, P. (1999). Loss, happiness and postpartum depression: The ultimate paradox. *Canadian Psychology/Psychologie Canadienne*, 40(2), 162. <http://dx.doi.org/10.1037/h0086834>

Nicolson, S., Judd, F., Thomson-Salo, F., & Mitchell, S. (2013). Supporting the adolescent mother–infant relationship: Preliminary trial of a brief perinatal attachment intervention. *Archives of women's mental health*, 16(6), 511-520. <https://link.springer.com/article/10.1007/s00737-013-0364-9>

- Nicholls, K., & Ayers, S. (2007). Childbirth related posttraumatic stress disorder in couples: A qualitative study. *British journal of health psychology, 12*(4), 491-509. <https://doi.org/10.1348/135910706X120627>
- Niedenthal, P. M., Augustinova, M., Rychlowska, M., Droit-Volet, S., Zinner, L., Knafo, A., & Brauer, M. (2012). Negative relations between pacifier use and emotional competence. *Basic and Applied Social Psychology, 34*(5), 387-394. doi: 10.1080/01973533.2012.712019
- Niemelä, M., Uhari, M., & Hannuksela, A. (1994). Pacifiers and dental structure as risk factors for otitis media. *International journal of pediatric otorhinolaryngology, 29*(2), 121-127. [https://doi.org/10.1016/0165-5876\(94\)90091-4](https://doi.org/10.1016/0165-5876(94)90091-4)
- Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: a systematic review and meta-analysis. *PLoS medicine, 9*(11), e1001349. Doi: 10.1371/journal.pmed.1001349
- Norris, F. H. (1992). Epidemiology of trauma: frequency and impact of different potentially traumatic events on different demographic groups. *Journal of consulting and clinical psychology, 60*(3), 409. Doi: 10.1037/0022-006X.60.3.409
- Nylen, K. J., Moran, T. E., Franklin, C. L., & O'Hara, M. W. (2006). Maternal depression: A review of relevant treatment approaches for mothers and infants. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health, 27*(4), 327-343. <https://doi-org.libproxy.murdoch.edu.au/10.1002/imhj.20095>

- O'Connell, M. E., Boat, T., & Warner, K. E. (2009). *Preventing mental, emotional, and behavioural disorders among young people: Progress and possibilities* (Vol. 7). Washington, DC: National Academies Press.
- O'Connor, T. G., & Byrne, G.J. (2007). Attachment measures for research and practice. *Child and Adolescent Mental Health, 12*(4), 187-192.
<https://doi.org/10.1111/j.1475-3588.2007.00444.x>
- Offord, D. R., & Bennett, K. J. (1994). Conduct disorder: Long-term outcomes and intervention effectiveness. *Journal of the American Academy of Child & Adolescent Psychiatry, 33*(8), 1069-1078. <https://doi.org/10.1097/00004583-199410000-00001>
- Ogle, C. M., Rubin, D. C., & Siegler, I. C. (2013). The impact of the developmental timing of trauma exposure on PTSD symptoms and psychosocial functioning among older adults. *Developmental psychology, 49*(11), 2191. Doi: [10.1037/a0031985](https://doi.org/10.1037/a0031985)
- O'Hara, M. W., & Wisner, K. L. (2014). Perinatal mental illness: definition, description and aetiology. *Best Practice & Research Clinical Obstetrics & Gynaecology, 28*(1), 3-12. <https://doi-org.libproxy.murdoch.edu.au/10.1016/j.bpobgyn.2013.09.002>
- O'Hara, M. W., Stuart, S., Gorman, L. L., & Wenzel, A. (2000). Efficacy of interpersonal psychotherapy for postpartum depression. *Archives of general psychiatry, 57*(11), 1039-1045. doi:10.1001/archpsyc.57.11.1039
- Olde, E., van der Hart, O., Kleber, R. J., van Son, M. J., Wijnen, H. A., & Pop, V. J. (2005). Peri-traumatic dissociation and emotions as predictors of PTSD symptoms following childbirth. *Journal of Trauma & Dissociation, 6*(3), 125-142. https://doi.org/10.1300/J229v06n03_06

Olds, D. L., Robinson, J., O'Brien, R., Luckey, D. W., Pettitt, L. M., Henderson, C.

R., ... & Talmi, A. (2002). Home visiting by paraprofessionals and by nurses: a randomized, controlled trial. *Pediatrics*, *110*(3), 486-496.

<https://pediatrics.aappublications.org/content/110/3/486.short>

Olds, D. L., Sadler, L., & Kitzman, H. (2007). Programs for parents of infants and toddlers: recent evidence from randomized trials. *Journal of child psychology and psychiatry*, *48*(34), 355-391. [https://doi.org/10.1111/j.1469-](https://doi.org/10.1111/j.1469-7610.2006.01702.x)

[7610.2006.01702.x](https://doi.org/10.1111/j.1469-7610.2006.01702.x)

O'Neill, M. C., Riddell, R. P., Garfield, H., & Greenberg, S. (2016). Does Caregiver Behaviour Mediate the Relationship Between Cultural Individualism and Infant Pain at 12 Months of Age?. *The Journal of Pain*, *17*(12), 1273-1280.

<https://doi.org/10.1016/j.jpain.2016.08.008>

<https://doi.org/10.1016/j.jpain.2016.08.008>

Olson, S. L., Bates, J. E., & Bayles, K. (1984). Mother–infant interaction and the development of individual differences in children's cognitive competence. *Developmental Psychology*, *20*(1), 166.

<http://dx.doi.org/10.1037/0012-1649.20.1.166>

<http://dx.doi.org/10.1037/0012-1649.20.1.166>

Oppenheim, D. (2012). Emotional availability: Research advances and theoretical questions. *Development and Psychopathology*, *24*(1), 131-136.

<https://doi.org/10.1017/S0954579411000721>

<https://doi.org/10.1017/S0954579411000721>

Ormel, J., Raven, D., Van Oort, F., Hartman, C. A., Reijneveld, S. A., Veenstra, R., ...

& Oldehinkel, A. J. (2015). Mental health in Dutch adolescents: a TRAILS report on prevalence, severity, age of onset, continuity and co-morbidity of DSM disorders. *Psychological Medicine*, *45*(2), 345-360.

<https://doi.org/10.1017/S0033291714001469>

<https://doi.org/10.1017/S0033291714001469>

<https://doi.org/10.1017/S0033291714001469>

- Östberg, M., & Hagekull, B. (2000). A structural modeling approach to the understanding of parenting stress. *Journal of clinical child psychology*, 29(4), 615-625. https://doi.org/10.1207/S15374424JCCP2904_13
- Oyen, A. S., Landy, S., & Hilburn-Cobb, C. (2000). Maternal attachment and sensitivity in an at-risk sample. *Attachment & Human Development*, 2(2), 203-217. doi:10.1080/14616730050085563
- Pansy, J., Zotter, H., Sauseng, W., Schneuber, S., Lang, U., & Kerbl, R. (2008). Pacifier use: What makes mothers change their mind?. *Acta Paediatrica*, 97(7), 968-971. doi: 10.1111/j.1651-2227.2008.00821.x
- Papoušek, M., & von Hofacker, N. (1998). Persistent crying in early infancy: A non-trivial condition of risk for the developing mother–infant relationship. *Child: care, health and development*. <http://dx.doi.org/10.1046/j.1365-2214.2002.00091.x>
- Paradis, G., & Koester, L. S. (2015). Emotional Availability and Touch in Deaf and Hearing Dyads. *American annals of the deaf*, 160(3), 303-315. <https://www.jstor.org/stable/26235219>
- Parfitt, Y., Pike, A. and Ayers, S., 2013. The impact of parents' mental health on parent–baby interaction: A prospective study. *Infant Behaviour and Development*, 36(4), 599-608. <https://doi.org/10.1016/j.infbeh.2013.06.003>
- Parfitt, Y. M., & Ayers, S. (2009). The effect of postnatal symptoms of posttraumatic stress and depression on the couple's relationship and parent–baby bond. *Journal of Reproductive and Infant Psychology*, 27(2), 127-142. doi:10.1080/02646830802350831
- Paris, R., Bolton, R. E., & Spielman, E. (2011). Evaluating a home-based dyadic intervention: Changes in postpartum depression, maternal perceptions, and

mother–infant interactions. *Infant Mental Health Journal*, 32(3), 319-338.

<https://doi.org/10.1002/imhj.20299>

Paul, G. L. (1967). Strategy of outcome research in psychotherapy. *Journal of consulting psychology*, 31(2), 109.

Pauli-Pott, U., Mertesacker, B., Bade, U., Haverkock, A., & Beckmann, D. (2003).

Parental perceptions and infant temperament development. *Infant behavior*

and development, 26(1), 27-48. [https://doi.org/10.1016/S0163-](https://doi.org/10.1016/S0163-6383(02)00167-4)

[6383\(02\)00167-4](https://doi.org/10.1016/S0163-6383(02)00167-4)

Paulson, J. F., Dauber, S., & Leiferman, J. A. (2006). Individual and combined effects

of postpartum depression in mothers and fathers on parenting

behavior. *Pediatrics*, 118(2), 659-668.

[https://pediatrics.aappublications.org/content/118/2/659.short?casa_token=Yb](https://pediatrics.aappublications.org/content/118/2/659.short?casa_token=YbRF4F1RWksAAAAA:wji1zGWijxZzCYhV0tjFR-c-FARBDYvnPzVeaLAKTlq4u92Bo29T7o2YX6vanLr0WRRggG9vRA4)

[RF4F1RWksAAAAA:wji1zGWijxZzCYhV0tjFR-c-](https://pediatrics.aappublications.org/content/118/2/659.short?casa_token=YbRF4F1RWksAAAAA:wji1zGWijxZzCYhV0tjFR-c-FARBDYvnPzVeaLAKTlq4u92Bo29T7o2YX6vanLr0WRRggG9vRA4)

[FARBDYvnPzVeaLAKTlq4u92Bo29T7o2YX6vanLr0WRRggG9vRA4](https://pediatrics.aappublications.org/content/118/2/659.short?casa_token=YbRF4F1RWksAAAAA:wji1zGWijxZzCYhV0tjFR-c-FARBDYvnPzVeaLAKTlq4u92Bo29T7o2YX6vanLr0WRRggG9vRA4)

Paulus, M., Licata, M., Gniewosz, B., & Sodian, B. (2018). The impact of mother-

child interaction quality and cognitive abilities on children's self-concept and

self-esteem. *Cognitive Development*, 48, 42-51.

<https://doi.org/10.1016/j.cogdev.2018.07.001>

Pawlby, S., Hay, D. F., Sharp, D., Waters, C. S., & O'Keane, V. (2009). Antenatal

depression predicts depression in adolescent offspring: prospective

longitudinal community-based study. *Journal of affective disorders*, 113(3),

236-243. <https://doi.org/10.1016/j.jad.2008.05.018>

Pazzagli, C., Laghezza, L., Manaresi, F., Mazzeschi, C., & Powell, B. (2014). The

circle of security parenting and parental conflict: a single case study. *Frontiers*

in psychology, 5, 887. <https://doi.org/10.3389/fpsyg.2014.00887>

- Pearlman, L. A. (1997). Trauma and the self: A theoretical and clinical perspective. *Journal of emotional abuse, 1*(1), 7-25. Doi: 10.1300/J135v01n01_02
- Pearson, R.M., Melotti, R., Heron, J., Joinson, C., Stein, A., Ramchandani, P.G. and Evans, J., 2012. Disruption to the development of maternal responsiveness? The impact of prenatal depression on mother–infant interactions. *Infant Behavior and Development, 35*(4), 613-626. <https://doi.org/10.1016/j.infbeh.2012.07.020>
- Pederson, D. R., Gleason, K. E., Moran, G., & Bento, S. (1998). Maternal attachment representations, maternal sensitivity, and the infant–mother attachment relationship. *Developmental psychology, 34*(5), 925. <https://psycnet.apa.org/doi/10.1037/0012-1649.34.5.925>
- Peltz, J. S., Rogge, R. D., Rogosch, F. A., Cicchetti, D., & Toth, S. L. (2015). The benefits of child-parent psychotherapy to marital satisfaction. *Families, Systems, & Health, 33*(4), 372. <http://dx.doi.org/10.1037/fsh0000149>
- Philbrook, L. E., & Teti, D. M. (2016). Bidirectional associations between bedtime parenting and infant sleep: Parenting quality, parenting practices, and their interaction. *Journal of Family Psychology, 30*(4), 431. <https://psycnet.apa.org/doi/10.1037/fam0000198>
- Piermattei, C., Pace, C. S., Tambelli, R., D'Onofrio, E., & Di Folco, S. (2017). Late adoptions: attachment security and emotional availability in mother–child and father–child dyads. *Journal of Child and Family Studies, 26*(8), 2114-2125. <https://link.springer.com/article/10.1007/s>
- Pinchover, S., & Shulman, C. (2018). Behavioural problems and playfulness of young children with ASD: the moderating role of a teacher's emotional availability.

Early Child Development and Care, 1-13.

<https://doi.org/10.1080/03004430.2018.1447934>

Pipp-Siegel, S., & Biringen, Z. (1998). Assessing the quality of relationships between parents and children: The emotional availability scales. *The Volta Review*.

<https://psycnet.apa.org/record/2001-01313-008>

Pinelli, J., & Symington, A. J. (2005). Non-nutritive sucking for promoting physiologic stability and nutrition in preterm infants. *Cochrane Database of Systematic Reviews*, (4). doi: 10.1002/14651858.CD001071.pub2

Pollak, S. D., Cicchetti, D., Hornung, K., & Reed, A. (2000). Recognizing emotion in faces: developmental effects of child abuse and neglect. *Developmental psychology*, 36(5), 679. Doi: 10.1037/0012-1649.36.5.679

Poobalan, A. S., Aucott, L. S., Ross, L., Smith, W. C. S., Helms, P. J., & Williams, J. H. (2007). Effects of treating postnatal depression on mother-infant interaction and child development: systematic review. *The British Journal of Psychiatry*, 191(5), 378-386. <https://doi.org/10.1192/bjp.bp.106.032789>

Porreca, A., Biringen, Z., Parolin, M., Saunders, H., Ballarotto, G., & Simonelli, A. (2018). Emotional availability, neuropsychological functioning, and psychopathology: the context of parental substance use disorder. *BioMed research international*, 2018. <https://doi.org/10.1155/2018/5359037>

Porreca, A., De Palo, F., Simonelli, A., & Capra, N. (2016). Attachment representations and early interactions in drug addicted mothers: a case study of four women with distinct adult attachment interview classifications. *Frontiers in psychology*, 7, 346. <https://doi.org/10.3389/fpsyg.2016.00346>

Pressman, L., Pipp-Siegel, S., Yoshinaga-Itano, C., & Deas, A. (1999). Maternal sensitivity predicts language gain in preschool children who are deaf and hard

of hearing. *Journal of deaf studies and deaf education*, 4(4), 294-304.

<https://doi.org/10.1093/deafed/4.4.294>

Pressman, L. J., Pipp-Siegel, S., Yoshinaga-Itano, C., Kubicek, L., & Emde, R. N.

(1999). A comparison of the links between emotional availability and language gain in young children with and without hearing loss. *Volta Review*, 100(5), 251-77.

Priest, S. R., Austin, M. P., Barnett, B. B., & Buist, A. (2008). A psychosocial risk assessment model (PRAM) for use with pregnant and postpartum women in primary care settings. *Archives of women's mental health*, 11(5-6), 307. Doi: 10.1007/s00737-008-0028-3

Qobadi, M., Collier, C., & Zhang, L. (2016). The effect of stressful life events on postpartum depression: Findings from the 2009–2011 Mississippi pregnancy risk assessment monitoring system. *Maternal and child health journal*, 20(1), 164-172. Retrieved from <https://link.springer.com/article/10.1007/s10995-016-2028-7>

Racine, N. M., Pillai Riddell, R. R., Flora, D., Garfield, H., & Greenberg, S. (2012). A longitudinal examination of verbal reassurance during infant immunization: occurrence and examination of emotional availability as a potential moderator. *Journal of pediatric psychology*, 37(8), 935-944.

<https://doi.org/10.1093/jpepsy/jss066>

Rahman, A., Iqbal, Z., Bunn, J., Lovel, H., & Harrington, R. (2004). Impact of maternal depression on infant nutritional status and illness: a cohort study. *Archives of general psychiatry*, 61(9), 946-952. doi: 10.1001/archpsyc.61.9.946

- Raine, K., Cockshaw, W., Boyce, P. and Thorpe, K. (2016). Antenatal interpersonal sensitivity is more strongly associated than perinatal depressive symptoms with postnatal mother-infant interaction quality. *Archives of women's mental health, 19*(5), 917-925. Doi: 10.1007/s00737-016-0640-6
- Records, K., & Rice, M. (2007). Psychosocial correlates of depression symptoms during the third trimester of pregnancy. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 36*(3), 231-242. <https://doi.org/10.1111/j.1552-6909.2007.00140.x>
- Regier, D.A., Kuhl, E.A., & Kupfer, D.J. (2013). The DSM-5: Classification and criteria changes. *World Psychiatry, 12*(2), 92-98. <https://doi.org/10.1002/wps.20050>.
- Resnick, H. S., Kilpatrick, D. G., Dansky, B. S., Saunders, B. E., & Best, C. L. (1993). Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *Journal of consulting and clinical psychology, 61*(6), 984. <https://psycnet.apa.org/buy/1994-25706-001>
- Rickmeyer, C., Lebiger-Vogel, J., & Leuzinger-Bohleber, M. (2017). Transition to kindergarten: negative associations between the emotional availability in Mother–Child relationships and elevated cortisol levels in children with an immigrant background. *Frontiers in psychology, 8*, 425. <https://doi.org/10.3389/fpsyg.2017.00425>
- Riddell, R. P., Campbell, L., Flora, D. B., Racine, N., Osmun, L. D., Garfield, H., & Greenberg, S. (2011). The relationship between caregiver sensitivity and infant pain behaviors across the first year of life. *Pain, 152*(12), 2819-2826. <https://doi.org/10.1016/j.pain.2011.09.011>

- Righard, L., & Alade, M. O. (1997). Breastfeeding and the use of pacifiers. *Birth*, 24(2), 116-120. doi.org/10.1111/j.1523-536X.1997.tb00351.x
- Riordan, D., Appleby, L., & Faragher, B. (1999). Mother–infant interaction in post-partum women with schizophrenia and affective disorders. *Psychological medicine*, 29(4), 991-995. https://doi.org/10.1017/S0033291798007727
- Risholm-Mothander, P., Furmark, C., & Neander, K. (2018). Adding “Circle of Security–Parenting” to treatment as usual in three Swedish infant mental health clinics. Effects on parents’ internal representations and quality of parent-infant interaction. *Scandinavian journal of psychology*, 59(3), 262-272. https://doi.org/10.1111/sjop.12419
- Robinson, J., & Little, C. (1994). Emotional availability in mother-twin dyads: Effects on the organization of relationships. *Psychiatry*, 57(1), 22-31. https://doi.org/10.1080/00332747.1994.11024665
- Robinson, J., Little, C., & Biringen, Z. (1993). Emotional communication in mother-toddler relationships: Evidence for early gender differentiation. *Merrill-Palmer Quarterly (1982-)*, 496-517. https://www.jstor.org/stable/23087246?seq=1#page_scan_tab_contents
- Robinson, M., Mattes, E., Oddy, W. H., Pennell, C. E., van Eekelen, A., McLean, N. J., ... & Stanley, F. J. (2011). Prenatal stress and risk of behavioral morbidity from age 2 to 14 years: The influence of the number, type, and timing of stressful life events. *Development and Psychopathology*, 23(2), 507-520. https://doi.org/10.1017/S0954579411000241
- Rodrigo, M. J., León, I., Góngora, D., Hernández-Cabrera, J. A., Byrne, S., & Bobes, M. A. (2016). Inferior fronto-temporo-occipital connectivity: a missing link

between maltreated girls and neglectful mothers. *Social cognitive and affective neuroscience*, 11(10), 1658-1665. <https://doi.org/10.1093/scan/nsw080>

- Rossen, L., Mattick, R. P., Wilson, J., Burns, L., Macdonald, J. A., Olsson, C., ... & Hutchinson, D. (2018). Mother–infant and partner–infant emotional availability at 12 Months of age: Findings from an Australian longitudinal study. *Infancy*, 23(6), 893-916. <https://doi.org/10.1111/infa.12247>
- Rowe, M. L., Pan, B. A., & Ayoub, C. (2005). Predictors of variation in maternal talk to children: A longitudinal study of low-income families. *Parenting: Science and Practice*, 5(3), 259-283. https://doi.org/10.1207/s15327922par0503_3
- Rubio, D. M., Schoenbaum, E. E., Lee, L. S., Schteingart, D. E., Marantz, P. R., Anderson, K. E., ... & Esposito, K. (2010). Defining translational research: implications for training. *Academic medicine: journal of the Association of American Medical Colleges*, 85(3), 470. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2829707/>
- Rutter, M. (1989). Pathways from childhood to adult life. *Child Psychology & Psychiatry & Allied Disciplines*, 30 (1), 23-51.
- Rychlowska, M., Korb, S., Brauer, M., Droit-Volet, S., Augustinova, M., Zinner, L., & Niedenthal, P. M. (2014). Pacifiers disrupt adults' responses to infants' emotions. *Basic and Applied Social Psychology*, 36(4), 299-308. doi.org/10.1080/01973533.2014.915217
- Sadeh-Sharvit, S., Levy-Shiff, R., Arnow, K. D., & Lock, J. D. (2016). The interactions of mothers with eating disorders with their toddlers: identifying broader risk factors. *Attachment & human development*, 18(4), 418-428. <https://doi.org/10.1080/14616734.2016.1164201>

- Sagi, A., Koren-Karie, N., Gini, M., Ziv, Y., & Joels, T. (2002). Shedding further light on the effects of various types and quality of early child care on infant–mother attachment relationship: The Haifa study of early child care. *Child development, 73*(4), 1166-1186. doi: 10.1111/1467-8624.00465
- Salo, F. T. (2007). Recognizing the infant as subject in infant-parent psychotherapy. *The International Journal of Psychoanalysis, 88*(4), 961-979. Doi: 10.1516/D67X-384K-9888-210
- Salo, S., Kivistö, K., Korja, R., Biringen, Z., Tupola, S., Kahila, H., & Kivitie-Kallio, S. (2009). Emotional availability, parental self-efficacy beliefs, and child development in caregiver-child relationships with buprenorphine-exposed 3-year-olds. *Parenting: Science and Practice, 9*(3-4), 244-259. <https://doi.org/10.1080/15295190902844563>
- Salo, S., Lampi, L., & Lindaman, S. (2010). Use of the emotional availability scales to evaluate attachment-based intervention-Theraplay-in substance abusing mother-infant dyads in Finland. *Infant mental health Journal Supplement, 32*, 77.
- Salomonsson, B. (2015). Extending the field: parent–toddler psychotherapy inspired by mother–infant work. *Journal of Child Psychotherapy, 41*(1), 3-21. <https://doi.org/10.1080/0075417X.2015.1005383>
- Salomonsson, B., & Sandell, R. (2011). A randomized controlled trial of mother–infant psychoanalytic treatment: I. Outcomes on self-report questionnaires and external ratings. *Infant Mental Health Journal, 32*(2), 207-231. <https://doi.org/10.1002/imhj.20291>
- Salmon, M., Abel, K., Cordingley, L., Friedman, T., & Appleby, L. (2003). Clinical and parenting skills outcomes following joint mother–baby psychiatric

- admission. *Australian and New Zealand Journal of Psychiatry*, 37(5), 556-562. <https://www.tandfonline.com/doi/abs/10.1046/j.1440-1614.2003.01253.x>
- Samuelson, K. W., Wilson, C. K., Padrón, E., Lee, S., & Gavron, L. (2017). Maternal PTSD and children's adjustment: Parenting stress and emotional availability as proposed mediators. *Journal of clinical psychology*, 73(6), 693-706. <https://doi.org/10.1002/jclp.22369>
- Sanders, M.R., Morawska, A., Haslam, D.M., Filus, A., & Fletcher, R. (2014). Parenting and Family Adjustment Scales (PAFAS): validation of a brief parent-report measure for use in the assessment of parenting skills and family relationships. *Child Psychiatry & Human Development*, 45(3), 255-272. Retrieved from <https://eprints.qut.edu.au/131272/>
- Satter, E. (1990). The feeding relationship: problems and interventions. *The Journal of pediatrics*, 117(2), S181-S189. [https://doi.org/10.1016/S0022-3476\(05\)80017-4](https://doi.org/10.1016/S0022-3476(05)80017-4)
- Saunders, H., Kraus, A., Barone, L., & Biringen, Z. (2015). Emotional availability: theory, research, and intervention. *Frontiers in psychology*, 6, 1069. <https://doi.org/10.3389/fpsyg.2015.01069>
- Sawyer, A., & Ayers, S. (2009). Post-traumatic growth in women after childbirth. *Psychology and Health*, 24(4), 457-471. <https://doi.org/10.1080/08870440701864520>
- Schechter, D. S., Coots, T., Zeanah, C. H., Davies, M., Coates, S. W., Trabka, K. A., ... & Myers, M. M. (2005). Maternal mental representations of the child in an inner-city clinical sample: Violence-related posttraumatic stress and reflective functioning. *Attachment & Human Development*, 7(3), 313-331.

- Scher, A. (2001). Mother–child interaction and sleep regulation in one year olds. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 22(5), 515-528. <https://doi.org/10.1002/imhj.1015>
- Scher, C. D., Stein, M. B., Asmundson, G. J., McCreary, D. R., & Forde, D. R. (2001). The childhood trauma questionnaire in a community sample: psychometric properties and normative data. *Journal of traumatic stress*, 14(4), 843-857. Retrieved from <https://link.springer.com/article/10.1023/A:1013058625719>
- Scherer, K. R., & Wallbott, H. G. (1994). Evidence for universality and cultural variation of differential emotion response patterning. *Journal of personality and social psychology*, 66(2), 310. <http://dx.doi.org/10.1037/0022-3514.66.2.310>
- Schmied, V., Langdon, R., Matthey, S., Kemp, L., Austin, M. P., & Johnson, M. (2016). Antenatal psychosocial risk status and Australian women’s use of primary care and specialist mental health services in the year after birth: a prospective study. *BMC women's health*, 16(1), 69. Doi: 10.1186/s12905-016-0344-0
- Schneider, B. H., Atkinson, L., & Tardif, C. (2001). Child–parent attachment and children's peer relations: A quantitative review. *Developmental psychology*, 37(1), 86. <http://dx.doi.org/10.1037/0012-1649.37.1.86>
- Schoenmaker, C., Juffer, F., van IJzendoorn, M. H., Linting, M., van der Voort, A., & Bakermans-Kranenburg, M. J. (2015). From maternal sensitivity in infancy to adult attachment representations: A longitudinal adoption study with secure base scripts. *Attachment & Human Development*, 17(3), 241-256. <https://doi.org/10.1080/14616734.2015.1037315>

- Schreiber, J., Nora, A., Stage, F., Barlow, L., & King, J. (2006). Confirmatory factor analyses and structural equations modeling: an introduction and review. *Journal of Educational Research*, *99*(6). Retrieved from <https://nyu-staging.pure.elsevier.com/en/publications/confirmatory-factor-analyses-and-structural-equations-modeling-an>
- Schumm, J. A., Briggs-Phillips, M., & Hobfoll, S. E. (2006). Cumulative interpersonal traumas and social support as risk and resiliency factors in predicting PTSD and depression among inner city women. *Journal of Traumatic Stress: Official Publication of the International Society for Traumatic Stress Studies*, *19*(6), 825-836. <https://doi.org/10.1002/jts.20159>
- Schwerdtfeger, K. L., & Goff, B. S. N. (2007). Intergenerational transmission of trauma: Exploring mother–infant prenatal attachment. *Journal of Traumatic Stress*, *20*(1), 39-51. <https://doi.org/10.1002/jts.20179>
- Scollon, C. N., Diener, E., Oishi, S., & Biswas-Diener, R. (2004). Emotions across cultures and methods. *Journal of cross-cultural psychology*, *35*(3), 304-326. Doi: 10.1177/0022022104264124
- Scott, J. A., Binns, C. W., Oddy, W. H., & Graham, K. I. (2006). Predictors of breastfeeding duration: evidence from a cohort study. *Pediatrics*, *117*(4), e646-e655. doi: 10.1542/peds.2005-1991
- Sears, R. R., Maccoby, E. E., & Levin, H. (1957). *Patterns of child rearing*. Evanston, Row, Peterson and Co.
- Seng, J. S., Low, L. M. K., Sperlich, M., Ronis, D. L., & Liberzon, I. (2009). Prevalence, trauma history, and risk for posttraumatic stress disorder among nulliparous women in maternity care. *Obstetrics and gynecology*, *114*(4), 839. doi: 10.1097/AOG.0b013e3181b8f8a2

Seng, J. S., Sperlich, M., Low, L. K., Ronis, D. L., Muzik, M., & Liberzon, I. (2013).

Childhood abuse history, posttraumatic stress disorder, postpartum mental health, and bonding: a prospective cohort study. *Journal of midwifery & women's health*, 58(1), 57-68. <https://doi.org/10.1111/j.1542-2011.2012.00237.x>

Seymour-Smith, M., Cruwys, T., Haslam, S. A., & Brodribb, W. (2017). Loss of

group memberships predicts depression in postpartum mothers. *Social psychiatry and psychiatric epidemiology*, 52(2), 201-210. Doi: 10.1007/s00127-016-1315-3

Shalev, A. Y., Freedman, S., Peri, T., Brandes, D., Sahar, T., Orr, S. P., & Pitman, R.

K. (1998). Prospective study of posttraumatic stress disorder and depression following trauma. *American Journal of psychiatry*, 155(5), 630-637. <https://doi.org/10.1176/ajp.155.5.630>

Shachar-Dadon, A., Gueron-Sela, N., Weintraub, Z., Maayan-Metzger, A., & Leshem,

M. (2017). Pre-conception war exposure and mother and child adjustment 4 years later. *Journal of abnormal child psychology*, 45(1), 131-142. <https://link.springer.com/article/10.1007/s10802-016-0153-9>

Shaw, R.L., Giles, D.C. (2009). Motherhood on ice? A media framing analysis of

older mothers in the UK news. *Psychology and Health*. 24(2). 221-236.

Sher-Censor, E., Dolev, S., Said, M., Baransi, N., & Amara, K. (2017). Coherence of

representations regarding the child, resolution of the child's diagnosis and emotional availability: a study of Arab-Israeli mothers of children with ASD. *Journal of autism and developmental disorders*, 47(10), 3139-3149. <https://link.springer.com/article/10.1007/s10803-017-3228-8>

- Shrira, A., Shmotkin, D., & Litwin, H. (2012). Potentially traumatic events at different points in the life span and mental health: Findings from SHARE-Israel. *American Journal of Orthopsychiatry*, 82(2), 251.
<http://dx.doi.org/10.1111/j.1939-0025.2012.01149.x>
- Shivers, E. M. (2008). Using the emotional availability scales along the child-care continuum. *Journal of Early Childhood and Infant Psychology*, 4, 27-38.
<https://go.galegroup.com/ps/anonymous?id=GALE%7CA220640569&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=15546144&p=AONE&sw=w>
- Shivers, E. M. (2008). Using the emotional availability scales along the child care continuum. *Journal of Early Childhood and Infant Psychology*, 4, 27-38.
<https://go.galegroup.com>
- Siddiqui, A., & Hägglöf, B. (2000). Does maternal prenatal attachment predict postnatal mother–infant interaction?. *Early human development*, 59(1), 13-25.
[https://doi.org/10.1016/S0378-3782\(00\)00076-1](https://doi.org/10.1016/S0378-3782(00)00076-1)
- Sidor, A., Kunz, E., Schweyer, D., Eickhorst, A., & Cierpka, M. (2011). Links between maternal postpartum depressive symptoms, maternal distress, infant gender and sensitivity in a high-risk population. *Child and Adolescent Psychiatry and Mental Health*, 5(1), 7. <https://doi.org/10.1186/1753-2000-5-7>
- Sipsma, H. L., Kornfeind, K., & Kair, L. R. (2017). Pacifiers and Exclusive Breastfeeding: Does Risk for Postpartum Depression Modify the Association?. *Journal of Human Lactation*, 33(4), 692-700. doi:10.1177/0890334417725033
- Skaug, S., Englund, K. T., & Wichstrøm, L. (2018). Young children's television viewing and the quality of their interactions with parents: A prospective community study. *Scandinavian journal of psychology*, 59(5), 503-510.
<https://doi.org/10.1111/sjop.12467>

- Slade, A., Grienenberger, J., Bernbach, E., Levy, D., & Locker, A. (2005). Maternal reflective functioning, attachment, and the transmission gap: A preliminary study. *Attachment & Human Development, 7*(3), 283-298.
doi.org/10.1080/14616730500245880
- Smith, A. L., Cross, D., Winkler, J., Jovanovic, T., & Bradley, B. (2014). Emotional dysregulation and negative affect mediate the relationship between maternal history of child maltreatment and maternal child abuse potential. *Journal of Family Violence, 29*(5), 483-494. Retrieved from
<https://link.springer.com/article/10.1007/s10896-014-9606-5>
- Smith, M. V., Poschman, K., Cavaleri, M. A., Howell, H. B., & Yonkers, K. A. (2006). Symptoms of posttraumatic stress disorder in a community sample of low-income pregnant women. *American Journal of Psychiatry, 163*(5), 881-884. <https://ajp.psychiatryonline.org/doi/full/10.1176/ajp.2006.163.5.881>
- Smith, M. V., Shao, L., Howell, H., Lin, H., & Yonkers, K. A. (2011). Perinatal depression and birth outcomes in a Healthy Start project. *Maternal and child health journal, 15*(3), 401-409. Doi: 10.1007/s10995-010-0595-6
- Soet, J. E., Brack, G. A., & DiIorio, C. (2003). Prevalence and predictors of women's experience of psychological trauma during childbirth. *Birth, 30*(1), 36-46.
doi.org/10.1046/j.1523-536X.2003.00215.x
- Solomon, J., & George, C. (1996). Defining the caregiving system: Toward a theory of caregiving. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health, 17*(3), 183-197. Doi: 10.1002/(SICI)1097-0355(199623)17:3<183::AID-IMHJ1>3.0.CO;2-Q
- Solomon, J., George, C., & De Jong, A. (1995). Children classified as controlling at age six: Evidence of disorganized representational strategies and aggression at

home and at school. *Development and Psychopathology*, 7(3), 447-463.

<https://doi.org/10.1017/S0954579400006623>

Sonkin, D. J. (2005). Attachment theory and psychotherapy. *The therapist*, 17, 68–77.

http://www.danielsonkin.com/articles/attachment_pschotherapy.html

Sorce, J. F., & Emde, R. N. (1981). Mother's presence is not enough: Effect of emotional availability on infant exploration. *Developmental Psychology*, 17(6), 737. doi.org/10.1037/0012-1649.17.6.737

doi.org/10.1037/0012-1649.17.6.737

Spauwen, J., Krabbendam, L., Lieb, R., Wittchen, H. U., & Van Os, J. (2004). Early maternal stress and health behaviours and offspring expression of psychosis in adolescence. *Acta Psychiatrica Scandinavica*, 110(5), 356-364.

<https://doi.org/10.1111/j.1600-0447.2004.00429.x>

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983).

Manual for the state-trait anxiety scale. *Consulting Psychologists*.

Spinhoven, P., Penninx, B. W., Hickendorff, M., van Hemert, A. M., Bernstein, D. P.,

& Elzinga, B. M. (2014). Childhood Trauma Questionnaire: Factor structure, measurement invariance, and validity across emotional

disorders. *Psychological assessment*, 26(3), 717. doi.org/10.1037/pas0000002

Spielman, E. (2002). Early connections: Mother-infant psychotherapy in support of perinatal mental health. *Zero to Three*, 22(6), 26-30.

Sroufe, L., & Fleeson, J. (1985). Attachment and the construction of relationships In

The Nature and Development of Relationships ed. W. Hartup & Z. Rubin.

Hillsdale, NJ: Erlbaum.

Stack, D. M., Matte-Gagné, C., & Dickson, D. J. (2018). Persistence of effects of

VLBW/PT birth status and maternal emotional availability on child emotional

availability trajectories. *Frontiers in psychology*, 9, 2715.

<https://doi.org/10.3389/fpsyg.2018.02715>

- Stack, D. M., Serbin, L. A., Girouard, N., Enns, L. N., Bentley, V. M., Ledingham, J. E., & Schwartzman, A. E. (2012). The quality of the mother–child relationship in high-risk dyads: Application of the Emotional Availability Scales in an intergenerational, longitudinal study. *Development and psychopathology*, 24(1), 93-105. <https://doi.org/10.1017/S095457941100068X>
- Steinberg, Z. (2005). Donning the mask of motherhood: A defensive strategy, a developmental search. *Studies in Gender and Sexuality*, 6(2), 173-198. Doi: 0.1080/15240650609349273
- Steinberg, L., Lamborn, S., Darling, N., Mounts, N., & Dornbusch, S. (1994). Over time changes in adjustment and competence among adolescents from authoritative, authoritarian, indulgent and neglectful families. *Child Development*, 65, 754-770. Doi: 10.1111/j.1476-8624.1994.tb00781.x
- Stein, A., Pearson, R. M., Goodman, S. H., Rapa, E., Rahman, A., McCallum, M., ... & Pariante, C. M. (2014). Effects of perinatal mental disorders on the fetus and child. *The Lancet*, 384(9956), 1800-1819. Doi: 10.1016/S0140-6736(14)61277-0
- Stein, A., Netsi, E., Lawrence, P. J., Granger, C., Kempton, C., Craske, M. G., ... & West, V. (2018). Mitigating the effect of persistent postnatal depression on child outcomes through an intervention to treat depression and improve parenting: a randomised controlled trial. *The Lancet Psychiatry*, 5(2), 134-144. [https://doi.org/10.1016/S2215-0366\(18\)30006-3](https://doi.org/10.1016/S2215-0366(18)30006-3)
- Steinsbekk, S., Bonneville-Roussy, A., Fildes, A., Llewellyn, C. H., & Wichstrøm, L. (2017). Child and parent predictors of picky eating from preschool to school

age. *International Journal of Behavioral Nutrition and Physical Activity*, 14(1), 87. <https://ijbnpa.biomedcentral.com/articles/10.1186/s12966-017-0542-7>

Stephens, S., Ford, E., Paudyal, P., & Smith, H. (2016). Effectiveness of psychological interventions for postnatal depression in primary care: a meta-analysis. *The Annals of Family Medicine*, 14(5), 463-472. Retrieved from <http://www.annfammed.org/content/14/5/463.short>

Stern, D. N. (1991). Maternal representations: A clinical and subjective phenomenological view. *Infant Mental Health Journal*, 12(3), 174-186. <https://onlinelibrary.wiley.com/doi/pdf/10.1002/1097-0355%28199123%2912%3A3%3C174%3A%3AAID-IMHJ2280120305%3E3.0.CO%3B2-0>

Stern-Bruschweiler, N., & Stern, D. N. (1989). A model for conceptualizing the role of the mother's representational world in various mother-infant therapies. *Infant mental health journal*, 10(3), 142-156. [https://doi.org/10.1002/1097-0355\(198923\)10:3<142::AID-IMHJ2280100303>3.0.CO;2-M](https://doi.org/10.1002/1097-0355(198923)10:3<142::AID-IMHJ2280100303>3.0.CO;2-M)

Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences (4th ed.)*. Hillsdale, NS: Erlbaum.

Suess, G. J., Grossmann, K. E., & Sroufe, L. A. (1992). Effects of infant attachment to mother and father on quality of adaptation in preschool: From dyadic to individual organisation of self. *International journal of behavioral development*, 15(1), 43-65. Doi: 10.1177/016502549201500103

Susman-Stillman, A., Pleuss, J., & Englund, M. M. (2013). Attitudes and beliefs of family-and center-based child care providers predict differences in caregiving

behavior over time. *Early Childhood Research Quarterly*, 28(4), 905-917.

<https://doi.org/10.1016/j.ecresq.2013.04.003>

Sutherland, K. E., Altenhofen, S., & Biringen, Z. (2012). Emotional availability during mother–child interactions in divorcing and intact married families.

Journal of Divorce & Remarriage, 53(2), 126-141.

<https://doi.org/10.1080/10502556.2011.651974>

Swanson, K., Beckwith, L., & Howard, J. (2000). Intrusive caregiving and quality of attachment in prenatally drug-exposed toddlers and their primary caregivers.

Attachment & human development, 2(2), 130-148.

<https://doi.org/10.1080/14616730050085527>

Swanson, J. D., & Wadhwa, P. M. (2008). Developmental origins of child mental health disorders. *Journal of Child Psychology and Psychiatry*, 49(10), 1009-

1019. <https://doi.org/10.1111/j.1469-7610.2008.02014.x>

Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: a social psychological perspective on mental health. *Psychological bulletin*, 103(2), 193. Retrieved

from <https://psycnet.apa.org/>

Taylor-Colls, S., & Pasco Fearon, R. M. (2015). The effects of parental behaviour on infants' neural processing of emotion expressions. *Child development*, 86(3),

877-888. <https://doi.org/10.1111/cdev.12348>

Teti, D. M., Kim, B. R., Mayer, G., & Countermine, M. (2010). Maternal emotional availability at bedtime predicts infant sleep quality. *Journal of Family*

Psychology, 24(3), 307. Doi:10.1037/a0019306

Teti, D. M., Shimizu, M., Crosby, B., & Kim, B. R. (2016). Sleep arrangements, parent–infant sleep during the first year, and family functioning.

Developmental psychology, 52(8), 1169. DOI:10.1037/dev0000148

- Thomas, R., & Zimmer-Gembeck, M. J. (2011). Accumulating evidence for parent–child interaction therapy in the prevention of child maltreatment. *Child development, 82*(1), 177-192. <https://doi.org/10.1111/j.1467-8624.2010.01548.x>
- Thombs, B.D., Ziegelstein, R.C. (2014). Does depression screening improve depression outcomes in primary care?. *Bmj. 348*. 1253 - 1256. <https://doi.org/10.1136/bmj.g1253>
- Tikotzky, L., Chambers, A. S., Kent, J., Gaylor, E., & Manber, R. (2012). Postpartum maternal sleep and mothers' perceptions of their attachment relationship with the infant among women with a history of depression during pregnancy. *International Journal of Behavioral Development, 36*(6), 440-448. <https://doi.org/10.1177%2F0165025412450528>
- Timmer, S. G., Ho, L. K., Urquiza, A. J., Zebell, N. M., y Garcia, E. F., & Boys, D. (2011). The effectiveness of parent–child interaction therapy with depressive mothers: The changing relationship as the agent of individual change. *Child Psychiatry & Human Development, 42*(4), 406-423. <https://link.springer.com/article/10.1007/s10578-011-0226-5>
- Tonmyr, L., Draca, J., Crain, J., & MacMillan, H. L. (2011). Measurement of emotional/psychological child maltreatment: A review. *Child Abuse & Neglect, 35*(10), 767-782. doi.org/10.1016/j.chiabu.2011.04.011
- Toth, S. L., & Manly, J. T. (2019). Developmental consequences of child abuse and neglect: implications for intervention. *Child Development Perspectives, 13*(1), 59-64.
- Trapolini, T., Ungerer, J. A., & McMahon, C. A. (2008). Maternal depression: Relations with maternal caregiving representations and emotional availability

during the preschool years. *Attachment & Human Development*, 10(1), 73-90.

doi: 10.1080/14616730801900712

Triebenbacher, S. L. (1997). Children's use of transitional objects: Parental attitudes and perceptions. *Child psychiatry and human development*, 27(4), 221-230.

<https://link.springer.com/article/10.1007/BF02353351>

Tronick, E., Als, H., Adamson, L., Wise, S., & Brazelton, T. B. (1978). The infant's response to entrapment between contradictory messages in face-to-face interaction. *Journal of the American Academy of Child psychiatry*, 17(1), 1-13.

[https://doi.org/10.1016/S0002-7138\(09\)62273-1](https://doi.org/10.1016/S0002-7138(09)62273-1)

Tronick, E. Z., & Gianino Jr, A. F. (1986). The transmission of maternal disturbance to the infant. *New directions for child and adolescent development*, 1986(34), 5-11. Retrieved from

https://onlinelibrary.wiley.com/doi/pdf/10.1002/cd.23219863403?casa_token=ZkPrtRWjk3YAAAAA:tLUTpIIyiFtDfpA2a6EIJbWOSG3oKzTKM8fQB7Wvq5Woo9nctBRmEaUSvZa8pnmb_ofHSIjIsl7eRaQ

Trupe, R.V. (2010). Effect of maternal borderline personality disorder on emotional availability in mother-child interactions. Master's Thesis, University of Tennessee, 2010.

https://trace.tennessee.edu/utk_gradthes/836

Trupe, R. D., Macfie, J., Skadberg, R. M., & Kurdziel, G. (2018). Patterns of emotional availability between mothers and young children: Associations with risk factors for borderline personality disorder. *Infant and child development*, 27(1), e2046.

Tull, M. T., Jakupcak, M., McFadden, M. E., & Roemer, L. (2007). The role of negative affect intensity and the fear of emotions in posttraumatic stress

symptom severity among victims of childhood interpersonal violence. *The Journal of Nervous and Mental Disease*, 195(7), 580-587. Doi: [oi: 10.1097/NMD.0b013e318093ed5](https://doi.org/10.1097/NMD.0b013e318093ed5)

Van Andel, H. W. H., Post, W. J., Jansen, L. M. C., Kamphuis, J. S., Van der Gaag, R. J., Knorth, E. J., & Grietens, H. (2015). The developing relationship between recently placed foster infants and toddlers and their foster carers: Do demographic factors, placement characteristics and biological stress markers matter?. *Children and Youth Services Review*, 58, 219-226.
<https://doi.org/10.1016/j.chilyouth.2015.10.003>

van Bussel, J. C., Spitz, B., & Demyttenaere, K. (2009). Depressive symptomatology in pregnant and postpartum women. An exploratory study of the role of maternal antenatal orientations. *Archives of women's mental health*, 12(3), 155-166. <https://link.springer.com/article/10.1007/s00737-009-0061-x>

Van Bussel, J. C., Spitz, B., & Demyttenaere, K. (2010). Three self-report questionnaires of the early mother-to-infant bond: reliability and validity of the Dutch version of the MPAS, PBQ and MIBS. *Archives of women's mental health*, 13(5), 373-384. <https://link.springer.com/article/10.1007/s00737-009-0140-z>

Van Den Dries, L., Juffer, F., Van Ijzendoorn, M. H., Bakermans-Kranenburg, M. J., & Alink, L. R. (2012). Infants' responsiveness, attachment, and indiscriminate friendliness after international adoption from institutions or foster care in China: Application of Emotional Availability Scales to adoptive families. *Development and Psychopathology*, 24(1), 49-64.
<https://doi.org/10.1017/S0954579411000654>

- Van der Kolk, B. A. (1994). The body keeps the score: Memory and the evolving psychobiology of posttraumatic stress. *Harvard review of psychiatry*, *1*(5), 253-265. Retrieved from http://www.franweiss.com/pdfs/sensorimotor_vanderkolk_1994.pdf
- VanderKruik, R., Barreix, M., Chou, D., Allen, T., Say, L., & Cohen, L. S. (2017). The global prevalence of postpartum psychosis: a systematic review. *BMC psychiatry*, *17*(1), 272. <https://bmcp psychiatry.biomedcentral.com/articles/10.1186/s12888-017-1427-7>
- Vando, J., Rhule-Louie, D. M., McMahon, R. J., & Spieker, S. J. (2008). Examining the link between infant attachment and child conduct problems in grade 1. *Journal of Child and Family Studies*, *17*(5), 615. Doi: 10.1007/s10826-007-9173-y
- van Doesum, K. T., Hosman, C. M., Riksen-Walraven, J. M., & Hoefnagels, C. (2007). Correlates of depressed mothers' sensitivity toward their infants: the role of maternal, child, and contextual characteristics. *Journal of the American Academy of Child & Adolescent Psychiatry*, *46*(6), 747-756. doi: 10.1097/CHI.0b013e318040b272
- Van Ee, E., Jongmans, M. J., Van der Aa, N., & Kleber, R. J. (2017). Attachment representation and sensitivity: the moderating role of posttraumatic stress disorder in a refugee sample. *Family process*, *56*(3), 781-792. <https://doi.org/10.1111/famp.12228>
- van Ee, E., Kleber, R. J., & Mooren, T. T. (2012). War trauma lingers on: Associations between maternal posttraumatic stress disorder, parent–child interaction, and child development. *Infant mental health journal*, *33*(5), 459-468. Doi: 10.1002/imhj.21324

- Van Ee, E., Sleijpen, M., Kleber, R. J., & Jongmans, M. J. (2013). Father-involvement in a refugee sample: Relations between posttraumatic stress and caregiving. *Family Process, 52*(4), 723-735.
<https://doi.org/10.1111/famp.12045>
- Van Ijzendoorn, M. H., Bakermans-Kranenburg, M. J., & Sagi-Schwartz, A. (2006). Attachment across diverse sociocultural contexts: The limits of universality. *Parenting beliefs, behaviors, and parent-child relations: A cross-cultural perspective*, 107-42. Access by
https://books.google.com.au/books?hl=en&lr=&id=BMgtwiEbfq8C&oi=fnd&pg=PA107&dq=van+Ijzendoorn,+Bakermans-Kranenburg,+%26+Sagi-Schwartz,+2006&ots=dFFQ8rQmiL&sig=7QHRnPaMuGIJVvb9OGNgEcuB040&redir_esc=y#v=onepage&q&f=false
- Van IJzendoorn, M. H., Rutgers, A. H., Bakermans-Kranenburg, M. J., Swinkels, S. H., Van Daalen, E., Dietz, C., ... & Van Engeland, H. (2007). Parental sensitivity and attachment in children with autism spectrum disorder: Comparison with children with mental retardation, with language delays, and with typical development. *Child development, 78*(2), 597-608.
<https://doi.org/10.1111/j.1467-8624.2007.01016.x>
- Van Ijzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and psychopathology, 11*(2), 225-250. <https://doi.org/10.1017/S0954579499002035>
- Van Lieshout, R. J., Taylor, V. H., & Boyle, M. H. (2011). Pre-pregnancy and pregnancy obesity and neurodevelopmental outcomes in offspring: a

systematic review. *Obesity reviews*, 12(5), e548-e559.

<https://doi.org/10.1111/j.1467-789X.2010.00850.x>

Venuti, P., De Falco, S., Giusti, Z., & Bornstein, M. H. (2008). Play and emotional availability in young children with down syndrome. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 29(2), 133-152 <https://doi.org/10.1002/imhj.20168>

Victora, C. G., Behague, D. P., Barros, F. C., Olinto, M. T. A., & Weiderpass, E. (1997). Pacifier use and short breastfeeding duration: cause, consequence, or coincidence?. *Pediatrics*, 99(3), 445-453. Retrieved from: http://pediatrics.aappublications.org/content/pediatrics/99/3/445.full.pdf?casa_token=CGJYu1FhTysAAAAA:SN7HTYMitU5wi__qP1R9FcVOml2mA2sC GgRpaf3O8DWY9ntadeYD5ejb9676mg5GPP6dwLbxSWuA

Vinall, J. (2013). Parental Emotional Availability Moderates the Relationship between Neonatal Pain-Related Stress and Internalizing Behaviors in Children Born Very Preterm at 18 Months. *International Journal of Child Health and Human Development*, 6(4), 586.

<https://search.proquest.com/docview/1625526651?pq-origsite=gscholar>

Vliegen, N., Luyten, P., & Biringen, Z. (2009). A multi-method perspective on emotional availability in the postpartum period. *Parenting: Science and Practice*, 9(3-4), 228-243. <https://doi.org/10.1080/15295190902844514>

Vliegen, N., Luyten, P., Meurs, P. and Cluckers, G. (2006). Adaptive and maladaptive dimensions of relatedness and self-definition: Relationship with postpartum depression and anxiety. *Personality and Individual Differences*. 41(3). 395-406. <https://doi.org/10.1016/j.paid.2005.11.029>

- Volling, B. L., McElwain, N. L., Notaro, P. C., & Herrera, C. (2002). Parents' emotional availability and infant emotional competence: Predictors of parent-infant attachment and emerging self-regulation. *Journal of Family Psychology, 16*(4), 447. Doi:10.1037/0893-3200.16.4.447
- Wakefield, J. C., & Kirk, S. A. (1996). Unscientific thinking about scientific practice: Evaluating the scientist-practitioner model. *Social Work Research, 20*(2), 83-95. <https://doi.org/10.1093/swr/20.2.83>
- Walker, K. F., Wilson, P., Bugg, G. J., Dencker, A., & Thornton, J. G. (2015). Childbirth experience questionnaire: validating its use in the United Kingdom. *BMC pregnancy and childbirth, 15*(1), 86. doi: 10.1186/s12884-015-0513-4
- Weinberg, M., Olson, K. L., Beeghly, M., & Tronick, E. Z. (2006). Making up is hard to do, especially for mothers with high levels of depressive symptoms and their infant sons. *Journal of Child Psychology and Psychiatry, 47*(7), 670-683. <https://doi.org/10.1111/j.1469-7610.2005.01545.x>
- Westen, D., & Morrison, K. (2001). A multidimensional meta-analysis of treatments for depression, panic, and generalized anxiety disorder: an empirical examination of the status of empirically supported therapies. *Journal of consulting and clinical psychology, 69*(6), 875. <https://doi.org/10.1037/0022-006X.69.6.875>
- Wesseloo, R., Kamperman, A. M., Munk-Olsen, T., Pop, V. J., Kushner, S. A., & Bergink, V. (2015). Risk of postpartum relapse in bipolar disorder and postpartum psychosis: a systematic review and meta-analysis. *American Journal of Psychiatry, 173*(2), 117-127. <https://ajp.psychiatryonline.org/doi/pdf/10.1176/appi.ajp.2015.15010124>

- Whitesell, C. J., Crosby, B., Anders, T. F., & Teti, D. M. (2018). Household chaos and family sleep during infants' first year. *Journal of Family Psychology*, 32(5), 622. <https://psycnet.apa.org/doi/10.1037/fam0000422>
- Wiefel, A., Wollenweber, S., Oepen, G., Lenz, K., Lehmkuhl, U., & Biringen, Z. (2005). Emotional availability in infant psychiatry. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 26(4), 392-403. <https://doi-org.libproxy.murdoch.edu.au/10.1002/imhj.20059>
- Wilson, J. P. (1995). Traumatic events and PTSD prevention. In B. Raphael & E. D. Barrows (Eds.), *The handbook of preventative psychiatry* (pp. 281-296). Amsterdam, the Netherlands: Elsevier North-Holland.
- Wilson, J. P & Drozdek, B. (Eds.). (2004). *Broken spirits: The treatment of traumatized asylum seekers, refugees and war and torture victims*. New York: Brunner/Routledge.
- Winnicott, D. W. (1969). The use of an object. *International Journal of Psychoanalysis*, 50, 711 – 716. Retrieved from <http://icpla.edu/wp-content/uploads/2017/11/Winnicott-D.-The-Use-of-an-Object.pdf>
- Winnicott, D. W. (1989). *Playing and reality*. 1971. London: Tavistock Publications
- Winnicott, D. W. (1956). Primary maternal preoccupation. *The maternal lineage: identification, desire, and transgenerational issues*, 59-66.
- Wisner, K. L., Sit, D. K., McShea, M. C., Rizzo, D. M., Zoretich, R. A., Hughes, C. L., ... & Confer, A. L. (2013). Onset timing, thoughts of self-harm, and diagnoses in postpartum women with screen-positive depression findings. *JAMA psychiatry*, 70(5), 490-498. doi:10.1001/jamapsychiatry.2013.87

- Wood, J. J., Emmerson, N. A., & Cowan, P. A. (2004). Is early attachment security carried forward into relationships with preschool peers?. *British Journal of Developmental Psychology*, 22(2), 245-253.
<https://doi.org/10.1348/026151004323044591>
- Woolf, S. H. (2008). The meaning of translational research and why it matters. *Jama*, 299(2), 211-213. <https://www.semanticscholar.org/paper/The-meaning-of-translational-research-and-why-it-Woolf/4970f025e5054b54202aab8d4dbdad8a9f33d901>
- Woolf, S. H. (2008). The meaning of translational research and why it matters. *Jama*, 299(2), 211-213. Doi: 10.1001/jama.2007.26
- World Health Organization
http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf 2008, Accessed 16 November 2018.
- Yam, K. Y., Naninck, E. F., Schmidt, M. V., Lucassen, P. J., & Korosi, A. (2015). Early-life adversity programs emotional functions and the neuroendocrine stress system: the contribution of nutrition, metabolic hormones and epigenetic mechanisms. *Stress*, 18(3), 328-342.
<https://doi.org/10.3109/10253890.2015.1064890>
- Yates, B. T., & Taub, J. (2003). Assessing the costs, benefits, cost-effectiveness, and cost-benefit of psychological assessment: we should, we can, and here's how. *Psychological assessment*, 15(4), 478. <https://doi.org/10.1037/1040-3590.15.4.478>
- Zambaldi, C. F., Cantilino, A., Farias, J. A., Moraes, G. P., & Sougey, E.B. (2011). Dissociative experience during childbirth. *Journal of Psychosomatic*

Obstetrics & Gynecology, 32(4), 204-209.

<https://www.tandfonline.com/doi/pdf/10.3109/0167482X.2011.626092>

Zeanah, C. H., & Anders, T. F. (1987). Subjectivity in parent-infant relationships: A discussion of internal working models. *Infant Mental Health Journal*, 8(3), 237-250. <https://onlinelibrary.wiley.com/doi/pdf/10.1002/1097-0355%28198723%298%3A3%3C237%3A%3AAID-IMHJ2280080307%3E3.0.CO%3B2-H>

Zeanah, C. H., & Barton, M. L. (1989). Introduction: Internal representations and parent-infant relationships. *Infant Mental Health Journal*, 10(3), 135-141. [https://onlinelibrary.wiley.com/doi/pdf/10.1002/1097-0355\(198923\)10:3%3C135::AID-IMHJ2280100302%3E3.0.CO;2-H](https://onlinelibrary.wiley.com/doi/pdf/10.1002/1097-0355(198923)10:3%3C135::AID-IMHJ2280100302%3E3.0.CO;2-H)

Zeanah, C. H., Benoit, D., Hirshberg, L., Barton, M. L., & Regan, C. (1994). Mothers' representations of their infants are concordant with infant attachment classifications. *Developmental Issues in Psychiatry and Psychology*, 1(1), 1-14. Retrieved from: https://www.researchgate.net/profile/Charles_Zeanah/publication/285330060_Mothers'_representations_of_their_infant_are_concordant_with_infant_attachment_classification/links/5661f78f08ae4931cd5c6b92/Mothers-representations-of-their-infant-are-concordant-with-infant-attachment-classification.pdf

Zeanah, C. H., Berlin, L. J., & Boris, N. W. (2011). Practitioner review: Clinical applications of attachment theory and research for infants and young children. *Journal of Child Psychology and Psychiatry*, 52(8), 819-833. <https://doi.org/10.1111/j.1469-7610.2011.02399.x>

- Zeanah, C. H., Boris, N. W., Heller, S. S., Hinshaw-Fuselier, S., Larrieu, J. A., Lewis, M., ... & Valliere, J. (1997). Relationship assessment in infant mental health. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 18(2), 182-197. [https://doi.org/10.1002/\(SICI\)1097-0355\(199722\)18:2<182::AID-IMHJ7>3.0.CO;2-R](https://doi.org/10.1002/(SICI)1097-0355(199722)18:2<182::AID-IMHJ7>3.0.CO;2-R)
- Zeanah, C. H., Boris, N. W., & Larrieu, J. A. (1997). Infant development and developmental risk: A review of the past 10 years. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(2), 165-178. <https://doi.org/10.1097/00004583-199702000-00007>
- Zelkowitz, P., Na, S., Wang, T., Bardin, C., & Papageorgiou, A. (2011). Early maternal anxiety predicts cognitive and behavioural outcomes of VLBW children at 24 months corrected age. *Acta Paediatrica*, 100(5), 700-704. <https://doi.org/10.1111/j.1651-2227.2010.02128.x>
- Zelkowitz, P., Papageorgiou, A., Bardin, C., & Wang, T. (2009). Persistent maternal anxiety affects the interaction between mothers and their very low birthweight children at 24 months. *Early human development*, 85(1), 51-58. <https://doi-org.libproxy.murdoch.edu.au/10.1016/j.earlhumdev.2008.06.010>
- Zhou, L., Li, Y., Bosworth, H. B., Ehiri, J., & Luo, C. (2013). Challenges facing translational research organizations in China: a qualitative multiple case study. *Journal of translational medicine*, 11(1), 256. Doi: 10.1186/1479-5876-11-256
- Zhu, P., Tao, F., Hao, J., Sun, Y., & Jiang, X. (2010). Prenatal life events stress: implications for preterm birth and infant birthweight. *American journal of obstetrics and gynecology*, 203(1), 34-e1. <https://doi.org/10.1016/j.ajog.2010.02.023>

- Zimmerman, L., & Fassler, I. (2003). The dynamics of emotional availability in childcare: How infants involve and respond to their teen mothers and childcare teachers. *Infants & Young Children, 16*(3), 258-269.
- Zimmerman, L., & McDonald, L. (1995). Emotional availability in infant's relationships with multiple caregivers.. *American Journal of Orthopsychiatry, 65*(1), 147-152. <https://doi.org/10.1037/h0079586>
- Ziv IV, Y., Aviezer, O., Gini, M., Sagi, A., & Karie, N. K. (2000). Emotional availability in the mother–infant dyad as related to the quality of infant–mother attachment relationship. *Attachment & Human Development, 2*(2), 149-169. <https://doi.org/10.1080/14616730050085536>
- Ziv, Y., Kaplan, B. A., & Venza, J. (2016). Practicing attachment in the real world: improving maternal insightfulness and dyadic emotional availability at an outpatient community mental health clinic. *Attachment & human development, 18*(3), 292-315. <https://doi.org/10.1080/14616734.2015.1135972>
- Ziv, Y., Kupermintz, H., & Aviezer, O. (2016). The associations among maternal negative control, children's social information processing patterns, and teachers' perceptions of children's behavior in preschool. *Journal of experimental child psychology, 142*, 18-35. <https://doi.org/10.1016/j.jecp.2015.09.004>
- Ziv, Y., Umphlet, K. L. C., Olarte, S., & Venza, J. (2018). Early childhood trauma in high-risk families: associations with caregiver emotional availability and insightfulness, and children's social information processing and social behavior. *Attachment & human development, 20*(3), 309-332. <https://doi.org/10.1080/14616734.2018.1446738>

Ziv, Y., Umphlet, K. L. C., Olarte, S., & Venza, J. (2018). Early childhood trauma in high-risk families: associations with caregiver emotional availability and insightfulness, and children's social information processing and social behavior. *Attachment & human development, 20*(3), 309-332.
<https://doi.org/10.1080/14616734.2018.1446738>

Zubrick, S. R., Silburn, S. R., Burton, P., & Blair, E. (2000). Mental health disorders in children and young people: scope, cause and prevention. *Australian & New Zealand Journal of Psychiatry, 34*(4), 570-578. Doi:
[10.1080/j.1440-1614.2000.00703.x](https://doi.org/10.1080/j.1440-1614.2000.00703.x)

Zuckerman, M. (1999). *Vulnerability to psychopathology: A biosocial model*. Washington, DC, US: American Psychological Association.
