



**Quality of Caregiving in High-Risk Mothers: An Investigation of Potential Mechanisms Influencing Child Outcomes**

**Author**

Hatzis, Denise Margaret

**Published**

2017

**Thesis Type**

Thesis (PhD Doctorate)

**DOI**

[10.25904/1912/1570](https://doi.org/10.25904/1912/1570)

**Downloaded from**

<http://hdl.handle.net/10072/369415>

**Griffith Research Online**

<https://research-repository.griffith.edu.au>

# QUALITY OF CAREGIVING

## Quality of Caregiving in High-Risk Mothers: An Investigation of Potential Mechanisms Influencing Child Outcomes

Denise Margaret Hatzis

Bachelor of Psychological Science (Honours)

Bachelor of Nursing

Principal Supervisor: Professor Sharon Dawe

Associate Supervisor: Dr Natalie Loxton

School of Applied Psychology

Griffith Health

Griffith University

Submitted in partial fulfilment of the requirements of the degree of  
Doctor of Philosophy (in Clinical Psychology)

Submitted: March, 2017

### Abstract

The quality of caregiving in early infancy and childhood is one of the most important predictors of child outcome. The caregiving relationship is often compromised when mothers are unable to attend to their infants' needs due to their own experiences of childhood trauma, maternal stress, mental health difficulties, and other environmental adversities. One particular group who experience many, if not all of these adversities, are mothers with substance misuse problems. The outcomes for their children are consistently poor. These difficulties emerge in early years, when infants and young children live in chaotic environments, and at times, with mothers who are unable to provide sensitive and responsive caregiving. Given the extensive literature documenting the link between early caregiving and child developmental outcome, it is not surprising that there has been a significant research effort investigating the quality of caregiving in substance abusing mothers.

This thesis began with a focus on substance misusing mothers as a high-risk group. Research studies examining the quality of caregiving in mothers with substance use problems have had inconsistent findings. There are many studies that find poor quality caregiving in mothers with substance misuse compared to non-substance misusing mothers, while other studies find relatively little difference between groups. However, there is considerable variability across studies. Quality of study design is highly variable with a number of studies drawing comparison groups from community populations that differ from the substance misusing group on a range of demographic factors. The ages of the children range from birth to toddlerhood and a number of studies use mothers in treatment as their reference group.

In the light of the diverse findings in the extant literature, the aim of Study 1 was to assess the extent to which mothers with substance misuse have compromised caregiving. To this end a systematic review and meta-analysis of research studies spanning two decades (1995 - 2015; final update prior to publication) was undertaken. The initial search was

undertaken from Scopus, MEDLINE, Science Direct, PsycINFO, SpringerLink and Google Scholar and identified 2028 potential studies. Twenty four studies met the following inclusion criteria: mothers with children aged birth to 40 months; mothers currently using illicit substance misusers and/or were on opioid replacement therapy due to a history of opioid dependence and/or were in residential treatment due to a history of illicit substance use; a comparison group of non-substance using mothers; and maternal-child interactions were assessed using an observational method that was videotaped and coded to rate maternal caregiving quality. The key outcomes were measures of two constructs (i) maternal sensitivity and (ii) child responsiveness. A global meta-analysis for maternal sensitivity ( $n = 24$  studies) and child responsiveness ( $n = 16$  studies) on 3433 mother-infant dyads yielded significant population effect sizes and significant heterogeneity. Using subgroup analyses, heterogeneity was significantly reduced when studies were grouped by design (i.e., participants matched versus not matched on key demographic characteristics). Substance misusing mothers were still significantly poorer on scores of maternal sensitivity compared with their matched counterparts, but the effect size was significantly smaller. These results highlighted that compromised caregiving is found in high-risk mothers, and a common factor impacting maternal caregiving was shared environmental adversity.

Thus, Study 2 set out to compare the quality of caregiving in three groups: substance misusing mothers, mothers matched in socioeconomic characteristics and mothers drawn from a community sample. There is extensive evidence linking maternal substance misuse with compromised caregiving of young infants. However, there is also widely documented evidence that other psychosocial risk factors, childhood trauma, maternal psychopathology and environment characterised by financial and social disadvantage are also predictive of poor caregiving. As mothers with substance misuse problems share many of these risk factors, it is possible that compromised caregiving, including the quality of the parent-child

relationship, is attributable to these co-occurring factors. Hence, the second aim was to investigate a potential pathway in which factors associated with compromised caregiving could be tested; specifically, if there was a pathway from childhood trauma to caregiving quality that was mediated by environmental risk factors and borderline personality features.

A total sample of 51 Australian mothers and their children (12-42 months) participated in this study: 17 mothers currently in treatment for opioid and/or poly-substance dependence; 17 mothers matched on years of education, source of income, maternal age and child age reporting no current substance misuse; and 17 mothers reporting no substance misuse history matched on maternal age and child age only. Assessment duration was 90-120 minutes and consisted of completion of measures and videotaping of a 20 minutes mother-child interaction. Results showed that (i) there was no significant difference between the two high-risk groups of mothers but (ii) there were significant differences on all key variables between the two high risk mothers and the community sample; and (iii) irrespective of substance misuse, the relationship between exposure to childhood trauma and quality of caregiving was mediated via environmental risk but not severity of borderline personality features.

Study 3 extended these findings by further investigating the association between maternal childhood trauma, borderline personality features, environmental risk, quality of caregiving and child developmental outcome in a sample of mother-infant dyads, oversampling for at-risk mothers (N= 125). Method of collecting data was the same as for Study 2. The model tested was a serial mediation model, in which the association between maternal childhood trauma and child developmental outcome was proposed to be influenced by the extent to which mothers experience personality pathology and ongoing exposure of environmental risk, in turn impacts on her capacity to provide optimal caregiving to her child. In this model, two out of seven potential pathways tested in the serial PROCESS mediation

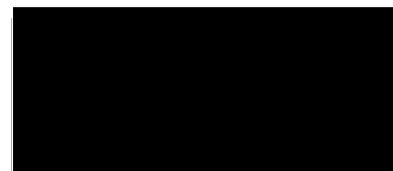
analysis were significant. The pathway between childhood adversity and child developmental outcomes via borderline personality, environmental risk and caregiving quality was supported, along with the pathway from childhood adversity to child development outcomes via borderline personality and environmental risk.

Overall, the current thesis advances the substance misuse, childhood adversity, trauma and attachment literature in several important ways. Firstly, the thesis presented a comprehensive review and meta-analysis of the available studies examining caregiving quality in mothers using illicit substances (Study 1). This review highlighted the potential for future research to investigate the potential mechanisms that underpin the development of poor caregiving in a population of mothers sampled for high risk including substance misuse, conducted via Study 2. Study 3 extended on findings from Study 2, investigating the potential underlying mechanisms or causal pathways that may be implicated in the development of compromised caregiving and child outcomes.

In summary, the thesis findings highlight the importance of identifying and understanding the mechanisms that impact quality caregiving and child outcomes in high-risk families. This in turn, informs how interventions can be designed (e.g., trauma focused care) and underscores the importance of early intervention to counteract the impact of environmental adversity and maternal childhood trauma on quality of caregiving. These findings have important implications for future research, policy design, intervention planning, and clinical practices.

### **Declaration of Originality**

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself. The author in conjunction with a Clinical Doctoral student and an honour's student was involved in collecting the data (i.e., 45%, 37% & 18% respectively). The author was responsible for the data entry and management of the project, including ethics applications and liaising with all organisations to negotiate data collection at each site. The coding of the observation measure of caregiving quality (Emotional Availability) was predominately undertaken by the author. All coding was done post data collection and prior to the classification of mothers into subgroups. The order of coding was undertaken by unique identifier for each participant, (i.e., starting with participant 1 and proceeding to final participant). Fifteen percent of the video-taped mother-child interactions were randomly chosen and recoded by an independent trained coder for inter-rater reliability, including five percent of tapes coded the method trainer (Zeynep Biringen). In addition, the author's original input includes the data analysis, literature review, designing the research questions and producing the written work.



.....

Denise Hatzis

Date: 17.3.2017

## Table of Contents

Abstract.....	ii
<b>Declaration of Originality .....</b>	<b>vi</b>
<b>List of Tables .....</b>	<b>xi</b>
<b>List of Figures.....</b>	<b>xii</b>
<b>List of Abbreviations Used .....</b>	<b>xiii</b>
<b>List of Terminologies and Definitions Used.....</b>	<b>xiv</b>
<b>Acknowledgements .....</b>	<b>xvi</b>
<b>Author Publications and Acknowledgement of Published Work Included in Thesis .</b>	<b>xviii</b>
<b>Domestic and International Presentations Relevant to this Thesis .....</b>	<b>xx</b>
<b>Chapter 1: Thesis Introduction .....</b>	<b>1</b>
<b>Overview of Thesis Topic and Structure .....</b>	<b>1</b>
<b>Chapter 2: An Overview of Attachment, Quality of Caregiving and Child Outcomes.....</b>	<b>9</b>
<b>Attachment and Sensitivity.....</b>	<b>9</b>
<b>The Relationship between Quality of Caregiving and Attachment Security .....</b>	<b>11</b>
<b>The Relationship between Quality of Caregiving, Attachment Style and Child Outcome .....</b>	<b>14</b>
<b>Maternal Risk Factors associated with Compromised Caregiving.....</b>	<b>16</b>
<b>Chapter 3: Quality of Caregiving in Substance Misusing Mothers: A Special Case of High Risk Mothers.....</b>	<b>24</b>
<b>Experience of Maternal Childhood Trauma in Women with Substance Misuse Problems .....</b>	<b>24</b>
<b>Comorbid Psychopathology and Maternal Substance Misuse .....</b>	<b>26</b>
<b>Psychosocial Risk and Environmental Adversity in the Lives of Women with Substance Misuse Problems.....</b>	<b>27</b>
<b>Studies of Caregiving Based on Observations of Mother-Infant Interactions in Substance Abusing Mothers.....</b>	<b>30</b>
<b>Studies using Ainsworth’s Maternal Sensitivity Scale.....</b>	<b>31</b>
<b>Studies using the CARE Index.....</b>	<b>32</b>

Studies using the Parent-Child Early Relational Assessment (PCERA).....	33
Studies using the Emotional Availability Scales (EAS). ....	35
Miscellaneous Measures of Caregiving Quality. ....	37
Studies Investigating Infant Attachment Outcomes in Substance Using Mothers.....	41
<b>Summary .....</b>	<b>43</b>
<b>Aims of the Thesis.....</b>	<b>44</b>
<b>Chapter 4: Quality of Caregiving in Mothers with Illicit Substance Use: A Systematic Review and Meta-analysis.....</b>	<b>45</b>
<b>Introduction .....</b>	<b>46</b>
<b>Method.....</b>	<b>49</b>
Studies .....	49
Outcomes.....	49
Search Strategy.....	50
Study Selection and Data Extraction.....	53
Data Synthesis, Study Quality Appraisal and Analyses.....	54
<b>Results.....</b>	<b>55</b>
Study Characteristics and Quality Appraisal.....	55
Global Analyses of Maternal Sensitivity and Child Responsiveness.....	69
Moderation Analyses to Identify Sources of Heterogeneity .....	69
Publication Bias .....	73
<b>Discussion .....</b>	<b>73</b>
Implications for Research, Practice and Policy.....	75
Conclusion.....	77
<b>Chapter 5: An Investigation of Childhood Trauma on Quality of Caregiving in High Risk Mothers: Does Maternal Substance Misuse Confer Additional Risk? .....</b>	<b>80</b>
<b>Foreword to Chapter 5.....</b>	<b>81</b>
<b>Method.....</b>	<b>85</b>
Participants and Procedure .....	85
Measures .....	86

Analysis Plan.....	89
<b>Results.....</b>	<b>90</b>
Sample Characteristics .....	90
Testing of Group Differences.....	93
Tests of Indirect Effects .....	96
<b>Discussion .....</b>	<b>100</b>
Limitations .....	103
Conclusions .....	104
<b>Chapter 6: The Mediating Influences of Borderline Personality Features, Environmental Risk and Quality of Caregiving on Child Outcome in Mothers with Childhood Trauma .....</b>	<b>105</b>
Foreword to Chapter 6.....	106
Maternal History of Trauma, Adult Outcomes and Compromised Parenting.....	108
Poor Parenting Associated with Compromised Child Outcome. ....	110
The Investigation of Potential Pathways .....	112
Current Study Aims .....	113
Method.....	114
Participants and Procedure .....	114
Measures .....	115
Analysis Plan.....	119
<b>Results.....</b>	<b>119</b>
Descriptive Statistics .....	119
Tests of serial mediation .....	<b>Error! Bookmark not defined.</b>
<b>Discussion .....</b>	<b>126</b>
<b>Chapter 7: General Discussion .....</b>	<b>132</b>
<b>Summary of Results.....</b>	<b>132</b>
<b>Methodological Considerations .....</b>	<b>140</b>
<b>Policy and Clinical Practice Implications.....</b>	<b>143</b>
The Cost of Not Acting .....	143

Early Intervention and Screening.....	145
<b>Future Research.....</b>	<b>149</b>
<b>Conclusion.....</b>	<b>153</b>
<b>Appendix A: Summary of EA Empirical Studies .....</b>	<b>157</b>
<b>Appendix B: Ethics Approval.....</b>	<b>165</b>
<b>Appendix C: Final Project Approval .....</b>	<b>166</b>
<b>Appendix D: Online Assessment Package to Assess Mothers.....</b>	<b>170</b>
<b>Appendix E: Study 1 Published Paper.....</b>	<b>200</b>
<b>Appendix F: Summary of Strategies and Areas for Action in the Third Action Plan ..</b>	<b>215</b>
<b>References.....</b>	<b>217</b>

**List of Tables**

Table 1.1 Overview of Studies Contained in the Thesis.....	8
Table 4.1 Participant Characteristics .....	57
Table 4.2 Supplementary Table .....	78
Table 5.1 Demographic Characteristics .....	92
Table 5.2 Environmental Risk Factors and Cutt-off Scores .....	93
Table 5.3 Group Differences and Planned Contrasts on Outcome Measures.....	95
Table 5.4 Correlations of Means and Standard Deviations of Study Variables .....	97
Table 5.5 Unstandardized Indirect Effects.....	100
Table 6.1 Demographic sample characteristics as a percentage of the sample .....	121
Table 6.2 Environmental risk factors and cut-off scores .....	122
Table 6.3 Correlations of Means and Standard Deviations of Study Variables .....	123
Table 6.4 Unstandardized Indirect Effect .....	126
Table 7.1 Summary of Aims, Key Findings, and Implications of Each Study.....	137
Table 7.2 Principles of Trauma-Informed Care.....	155

**List of Figures**

Figure 4.1 Selection process for eligible papers for systematic review and meta-analysis (PRISMA) 2009 flow diagram.....	52
Figure 4.2 Forest plot of maternal sensitivity for total sample (n = 24) grouped by study design (matched and non-matched) .....	71
Figure 4.3 Forest plot of child responsiveness for total sample (n = 16) grouped by study design (matched and non-matched) .....	72
<i>Figure 5.1. Multiple mediation model – Borderline personality and Environmental Risk as mediators of the association between Childhood Trauma and Total scores of Emotional Availability.....</i>	<i>99</i>
Figure 6.1 Proposed model testing whether borderline personality features, environmental risk and quality of caregiving serve as serial mediators linking maternal childhood trauma with child developmental outcomes .....	114
Figure 6.2 <i>N</i> = 125. Direct and indirect effects of childhood trauma on child's cognitive ability via environment risk and emotional availability shown as unstandardized coefficients.....	125

**List of Abbreviations Used**

EA	Emotional Availability
EAS	Emotional Availability Scales
Bayley's Screener	Bayley Scales of Infant and Toddler Development Screening Test
BPD	Borderline Personality Disorder
CM	Community Mothers
CTQ	Childhood Trauma Questionnaire
ENV_Risk	Environmental Risk
MCM	Matched Comparison Mothers
PAI-BOR	Personality Assessment Inventory-Borderline Scale
SES	Socio Economic Status
SUM	Substance Using Mothers

**List of Terminologies and Definitions Used**

Compromised Caregiving	The inability of a mother to meet the emotional and/or physical needs of a child in their care
Disorganised Attachment	Children who are exposed to severe and extreme disruption in the parent-child relationship, display a disorganised pattern of behaviour without showing any clear resistant, avoidant or secure behaviour.
Emotional Availability	Focuses on the behaviours of both mother and child, to provide an evaluation of the emotional climate of the relationship
Externalising Behaviours	Are characterised by uncooperative, aggressive, defiant and disobedient like behaviours. In children under three years of age this is demonstrated by hitting, kicking, biting and screaming in the presence of family-life stressors.
Frightening Caregiving	A mother who displays a frightening caregiving style often has experienced trauma in their own past and experienced dysfunctional parenting within a dysfunctional maltreating caretaking relationship. Hence the mother brings to parenting her own experiences of abuse and is often unempathetic, inconsistently responsive and confusing, or frightening in their interactions with their child
High Risk Families	Are those families who present to services with complex needs that could include a history of one or many of the following: psychopathology, substance misuse, environmental adversity or

	a history of trauma, without a history of maltreating their children.
Internalising Behaviours	Are characterised by anxiety like behaviours (e.g., crying, whining, clinging) based on unrealistic appraisal of threat from their environment
Maternal Sensitivity	Is the process by which a mother perceives her child's signals and communications and her appropriate responsiveness in meeting her child's needs in a timely fashion
Mentalization	The capacity to mentally envisage mental states in self and others
Maltreating Families	Any family that has been identified by a service of maltreating their child. Maltreatment can take the form of one of many of the following forms of abuse: physical abuse, emotional abuse, physical neglect, emotional neglect or sexual abuse.
Reflective Functioning	A process by which parents are able to view their child's experience of life from the child's perspective and respond sensitively
Substance Misuse	Is the use of illicit substances only. Alcohol and tobacco have been excluded throughout this thesis.

### **Acknowledgements**

It has been a long road to this point, but thankfully I am here. There are a lot of people whom I need to thank; without their support, my submission would not have been possible. Firstly, I need to thank my principal supervisor, Professor Sharon Dawe. What I have learnt and been professionally exposed to because of Sharon goes way beyond the boundaries of a PhD and I am eternally grateful. I would also like to thank associate supervisor, Dr Natalie Loxton, for her support and feedback in the later part of my PhD journey and Dr Paul Harnett for his input as a co-author on the papers submitted for publication.

During my six years I have met some wonderful and supportive PhD, Doctoral and Master's students who have supported me through the highs and lows of my journey. Without them, my resolve to reach the finish line would have waned a long time ago. To name just a few: Lori Leach and Cate Hearne, who have supported me both professionally and personally and our associations have grown into strong friendships; Storm Cory, who assisted in data collection; and the girls in my office, Melissa Wyllie, Natasha Reid, Liz Eggins, Lolohea Tongi, Moana Harlen and Julie Nos, who have known the right thing to say at the right time and have made the long hard trek to submission possible.

To my friends and family (especially my sister Robyn), who have been a witness to the entire process and never wavered in their belief I would reach this point, I thank you all. But a special thanks must go to my wonderful husband George. I thank you for being my rock and never doubting my completion. I do love you. To my beautiful sons, James, Nicholas and Alexander, the end is near and you can have your loving mother back. I set out on this journey to hopefully inspire you to believe anything is possible. I hope I have done this. But in the process I have witnessed each one of you grow into wonderful men, whom I am so very proud of.

A special mention must go to all the mothers and children who participated in my research. Without their generous gift of time, and willingness to be videotaped, all this would not have been possible. I am truly grateful. To the staff at each recruitment organisation (Benevolent Society, Eagleby State School playgroup, Salvation Army, Biala Drug and Alcohol Services), who advocated to their clients that participating in this research was beneficial not only for themselves, but could assist other mothers, by understanding what makes mothering difficult and what contributes to fostering great outcomes for children. Furthermore, I would also like to acknowledge the financial assistance I received from the Griffith University Postgraduate Research Scholarship (GUPRS) that enabled me to present preliminary data at both an international and national conferences.

Finally, I would like to make two dedications. Firstly, to my mother, who passed away three years ago. My mother had very little education, but she worked very hard to provide the best opportunities for her daughters. I know she was so proud of us and she would be smiling now knowing I have submitted. Secondly, to Dr Penny Davis, who was my associate supervisor, and who passed away last year. Her incredible knowledge expressed through her story telling will always stay with me and inspire me. She made you feel special and was always interested in you, not just your topic. May they rest in peace.

**Author Publications and Acknowledgement of Published Work Included in Thesis**

Section 9.1 of the Griffith University Code for the Responsible Conduct of Research (“Criteria for Authorship”), and in accordance with Section 5 of the Australian Code for the Responsible Conduct of Research the following must be adhered to:

To be named as an author, a researcher must have made a substantial scholarly contribution to the creative or scholarly work that constitutes the research output, and be able to take public responsibility for at least that part of the work they contributed. Attribution of authorship depends to some extent on the discipline and publisher policies, but in all cases, authorship must be based on substantial contributions in a combination of one or more of:

- Conception and design of the research project
- Analysis and interpretation of research data
- Drafting or making significant parts of the creative or scholarly work or critically revising it so as to contribute significantly to the final output.

Section 9.3 of the Griffith University Code (“Responsibilities of Researchers”), in accordance with Section 5 of the Australian Code, states: Researchers are expected to:

- Offer authorship to all people, including research trainees, who meet the criteria for authorship listed above, but only those people.
- Accept or decline offers of authorship promptly in writing.
- Include in the list of authors only those who have accepted authorship.
- Appoint one author to be the executive author to record authorship and manage correspondence about the work with the publisher and other interested parties.
- Acknowledge all those who have contributed to the research, facilitates, or materials but who do not qualify as authors, such as research assistants, technical staff, and advisors on cultural or community knowledge. Obtain written consent to name individuals.

This thesis includes one published paper, one paper submitted and one unpublished manuscript. All three papers are co-authored with other researchers including my supervisors. Prior to each chapter containing a co-authored paper, a preamble will outline my contribution and outline of the paper. The bibliographic details of these papers are as follows:

Chapter 4:

Hatzis, D., Dawe, S., Harnett, P., & Barlow, J. (2017). Quality of caregiving in mothers with illicit substance use: A systematic review and meta-analysis. *Substance Abuse: Research and Treatment*, *11*, 1-15. doi:10.1177/1178221817694038

Chapter 5:

Hatzis, D., Dawe, S., Loxton, N., & Harnett, P. (Submitted). An examination of childhood misuse, environmental risk and psychopathology on quality of caregiving in mothers in treatment for substance use: A comparison with matched and community samples. *Infant Behavior and Development Journal*.

Chapter 6:

Hatzis, D., Dawe, S., Harnett, P., & Loxton, N. (Unpublished Manuscript). The mediating influences of environmental risk and quality of caregiving on child outcome in mothers with childhood trauma.

### **Domestic and International Presentations Relevant to this Thesis**

The following are **E 3: Published abstracts**.

This presentation was conducted by the author based on the findings of the systematic review from Chapter 3.

**Hatzis, D.**, Dawe, S., & Harnett, P. (November 2013). Quality of care giving in mothers with substance misuse problems: How research can inform our clinical practice. *13th Australasian Conference on Child Abuse and Neglect, Protecting children: New solutions to old problems*: Melbourne, Australia.

#### **Published Abstract**

If a mother is able to provide love, warmth and respond sensitively in her day-to-day interactions with her baby, her baby, in turn will develop a view that the world is a safe and trusting place. Such infants will feel secure in the presence of their mother, enabling them to venture forth in early childhood thereby providing the grounding to develop as secure, confident, and sensitive adults. However, not all infants experience sensitive and nurturing caregiving in their early lives, and children living in families with maternal substance misuse are particularly vulnerable with problems compounded by multiple environmental stressors (e.g., domestic violence, criminal behaviours and parental relationship breakdown) and social and financial disadvantage. We undertook a systematic review of 36 published studies on the quality of caregiving in substance misusing mothers. Inclusion criteria required that the study used observational methodology to assess caregiving and that children were under 3 years of age. Notably, not all mothers had compromised caregiving. Further interrogation of this literature led us to conclude that concurrent psychopathology, in particular diagnoses associated with poor impulse control and affect dysregulation, was predictive of compromised care giving. These finding highlight the importance of addressing both the

quality of caregiving and the attachment relationship in these high-risk dyads as well as ensuring treatment has a focus on helping mothers manage dysregulated affect.

The following poster presentation was conducted by the author at the World Association for Infant Mental Health World Congress in Edinburgh, June 2014 based on the findings from the data collected for Chapter 4.

**Hatzis, D.,** Carlos, E., Dawe, S. (2014). Quality of caregiving in mother infant dyads is associated with child abuse potential. *Infant Mental Health Journal*, Supplement to Volume 35, Issue 3, P1-65

**Introduction:** The relationship between quality of caregiving and scores on the Brief Child Abuse Potential Inventory (BCAP) is an important test of the ecological and construct validity of this measure.

**Method:** Mothers recruited from community agencies providing emergency relief (e.g., Salvation Army) completed a series of self-report measures related to child maltreatment risk factors. An interaction was filmed between mother and infant, and coded with the Emotional Availability Scales.

**Results:** Mean age of mothers was 30.44 years, the mean age of children was 23.40 months. Convergent validity of the BCAP with self-report measures assessing known risk factors of child maltreatment was supported. Construct and ecological validity with observed parent-child interactions were supported, where it was found that high child abuse potential was related to lower levels of maternal sensitivity and structuring, and lower level of child involvement and responsiveness. The BCAP was also able to accurately classify those at high-risk of abuse.

**Conclusions:** The BCAP could be used in conjunction with current risk assessment instruments, as well as observations, in the Child Protection field. This would provide a comprehensive risk assessment, thus increasing the accuracy of detection.

## **Chapter 1: Thesis Introduction**

Chapter 1 provides an outline and the main aims of this thesis, which is presented in a thesis-with-publication format. Included here is a general overview of the thesis topic and an outline of the structure contained in the following chapters.

### **Overview of Thesis Topic and Structure**

The quality of caregiving in infancy and early childhood lays the foundation for the development of secure attachment and impacts on all aspects of future child development (Bakermans-Kranenburg, van Ijzendoorn, & Juffer, 2005; Sroufe, Coffino, & Carlson, 2010; van Ijzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). This study is limited to maternal caregivers. Central to understanding the emergence of the sensitivity construct, which has been defined for this thesis as a caregiver who is sensitive to her child's cues and is able to readily respond appropriately, reflecting an understanding of her child's needs and provides quality caregiving (Alink et al., 2009). A secure attachment style is the product of sensitive and responsive caregiving, hence a brief description of the different attachment relationship and its organisation status will follow.

Bowlby (1969) described the theoretical concept of attachment as the emotional connection between the mother and her child, which ultimately lays the foundations for future interpersonal and loving relationships (Bowlby, 1969). Attachment theory argues these connections are essential from an evolutionary perspective. The attachment observed between an infant and caregiver fosters and promotes the survival of the vulnerable infant, ensuring they receive adequate nurturance for their physical, social and emotional needs (Bowlby, 1969). Bowlby advocated for attachment theory by proposing a four phase model that mirror development, starting with complete reliance on an adult and ending in some degree of independence. The first three stages occur during the infant's first year of life and the last commences after the child's fourth birthday (Marvin & Britner, 1999).

Elaborating on Bowlby's work, Ainsworth and colleagues pioneered a systematic observation of infants and their mothers between the ages of nine and 18 months known as the strange situation procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978). This classification is regarded as the gold standard in assessing attachment. During the procedure infants undergo a series of separations and reunions with their caregiver and a stranger. It is during the reunion phase of the procedure that the observer is able to identify how the infant's internal working model influences the way they reunite with their attachment figure and, as such, the observer can discriminate between attachment styles, as described in the following section.

The two basic categories of attachment identified were secure and insecure (both identified organised styles of attachment). An infant's internal working model of attachment is observed as either positive (secure) or negative (insecure). Secure infants feel safe when their parents are close, seeking comfort when anxious or fearful. This indicates that the infant has an internal working model of their caregiver as sensitive, available, trusting and responsive to their emotional and exploratory needs (Ainsworth, Blehar, Waters, et al., 1978). Because these infants feel safe, they are able to enjoy exploration and learning, which in middle childhood is associated with positive social activity and peer popularity. Conversely, children who demonstrate an insecure attachment interact with their caregivers and their world differently (Bohlin, Hagekull, & Rydell, 2000).

The behaviour of an insecurely attached infant can be classified into either one of two organised categories (Ainsworth, Blehar, Waters, et al., 1978) and one disorganised category (Main & Solomon, 1990). The two organised categories are insecure-avoidant and insecure-resistant or anxious-ambivalent. Insecure-avoidant infants fail to return to their attachment figure on reunion, demonstrating an internal working model of their caregiver as consistently failing to provide a safe haven and rejecting their basic needs for comfort during times of

distress. It is suggested that in the future these infants tend to develop a working model of themselves as being unacceptable and unworthy. On the other hand, an infant's behaviour that seeks to keep their attachment figure close at all costs demonstrates the internal working model of an infant who sees their attachment figure as being inconsistent and unpredictable in responding to their needs (Cassidy & Berlin, 1994). The reunion of these infants with their attachment figure is often characterised by the infant seeking attention, yet unable to experience the attachment figure's attempts to sooth or comfort. As a result, these infants too often develop a negative self-image and exaggerate their emotional responses to gain their caregiver's attention.

A fourth category of infant behaviour was later identified as insecure-disorganized (Hesse & Main, 1999; Lyons-Ruth, Bronfman, & Parsons, 1999). These infants' behaviours appear to lack an organised strategy to attract an effective response from their attachment figure. They engage in unusual movements or postures and display contradictory attachment behaviours simultaneously (Riggs, 2010). These infants show strong avoidant behaviours (hostile) and in some cases, display signs of fear (fearful), coupled with extreme desire to seek closeness to their attachment figure (helpless) (Lyons-Ruth et al., 1999). An insecure-disorganised infant is suggested to have an internal working model of their attachment figure as a potential source of danger, which results in the infant behaving in a frightened or disoriented manner (Hesse & Main, 1999). Disorganised attachment is often identified in families where maltreatment and domestic violence is suspected, in children with developmental disabilities and, less often, in normative samples (Cassidy & Shaver, 2008)

The understanding of these internal working models was further developed in the understanding of mentalizing capacity. Mentalization is the process of how we make sense of our world, and even more importantly, to anticipate and understand the actions and thoughts or another (Fonagy & Target, 1996), which fosters the development of structures crucial to

self-identify, affect regulation and a reflective stance. The development of a functional reflective stance in childhood, depends on the caregiver's capacity to both enter into the world of their child's imagination whilst maintaining reality distinctions at the same time (Slade, 2005). In other words, early meanings are created in the interactions between the mother and child. The child begins to form a representation of self as a function of his mother's capacity to make early experiences real and meaningful. The derailment of these normal interactive experiences are at the heart of many pathological adaptation, from disrupted and disorganised attachment styles in early childhood to a range of personality and borderline psychopathology in later life (Fonagy & Target, 2002). Mothers with such pathology often transfer a similar dysfunctional attachment relationship onto their own offspring. Hence sets up a transgenerational model, whereby her own maternal attachment style as a result of her own experiences as being parented, shape her reflective functioning and also her psychological model of the infant. Deficits in reflective functioning are hypothesised to be probably the most significant mediating factor in predicting compromised child outcomes.

A caregiver's capacity to provide sensitive and responsive caregiving, is also influenced by a range of historical and contextual factors. For example, mothers who have experienced significant childhood adversity, including childhood trauma (McDonnell & Valentino, 2016; Moehler, Biringen, & Poustka, 2007), maternal stress (Ammerman et al., 2013; Martinez-Torteya et al., 2014), mental health difficulties (Afifi et al., 2011; J. S. Ball & Links, 2009), and environmental adversity (Chaudhuri, Easterbrooks, & Davis, 2009; Oyen, Landy, & Hilburn-Cobb, 2000; Ziv, Aviezer, Gini, Sagi, & Karie, 2000) have been found to show compromised caregiving.

Thus, the overarching goal of this thesis is to investigate the relationship between the quality of caregiving and factors that have been associated with compromised caregiving,

with a view to further explication of the ways in which these risk factors contribute to poor quality caregiving. The content of the following chapters are described below.

### **Chapter 2: An Overview of Attachment, Quality of Caregiving and Child Outcomes**

Chapter 2 provides an overview of the literature linking quality of caregiving with infant and child outcomes. In particular its focus lies in the association between the quality of caregiving and adverse child events including trauma and abuse, and the further link between this relationship and adult psychopathology, including the development of personality features and environmental risk associated with compromised caregiving.

### **Chapter 3: Literature of Psycho-Social and Environmental Risk Factors Impacting Quality Caregiving and Child Outcomes in Substance Misusing Mothers.**

This chapter provides an overview of the key research addressing the quality of caregiving in substance misusing mothers. The chapter begins with a description of the characteristics of women with substance misuse problems that place them at high risk as mothers. This includes a description of maternal early life experiences including mother's exposure to childhood adversity and trauma, the high rates of comorbidity with mental health and personality difficulties and the outcomes for their children, including involvement in child protection.

### **Chapter 4: Systematic Literature Review and Meta-Analysis (Study 1)**

Chapter 4 (Study 1) consists of a published peer-reviewed systematic literature review and meta-analysis exploring the quality of maternal caregiving in substance misusing mothers. The primary aim of the current study was to investigate the quality of the caregiving relationship in mothers with substance misuse problems (including those on opioid replacement therapy) using observational measures of maternal sensitivity and child responsiveness with mothers who did not have a substance misuse problem. The second aim was to examine moderating factors (e.g., design, treatment and child age) that could influence the quality of the caregiving relationship.

The key finding, after conducting subgroup analyses, was a significant difference between substance misusing mothers and non-substance using mothers who were matched on demographic characteristics such as education, income, and receipt of welfare on quality of caregiving. However, while significant, this was a relatively small effect. This result fits with a wide body of research. Thus, while substance misuse affects the quality of caregiving, other factors are also implicated in compromised caregiving.

### **Chapter 5: An Investigation of the Impact of Childhood Trauma on Quality of Caregiving in High Risk Mothers: Does Maternal Substance Misuse Confer Additional Risk (Study 2)**

Chapter 5 (Study 2) comprises a submitted article (which has undergone a revise and resubmit since submission) that builds on the findings of the meta-analysis by testing the quality of caregiving in three groups: mothers with substance misuse problems, mothers matched with the first group on key demographic variables but not substance use and mothers drawn from a community sample only matched on maternal age and child age. Comparison across key factors associated with compromised caregiving was undertaken and secondary analysis investigated potential mechanisms underpinning quality of caregiving using the total sample.

### **Chapter 6. The Mediating Influences of Borderline Personality Features, Environmental Risk and Quality of Caregiving on Child Outcomes with Childhood Trauma (Study 3)**

Chapter 6 (Study 3) comprises an unpublished manuscript. This study aimed to extend current knowledge of mechanisms that contribute to poor child outcomes by exploring the association between maternal childhood trauma, borderline personality features, environmental risk, caregiving quality and child development outcomes.

### **Chapter 7. Discussion Overview**

This final chapter synthesises the key findings from the studies reported in Chapters 4, 5 and 6. The major aim of this chapter is to highlight how this research has advanced

knowledge in the field, including the implications for clinical practice, prevention and intervention planning and policy development. Also, this chapter discusses the studies' methodological limitations and recommendations for future research.

Table 1.1

*Overview of Studies Contained in the Thesis*

Factors Contributing to Inensitive Caregiving & Poor Child Outcomes	Study 1 (Chapter 4) Aims	Study 2 (Chapter 5) Aims	Study 3 (Chapter 6) Aims
Psychopathology - Substance Misuse  - Borderline Personality Disorder (BPD)  - History of Childhood Trauma	Study 1: Systematic Review and Meta-analysis - Divergent finding exists - Methodological variability and sampling characteristics point to a need for research synthesis  - Identify studies investigating the key outcomes of: Quality of caregiving in a substance using population of mothers - Using a systematic approach to identify eligible studies, to synthesise key findings, and identify factors that contribute to insensitive maternal caregiving from the existing literature to guide future research	Study 2: Using a matched sampling approach (informed by meta-analysis) to examine mechanisms underpinning poor caregiving quality in high risk mothers  To investigate: 1) Differences on the key psychosocial factors and quality of caregiving between substance misusing, matched comparison and community mothers  2) Model design: The relationship between history of childhood trauma and maternal caregiving via BPD and environmental risk	Study 3: Examining mechanisms underpinning poor child outcomes gained from previous studies in a group of mothers oversampled for risk. To examine: 1) Model fit from Study 2 in a non-clinical sample of mothers 2) Extend model to include influence on child outcomes
Socio-Demographic - Environmental Risk			

## **Chapter 2: An Overview of Attachment, Quality of Caregiving and Child Outcomes**

There is extensive research and clinical evidence linking the provision of a sensitive and responsive caregiving relationship to the development of secure attachment relationships, which occurs in appropriately 58% of non-clinical populations (Bakermans-Kranenburg & van Ijzendoorn, 2009). These, in turn, are strongly predictive of optimal child outcomes. The capacity of a mother to provide sensitive and nurturing caregiving is influenced by both historical and current environmental and psychological factors. Most importantly for the current thesis is the enduring impact that maternal childhood adversity has on a mother's capacity to provide optimal caregiving, with extensive evidence linking the experience of childhood adversity with unresponsive and insensitive caregiving. This has been clearly linked to an interactional style that results in a pattern of insecure attachment shown by the child. It is important to note, that a child with a disorganised attachment style is much more likely to have developmental significance and is more clearly related to developmental psychopathology than either form of insecurity, and is discussed further in this chapter.

The following chapter will provide a brief overview of the outcomes for children who have a poor quality caregiving relationship, and the factors that have been found to be predictive of poor quality caregiving in mothers.

### **Attachment and Sensitivity**

Bowlby described the theoretical concept of attachment as the emotional connection between a parent and child, which ultimately lays the foundations for future interpersonal and loving relationships (Bowlby (1969). Within attachment theory, these connections serve an important evolutionary function. The attachment observed between an infant and mother fosters and promotes the survival of the vulnerable infant, ensuring they receive adequate nurturance for their physical, social and emotional needs (Bowlby, 1969) within a sensitive and responsive environment (Ainsworth, Blehar, Walters, & Wall, 1978). Hence, for most

children, the consequence of a positive attachment allows for inquisitive children to view their mother as a safe haven and secure base from which to explore the world around them.

The concept of sensitivity, derived from the original work by Bowlby (1969, 1973) and extended by the seminal work of Ainsworth and colleagues (1978), is the process by which a mother perceives her child's signals and communications and her appropriate responsiveness in meeting her child's needs in a timely fashion (Biringen & Easterbrooks, 2012). There have been many operational definitions that capture the quality of caregiving that is responsive and nurturing. Ainsworth's early measure of maternal sensitivity, the Maternal Sensitivity Scale, predominantly focused on maternal exchanges in the dyadic interaction. The interactions were rated using criteria drawn from child development literature that included not only the importance of physical closeness, but also the affective quality and sensitivity shown to the child's cues.

A measure conceptually related to Ainsworth's Maternal Sensitivity Scale is the CARE Index (Crittenden, 2003). This assessment protocol also has a primary focus of assessing maternal sensitivity in a dyadic context, focusing on the affective quality of the interaction and the mother's ability to read cues and set the tone and pace of the exchanges. However in this procedure, each aspect of these behaviours is evaluated separately from an adult's and a child's perspective.

Another assessment protocol, the Parent-Child Early Relational Assessment (Clark, 1985), was also designed to measure the affect and behaviour in dyadic interactions. This assessment procedure not only assesses maternal and child behaviours, but also included the coding for the dyadic interplay between mother and child. This conceptual framework was drawn from a number of different theoretical perspectives including Ainsworth's definitions of sensitivity and responsiveness, but also Tronick (1982) for affect matching, Vygotsky (1978) for understanding the importance of structuring and scaffolding of learning during in a

dyadic exchange, Winnicott (1965) for the need for genuineness in interactions and Emde (1980) for introducing the importance of a mother being emotionally available to the needs of her child.

A later construct by Biringen (2008) has extended the construct of maternal sensitivity by not only drawing from attachment theory, but also including dyadic, emotional and structural characteristics of a relationship within a transactional analysis. The key difference in Biringen's emotional availability framework from other measures of maternal sensitivity is that the focus is on the behaviours of both parent and child, to provide an evaluation of the emotional climate of the relationship (Biringen, Derscheid, Vliegen, Closson, & Easterbrooks, 2014). Thus, the emotional availability construct views the relationship between a mother and child in a dynamic context. This transactional perspective acknowledges the importance of both the child's and the parent's contribution to the relationship. Hence the degree to which a child is viewed as being emotionally responsive during an interaction is directly related to how receptive the mother is to the child (Easterbrooks & Biringen, 2000).

### **The Relationship between Quality of Caregiving and Attachment Security**

Sensitive caregiving is crucial for the development of a secure attachment relationship (De Wolff & Van Ijzendoorn, 1997; van der Voort, Juffer, & Bakermans-Kranenburg, 2014). This association has been demonstrated in low-risk and high-risk populations and culturally diverse settings (Altenhofen, Sutherland, & Biringen, 2010; Cassibba, van Ijzendoorn, & Coppola, 2011; Easterbrooks, Biesecker, & Lyons-Ruth, 2000; Ziv et al., 2000). In an early US study of 29 mother-infant dyads, infants as young as 4 months were more willing to re-engage during a low stress situation, if their mothers were coded as demonstrating maternal sensitivity (Kogan & Carter, 1996). In a follow-up assessment, re-engagement behaviours at 4 months were predictive of attachment behaviours at 12 months. Patterns of association

between maternal sensitivity and secure attachment have been found in non-western interactions, for example in Israeli dyads. Ziv and colleagues (2000), when observing a large number of mothers ( $N = 687$ ), identified maternal sensitivity as a potential protective factor which appeared to neutralise the effects of living with low economic resources and disadvantage. They found that the children of mothers of low SES who were rated as having a secure attachment, their mothers were coded as more sensitive and in some instances, had higher scores of maternal sensitivity than their high SES counterparts. These findings support a meta-analytic study which investigated the parental antecedents of infant attachment development. This study, by De Wolff and Van Ijzendoorn (1997), identified that maternal sensitivity and the dyadic interaction occur in a diverse contextual setting, which can be influenced for example by environmental adversity, changes in family dynamics, childcare arrangements and child's health. Thus, De Wolff and van Ijzendoorn urged researchers to investigate the possible mediation and moderating effects that maternal sensitivity has on its association with attachment security. The following studies have addressed this issue.

Attachment distress occurs in the context of major family disruption such as divorce (Altenhofen et al., 2010). Importantly, for the purpose of the current discussion, an interactional style that included child responsivity to the mother was more predictive of attachment security in the context of major disruption to child routine and custody arrangements.

An important long-term outcome of the quality of the attachment relationship is the impact on a child's social-emotional development, which has been supported by numerous empirical and meta-analytic studies (van der Voort et al., 2014). Bakermans-Kranenburg and colleagues (2003) in a meta-analysis aimed to synthesise data from 70 studies with 9,139 children and their parents describing 88 interventions designed to improve maternal sensitivity and/or attachment relationship. Overall, the meta-analytic results supported the

effectiveness of sensitivity focused interventions ( $d = .33$ ) in improving social-emotional development, as assessed by attachment security ( $d = .20$ ), which supports the causal impact that sensitivity has on attachment security. Further support for the association of mother-infant security and later social-emotional and language development in early childhood, but not cognitive ability (as indicated by school readiness assessment), was found in a large sample ( $N = 946$ ) (Belsky & Fearon, 2002). Additionally, difficulties in managing dysregulated affect and impulsive behaviours, which is associated with dysfunctional parenting capacity (also seen when families have substance misuse issues) is also associated with the observation of negative emotional states and later social-emotional difficulties in their children (Barlow et al., 2013). There is likely to be variability in the impact that various substances of use may have on parenting. For example, psychomotor stimulants may be more strongly associated with hostile or aggressive behaviour given the direct effects of these substance (Dawe, Davis, Lapworth, & McKetin, 2009) compared to other substances such as cannabis that are more likely to have an association with neglectful parenting behaviour. Furthermore, the relationship between attachment security and these outcome domains was significantly negatively influenced by contextual cumulative risk.

In summary, the caregiving relationship is a dyadic and relational experience. A caregiver's ability to be emotionally available to their child's positive and negative responses during interactions promotes a child's responsiveness and involvement with the caregiver, in order to give feedback to them on how the caregiver's response has been received. This acceptance by the caregiver of the child's feedback is central to the development of a secure attachment. However, there are contextual factors that may impact optimal caregiving and a child's social-emotional development. The following two sections will review this literature.

### **The Relationship between Quality of Caregiving, Attachment Style and Child Outcome**

There is an established body of literature documenting that compromised caregiving and/or an insecure attachment style in early infancy is associated with a poor child outcome. This has been extensively investigated, with currently five systematic reviews and meta-analytic studies that have drawn together a diverse range of research studies (Bakermans-Kranenburg et al., 2005; Cyr, Euser, Bakermans-Kranenburg, & van Ijzendoorn, 2010; Fearon, Bakermans-Kranenburg, Van Ijzendoorn, Lapsley, & Roisman, 2010; Groh, Roisman, van Ijzendoorn, Bakermans-Kranenburg, & Fearon, 2012; van Ijzendoorn et al., 1999).

The first of these papers by van Ijzendoorn et al. (1999) brought together data from clinical and non-clinical populations with over 6,000 dyadic relations from 80 studies, attempting to understand the factors contributing to the development of disorganised attachment styles. The discussion specifically related to the parental factors which contribute to compromised caregiving, which will be discussed further in the next section. However, two other key findings are important here. Firstly, a frightening caregiving style was the most important precursor to the development of disorganised attachment. A mother who displays a frightening caregiving style often has experienced trauma in their own past and experienced dysfunctional parenting within a dysfunctional maltreating caretaking relationship. Hence the mother brings to parenting her own experiences of abuse and is often unempathetic, inconsistently responsive and confusing, or frightening in their interactions with their child (Newman & Stevenson, 2005). Across studies, 48% of maltreated children were rated as having a disorganised attachment style in comparison to 17% of normative samples. Furthermore, all studies examined showed a strong association between maltreatment and disorganised attachment, with effect sizes varying from  $r = .03$  to  $r = .60$ , with a combined effect size of  $r = .41$ . Secondly, and most disturbing, was the strength of the association,

irrespective of SES status, between short- and long-term stability and disorganised attachment style over time. This in turn, is associated with an elevated risk of problematic emotion regulation, and later psychopathology including disassociation and externalising problem behaviours.

Following on from this earlier systematic review and meta-analysis, Fearon et al. (2010) found a significant association between insecure attachment (including disorganised attachment) and child externalising behaviours in a review of 69 studies ( $N = 5,947$ ;  $d = 0.31$ ). There was a gender difference, with boys found to be more likely to demonstrate externalising behaviours ( $d = 0.35$ ). When these behaviours are co-morbid with other psychosocial issues (e.g. reduced self-efficacy, hostility and aggression, poor prosocial behaviours and poor emotion regulation) the effect size increased to  $d = 0.49$ . Having a disorganised attachment style poses a greater risk for children to develop externalising behaviours ( $d = 0.34$ ) in comparison to the other insecure attachment styles, that is, avoidant attachment ( $d = 0.12$ ) and resistant attachment ( $d = 0.11$ ). Hence, as the authors propose, the risk of future mental health issues in children with disorganised and insecure attachment styles is significant.

Groh and colleagues (2012) added to this literature by finding that insecure attachment was related to the development of internalising symptoms ( $d = 0.15$ ) across 42 studies ( $N = 4,614$ ). A child rated as having an avoidant insecure attachment had a stronger association with later internalising symptoms, particularly social withdrawal ( $d = 0.17$ ), in contrast to resistant ( $d = 0.03$ ) or disorganised attachment styles ( $d = 0.08$ ). Further, combined effect sizes for the four attachments styles were computed to assess the association with internalising and externalising behaviours. Overall, insecure attachment styles were again more strongly associated with externalising behaviours, in particular avoidant ( $d = 0.31$ ) and disorganised attachment styles ( $d = 0.34$ ).

Finally, Cyr and colleagues (2010) synthesised literature from 55 studies ( $N = 4,792$ ) to examine attachment security in maltreating and high-risk families. Again this article explored the parental risk indicators which contribute to child maltreatment, which will be discussed in the following section. There was a significant and large effect size between child maltreatment and the development of insecure attachment ( $d = 2.10$ ), in comparison to families that were classified as high risk but did not have reports of child maltreatment ( $d = 0.48$ ). Further, separate effects were found for physical abuse ( $d = 2.22$ ) and neglect ( $d = 2.17$ ). Similar results were found for children classified as having a disorganised attachment style ( $d = 2.19$ ) in comparison to high-risk non-maltreated families ( $d = 0.48$ ). Hence, there were significantly more children in maltreated family settings with disorganised attachment styles in comparison to families identified as low risk for maltreatment.

In summary, there is substantial evidence documenting the impact that poor quality caregiving has on child outcome. Notably, there is strong evidence that many women with compromised caregiving, have themselves been exposed to significant childhood adversity and thus we find that an intergenerational cycle of abuse is established that, for many, is difficult to escape from (Egeland, Jacobvitz, & Sroufe, 1988). Hence it is important to understand the risk factors or precursors that impact on a mother's capacity to provide sensitive and nurturing caregiving.

### **Maternal Risk Factors associated with Compromised Caregiving**

There has been a significant investigation of the factors that contribute to poor quality caregiving. In one of the earliest meta-analytic studies by van Ijzendoorn et al. (1999), insensitive caregiving, and in particular frightening parenting behaviours (e.g., chaotic, unpredictable and harsh) were found to be associated with infant disorganised attachment style. These maternal behaviours are clearly linked to a mother's own experience of childhood adversity that includes significant loss during childhood or trauma (van Ijzendoorn

et al., 1999). Such childhood adversity is associated with later psychopathology, including depression, dissociation, and altered states of minds including personality symptomatology.

Since this early meta-analysis, there has been further documentation of the link between early childhood adversities, including abuse and neglect, and subsequent compromised caregiving. Moehler and colleagues (2007) found that mothers with a history of childhood abuse (i.e., either sexual or physical) were more intrusive towards their infants in comparison to non-exposed mothers. In a later study of 83 mothers with a history of childhood trauma and their toddlers at 16 months old, Stacks and colleagues (2014) found maternal negativity mediated the relationship between reflective functioning (a process by which parents are able to view their child's experience of life from the child's perspective and respond sensitively), and attachment insecurity. Martinez-Torteya and colleagues (2014) also found that positive parenting behaviours at 7 months buffered the impact of past adverse childhood trauma and current psycho-social issues, to facilitate positive child outcomes during a mildly stressful situation. Fuchs and colleagues (2015) found that compared to mothers with no childhood adversity, mothers with a history of childhood adversity showed compromised caregiving when their infants were 12 months old. Notably, however, there was no difference in caregiving capacity at 5 months, leading the authors to suggest that as children became more mobile, a layer of complexity was added to the task of motherhood that resulted in compromised caregiving.

Furthermore, the experience of early adversity and childhood trauma is associated with a range of adulthood difficulties that include depression, personality difficulties including borderline personality disorder (BPD) (Rogosch & Cicchetti, 2005) and substance misuse (Lindberg & Zeid, 2017). The consequences of each of these on the quality of caregiving and attachment relationships have been extensively researched. Depressed patients in general form a heterogeneous group showing quite different pathogeneses. History of

traumatic childhood experiences are shown to be found in most multifactor models of etiopathogenesis when considering depression from a psychosocial context (Hill, 2009). Interestingly, one study showed that up to 76% of chronically depressed patients reported clinically significant histories of childhood trauma (Negele, Kaufhold, Kallenbach, & Leuzinger-Bohleber, 2015). Furthermore, depressed mothers with a history of childhood trauma display greater negativity in parent-child interactions (Zalewski, Cyranowski, Cheng, & Swartz, 2013). Given this information it is not surprising that there appears to be only a modest association between maternal depression and attachment security in toddlers (see meta-analytic studies from Atkinson et al., 2000; van Ijzendoorn et al., 1999). Thus, the considerable overlap of depressive symptomology with a history of childhood trauma is one reason for the heterogeneity in results for depressed mothers suggesting that while children are at increased risk of insecure attachment relationships, there are a range of environmental factors (historical, e.g., childhood trauma and current e.g., environmental risk) that are also contributing to these outcomes, which are the current focus of this thesis.

Conversely, the impact of BPD appears almost uniformly to affect the quality of caregiving which mothers can provide. This is not surprising. The acquisition of coping skills and the ability to form meaningful interpersonal relationships can be significantly compromised in many women who have experienced childhood trauma, which in turn is strongly predictive of dysregulated affect. Indeed, the developmental roots of BPD begins with poor early attachment experiences (Fonagy, Target, Gergely, Allen, & Bateman, 2003) resulting in unstable or reduced mentalizing capacity that influences these individuals' own attachment security style and how they engage with the world around them (Ensink, Normandin, Plamondon, Berthelot, & Fonagy, 2016; Fonagy & Bateman, 2007). For some of these women, a pattern of interpersonal instability, poor self-image, and marked emotional dysregulation emerges (J. S. Ball & Links, 2009; Rogosch & Cicchetti, 2005), with

characteristics associated with BPD emerging. A number of studies indicate that women with BPD struggle with interpersonal relationship with their infant and experience dysregulated emotions in response to infant cues that results in compromised caregiving.

In a recent comprehensive systematic review of published literature between 1980 and 2015, Eyden and colleagues (2016) aimed to discern whether parenting behaviours and child outcomes differed between BPD mothers and mothers without BPD. The literature was synthesised according to four areas of interest: maternal characteristics associated with BPD and caregiving; the dyadic interplay between mother and child; child outcomes; and the mechanisms underpinning the relationship between BPD and child outcomes. They found that mothers with borderline pathology and/or symptoms were more insensitive (Crandell, Patrick, & Hobson, 2003; Howard, Beckwith, Espinosa, & Tyler, 1995; Newman, Stevenson, Bergman, & Boyce, 2007), more intrusive (Crandell et al., 2003; Hobson et al., 2009), more hostile (Elliot et al., 2014; Frankel-Waldheter, Macfie, Strimpfel, & Watkins, 2015) and conversely, also engaged in overprotective caregiving behaviours (Elliot et al., 2014). This contrast in caregiving between on the one hand ultra-protective, and on the other, rejecting, hostile, frightening and/or fearful behaviour (Hobson et al., 2009; White, Flanagan, Martin, & Silvermann, 2011) has been observed as uniquely BPD maternal characteristics, with a push/pull dyadic nature (Stepp, Whalen, Pilkonis, Hipwell, & Levine, 2012), which can result in poor child outcomes.

Notably, children of BPD mothers compared with mothers without BPD are exposed to a range of detrimental outcomes and collectively are at a higher risk of developing psychosocial and mental health issues across their lifespan. Overall from the narrative review, Eyden and colleagues (2016) found even in infancy children demonstrated behaviours which are associated with adult BPD symptomatology (e.g., emotional dysregulation, insecure attachment styles, internalising and externalising behaviours and poor interpersonal relations)

(Crandell et al., 2003; Gratz et al., 2014; Hobson, Patrick, Crandell, Garcia-Perez, & Lee, 2005; H. White et al., 2011), which also extends into later childhood and adolescents (Macfie & Swan, 2009; Zalewski et al., 2014).

There appears to be an intergenerational transmission of BPD and one of the mechanisms proposed as a causal link between maternal BPD and child outcomes is compromised and/or maladaptive caregiving (Macfie, Swan, Fitzpatrick, Watkins, & Rivas, 2014). Compromised/maladaptive caregiving is defined for the purpose of this thesis as not only a mother who is not responsive to the cues and needs of her child, but also one who has limited ability to view their child's experience of life from the child's perspective and respond sensitively. In contrast when a mother demonstrates reflective functioning, she is able to understand the psychological processes underpinning a person's capacity to understand not only her own mental states (e.g., feelings, beliefs and desires), but those of her infants (Pajulo et al., 2008). Macfie and group found that insensitive caregiving mediated the relationship between maternal unresolved attachment style and a child's fear of abandonment. Also, Gratz et al. (2014) found that a key mechanism mediating the relationship between maternal BPD and a child's dysregulation was indeed a mother's level of emotional dysfunction. Hence the quality of maternal caregiving in BPD mothers matters. In brief, evidence available to date supports the view of BPD mothers as being insensitive, intrusive and at times hostile and/or frightening in their interaction style with their children, which impacts on their ability to bond with their child and provide a safe and secure base for optimal child outcomes.

Maternal substance misuse is also a significant risk factor associated with poor caregiving quality and child outcomes (Lindberg & Zeid, 2017). However, women with substance misuse problems typically experience extensive adversity including high rates of exposure to childhood trauma. Further, the well-established links between psychosocial

factors and caregiving which were highlighted in the meta-analysis by Cyr and colleagues (2010) are typical features of the chaotic lives of women with substance misuse problems: financial disadvantage, becoming an adolescent mother, low educational achievement, single parenting, limited social support and (in some locations) ethnic minority status. Perry and colleagues (2015) highlight substance misuse and mental health issues are also accompanied by ongoing adversity such as, including criminal involvement, and exposure to ongoing trauma and re-victimisation (e.g., sexual and physical assault, being threatened with a weapon, property damage) (Chapple, 2003; Widom, Czaja, & Dutton, 2008; Widom & White, 1997) and the social stressors related to poverty and feeling marginalised within society with minimal social supports (Cancian, Slack, & Yang, 2010; Sperry & Widom; Suchman, McMahon, Slade, & Luthar, 2005). Thus, it is possible that the lifestyle and precursors to substance misuse play a greater role in shaping the quality of caregiving than substance use per se. This will be discussed in detail in Chapter 3.

However, there is some variability in the literature, drawing our attention to the complexity of risk which substance abusing mothers face. Perry and colleagues (2015) found no difference on scores of reflective functioning and caregiving capacity as measured by EAS (Biringen, 2008) between 11 high-risk mothers on opioid substitution therapy and 14 comparison mothers. However, mothers on opioid substitution therapy had significantly more psycho-social risk factors, including mental health issues (BPD, childhood adversity and substance misuse), forensic charges, lower educational attainment, being a single parent and experiencing homelessness. The authors noted that despite the mothers on ORT showing reflective functioning and caregiving capacity, 18% had an involvement with child protection services. They propose that the high-risk mothers' mental health may have suffered as a result of increased psycho-social stress, in turn impacting on their parental reflective functioning with compromised caregiving, and hence increased child protection involvement.

Therefore, these results reinforce the point that caregiving occurs in a diverse contextual setting (De Wolff & Van Ijzendoorn, 1997) and often an accumulation of risk factors contribute to compromised caregiving and poor child outcomes.

Indeed, mothers with a history of childhood adversity and trauma rarely experience only a single traumatic event, but rather are more likely to experience multiple episodes of traumatic experiences into their adulthood (Kessler, 2000). In addition to this, research has shown that women postnatally who have experienced childhood abuse are reportedly at a significantly higher risk of experiencing depression and posttraumatic stress disorder comorbidity compared with mothers having no history of childhood abuse (Oh et al., 2016). Research has also found that exposure of childhood adversity coupled with current trauma (e.g., domestic violence and poverty) has a negative effect on parenting (Widom et al., 2008). During observed mother-child interactions, mother with a history of childhood sexual abuse are more likely to be emotionally withdrawn (Lyons-Ruth & Block, 1996) or permissive, however when faced with daily stressors demonstrate hostile caregiving with punitive and physical punishment (DiLillo & Damashek, 2003). These women also often present with a distorted and negative view of themselves as a parent, have limited ability to perceive child behaviours in a balanced perspective, role-reversal is common and have more malevolent, hostile attributions and distorted representations towards parenting (Muzik et al., 2013). Hence perpetuating the intergenerational cycle of abuse with poor child outcomes.

Therefore, for families with complex needs, including substance misuse, there is a need to take account of all potential risks. One solution to determining how to do this has been to conceptualise risk as the cumulative effect of multiple psycho-social risk factors (Evans, Li, & Whipple, 2013; Rutter, 1979; Sameroff, 1998; Sameroff, Ronald Seifer, Baldwin, & Baldwin, 1993). Indeed, there is growing evidence that the accumulation of risk factors has more predictive power than single risk factors in empirical research of the

aetiology of child maltreatment (Evans et al., 2013; Sameroff, 1998). When a combination of risk factors coexist, the risk of compromised caregiving resulting in child maltreatment can increase from 3% with no risk factors present, to 24% when four or more risk factors are present (Brown, Cohen, Johnson, & Salzinger, 1998). Thus, it is important to view risk within an ecological perspective (Bronfenbrenner, 1979) to investigate how risk factors interact to influence outcomes (Appleyard, Egeland, Dulmen, & Alan Sroufe, 2005). Risk factors considered for this thesis are those that influence compromised caregiving and child outcomes.

Oyen and colleagues (2000), examining caregiving capacity in 30 at-risk mothers, found maternal sensitivity was negatively correlated with a greater number of risk factors. This earlier research findings indeed supports one of the key findings from Cyr and colleague's meta-analysis, which was that the effect of cumulative risk on poor child outcomes as a result of compromised caregiving was significant ( $d = 1.20$ ) (Cyr et al., 2010). Salo and colleagues (2010) also found support for multiple risk exaggerating the effect of compromised caregiving, with mothers rating poorly on all seven domains of EAS (Biringen, 2008) when exposed to a greater number of psychosocial risk factors (including substance use). These mothers also were more likely to be involved with child protection services and to have had their child or children removed from their care.

In summary, the quality of maternal caregiving is important for optimal child development. When a child suffers adverse childhood experiences this impacts their lifelong psychological, social and emotional outcomes, and these consequences are important during their own childbearing years. In Chapter 3, substance misuse will be discussed in relation to the quality of caregiving and the impact on children outcomes.

### **Chapter 3: Quality of Caregiving in Substance Misusing Mothers: A Special Case of High Risk Mothers**

A substantial body of research indicates that the quality of caregiving in women with substance misuse problems can often be compromised, resulting in caregiving that is insensitive and at times hostile and/or intrusive. Notably however, there appears to be considerable variability in the quality of caregiving in substance abusing women. Given the literature reviewed in Chapter 2, it is proposed that some of this heterogeneity may be attributable to other co-existing risk factors that are well documented in women with substance misuse problems, namely: (i) maternal childhood trauma including exposure to inconsistent caregiving, (ii) maternal psychopathology – depression and personality pathology with the extreme end of the continuum resulting in borderline personality disorder (BPD) and (iii) environmental risk that includes financial disadvantage, limited or no employment, overcrowded housing, sole parenting, low educational attainment, life stress with limited social support, and, if they have a partner, his misuse of substances. The overarching model guiding this thesis is drawn from a wide body of theoretical literature that has emphasised the important of the interaction between proximal factors such as maternal sensitivity caregiving behaviour and maternal psychopathology within a wider ecological context (e.g., Belsky, 1984; Bronfenbrenner, 1979; Sameroff, R. Seifer, Baldwin, & Baldwin, 1993). Therefore, this thesis will be looking at the impact on child developmental outcome of those factors. This chapter will firstly provide a review of the literature relating to the co-occurrence of each of the above factors and secondly, review the extant literature relating to the quality of caregiving in mothers with substance misuse problems.

#### **Experience of Maternal Childhood Trauma in Women with Substance Misuse Problems**

Well established literature, including epidemiological, biological and cross-sectional studies (Barrett et al., 2015; Teesson & Proudfoot, 2003), supports the relationship between

early childhood adversity and childhood trauma with later development of substance use (Dube et al., 2003). Barrett and colleagues reported on data collected in 2007 ( $N = 8841$  adults) from the Australian National Survey of Mental Health and Wellbeing, where 41% of respondents reported being exposed to a traumatic event before the age of 17 years and 20% prior to the age of 9 years. The most common childhood trauma experiences included sexual misuse, witnessing a serious injury and in the extreme cases, death, and the unexpected loss of a loved one. Notably, 53% of these respondents, compared with 24% who had not experienced a childhood trauma, met diagnostic criteria for a range of disorders including substance use disorder (29%), major depressive disorder (21%) and post-traumatic stress disorder (13%). Indeed, after controlling for demographics, an individual was 3.6 times more likely to experience mental health issues including substance misuse, when having experienced childhood trauma than those not having experienced a traumatic childhood.

The evidence for the relationship between childhood trauma and later addictive behaviours has also been found at a biological level. When children, especially infants, are exposed to continuous and severe trauma and/or stress, a series of biological responses involving the neuroendocrine system is activated that can compromise brain development (Teicher & Samson, 2016). Significant work to date has investigated the relationship between stress and underlying neurobiological systems in both clinical and preclinical studies (Gunnar & Quevedo, 2007), some with a specific focus on early stress and self-administration of cocaine (Enoch, 2011). See Enoch (2011 for a comprehensive review of this literature). Importantly, this review highlights the impact of stress and trauma on early brain development, shaping intrinsic functions such as affect regulation, attention and stress regulation in the context of attachment relationships, especially when substance misuse is also present.

A number of longitudinal studies have investigated the relationship between exposure to child misuse and subsequent adult outcomes. For example, women with a documented history of childhood maltreatment were significantly more likely to report substance misuse issues or a substance related disorder at 40 years of age, according to White and Widom (2008). Herrenkohl and associates (2013) found that after controlling for age, SES, marital status and educational attainment, adults who reported a history of childhood trauma were significantly more likely to be at risk of developing a substance related disorder. Further, this risk was even greater for adults who had been involved in the child protection system, which may have involved additional exposure to a range of risk factors that included unstable living conditions and attachment related issues. Lindberg and Zeid (2017), using pathway analysis, identified a pathway to substance misuse that began with an insecure parental attachment as a product of adverse childhood traumatic events.

### **Comorbid Psychopathology and Maternal Substance Misuse**

Substance misuse is associated with high levels of comorbid psychopathology (Huang et al., 2009), which includes both Axis 1 and Axis II disorders when using the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV-TR; American Psychiatric Association, 2000) and as a differential diagnosis using the current diagnostic nomenclature in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5; American Psychiatric Association, 2013). Approximately one in four people with a substance misuse disorder also have at least one other mental disorder (Teesson & Proudfoot, 2003). From a recent systematic review, clients with substance misuse history report up to 85% having a depressive symptomatology and 75% with anxiety related issues (Axis 1 disorders) (Kingston, Marel, & Mills, 2016). There is also high comorbidity of substance misuse with Axis 2 diagnoses, for example, between 14% and 72% of substance users also have a diagnosis of borderline personality disorder (Links, Heslegrave, Mitton, Van Reekum, &

Patrick, 1995; Sansone & Sansone, 2011; Trull, Sher, Minks-Brown, Durbin, & Burr, 2000). A key component of BPD is impulsivity, which has also been associated with persistent substance misuse (Bornovalova, Lejuez, Daughters, Rosenthal, & Lynch, 2005; Dawe, Gullo, & Loxton, 2004). When impulsivity and negative affectivity interact, as discussed in Chapter 2, compromised caregiving occurs in the form of a frightening and inconsistent interaction style (and at the extreme, maltreatment), leading to poor child outcomes.

The aetiology of personality disorders is likely to lie in childhood experiences associated with trauma and disrupted attachment relationships (Fonagy, 2003; Fonagy et al., 1996; Fonagy, Luyten, & Strathearn, 2011; Fonagy et al., 2003). Thus, it is not surprising that only 21% of people with addictive (and related) disorders report secure attachment with 51% insecure-dismissive and 29% insecure-preoccupied (Bakermans-Kranenburg & van Ijzendoorn, 2009).

Thus many factors have been seen to affect caregiving. These include the impact of personality pathology on caregiving (Crandell et al., 2003; Hobson et al., 2005), the high comorbidity between personality pathology, in particular BPD and substance misuse (Haller & Miles, 2004; Links et al., 1995; Sansone & Sansone, 2011; Trull et al., 2000), the potential for disruptive attachment styles and a failure to engage with or have sufficient social support. Therefore, it is proposed that a key way forward in understanding the development of caregiving in substance misusing women would be to investigate the relative contributions of these factors on the quality of caregiving and, in turn, on infant outcomes.

### **Psychosocial Risk and Environmental Adversity in the Lives of Women with Substance Misuse Problems.**

There is considerable evidence for the association between exposure to psychosocial risk and environmental adversity for women with a substance misuse history. Attempting to disentangle the influence of broader environmental adversity and stressors associated with substance misuse is difficult (Dawe, Harnett, & Frye, 2008). Women using illicit substances

are associated with poverty, have fewer years of education, experience their first pregnancy at a younger age and parent on their own (Kettinger, Nair, & Schuler, 2000), therefore limiting/or having no opportunity to gain employment. This may result in homelessness or overcrowding (i.e., couch surfing), and require engagement in criminal activities to support this substance use and dependence (Loxley et al., 2004). Many substance misusing mothers experience domestic violence. Domestic violence is associated with significant mortality and morbidity amongst women, with an expected 20% of women being subjected to domestic violence for the first time during pregnancy (Quinlivan & Evans, 2005). Partner alcohol and drug use is associated with an increased risk for intimate partner violence, including physical, sexual and psychological aggression (Moore, Easton, & McMahon, 2011). As discussed in Chapter 2, any one of these risk factors can impact caregiving quality, but when there is an accumulation of risk factors, as often seen with substance misusing mothers, how they live on a daily basis poses many challenges. This is the focus of this section.

Women with illicit substance use problems face a range of health problems, including contracting hepatitis B and C from either unsafe sexually practices and/or reuse of infected syringes (Centers for Disease Control and Prevention, 2011). Lifestyle factors associated with illicit drug use also include increased risk of exposure to violence and revictimisation, especially if the women have also been exposed to childhood trauma (Widom et al., 2008). Acute intoxication is associated with increased family conflict, intentional or unintentional injury to themselves or others, and participating in reckless and at times risky and illegal behaviours (e.g., prostitution) (see review by Loxley et al., 2004). These women often find themselves involved in the criminal justice system, and if also faced with an unplanned pregnancy, often resist reaching out for help and treatment for fear of the removal of their child or children (Powis, Gossop, Bury, Payne, & Griffiths, 2000), thus perpetuating their social isolation and disadvantage.

The stigma associated with substance misuse, particularly intravenous drug use, is a key component that isolates women from their family, friends and community (Loxley et al., 2004). Typically, substance using mothers have little engagement in a range of activities, for example, play groups, community fun days and school functions and hence their perception of the availability of social support is limited (Dawe et al., 2008). Indeed, Suchman and colleagues (2005) found in a sample of 125 methadone maintained mothers that a poor attachment relationship with their own family negatively influenced their perception of the availability of support in their daily lives, consequently impacting on family functioning.

The ability to function on a daily basis will be also impacted by the level of intoxication (e.g., extreme drowsiness and impaired concentration and attention), or withdrawal symptoms (e.g., agitation, restlessness and impaired judgement) (Dawe et al., 2008). In either state, substance using mothers are less likely to be engaged in functional work either in the home or in outside employment and as a result experience financial disadvantage, homelessness and poverty (Human Services Community Services, 2010). These factors, pose an increased risk of compromised caregiving and poor child outcomes in isolation let alone combined, as previously discussed ( Eiden, Godleski, Colder, & Schuetze, 2014; Hans, Bernstein, & Henson, 1999; Nair, Schuler, Black, Kettinger, & Harrington, 2003; Yumoto, Jacobson, & Jacobson, 2008).

### **Consequences of Substance Use in Motherhood.**

It is estimated that 2.2% of women who present to a maternity unit for delivery in Australia (i.e., approximately 6,720 annually) will report some form of illicit drug use or meet criteria for a substance use disorder (Australian Bureau of Statistics, 2016; Australian Institute of Health Welfare, 2014). Maternal substance use is strongly associated with subsequent child maltreatment (Suchman et al., 2005) and hence such mothers often have

involvement in child protection services. Statistics regarding this population of mothers reveals:

- an estimated 73% - 80% of referrals to Australian child services involve parental substance use (Australian Institute of Health and Welfare, 2005; Sarlos, 2003);
- children of substance using mothers are 12 times more likely to be identified by child protection services or have a substantiated report made against them in comparison to non-substance using mothers (McGlade, Ware, & Crawford, 2009);
- up to 20% of cocaine-using mothers lose custody of their children in the first postnatal month (Eiden, Foote, & Schuetze, 2007);
- approximately 25% of children of substance using mothers have received no health check by the age of two years (Callaghan, Crimmins, & Schweitzer, 2011); and
- involvement with child protection services declines in methadone-using mothers when involved in regular child health checks, in contrast to no change when mothers were using illicit substances (Callaghan et al., 2011).

Hence, when considering this information, it is reasonable to assume that child outcomes associated with maternal substance use are often poor and often resulting in child removal from the family of origin. These children frequently experience a range of detrimental outcomes and adverse psychosocial problems. The next section provides a detailed review of studies that assess the quality of caregiving in substance abusing mothers.

### **Studies of Caregiving Based on Observations of Mother-Infant Interactions in Substance Abusing Mothers**

There have been a number of studies investigating the quality of mother-infant interaction in substance abusing mothers and whilst several different observational systems

have been used, there has been a focus on the construct of maternal sensitivity. Despite observational methods' use of a range of coding systems, there is a clear link across studies as maternal sensitivity and responsiveness to an infant or toddler is considered the key process variable (see Table 1). A smaller number of studies have investigated infant outcomes by using Ainsworth's attachment classification system score, following the strange situation procedure (see Table 2). Notably, while there are high rates of poor quality caregiving in this population, this is not a universal finding.

### **Studies using Ainsworth's Maternal Sensitivity Scale.**

Four studies have used Ainsworth's Maternal Sensitivity Scale as the key outcome measure to investigate the quality of caregiving in substance using women (Beckwith, Howard, Espinosa, & Tyler, 1999; Fineman, Beckwith, Howard, & Espinosa, 1997; Tyler, Howard, Espinosa, & Doakes, 1997; Uhlhorn, Messinger, & Bauer, 2005). The first of these (Tyler 1997) compared caregiving quality and infant outcomes at 6 months in mothers who retained the care of their infants compared with caregiving quality and infant outcomes for those removed to foster care with a relative. Notably, maternal sensitivity was less than optimal in both groups with child developmental outcome poorer in infants in foster care. Uhlhorn and associates (2005) also failed to find differences in maternal sensitivity between cocaine using mothers and a matched control group. Once again, there appeared to be suboptimal caregiving for both groups with scores on the maternal sensitivity scale similar to those found by Tyler's team (1999).

Beckwith and associates (1999) in a sample of polysubstance using women found that prenatal scores on paranoia but not dysthymia were related to a composite index of maternal sensitivity. Further, there was a direct path between prenatal paranoia and child development at 6 months and a mediating relationship between sensitivity and child development. Fineman and colleagues (1997) looked at the quality of caregiving at one month in low income

women, most of whom were polysubstance misusers, predominantly cocaine, alcohol and marijuana. Somewhat perplexing findings were obtained. Neither maternal history of trauma nor a composite measure of the severity of addiction was associated with maternal sensitivity. However, maternal drug use measured using the Millon Clinical Multiaxial Inventory (Millon, 1994) and poor ego development measured prior to birth of the infant was predictive of maternal sensitivity at one month. These four studies highlight the poor quality of care in ultra-high risk infants (Tyler et al., 1997; Uhlhorn et al., 2005) that appears to be influenced by personality characteristics such as paranoia (Beckwith et al., 1999) or ego development (Fineman et al., 1997).

### **Studies using the CARE Index.**

A measure conceptually related to the Maternal Sensitivity Scale, the CARE Index, has also been used to assess the quality of caregiving. In a series of studies (Pajulo et al., 2012; Pajulo et al., 2011; Pajulo et al., 2008) investigating psychiatric and historical factors pre- and post-delivery, Pajulo and colleagues (2008, 2011) found that over half of the substance abusing mothers in a residential treatment setting showed maternal sensitivity that was classified as “high-risk”. Further, this was strongly associated with global measures of post-natal psychiatric symptoms (Pajulo et al., 2011). The construct of reflective functioning, that is the capacity to understand one’s own and other’s mental states, such as feelings, beliefs, intentions and desires and to reason about one’s own and others’ behaviour in relation to mental states, was investigated in the pilot study in 2008 and a later paper. Pajulo and colleagues (2012) found that reflective functioning increased during residential treatment, and that substance use and maternal trauma history were predictive of improvements. Further, lower reflective functioning was associated with relapse post treatment (Pajulo et al., 2012).

**Studies using the Parent-Child Early Relational Assessment (PCERA).**

Five studies using the Parent-Child Early Relational Assessment explored the interactive behaviour of substance abusing mothers and their infants (Burns, Chethik, Burns, & Clark, 1997; Eiden, Schuetze, & Coles, 2011; Pajulo et al., 2001; Savonlahti et al., 2005; Siqueland, Smith, & Moe, 2012). The Parent-Child Early Relational Assessment was developed to assess the dynamic relationship between mothers and their infants using observational codes that assess maternal behaviour, infant behaviour and dyadic interaction. In a small sample of 10 cocaine using mothers and 10 matched comparison non-drug using mothers, Burns and colleagues observed that drug using mothers experienced less pleasure and enjoyment during dyadic interactions; however, no difference was found on infant ratings between the two groups at 12 months. A later and larger study following mother-infant dyads (119 cocaine exposed and 101 non-cocaine exposed) over a 13 month period exposed the impact of infant factors when examining maternal sensitivity (R. Eiden, P. Schuetze, & C. D. Coles, 2011). Eiden and associates found, irrespective of drug use, a relationship between insensitive caregiving at one month, infant reactivity at 7 months and decreased warm and sensitive caregiving at 13 months. Furthermore, infant reactivity moderated the relationship between prenatal cocaine use and maternal sensitivity at 13 months.

These results further support the role infant factors play in eliciting insensitive maternal caregiving when mothers are experiencing distress in their daily lives (Sarfi, Smith, Waal, & Sundet, 2011). Furthermore, these results have implications for parenting interventions when there is a dyadic mismatch, especially if infants are irritable and hyper reactive and mothers do not have the emotional resources to cope with these infants' demands (Tronick et al. 2005).

Pajulo and associates (2001) compared maternal-infant interactions in a small sample of mothers with alcohol and drug use problems in a residential treatment facility with a comparison, low risk group matched on maternal age and baby gender. Not surprisingly,

there were significantly more scores on the Parent-Child Early Relational Assessment that were classified as “concern scores” for substance using mothers in contrast to the low risk comparison group. Notably, they also scored significantly higher on measures of depression and reported less social support and more issues relating to social and relationship problems. Similar results were found by Savonlahti and colleagues (2005) in a pilot study (with 14 high risk and 12 non-drug using mothers) in a newly established residential treatment facility for substance-dependent mothers in Finland, where the comparison group were recruited from well-baby clinics. They found that the high-risk group compared to the non-drug using mothers had significantly higher levels of dyadic interactive deficiencies (i.e., lack of mutuality and flat affective tone of interaction). However, the interactive abilities of infants in both groups did not differ. Furthermore, the high risk group was more withdrawn and depressed and had fewer social support networks (Savonlahti et al., 2005).

The difficulties relating to social and relational issues were also highlighted in a recent study by Sigveland and team (2012) in a study of mothers with substance use problems during pregnancy and psychiatric problems. In comparison to mothers recruited from a well-baby clinic, the substance using mothers showed poorer scores on measures of dyadic interaction, psychiatric and addiction variables and a measure constructed to assess historical and current relational experiences with parents, siblings, partners and other significant others.

Importantly, this measure of relational experience acted as a mediator between mothers’ group status (substance using or comparison) and maternal sensitivity whilst psychiatric measures were not related to maternal sensitivity. This finding differs from previous studies where psychiatric issues, in particular personality pathology features, have been consistent predictors of maternal sensitivity (Beckwith et al., 1999; Fineman et al., 1997; Hans et al., 1999). However, it is possible that the measure of relational experience tapped into an underlying construct relating to maternal reflective functioning. The authors

allude to this by discussing the potential link between relational difficulties linked to a history of uncaring relationships that in turn impacts on a mother's mental representation as parent that restricts the capacity to provide sensitive caregiving.

### **Studies using the Emotional Availability Scales (EAS).**

A measure of the quality of caregiving in substance misusing mothers, also based on the dynamic nature of mother-child relationships, is the Emotional Availability Scales (EAS; (Biringen, 2008; Biringen & Robinson, 1991). Biringen's construct of emotional availability reflects an integration of attachment and emotional availability perspectives. The latter emphasises the emotional tone of interactions as a barometer of the parent/child relationship quality. As with the measures discussed above, the quality of the interaction was coded following video recording of mother-infant interactions using four scales that measure parent behaviour: parental sensitivity, structuring, non-hostility and non-intrusiveness and two scales that measure infant/child behaviour: child responsiveness and child's involvement with the parent.

In an early study using the EAS, Howard and associates (1995) investigated the relationship between quality of caregiving, psychiatric symptoms, gestational age and birth weight on infant development at 6 months in 51 cocaine using mothers (Howard et al., 1995). Both birth weight and maternal sensitivity were associated with infant development and in a separate series of analyses, higher scores on the personality scales of the Millon Clinical Multiaxial Inventory were associated with poorer quality of caregiving (i.e., sensitivity, structuring and negative regard). Notably, mothers scoring higher on the Addictive Severity Index had higher scores on measures of caregiving leading the authors to suggest that this may have reflected a greater understanding of the impact of substance misuse on the parenting role. Salo and associates (2009) compared emotional availability, maternal self-efficacy beliefs and child outcomes at 3 years in three groups of mothers: mothers maintained

on opioid substitution therapy, foster carers of prenatally drug-exposed children and mother-infant dyads with no drug exposure. Mothers on opioid substitution therapy scored lowest on all domains of EAS compared to the foster mothers and non-using mothers. In particular, mothers on opioid substitution therapy were significantly more insensitive and hostile and their toddlers were significantly less involved and responsive to maternal interactions. Also, mothers on opioid substitution therapy were less confident in their mothering ability and their toddlers' cognitive and language abilities were significantly lower compared to the non-using group.

These findings were replicated and extended by Salo and team (2010) in research of infants' cognitive ability (aged 6 to 12 months) and maternal emotional availability in opioid exposed infants born to mothers on buprenorphine replacement therapy. Compared to depressed mothers and non-drug using mothers, mothers on opioid substitution therapy scored lowest on EAS measures and their infants had poorer developmental outcomes. In particular, mothers were significantly less sensitive, more intrusive and hostile and found it difficult to structure the environment in order to facilitate normal infant development. Fraser and colleagues (2010) in a study of substance using mothers in residential treatment, found that compared to non-drug using mothers matched on age, educational level and race, drug using mothers scored lower on sensitivity and on a composite measure of emotional availability (Fraser, Harris-Britt, Thakkallapalli, Kurtz-Costes, & Martin, 2010). Substance using mothers had higher scores on depression. Although there was no significant correlation between depression and maternal sensitivity, there was an association between depression and intrusiveness. In summary, these findings suggest that emotional availability is significantly poorer in women with substance use problems (Fraser et al., 2010; Salo et al., 2009; Salo et al., 2010). One early study (Howard et al., 1995) supports other research

reviewed suggesting that personality pathology influences emotional availability (see Appendix one for review of EA studies for at-risk populations).

### **Miscellaneous Measures of Caregiving Quality.**

In addition to the measures described above, there have been a series of studies that have used purposely designed measures of caregiving. Again the findings are somewhat inconsistent. Mayes and colleagues (1997) found that compared to polydrug using mothers without cocaine use and non-drug using controls, polydrug using mothers with ongoing cocaine use showed significant differences on indices of caregiving, including being less attentive in their interactional style (Mayes, Bornstein, Chawarska, & Granger, 1995). At six months they were also more likely to interrupt interactions by looking away or withdrawing whilst polydrug using women and controls showed improvement in both their attentiveness and in maintaining interactions. Notably, infants of polydrug mothers with ongoing cocaine use were less ready to interact at 6 months compared to mothers in the other two groups. In a follow up study of these infants at 18 months, Molitor and Mayes (2010) found impaired caregiving on measures of interactive competence and maladaptive engagement in both drug using groups, although this was particularly pronounced in mothers with cocaine use (Molitor & Mayes, 2010). Similar findings were obtained on ratings of toddler behaviour on measures of responsiveness and active positive engagement with mothers, although not on a measure of organised and sustained play.

Blackwell and colleagues (1999) investigated maternal sensitivity over the first nine months postnatally in 25 cocaine exposed dyads in an outpatient early drug intervention program (Blackwell, Lockman, & Kaiser, 1999). Substance abusing mothers showed consistently lower rates of maternal sensitivity compared to a normed comparison group. Further despite remaining in treatment, maternal sensitivity decreased over the nine month assessment period. Adding to these findings, Minnes and colleagues (2005) found that

cocaine using women were less sensitive to their infants at 6 months compared to a matched control group and that sensitivity had decreased further at 12 months. Of particular importance was the negative correlation between the maternal dose of cocaine, indexed by cocaine metabolite concentration in infant meconium, and parental sensitivity to infant cues, underscoring the potential dose response effect of cocaine use (Minnes, Singer, Arendt, & Satayathum, 2005).

Tronick and team (2005) also found lower sensitivity in cocaine using mothers compared to both opiate users and non-users. Maternal sensitivity was measured by an experimental procedure that involved 2 minutes of play interaction followed by 2 minutes of still face and concluding with 2 minutes of reunion interaction (see Tronick, Als, & Brazelton, 1978). Mothers and infants were coded on the extent to which they were matched on three engagement states: neutral, negative and positive, in real time. Mismatches were higher among cocaine exposed dyads, with more infants showing a neutral response and mothers showing a negative response. Further, there were indications that when classified into heavy and some cocaine use, infants of mothers in the heavy cocaine use group showed more passive behaviour and withdrawal during the reunion phase. Although these effects are small, this study adds to a growing picture of disrupted mother-infant attachment in cocaine using mothers. Notably, there were few differences between mothers on opiates and non-drug controls, except in relation to child protection involvement, with 36% and 25% of cocaine using and opiate using mothers respectively having child protection involvement compared to 12% of comparison mothers.

Ball and colleagues (1997) compared 37 cocaine exposed mothers with 27 matched non-cocaine users during interactions with their infants at 3, 6, 12, and 18 months of age and found cocaine exposed mothers to be less attentive at three months compared with non-cocaine users. However, when maternal attentiveness was measured at the later time points

there were no differences recorded between the two groups (Ball, Mayes, DeTeso, & Schottenfeld, 1997). Although maternal depression was related to decreased maternal attentiveness, Ukeje and colleagues (2001) found no difference in overall caregiving (e.g., warmth, negative affect, structuring and inattentiveness) between cocaine exposed mothers and non-exposed mothers. However, they did identify infants of cocaine exposed mothers to be three times more likely to ignore the advances of their mother to interact and to be unresponsive when their mother leaves them unattended (Ukeje, Bendersky, & Lewis, 2001). Also, this group of children were found to have an increased risk of neonatal medical complications (e.g., low birth weight, foetal anomalies, feeding problems, respiratory problems and seizures). Similarly, Uhlorn and colleagues (2005) found no difference between cocaine exposed and non-exposed mothers on maternal sensitivity, maternal verbalisation and child responsiveness.

Hans and associates (1999) examined the quality of caregiving in methadone maintained mothers compared with non-drug using controls. Methadone maintained mothers were significantly less sensitive and responsive and harsher and more negative in their interactions with their children. Notably, however, comorbid personality disorder features contributed more variance to the quality of caregiving than drug use per se. Cluster B symptoms describing emotional, erratic symptoms associated with BPD in particular, were related to less sensitive parenting and more harsh negativity. Substance abusing mothers (38%) were also less likely to retain custody of their children in comparison to non-using mothers (81%) over the 10 years (Hans et al., 1999). Similarly, Sarfi and colleagues (2011) also found no differences in caregiving when comparing mothers on methadone or buprenorphine replacement therapy with a non-matched low-risk group. Notably however, mothers on methadone or buprenorphine had higher levels of parenting stress, which was an independent predictor of caregiving across the total sample (Sarfi et al., 2011).

Eiden and colleagues (2011) examined maternal aggression and negative affect from a series of observational contexts at 13 and 24 months in 119 cocaine exposed dyads and 101 non-cocaine using dyads. Furthermore, toddler physiological responsivity (heart rate, respirations and electrocardiograph) during the play interactions was measured at 13 months; with toddler aggressiveness measured at 24 months. Results indicated that maternal aggression in its relationship to maternal cocaine use was mediated by higher maternal negative affect (i.e. expressions of displeasure and criticism, expressed negative affect, with angry and/or hostile tones of voice) toward the infant during play interactions as well as lower infant autonomic regulation (Eiden, Schuetze, Colder, & Veira, 2011). These findings are consistent with the other findings where cocaine using mothers displayed higher negative engagement with their infant during the still-face paradigm (Tronick et al. 2005), were less responsive to infant distress (Minnes et al. 2005) and their caregiving was more maladaptive with less interactive competence (Molitor et al. 2010).

In a later study using a teaching task, Borelli and colleagues (2012) in 47 methadone maintained mothers, found support for teaching the use of positive language (more frequent positive feeling words and less frequent negative emotion words) in improving maternal sensitive caregiving with children under three. Indeed, positive feeling words partially mediated the relationship between maternal reflective functioning (the process by which an individual attempts to understand her own and others' thoughts and feelings that influences behaviour) and insensitive caregiving. In other words, it is imperative that high risk mothers understand sensitive caregiving is displayed not only in one's actions but also in tone of voice and language used (Borelli, West, Decoste, & Suchman, 2012).

In summary, this research demonstrates that cocaine use is associated with impaired caregiving, with at least two studies highlighting the relationship between severity of use and quality of caregiving (Minnes et al. 2005; Tronick et al. 2005). Notably, opiate dependent

women who are engaged in methadone treatment show less impairment in the quality of caregiving than cocaine using women (Tronick et al. 2005), and while quality of care is compromised in opiate using mothers compared to controls, it is notable that certain factors are strongly predictive of compromised care. These are severity of comorbid psychopathology (Hans et al., 1999; Sarfi et al., 2011) and infant factors such as low birth weight and infant responsivity (Uhlhorn et al., 2005; Ukeje et al., 2001).

### **Studies Investigating Infant Attachment Outcomes in Substance Using Mothers**

(refer to Appendix 1, Table 2)

Poor caregiving quality results can result in poor outcomes for children, including maltreatment (Dunn et al., 2002), which in turn can result in the removal of the child to foster care and other child protection involvement (Tronick, Messinger, Weinberg, et al., 2005; Tyler et al., 1997), cognitive and language difficulties (Salo et al., 2009), infant irritability (Eiden, Granger, Schuetze, & Veira, 2011), maladaptive engagement (Molitor & Mayes, 2010) and later psychopathology (Dutra, Bureau, Holmes, Lyubchik, & Lyons-Ruth, 2009; Huang et al., 2011). Substance misusing parents are over represented in the child protection system sharing many of the characteristics associated with poor quality caregiving including having a history of child maltreatment themselves; personality psychopathology, impulsivity issues, emotional dysregulation, poor cognitive functioning coupled with comorbid psychopathology (Ammerman, Kolko, Kirisci, Blackson, & Dawes, 1999). The additional factors that are often unique to substance users are anti-social personality and drug seeking behaviours that are often associated with criminal behaviours. An outcome of child maltreatment as a result of poor quality caregiving is poor attachment relationships and disorganised attachment styles (van Ijzendoorn et al., 1999). This was observed in a number of studies (Bergin & McCollough, 2009; Espinosa, Beckwith, Howard, Tyler, & Swanson, 2001; Swanson, Beckwith, & Howard, 2000). Rates of disorganised attachment styles in

children prenatally exposed to substance use were as high as 45% to 49% (refer to Appendix 1, Table 2).

However, these results are also not consistent. In a large prospective study ( $N = 860$ ) followed children exposed prenatally to cocaine, opiates and other substances (e.g., alcohol) from 18 months to 3 years to explore the factors (e.g., child temperament, child behaviour problems and caregiver's self-esteem) which may influence the stability of attachment classifications over time (Seifer et al., 2004). There were particularly high rates of secure attachment at both time periods (i.e., secure = 65%, 69%; ambivalent = 8%, 14%; avoidant = 11%, 9%; and disorganised = 12%, 6%, respectively). It is important to note that over 60% of the sample were abstinent from drug use at both 18 and 36 months (Seifer et al., 2004). However, infants of mothers identified as using both cocaine and opiates were rated as the least securely attached, but when mothers were also consuming large amounts of alcohol, there was an increased association with infants rated as disorganised. Also of note, infant disorganised classifications at 18 months were associated with decreased caregiver engagement and flexibility.

Bergin and McCollough (2009) specifically looked at the predictors of adverse child outcomes in infants prenatally exposed to maternal polysubstance misuse with a matched group of non-drug exposed infants. At 12 months of age, 49% of maternally drug and 45% of non-drug exposed infants were classified as disorganised with only 29% and 37% identified as securely attached respectively (Bergin & McCollough, 2009). Notably, scores of maternal sensitivity and involvement did not differ between the two groups, with both groups rating low on both domains. In addition, regression analyses revealed that quality of caregiving predicted was the strongest predictor of infant attachment over alcohol consumption and cocaine use. This implies that irrespective of maternal substance use, mothers in a high-risk context who display low-quality caregiving need intervention to enhance their caregiving, to

facilitate the best outcomes for their children and provides the underpinnings for the current thesis' examination of the mechanisms by which quality of caregiving is influenced.

### **Summary**

In summary, there is an association between adverse childhood trauma, current psychosocial risk and environmental adversity and comorbid psychopathology, including personality pathology and in particular substance misuse which contribute negatively to providing quality caregiving. Results from a substantial body of research converge to reveal that many substance abusing mothers are both less sensitive and less responsive, and more hostile and more intrusive during mother-child interactions than non-substance abusing mothers and mothers who are low substance users. Furthermore, this pattern of results is apparent in observational studies using a diverse range of measures which have assessed the quality of mother-child interactions at different ages, ranging from one month postnatal to early childhood, whether in a structured or free play situation, teaching, feeding or simulating a stressful mother-infant interaction.

However, it is also important to note the inconsistent findings in the literature review with reference to caregiving in substance abusing mothers. Substance misuse is not consistently associated with decreased caregiving skills, in that in some studies there is no difference in caregiving skills compared with non-drug using mothers. Why is there this discrepant finding across studies? Clearly a number of factors could be involved including severity of drug misuse, the substance itself (e.g., cocaine), socio-economic and demographic factors and maternal factors linked to compromised caregiving, including exposure to childhood adversity and comorbidity.

### **Aims of the Thesis**

The overarching goal of the current thesis is to investigate the factors that are involved in quality of caregiving in high-risk mothers. The initial focus will be on mothers with substance misuse problems as they are a population who share many of the well identified factors associated with compromised caregiving. On the basis of the literature reviewed above, the first study in this thesis (Study 1) is a systematic review and meta-analysis of the quality of caregiving in substance misusing mothers. This will lead to two further studies. Study 2 will compare the quality of caregiving in mothers with substance misuse problems, mothers matched on sociodemographic features (i.e., a high-risk group) and a community sample. Further investigation of the relationship between early childhood adversity, borderline personality disorder and environmental risk on quality of caregiving will be undertaken. Study 3 extends this by investigating these factors in a sample of women, with purposive sampling from a high-risk group, to see how these factors impact on quality of caregiving and, in turn, on child developmental outcome.

#### Chapter 4: Quality of Caregiving in Mothers with Illicit Substance Use: A Systematic Review and Meta-analysis

##### Statement of Contribution and Co-Authored Published Paper

**Hatzis, D.**, Dawe, S., Harnett, P., Barlow, J. (2017). Quality of Caregiving in Mothers with Illicit Substance Use: A Systematic Review and Meta-analysis. *Substance Abuse: Research and Treatment*.

This chapter includes a co-authored paper which has been prepared for publication to an international peer reviewed journal (see Appendix D for a copy of the published paper in its original format). The bibliographic details of the co-authored paper, including all authors, are: **Denise Hatzis**, Professor Sharon Dawe, Dr Paul Harnett and Professor Jane Barlow. The candidate's contribution to the paper involved conception of the study design, literature review, data collection and analyses, and writing of the manuscript. The co-authors provided guidance on direction, assistance with analysis interpretation, review of drafts and supervisory advice.



Name of student: Denise Hatzis

Names and signature of corresponding authors of paper:

Professor Sharon Dawe (Primary Supervisor)



Dr Paul Harnett



Professor Jane Barlow



## Introduction

The developmental outcomes of children living in families with illicit parental substance use are significantly compromised with difficulties initially identified in early infancy extending throughout childhood and into adolescence (Dawe et al., 2007). Many areas of children's functioning are compromised including early interaction with caregivers resulting in elevated rates of insecure and disorganised attachment (Beeghly, Frank, Rose-Jacobs, Cabral, & Tronick, 2003; Bergin & McCollough, 2009), performance on tests of cognitive functioning (Arendt et al., 2004; Chiriboga, 2003; Tronick & Beeghly, 1999) and language (Bandstra et al., 2002; Bandstra, Vogel, Morrow, Xue, & Anthony, 2004). The compromised caregiving seen in mother-infant dyads (M. O. Johnson, 2001) has been implicated in poor outcome and high rates of disorganised and insecure attachment (van Ijzendoorn et al., 1999). These difficulties extend into childhood with evidence of difficulties in a range of executive functions (Bridgett & Mayes, 2011), and higher than normal rates of internalising and externalising disorders (Bennett, Marini, Berzenski, Carmody, & Lewis, 2013; D. R. Dixon, Kurtz, & Chin, 2008; R. P. Fearon, M. J. Bakermans-Kranenburg, M. H. van Ijzendoorn, A. M. Lapsley, & G. I. Roisman, 2010).

Extensive research indicates that many of these difficulties are influenced by exposure to an early caregiving environment that lacks sensitive, contingent and responsive maternal caregiving behaviour (Bakermans-Kranenburg et al., 2005). For example, maternal insensitivity is associated with longer-term difficulties (Skovgaard, 2010; Skovgaard et al., 2008) including conflict within parent-child relationships (DeGangi, 2000; DeGangi, Breinbauer, Roosevelt, Porges, & Greenspan, 2000) and internalising and externalising disorders at five years of age (Keenan, Shaw, Delliquadri, Giovannelli, & Walsh, 1998) and beyond (Hemmi, Wolke, & Schneider, 2011).

There has been considerable investigation of the quality of caregiving in substance misusing mothers, although there is also wide variability in the way in which the quality of caregiving has been measured across studies. Substantial variability in sample size, populations studied and the quality of the study design, have contributed to mixed findings. An early narrative review of research studies published between 1990 and 1999 by Johnson (M. O. Johnson, 2001) provided an integrative synthesis of 23 studies in which mother-infant interaction had been measured. Fifteen of these studies were longitudinal or cross sectional in design and focused on correlational associations between maternal characteristics and quality of caregiving. Notably, only eight studies were included where there had been a direct comparison of mother-infant interaction in substance misusing and non-substance misusing mothers. While six of these studies found poorer quality caregiving in the substance misusing mothers, two found that substance-misusing mothers did not differ from a non-substance comparison group in their interactional style (Neuspiel, Hamel, Hochberg, Greene, & Campbell, 1991; Schuler, Black, & Starr, 1995), with both studies using a comparison group that was matched on demographic characteristics.

Since Johnson's review (M. O. Johnson, 2001), studies have continued to show differences in the quality of caregiving (LaGasse et al., 2003; E. Tronick et al., 2005). LaGasse and colleagues (2003) found that cocaine-using mothers were significantly poorer on three of five measures of maternal behaviour during feeding with their one month old infant compared to non-substance using mothers. Prenatal cocaine exposure was associated with poorer ratings of mother-child interactions measured at three years of age (Johnson et al., 2002). Mother-child interactions were poorest for children with prenatal cocaine exposure whose mothers continued cocaine use postnatally, compared with children whose mothers did not use cocaine during pregnancy or at a three-year follow-up visit. Poorer emotional availability was observed in a study of opioid dependent mothers and their seven month old

children compared to non-substance using mothers (Salo et al., 2009). Women who were polydrug and cocaine users during pregnancy have also shown greater dyadic conflict during feeding interactions (R. Eiden, 2001). Contrary findings by Ukeje and colleagues (Ukeje et al., 2001) found compromised care in both substance misusing mothers and a matched comparison group. Thus, it is possible that the poor quality caregiving relationship found in some studies may be more related to the accumulation of adverse environmental risk than maternal substance use per se (R. D. Eiden, S. Godleski, C. R. Colder, & P. Schuetze, 2014; Kettinger et al., 2000).

In summary, there is inconsistency in the results of studies addressing the quality of caregiving in mothers who have used illicit substances. One methodological issue that emerges from our reading of the literature that may potentially help explain discrepant results relates to study design. Studies with greatest methodological rigour have compared substance-misusing mothers with mothers facing similar environmental adversity, while those that are less methodologically robust have drawn the comparison group from a general population of mothers. However, studies also varied on other factors such as the age of children when the quality of caregiving was assessed. Finally, mothers who are engaged in treatment, and particularly residential treatment, may show less compromised caregiving as many treatment services, particularly residential programs, may have addressed parenting as part of the treatment process. Thus, associated improvements in wellbeing (Amato et al., 2005; Mattick, Breen, Kimber, & Davoli, 2009) and parenting practices (Niccols et al., 2012) may influence the quality of caregiving.

The aim of the present study is to assess the extent to which mothers with substance misuse have compromised caregiving. This builds on existing narrative reviews and extends this literature by providing a comprehensive systematic review and meta-analysis of studies that have compared the quality of parent-child interactions (maternal sensitivity and child

responsiveness) in illicit substance misusing and non-misusing groups. Illicit substance use was the focus of this review as there is a range of legal, environmental and lifestyle risks accompanying illicit substance use in women that makes them qualitatively different from women with tobacco or alcohol problems (Powis et al., 2000). The primary aim of the current study was to investigate the quality of caregiving relationship in mothers with substance use problems (including those on opioid replacement therapy) by comparing measures of maternal sensitivity and child responsiveness with mothers who did not have a substance misuse problem. The second aim was to examine factors (moderators) that could influence the quality of the caregiving relationship.

## **Method**

### **Studies**

Studies were included in the review if they included all of the following elements: mothers of children aged birth to three years; mothers who were current illicit substance misusers and/or were on opioid replacement therapy due to a history of opioid dependence and/or were in residential treatment due to a history of illicit substance use; a comparison group of non-substance using mothers was used; there was an assessment of maternal-child interactions using an observational method that was videotaped and subsequently coded to assess quality of maternal caregiving.

### **Outcomes**

The primary outcome measure was maternal sensitivity. This was operationalized as a maternal response to infant or child cues related to maternal warmth in situations of low frustration rather than during situations of frustration or negative affect (Lohaus, Keller, Ball, Elben, & Voelker, 2001). The measure of maternal sensitivity was extracted from a range of observational tasks that included free play, structured play and infant feeding observations. Thus, we selected scores on observational coding systems that explicitly measured maternal

behaviour and affect using terms such as “talks to infant”, “shows pleasure towards infant” and “appears cheerful” (R. Eiden, Stevens, Schuetze, & Dombkowski, 2006, p. 4) “responding to the child’s activity and interests (sensitivity/pacing), positive feelings shown to the child” (Goodman, Hans, & Bernstein, 2005, p. 557). The secondary outcome measure was child responsiveness. This was also required to have been explicitly included as a scale or construct measured in the observational system that rated infant or child responsiveness directly such as “involvement with the mother, positive feelings shown to mother” (Goodman et al., 2005, p. 557), and “child responsiveness indicates how well infant responds to maternal bids and expressions” (Salo et al., 2009, p. 250).

Given the diversity of study populations we identified three potential sources of heterogeneity across studies to test in subgroup analyses; (i) study design (groups matched on key demographic variables v. studies comparing substance misusing mothers with a general population group) (ii) age of child (less than 12 months v. over 12 months and up to 40 months) and (iii) treatment (not in treatment v. currently in outpatient treatment including opioid replacement therapy and/or residential treatment).

### **Search Strategy**

Search terms were identified by (a) an examination of indexing terms in relevant databases; and (b) a preliminary scoping of eligible studies prior to the systematic search. Search terms were combined together with Boolean OR and each set of search terms was then combined with Boolean AND to search across title, abstract and keywords in each search location. There were no restrictions placed on document type. Search terms were (“maternal substance use” OR “maternal drug use” OR “substance using mothers” OR “drug using mothers”) AND (“caregiving” OR “care giving” OR “interaction”). Studies were included if they were in English-language publications and the date range was from 1995 to 2015, (updated April 2016; see Figure 4.1) as this 20 year period reflects the steady increase

in the use of cannabis and the growing use of crack cocaine and heroin that began in the early 90's (United Nations Office on Drugs and Crime, 2016). Studies were identified by searching the following electronic databases: Scopus, MEDLINE, Science Direct, PsycINFO, SpringerLink and Google Scholar. The reference lists of existing reviews and eligible studies were harvested after completion of systematic screening to ensure capture of all eligible studies.

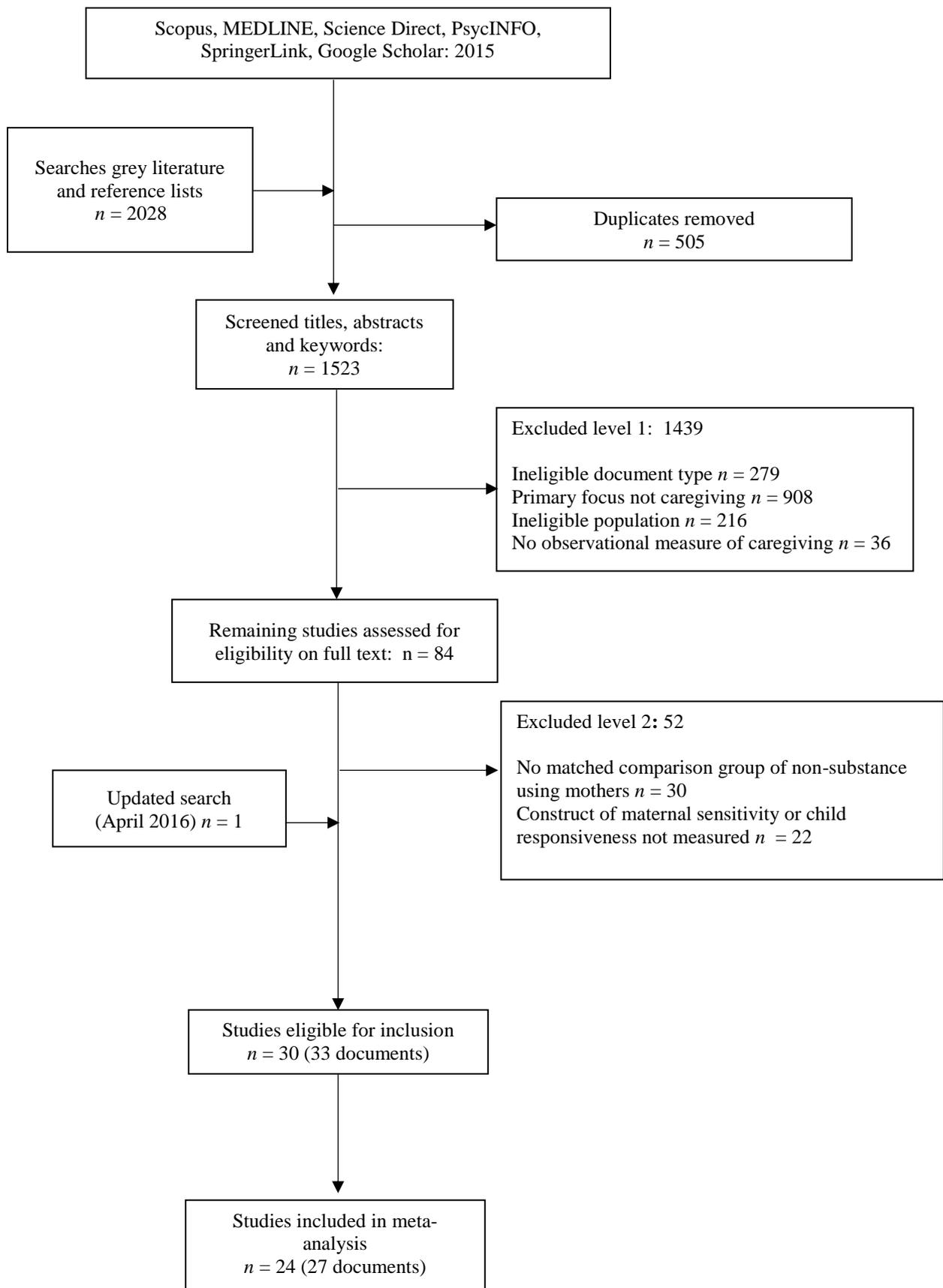


Figure 4.1 Selection process for eligible papers for systematic review and meta-analysis (PRISMA) 2009 flow diagram

### **Study Selection and Data Extraction**

The literature search identified 2028 studies. Figure 4.1 provides a description of the complete selection and exclusion process using Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) (Liberati, Altman, Tetzlaff, & et al., 2009) guidelines. The PRISMA Statement was developed to enhance clarity and transparency of reporting in systematic reviews. It includes a detailed 27-item checklist that provides explanations of the key components that need to be determined in a systematic review and an additional four-phase flow diagram that documents the decision making process in the selection of studies for the review (Moher, Liberati, Tetzlaff, & Altman, 2009). Search results were exported into Endnote Version X7 for Windows and duplicates and ineligible document types (e.g., books) were removed. The remaining records were imported into systematic review management software; *SysReview* (Higginson & Neville, 2014) for initial eligibility screening. Titles/abstracts/keywords were screened and excluded the record if the title and/or abstract and/or keyword indicated that the document was not an eligible document type. Following the completion of title and abstract screening, a full text review was undertaken and data were extracted in a standardised format following the PRISMA guidelines (Liberati et al., 2009). Of the remaining 84 articles, a further 52 documents were eliminated (Level 2 exclusion) reducing the pool to 32 documents. One further study was identified during an updated literature search (April, 2016) and included (see Figure 4.1).

These 33 documents reported the results of 30 unique research studies as three studies had reported on maternal sensitivity across different research reports. Finally, six studies were not included in the meta-analysis as data was not reported or not available from authors due to the passage of time (descriptive characteristics have been included in Table 4.1). Therefore, data from 24 studies were included in the final analysis.

### **Data Synthesis, Study Quality Appraisal and Analyses**

Study quality was assessed using nine of the items from the fourteen-item Quality Assessment Tool for Observational Cohort and Cross Sectional Studies (NIH) (National Heart Lung and Blood Institute, 2014). The excluded items related to aspects of study quality that required a follow up component (e.g., attrition, number of follow up points). The retained items are listed in Table 4.2 Supplementary Table. All meta-analytical calculations were performed using Review Manager 5 (Review Manager (RevMan), 2014). Standardised effect sizes ( $d$ ) were calculated for the included studies. When data on maternal sensitivity was reported at two time points in the same document, data from the second time point was used (i.e., 3 months and 6 months (Pajulo et al., 2001); 3 months and 12 months (T. S. Siqueland & Moe, 2014). On both occasions the second time point was used as this was closer to the mean age of children across all studies. Two studies (LaGasse et al., 2003; E. Tronick et al., 2005) divided their sample into “heavy” and “some use”, and we selected data from the heavy group as this reflected substance use patterns reported in other papers.

A random-effects model was used to calculate effect size due to expected heterogeneity in the studies (Borenstein, Hedges, Higgins, & Rothstein, 2010). Three potential sources of heterogeneity were identified a priori and two were subsequently investigated. The latter were (i) study design (groups matched on key demographic variables v. studies comparing substance misusing mothers with general population) and (ii) age of child (less than 12 months v. over 12 months and up to 40 months) in accordance with recommendations regarding subgroup analyses (Cochrane Handbook; Chapter 9.6.6) (J. P. T. Higgins, Green, & (editors), 2011). It was not possible to test whether treatment was a moderator as most of the studies that were classified as “in treatment” were also included in the subgroup “unmatched”.

A forest plot was calculated in Review Manager 5 (Version: 5.3.5) and the heterogeneity between studies was assessed using the Q statistic and  $I^2$  index. Sub-group

analyses were carried out to investigate sources of heterogeneity. Finally, sensitivity analyses using a priori weight functions were carried out to determine whether the estimates of effect size were likely to be influenced by publication bias (Field & Gillett, 2010; Vevea & Woods, 2005).

## **Results**

### **Study Characteristics and Quality Appraisal**

Twenty-four studies that included a total of 3433 mother-child dyads met final inclusion for the meta-analysis. Of these, 15 studies reported that the mother's primary drug of use was cocaine or a combination of cocaine and other drugs while nine studies reported that the primary drug was an opioid. Studies did not typically use diagnostic nomenclature to describe the study population. Thirteen studies provided information on quantity and frequency plus either urine toxicology, hair analysis and/or meconium testing; one study used clinical assessment to arrive at a diagnosis; nine studies reported that mothers were being prescribed opioid replacement therapy as either an outpatient and/or were currently in a residential treatment facility, one study used prenatal maternal urine toxicology reports to verify substance use. Of all the 17 studies reporting maternal substance use conducted in the United States of America (USA), only three studies had a focus on mothers in treatment. Conversely, all studies conducted outside the USA were conducted in either residential treatment or outpatient opioid replacement clinics (i.e., Finland, four studies; Norway, two studies; Australia, one study). The timing, identification and assessment of substance use also differed between studies. Twelve studies identified and assessed mothers for substance misuse antenatally, two studies reported assessment of substance use both antenatally and postnatally and the remaining ( $n = 10$ ) assessed substance use postnatally. Studies were divided relatively equally between infants less than 1 year ( $n=13$ ) and infants over 1 year ( $n=11$ ). The observational measures all included a measure of the construct of maternal

sensitivity and consisted of Ainsworth's Maternal Sensitivity Measure (n = 2) (Ainsworth, Blehar, Waters, et al., 1978); the Parent-Child Early Relational Assessment (n = 6), P-CERA (Clark, 1985); the Emotional Availability Scales (n = 4), EAS (Biringen, 2008); Still Face Paradigm (n = 1) (E. Tronick et al., 2005); and 11 studies used purposely designed measures of maternal sensitivity. See Table 4.1 for a description of studies.

There was relatively little variability in study quality with all studies scoring a YES on key elements of design (e.g., clearly stated research question; clearly defined population; clearly defined independent and dependent variables (see Table 4.2 Supplementary Table). The one item that showed variability related to study design: namely were participants recruited from the same or similar populations. Fourteen of the studies scored a YES indicating that the samples has been drawn from the same population. However, ten of the studies reported variations in sample characteristics and thus scored NO. This item was subsequently used to classify studies on the basis of matched or unmatched samples for later subgroup analyses.

Table 4.1 Participant characteristics including primary drug used, age, race, recruitment site and description of maternal sensitivity and child responsiveness measures

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
<u>Groups matched on demographic characteristics</u>						
Eiden, Stevens, Schuetze, Dombkowski (2006)	Mean age 31.6 (5.6) - (USA) Cocaine use screened – excluded if pos. for opioids & benzodiazepines. <u>Total sample</u> 72% African American 70% Family assistance Recruited from hospital post delivery	Mean age 29.3 (5.2) No illicit drug use – THC use declined post delivery Matched on same hospital recruitment site, maternal education, age, race and infant gender	Cocaine use measured by TLFB for quantity and frequency: confirmed by urine toxicology 99% and hair analysis 79%	1-2 mths	MIFS: derived a factor score of maternal sensitivity during feeding	Not measured
Eiden, McAuliffe, Kachadourian, Coles, Colder, Schuetze (2009)	Mean age 30.9 (6.0) - (USA) Excluded on screening if pos. for drugs other than cocaine and THC <u>Total sample</u> 74% African American 71% Family assistance Recruited from hospital post delivery	Mean age 28.6 (5.6) Matched on same hospital recruitment site, maternal education, age, race and infant gender	Cocaine use measured by TLFB for quantity and frequency: confirmed for 98% of sample using urine toxicology & hair analysis	7 mths	5 min free play coded using Clark et al. (1980): sensitivity measure	Not measured

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
Eiden Schuetze Cole (2011)	Mean age 31.1 (6.0) - (USA) Excluded on screening if pos. for drugs other than cocaine and THC <u>Total sample</u> 70% African American 81% Family assistance Recruited from two local hospitals post delivery	Mean age 27.9 (5.6) Matched on same hospital recruitment site, maternal education, age, race and infant gender	Cocaine use measured by TLFB for quantity and frequency: confirmed by urine toxicology 55% and 79% hair analysis	13 mths	10 min free play coded using PC-ERA: sensitivity measure	PC-ERA: responsiveness
Fraser, Harris-Britt, Thakkallapalli, Kurtz-Costes, Martin (2010)	Mean age 27.0 (USA) <u>Total sample</u> 60% African American 100% Medicaid eligible Recruited from services aimed to support substance using mothers	Recruited from same two recruitment sites – no differences on age, race, and education	Clinical assessment to arrive at substance use disorder: 95% substance-related disorder: 67% cocaine-related disorder & 67% reported polysubstance use	3.5 mths	10 min free play coded using EAS: sensitivity measure	EAS: responsiveness
French, Pituch, Brandt, Pohorecki (1998)	Age > 20 years (USA) 66% alcohol, THC&/or cocaine THC only (33%). <u>Total sample</u> 67% African American 97% single Recruited at initial prenatal visit	Recruited from same antenatal clinic – matched on parity, age, race, marital status and education	Prenatal urine drug toxicology	Within 24hrs after delivery	Feeding observation using NCAFS prior to intervention: total sensitive scale	NCAFS: total responsiveness

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
Goodman, Hans, Bernstein (2005)	Age range 18 – 35 years (USA) OMT; <u>Total sample</u> 100% African American Recruited from prenatal clinics	Recruited from same prenatal clinics- no differences on race, age, SES, years of education, parity	Self-report of methadone maintained for a minimum period of 6 months prior to pregnancy	12 mths	40 min of structured and unstructured activities: composite score of caregiver communication	PCOG: composite score of infant communication
Hans, Bernstein, Henson (1999)	Mean age 27.7 (3.9) - (USA) OMT. <u>Total sample</u> 100% African American Recruited from prenatal clinic	Mean age 25.7 (3.9) Recruited from same prenatal clinic- no differences on race and SES	Clinic records identified mothers receiving methadone maintenance	Authors report: Standardised and summed 4, 12 & 24 mths	40 min structure and unstructured age appropriate activities: sensitivity responsiveness measure	PCOGS: child perception of mother: accepting
Minnes, Singer, Arendt, Satayathum (2005)	Mean age 29.3 (5.0)- (USA) 100% cocaine + alcohol (87%), THC 53%), amphetamine (1%) <u>Total sample</u> – 81% “nonwhite” All mothers recruited prenatally from a large urban county hospital	Mean age 25.8 (5.0) alcohol (66%), THC (13%) and amphetamine (1%) Recruited from same antenatal clinic - no differences on race, SES status and education attained	Severity of substance use assessed by maternal report and toxicology; heavy use = maternal report > 17.5 units of use or >70 <sup>th</sup> percentile cocaine metabolite in meconium sample	12 mths	Feeding session videoed and coded using NCAFS-sensitive to cues measured	No means provided

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
Schuler, Black, Starr (1995)	Mean age 27.2 (6.4) - (USA) 100% cocaine + 45% heroin + 35% THC 85% African American 95% Single <u>Total sample</u> recruited from same postnatal wards	Mean age 24.5 (5.0) 90% African American 90% Single Did not differ on age, race, education, and marital status	Maternal self-report and infant urine toxicology results	2 wks	Free play mother-infant interaction coded using PCERA: composite scores on positive maternal involvement	PCERA: composite scores on positive infant involvement
Singer, Hawkins, Huang, Davillier, Baley (2001)	Mean age 27.1 (4.0) - (USA) 100% cocaine + alcohol (46%), THC (36%) & barbiturates (12 %). <u>Total sample</u> 100% African American 63% in care of biological mother All recruited from infant admission to NICU for VLBW	Mean age 25.6 (6.0) alcohol (6%), THC (0%) and barbiturates (9 %) 95% in care of biological mother No differences on age, race and SES	Maternal self-report and infant urine toxicology	Close to 40 weeks (gestational age)	Feeding interaction was coded using NCAFS: sensitive to cues	NCAFS: responsiveness
Tronick et al. (2005)	70.3% aged between 26-35yrs- (USA) Predominantly cocaine 77.5 % African American 81.4 % Single 89.8 % Medicaid <u>Total sample</u> recruited from 4 maternity hospitals (MLS study)	4.95% aged between 26-35yrs  75.2 % African American 70.3 % Single 74.3 % Medicaid No differences on race, sex, and gestational age	Maternal self-report and meconium sampling for cocaine or opiate metabolites	4 mths	6-7 min FFSF paradigm: structured interactions coded for maternal engagement	FFSF: reported Infant distancing (avoidance)

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
Uhlhorn, Messinger, Bauer (2005)	68.8% aged between 26-35yrs- (USA) 100% cocaine + alcohol (71%), THC (39%) 72.9 % African American 81.3 % Single <u>Total sample</u> recruited from 4 maternity hospitals (MLS study)	39.0% aged between 26-35yrs Alcohol (35%), THC (4%) 80.5 % African American 71.4 % Single No differences on education level, marital status, SES or race	Maternal self-report or meconium toxicology for cocaine metabolites	18 mths	10 min unstructured play coded using Ainsworth's Sensitivity Rating Scale (1974): maternal sensitivity	Ainsworth: positivity
Ukeje, Bendersky, Lewis (2001)	No Mean provided - (USA) Predominantly cocaine <u>Total sample</u> 100 % African American Recruited from 2 prenatal maternity hospital clinics or just after delivery	Recruited from same demographics: no difference on race	Maternal report of substance use via a structured interview (quantity & frequency) confirmed by meconium toxicology	12 mths	5 min free play interaction, then 2 min separation and 2 min reunion Adapted from Ainsworth (1978): maternal warmth	Ainsworth: positive affect
Veira, Finger, Schuetze, Colder, Godleski, Eiden (2014)	Mean age 31.0 (6.0) - (USA) Predominately Cocaine use. <u>Total sample</u> 74 % African American 71% receive welfare support 60% single All recruited from 2 maternity hospitals after delivery	Mean age 27.7 (5.6) Closest matching comparison family recruited matched on maternal education, maternal race and infant gender	Maternal self-report 2% and 98% via hair sampling	Authors report a mean of 7, 13 & 24 mths	10 min free play interaction coded using Clark et al. (1980): Maternal Sensitivity	Not measured

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
<u>Groups not matched on demographic characteristics</u>						
Johnson, Morrow, Accornero, Xue, Anthony, Bandstra (2002)	Mean age 32.0(4.8) – (USA) 100% cocaine + alcohol (45%), THC (26%). <u>Total sample</u> 100% African American Recruited from hospital post delivery 81% Unemployed	Mean age 27.2 (5.6) alcohol (40%), THC (11%)  64% Unemployed	Structured and standardised interview conducted for quantity and frequency. Confirmed by Maternal and infant urine and meconium toxicology metabolites	Mean age 40 mths	15 min semi-structured play interaction using Egeland et al. (1995): quality of instruction	Not measured
LaGasse et al. (2003)	Mean age 30.5 (4.8) - (USA) Predominantly cocaine 83% African American <u>Total sample</u> recruited after hospital discharge by four major universities 90.1% Single 78.6% Below poverty line 48.4% Education >high school 19.7% No antenatal care	Mean age 26.4 (5.8) 78.8% African American  78.2% Single 63.2% Below poverty line 32.1% Ed. >high school 4.3% No antenatal care	Mothers completed the MISU and ASI. Substance use exposure confirmed by maternal self-report, structured interview and meconium toxicology for metabolites	1 mth	15 min of a feeding session and coded using maternal flexibility	Not measured

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
Molitor, Mayes (2010)	Mean age 29.3 (4.2) - (USA) cocaine + alcohol, THC 92.9% African American 100% receiving welfare support 99.5 % single 69.2 % education > 12 years <u>Total sample</u> recruited during routine prenatal appointments	Mean age 25.8 (4.9)  75.0% African American 83.3% receiving welfare 85 % single 77.8% education > 12 years	Maternal self-report (life time exposure, frequency & quantity), urine toxicology	18 mths	5 min child play without mother's attention and 5 min free play with mother coded using RSIS: maternal interactive competence	RSIS responsiveness
Pajulo, Savonlahti, Sourander, Ahlqvist, Helenius, Piha (2001)	Mean age 25.4 (5.6) – (Finland) Residential treatment for drug (THC, amphetamine & heroin), or alcohol misuse Recruited from 3 treatment units 58% Single 17% education > 12 years 92% unemployed	Mean age 27.3 (3.4) Recruited from child health care centres in South Finland  0% Single 100% education > 12 years 25% unemployed	Admission to a residential treatment for severe substance use	3 & 6 mths	Feeding and a free play interaction was videoed and coded using PC-ERA : total score of maternal sensitivity	Not measured
Perry, Newman, Hunter, Dunlop (2015)	Mean age 29.2 (4.3) – (Aus) OMT 61% homeless 9% Aboriginal 45% single 63.6 % homeless <u>Total sample</u> recruited during routine prenatal appointments	Mean age 28.8 (4.9)  0% homeless 0% Aboriginal 7% single 0 % homeless	Structured interview for history of substance use (Psychosocial Assessment Interview) and supported by treatment for heroin addiction with opioid substitution	Less than 18 mths	15 min unstructured free play interaction was videoed and coded using EAS: total score of maternal sensitivity	EAS: responsiveness

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
Salo, Kivistö, Korja, Biringen, Tupola, Kahila, Kivitie-Kallio (2009)	Mean age 28 (2.8) – (Finland) ORT Recruited during pregnancy from maternity hospital 100% children had child welfare involvement	Mean age 29.08 (3.20) Recruited through well baby clinics 0% children had child welfare involvement	Current treatment for opioid dependence with buprenorphine	36 mths	5 min free play interaction and coded using EAS: maternal sensitivity	EAS: responsiveness
Salo, Politi, Tupola, Biringen, Kalland, Halmesmaki, Kahila, Kivitie-Kallio(2010)	Mean age 28.3 (3.4) – (Finland) ORT + THC (40%), alcohol 40%, amphetamine 40% 66.7% has criminal record 40% mother fostered as child Recruited during pregnancy from Maternity Hospital	Mean age 29.9 (3.2) 0% criminal record 0% mother fostered Recruited randomly through well baby clinics	Current treatment for opioid dependence with buprenorphine	7 mths	4 min free play interaction coded using EAS: maternal sensitivity	EAS: responsiveness
Sarfi, Smith, Waal, Sundet(2011)	Mean age 32.4 – (Norway) All on ORT 34% Unemployed 10 yrs of education 38.8% Single Recruited during pregnancy whilst in treatment	Mean age 32.5 Volunteered 0% Unemployed 16 yrs of education 0% Single Recruited via leaflets at local health centers	Prenatal assessment using European ASI with pregnant women enrolled in OMT programs	6 mths	15 min free play coded using NICHD modified by Cox & Crnic (2003): maternal style	Not measured

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
Savonlahti, Pajulo, Ahlqvist, Helenius, Korvenranta, Tamminen, Piha (2005)	Mean age 26.7 – (Finland) Residential treatment 93% Unemployed 78% Single 86% < 12 yrs education Recruited during pregnancy whilst in treatment from 3 sites	Mean age 27.3 0% Unemployed 0% Single 0% < 12 yrs education Recruited from well-baby clinics	Admission to a residential treatment for severe substance use	6 mths	5 min feeding and free play interactions videoed and coded using PC-ERA: Composite score of Dyadic interactive capacity	PC-ERA: Mutuality of affect in play situation
Siqveland, Moe(2014)	Mean age 26 – (Norway) Residential treatment and detoxified during pregnancy 77% single Recruited prenatally from Residential Treatment centers	Mean age 33.3 Voluntary participation 0% single Recruited from well-baby clinics	Prenatal assessment using European ASI with pregnant women admitted to residential treatment for severe substance use and detoxed during pregnancy	3 & 12 mths	15 min semi-structured play interactions at 12mths coded using PC-ERA: expressed affect	PC-ERA: child involvement

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
<u>Studies not included in Meta-analysis</u>						
Mayes Feldman Granger Haynes Bornstein Schottenfeld (1997)	Mean age 25.6(4.4) – (USA) Predominantly cocaine 58.1% completed high school <u>Total Sample</u> 86% African American 90% Single parents 100% Receiving welfare support Recruited prior to and post delivery	Mean age 26.6(5.3) No drug use 85.7% completed high school	Maternal report and urine toxicology	3 & 6 mths	3 mins interacting with infant with infant seated facing mother coded using Clark and Seifer – RSIS: Maternal Attentiveness	RSIS: infant readiness
Burns Chethik Burns Clark (1997)	Mean age 27.3(4.45) – USA Recruited clinics for substance using mothers 11.2 mean yrs of education 70% African American <u>Total Sample</u> Family income < \$15,000	Mean age 26.1 (6.3) Recruited from a public health clinic 12.6yrs education 80% African American	Maternal report and/or toxicology records	Mean age 10 mths	2 x 5 min (structured & unstructured) coded using PC-ERA: sensitivity & responsiveness to cues	PC-ERA: responsiveness to maternal social behavior
Ball Mayes DeTeso Schottenfeld (1997)	Mean age 28.2(4.8) –(USA) 100% cocaine use <u>Total Sample</u> 81.8% African American 89.3% Single parent 94.6% Unemployed 61.3% High school educated Recruited antenatally in hospital examining room	Mean age 26.2 (4.6) Repeated negative on urine toxicology	Structured interview for lifetime and recent substance use, ASI and urine toxicology	3, 6, 12 & 18 mths	10 – 15 min free play interaction while child sitting on mother’s lap as part of a developmental assessment (BSID): maternal attentiveness	Not measured

Author	Substance using mothers	Comparison non-substance mothers	Diagnostic assessment and measures of substance use	Age of infant	Measure of maternal sensitivity to child	Measure of child responsiveness to mother
Eiden (2001)	Mean age 31.53(6.34)- USA Predominantly cocaine and polydrug <u>Total Sample</u> 91% African American 72% Single parents 60% Receiving aid to families with dependents Recruited postnatally	Mean age 26.04 (5.18) No illicit drug use	Maternal report, chart review and maternal urine toxicology	2 mths	10 – 20 mins feeding task; MIFS: maternal sensitivity	MIFS: affect
Belt Flykt Punamaki Pajulo Posa Tamminen(2012)	Mean age 25.53(4.16) – Finland 19% Single parent 46% Basic education 38.5% Unemployed Recruited from 2 addiction outpatient psychiatry clinics	Mean age 29.24 (5.02) 4% Single parent 12% Basic education 6% Unemployed Recruited from maternal outpatient clinics	Maternal report and semi-structured assessment and urine toxicology	4 & 12 mths	7-10 min assessed at T(2) and T(3) using EAS: maternal sensitivity	EAS: child responsiveness
Lewis Phillips Bowser, DeLuca Johnson (2009)	Mean age 27 (5.7) – USA Predominantly cocaine 37.8% African American 53.3% Latina 11 (1.6) yrs of education 5.3(2.1) income logged <u>Total Sample</u> Recruited from high risk prenatal clinic	Mean age 23.4 (4.1) Non-cocaine using 26.9% African American 61.5% Latina 11.8 (2.3) yrs of education 5.5(2.4) income logged	Maternal report, interview and urine toxicology	6 mths	3 min interaction using FFSF: caregiver sensitivity	Not measured

*Note:* ASI: Addiction Severity Index; BSID: The Bayley Scales of Infant Development-Revised; EAS: Emotional Availability Scale; FFSF: Face-to Face Still-Face; MIFS: Mother Infant Feeding Scale; MLS: Maternal Lifestyle Study; MISU: Maternal Inventory of Substance Use; NICU: Neonatal Intensive Care Unit; NCAFS: Nursing Child Assessment Feeding Scale; NICHD: National Institute Child Health and Human

Development Network; OMT: Opioid Maintenance Therapy; ORT: Opioid Replacement Therapy; RSIS: Rating Scale of Interaction Style; PC-ERA – Parent-Child Early Relational Assessment; POGS: Parent-child Observation Guides for Program Planning; RSIS: Rating Scale of Interaction Style; THC: Marijuana; TLFB: Timeline Follow Back; USA; United States of America; VLBW: Very low birth weight.

### **Global Analyses of Maternal Sensitivity and Child Responsiveness**

A global meta-analysis of the 24 studies reporting maternal sensitivity yielded an overall population effect size of 0.46 (95% CI: 0.31 to 0.61,  $Z = 5.99$ ,  $p < .00001$ ), indicating that maternal sensitivity was higher in non-substance using mothers compared to substance misusing mothers. Notably, however, the proportion of total variability explained by heterogeneity was high ( $Q(23) = 73.53$ ,  $p < .00001$ ,  $I^2 = 69\%$ ).

Similar findings were obtained for a second global meta-analysis of the 16 studies reporting child responsiveness. The overall population effect size was 0.32 (95% CI: 0.06 to 0.59,  $Z = 2.37$ ,  $p = .02$ ), once again indicating that child responsiveness was higher in non-substance using mothers compared to substance misusing mothers. There was also significant heterogeneity across studies ( $Q(15) = 65.05$ ,  $p < .00001$ ), and the proportion of total variability explained by heterogeneity was high ( $I^2 = 77\%$ ).

### **Moderation Analyses to Identify Sources of Heterogeneity**

The significant heterogeneity did not allow any meaningful interpretation of the distribution of effect sizes across studies (Higgins & Thompson, 2002). In order to investigate potential sources of heterogeneity subgroup analyses were undertaken. The first of these was design, as the precision of effect sizes is related to methodological quality including the matching of study groups (Rose & Laan, 2009). Subgroup analysis for study design found that the overall effect size of maternal sensitivity for the matched subgroup was statistically significant ( $Z=5.60$ ,  $p < .00001$ ) but small (0.28, 95% CI 0.18-0.38; see Figure 4.2), while for the non-matched subgroups the overall effect size remained large (0.85, 95% CI 0.48-1.22), and also statistically significant ( $Z=4.47$ ,  $p < 0.00001$ ). A test for subgroup differences found that the lower estimate of effect size within the matched subgroup was statistically significant ( $Q(1) = 8.27$ ,  $p = 0.004$ ), and heterogeneity within the matched subgroup was significantly reduced and no longer statistically significant ( $Q(13) = 13.88$ ,  $p =$

0.38;  $I^2 = 6\%$ ), while heterogeneity within the non-matched subgroup remained high and statistically significant ( $Q(9) = 53.54$ ,  $p < 0.00001$ ;  $I^2 = 83\%$ ).

A similar but non significant pattern was found for child responsiveness. The overall effect size of child responsiveness for the matched subgroup was not statistically significant ( $Z=1.59$ ,  $p = 0.11$ ) and small (0.13, 95% CI -0.03-0.29; see Figure 4.3), while for the non-matched subgroup the overall effect size remained large (0.79, 95% CI 0.00-1.58), and statistically significant ( $Z=1.96$ ,  $p = 0.05$ ). A test for subgroup differences found that the lower estimate of effect size within the matched sub-group was not statistically significant ( $Q(1) = 2.57$ ,  $p = 0.11$ ). While heterogeneity within the matched subgroup was reduced, it was not statistically significant ( $Q(9) = 12.19(9)$ ,  $p = 0.20$ ;  $I^2 = 26\%$ ) and heterogeneity within the non-matched subgroup remained high and statistically significant ( $Q(5) = 36.82(5)$ ,  $p < 0.00001$ ;  $I^2 = 86\%$ ).

Overall, these results show significantly reduced levels of heterogeneity for estimates of effect size for both maternal sensitivity and child responsiveness, when samples of substance misusing mothers were compared with mothers matched on factors such as socioeconomic status, level of education, and (for US studies) eligibility for Medicaid. However, when substance misusing mothers were compared with mothers drawn from the general population, the differences between the groups on maternal sensitivity and child responsiveness were observed to be significantly larger.

There were no effects of age on heterogeneity. Further, consideration of the variable treatment (mothers in treatment v. not in treatment) was not pursued as the studies of mothers in treatment were also those with non-matched design, indicating that any finding relating to heterogeneity would be confounded by design

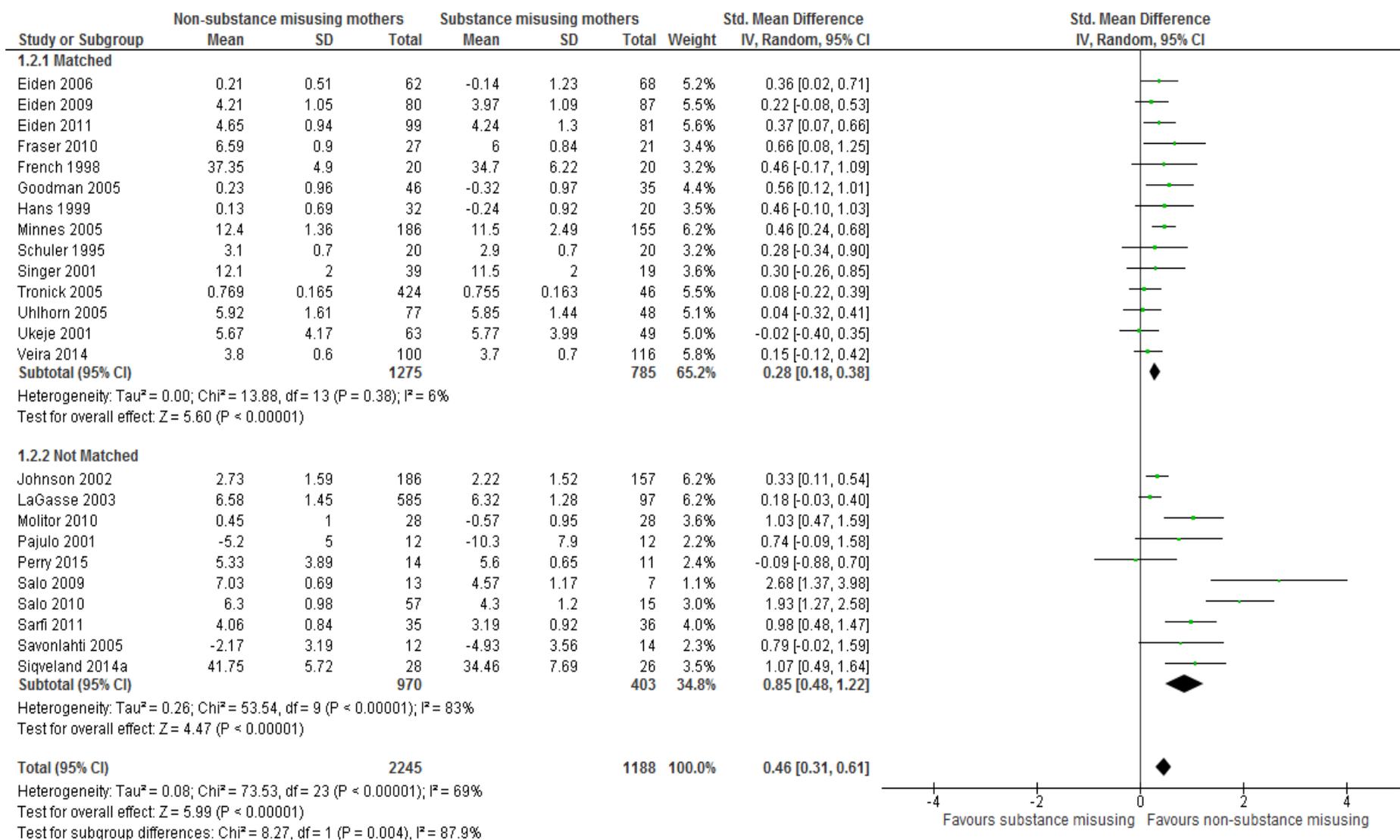


Figure 4.2 Forest plot of maternal sensitivity for total sample (n = 24) grouped by study design (matched and non-matched)

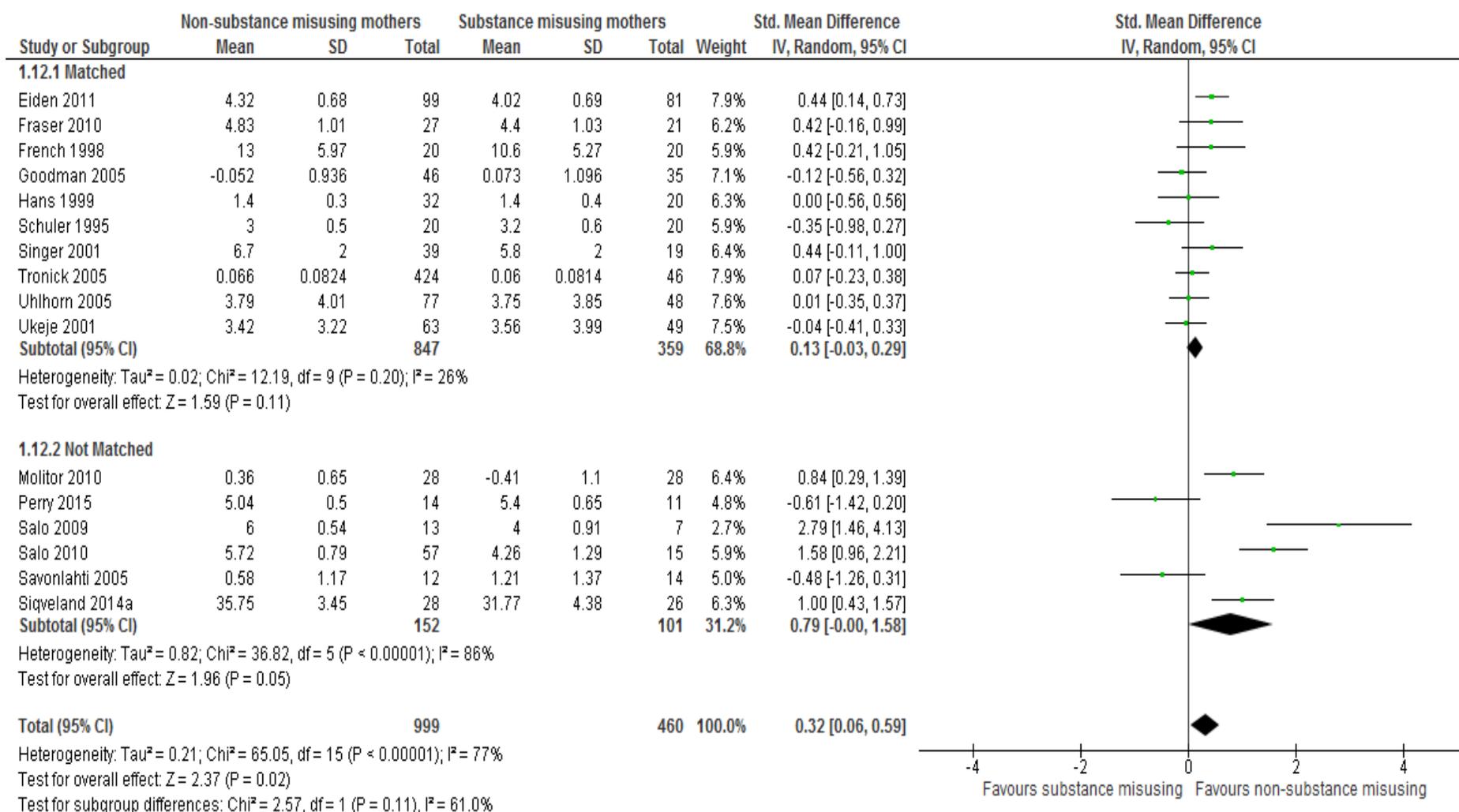


Figure 4.3 Forest plot of child responsiveness for total sample (n = 16) grouped by study design (matched and non-matched)

### **Publication Bias**

The existence of publication bias was evaluated by inspection of the funnel plots for maternal sensitivity and child responsiveness. A funnel plot is a scatter plot of effect size (x-axis) graphed against sample size (y-axis) centred on the true population effect size. In the absence of publication bias, studies with larger sample sizes would be expected to be closer to the true population effect size with greater variability of effect-size estimates in studies with smaller sample sizes. Thus, when the values of effect size estimates are plotted the values will be symmetrically distributed around the population effect size in the shape of a funnel. Visual inspection of the funnel plot for maternal sensitivity showed that three studies did not fall within the expected funnel shape. Kendall's  $\tau$ , a test to detect the presence of publication bias, was found to be significant  $\tau(N = 24) = .38, p = .01$ , suggesting publication bias. To assess whether the publication bias would differ when adjusted for publication bias, we used Vevea and Woods (2005) procedure as described in Field and Gillett (2010). This procedure assesses how effect size estimates would change if selection bias was present, using several models of possible selection bias. Adjusted parameter estimates ranged from .52 to .58, suggesting that slightly lower overall effect size for maternal sensitivity after adjusting for publication bias.

### **Discussion**

This systematic review and meta-analysis examined 24 studies with a combined total of 3433 mother-child dyads to compare quality of caregiving in mothers who were using illicit substances or were currently in treatment and/or prescribed opioid replacement therapy with the quality of caregiving in non-substance using women. These findings provide a synthesis of the literature on the quality of caregiving in substance misusing mothers and is the first quantitative analysis of caregiving quality in substance misusing mothers (M. O. Johnson, 2001).

Overall, the composite effect size based on the meta-analysis of all 24 studies indicated that maternal sensitivity and child responsiveness were higher in mothers who had not used illicit substances. However, we found considerable heterogeneity that limited meaningful interpretation of the results (Groenwold, Rovers, Lubsen, & Heijden, 2010). Therefore, we undertook an examination of potential moderators that might be influencing the variability in effect sizes between studies using subgroup analyses. The first moderator to be tested was design. Smaller effect size values were observed for maternal sensitivity but not child responsiveness for studies in which substance misusing mothers were drawn from the same population and thus shared similar demographic characteristics such as socioeconomic status, single parenthood, level of education and eligibility for Medicaid compared to those studies that were not matched groups. This finding raises important questions about the interplay between environmental risk and maternal substance use on a key moderator of child outcome: the quality of the caregiving relationship (Bakermans-Kranenburg et al., 2003). It is clear that the participants in the matched group of studies were recruited from high-risk populations: they were all of low income, drawn from geographical areas associated with severe financial disadvantage, had low levels of education, and in the case of the US studies, were predominantly from ethnic minority groups who were in receipt of Medicaid, all of which are well recognised risk factors that have a cumulative rather than additive effect on child outcome (Rutter, 1979; Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987). Thus, these families are at high risk of poor child outcome. The addition of maternal illicit substance use appeared to increase risk; there was still a significant, albeit small, difference in the quality of caregiving that favoured the non-substance using group, for maternal sensitivity. Thus, the additional risk of maternal substance use is likely to confer even greater vulnerability for these children who are already exposed to a significant number of socio-environmental risks (Roy & Raver, 2014; Yumoto et al., 2008).

We also tested age of child as a potential moderator. Typically, maternal sensitivity and associated constructs are relatively stable across time (Kempainen, Kumpulainen, Raita-Hasu, Moilanen, & Ebeling, 2006). However, family stress and adversity has been found to influence a range of maternal behaviours including sensitivity (Belsky & Fearon, 2002). Thus, it is plausible that for families with maternal substance use, and at least for those matched in sociodemographic features, age of the child may be associated with poorer sensitivity and child responsiveness. The third moderator that we had aimed to assess was whether mothers who were currently in treatment for opioid replacement therapy and/or residential treatment differed from mothers who were not in treatment. However, it is notable that most of the studies that met this criterion, were also non-matched. As design took precedence over testing treatment as a moderator we are unable to answer the question. Thus, the question remains one for further research.

### **Implications for Research, Practice and Policy**

These results have important research, practice and policy implications. First, the quality of the caregiving relationship in substance misusing mothers is poorer than for mothers facing similar environmental adversity, and although these differences are not large, they underscore the potential impact substance misuse has on a mother's capacity to provide sensitive and nurturing caregiving (Bakermans-Kranenburg et al., 2005).

What is also striking, however, is the number of risk factors present in the matched non-substance using group of mothers. The extensive literature linking multiple risk exposure to poor child outcomes dates from the seminal work of Rutter and colleagues (Rutter, 1979). More contemporary models of socioenvironmental risk emphasise the importance of cumulative risk rather than the identification of specific risk factors (Sameroff, 1998). Thus, within this model, maternal substance misuse should be viewed as one further risk that, in combination with a range of other risk factors such as poverty (Evans, 2004), will be

associated with compromised child outcome. This leads us to question whether there is a disproportionate focus on maternal substance use as a risk factor independent of the broader contextual environment of impoverished families. Substance use is one of the key reasons families are referred to child protection services in both pregnancy and the postnatal period (McGlade et al., 2009). While women with substance use problems have complex lives and histories, making them a high-risk group, these meta-analysis results raise issues about the potential failure to identify families where the quality of caregiving is poor, but maternal substance misuse is not necessarily present (Daniel, Taylor, & Scott, 2010).

Second, results highlight the importance of providing parenting support to substance-misusing mothers that focuses on enhancing maternal sensitivity and responsiveness to maximise child outcomes. This is an area of growing research and clinical focus, and a number of studies have shown the benefits of providing attachment-based interventions for high-risk mothers and their children (Dawe & Harnett, 2007; Pajulo, Suchman, Kalland, & Mayes, 2006; Suchman, Pajulo, Decoste, & Mayes, 2006). However, improving maternal sensitivity will also require a focus on helping mothers develop emotional regulation skills and additional support to address real world problems such as housing and access to material resources. Contemporary parenting programs such as the Parents Under Pressure program (Barlow et al., 2013; Dawe & Harnett, 2007) draw from conceptual models of affect regulation and integrate these within a parenting framework.

Third, it is notable that the majority of studies identified have focused on cocaine (sometimes in combination with other drugs of misuse), with only a few focusing on opioids but in the context of replacement therapy. Drug use patterns across much of Europe, Australia and North America are changing with a growing use of psychomotor stimulants such as “ice” and “crystal meth” (Dawe et al., 2009). These substances may influence the quality of caregiving in qualitatively different ways. For example, amphetamine misuse is more likely

to be associated with a pattern of interaction with the child that may be hostile and/or unpredictable given that these are both behaviours associated with ongoing amphetamine misuse (Dawe et al., 2009). This environment may be qualitatively different due to the direct effects of the substance, compared for example to cannabis, and could result in poorer outcomes including insecure/disorganised attachment strategies that occur in the context of hostile and unpredictable parent-child relationships (Bakermans-Kranenburg et al., 2005), leading to even greater risk of psychopathology (Bennett et al., 2013). Thus, future research should be conducted that investigates the relationship between the type of substances, the combination of substances and child outcome, ensuring that adverse environmental risk is controlled for by careful matching of comparison groups.

### **Conclusion**

This meta-analysis is the first study to bring together literature spanning 20 years to assess both the impact of maternal substance use on quality of caregiving and factors that might moderate this relationship. The clear operationalization of maternal sensitivity and child responsiveness enabled us to systematically identify and meta-analyse data from 24 studies, and undertake subgroup analyses that enabled us to look at the potential impact of study design and infant age. The results show that maternal illicit substance use is significantly related to caregiving quality in the first three years of a child's life. The subgroup analyses have highlighted that this difference, while significant, is nonetheless a small effect. These findings highlight the importance of addressing the quality of caregiving for substance using mothers and draws attention to the need for future studies to ensure that substance using mothers are compared to mothers who also face a range of environmental adversity

Table 4.2 Supplementary Table  
*Quality assessment tool for observational cohort and cross-sectional studies*

Articles used in Meta-analysis	Quality Assessment Criteria for Observational Cohort and Cross-Sectional Studies								
	1	2	3	4	5	6	7	8	9
Eiden, Stevens, Schuetze, Dombkowski (2006)	Y	Y	Y	Y	NR	N	Y	Y	Y
Eiden, McAuliffe, Kachadourian, Coles, Colder, Schuetze (2009)	Y	Y	Y	Y	NR	N	Y	Y	Y
Eiden, Schuetze, Cole (2011)	Y	Y	Y	Y	NR	N	Y	Y	Y
Fraser, Harris-Britt, Thakkallapalli, Kurtz-Costes, Martin (2010)	Y	Y	Y	Y	Y	N	Y	Y	Y
French, Pituch, Brandt, Pohorecki (1997)	Y	Y	Y	Y	NR	N	Y	Y	NR
Goodman, Hans, Bernstein (2005)	Y	Y	Y	Y	N	N	Y	Y	Y
Hans, Bernstein, Henson (1999)	Y	Y	Y	Y	N	N	Y	Y	Y
Minnes, Singer, Arendt, Satayathum (2005)	Y	Y	Y	Y	NR	N	Y	Y	Y
Schuler, Black, Starr (2010)	Y	Y	NR	Y	NR	N	Y	Y	Y
Singer, Hawkins, Huang, Davillier, Baley (2001)	Y	N	Y	Y	NR	N	NC	N	Y
Tronick et al. (2005)	Y	Y	Y	Y	NR	N	Y	Y	Y
Uhlhorn, Messinger, Bauer (2005)	Y	Y	NR	Y	NR	N	Y	Y	Y
Ukeje, Bendersky, Lewis (2001)	Y	Y	NR	Y	NR	N	Y	Y	NR
Veira, Finger, Schuetze, Colder, Godleski, Eiden (2014)	Y	Y	NR	Y	NR	N	Y	Y	NR
Johnson, Morrow, Accornero, Xue, Anthony, Bandstra (2002)	Y	Y	Y	N	NR	N	Y	Y	NR
LaGasse et al. (2002)	Y	Y	Y	N	NR	N	Y	Y	Y
Molitor, Mayes (2010)	Y	Y	Y	N	NR	N	Y	Y	Y
Pajulo, Savonlahti, Sourander, Ahlqvist, Helenius, Piha (2001)	Y	Y	Y	N	NR	N	Y	Y	NR
Perry, Newman, Hunter, Dunlop (2015)	Y	Y	Y	N	NR	N	Y	Y	Y
Salo, Kivistö, Korja, Biringen, Tupola, Kahila, Kivitie-Kallio (2009)	Y	Y	Y	N	NR	N	Y	Y	Y
Salo, Politi, Tupola, Biringen, Kalland, Halmesmaki, Kahila, Kivitie-Kallio (2010)	Y	Y	Y	N	N	N	Y	Y	Y
Sarfi, Smith, Waal, Sundet (2011)	Y	Y	Y	N	Y	N	Y	Y	Y
Savonlahti, Pajulo, Ahlqvist, Helenius, Korvenranta, Tamminen, Piha (2005)	Y	Y	Y	N	Y	N	Y	Y	Y
Siqveland, Moe (2014)	Y	Y	Y	N	NR	N	Y	Y	Y

\*Note. Y = Criteria present; N = Criteria not present; CD = cannot determine; N =, not applicable; NR = not reported

**Criteria legend for Supplementary Table to Chapter 4**

1. Was the research question or objective in this paper clearly stated?
2. Was the study population clearly specified and defined?
3. Was the participation rate of eligible persons at least 50%?
4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study pre-specified and applied uniformly to all participants?
5. Was a sample size justification, power description, or variance and effect estimates provided?
6. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?
7. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?
8. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?
9. Were the outcome assessors blinded to the exposure status of participants?

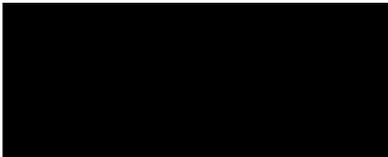
## Chapter 5: An Investigation of Childhood Trauma on Quality of Caregiving in High Risk Mothers: Does Maternal Substance Misuse Confer Additional Risk?

### Statement of Contribution and Co-Authored Submitted

**Hatzis, D.**, Dawe, S., Loxton, N., Harnett, P., (Revision INFBEH\_2017\_39\_R1). An investigation of childhood trauma on quality of caregiving in high risk mothers: Does maternal substance misuse confer additional risk? *Infant Behavior and Development Journal*.

This chapter includes a co-authored paper which has been prepared for submission to an international peer reviewed journal. The bibliographic details of the co-authored paper, including all authors, are: **Denise Hatzis**, Professor Sharon Dawe, Dr Natalie Loxton and Paul Harnett. The candidate's contribution to the paper involved conception of the study design, literature review, data collection and analyses, and writing of the manuscript. The co-authors provided guidance on direction, assistance with analysis interpretation, review of drafts and supervisory advice.

Name of student: Denise Hatzis



Names of corresponding authors of paper:

Professor Sharon Dawe (Primary Supervisor)

A handwritten signature in black ink, partially obscured by a black rectangular redaction box.

Dr Natalie Loxton (Secondary Supervisor)

A handwritten signature in black ink, partially obscured by a black rectangular redaction box.

Dr Paul Harnett

A handwritten signature in black ink, partially obscured by a black rectangular redaction box.

### **Foreword to Chapter 5**

As highlighted by the systematic review (study1), there is considerable variability when assessing the quality of caregiving in substance misusing mothers; however, heterogeneity is significantly reduced when groups of mothers are matched on key demographic variables. Furthermore, the review supported previous research highlighting the need for further research to examine the underlying mechanisms through which quality of caregiving is influenced in a population of mothers oversampled for risk, including substance misuse. However, prior to conducting this investigation, there was an initial need to further extend research by comparing quality of caregiving and associated risk factors within three groups of mother-child dyads: substance misusing, matched comparison and a community sample (see Table 1.1, Chapter 1). Relevant future directions for parenting program modifications are highlighted with recommendations for future research.

## Introduction

Extensive investigation of the quality of caregiving in mothers with substance misuse problems typically reports compromised caregiving. For example, substance misusing mothers have been found to display poorer emotional availability (Salo et al., 2009), less maternal responsiveness and reciprocity during interactions (Eiden, 2001), less sensitivity to the cues of their children (Howard, Beckwith, Espinosa, & Tyler, 1995). In turn, these infants are more likely to show disorganised and/or disorientated attachment styles (Espinosa, Beckwith, Howard, Tyler, & Swanson, 2001). The poor quality of caregiving has been observed in studies using a range of observational measures and paradigms (Eiden, 2001; Howard et al., 1995; LaGasse et al., 2003; Tronick et al., 2005) and in studies of mothers in residential treatment compared to non-substance using mothers recruited from health clinics (Sarfi et al., 2011); from well baby clinics (Salo et al., 2009; Salo et al., 2010); and routine antenatal services (Perry et al., 2015).

However, a number of studies have failed to find differences in the quality of caregiving between substance misusing and non-substance misusing mothers. Neuspiel, Hamel, Hochberg, Greene, and Campbell (1991) compared cocaine misusing and non-cocaine misusing mothers and found no differences in maternal sensitivity to the cues of infants or the responsiveness of the infants to their parent during a feeding observation. Two studies found that mothers who had used cocaine pre-natally were no different from non-cocaine misusing mothers in maternal warmth during a free play activity with either 12-month (Ukeje, Bendersky, & Lewis, 2001) or 18-month old infants (Uhlhorn, Messinger, & Bauer, 2005) and indeed not all substance misusing mothers are poor caregivers .

In the light of the mixed findings a systematic review and meta-analytic study was undertaken of studies that had used observational measures to compare caregiving in mothers with substance misuse problems and non-substance abusing groups (Hatzis, Dawe, Harnett,

& Barlow, 2017). The primary outcomes of interest were maternal sensitivity and child responsiveness coded using an observational system (e.g., Emotional Availability Scales (Biringen, 2008); Ainsworth Scales of Maternal Sensitivity (Ainsworth, Bell, & Stayton, 1974). The initial analysis suggested that measures of maternal sensitivity and child responsiveness were significantly poorer in substance misusing mothers. However, significant heterogeneity across the studies made interpretation difficult and thus subgroup analyses were undertaken. As the precision of effect sizes has been found to be related to methodological rigour, including matching of study groups (Rose & Laan, 2009), study design was investigated as a possible source of heterogeneity in the meta-analysis. Studies that compared substance misusing mothers with non-substance misusing mothers matched on SES, marital status, years of education, receipt of government benefits as primary source of income, showed consistently lower effect sizes on measures of maternal sensitivity (but not child responsiveness). Failing to match on these demographics variables was a significant source of heterogeneity. Thus, further research is needed to compare substance misusing mothers with mothers matched on key demographic factors that are also associated with compromised caregiving. Further, examination of potential casual mechanisms associated with substance misuse, environmental adversity and the quality of caregiving is also warranted.

Women who misuse substances report high rates of being maltreated during childhood (see review by Enoch, 2011) and high rates of maternal psychopathology in adulthood (Herrenkohl et al., 2013). They often face ongoing adversity including, involvement in criminal activity, and exposure to sexual assault and victimisation (Chapple, 2003; Widom, Czaja, & Dutton, 2008; Widom & White, 1997), along with general poverty and marginalisation within society (Cancian et al., 2010; Sedlak et al., 2010). As mothers, women exposed to these risk factors are at greater risk of compromised caregiving. For

example, there is a well-established link between maternal childhood trauma and quality of parenting (Ammerman et al., 2013; Bert, Guner, & Lanzi, 2009; Lyons-Ruth et al., 2013). Observational studies have reported both greater intrusiveness and hostility (e.g., DeOliveira, Wolfe, & Bailey, 2004), and poorer maternal sensitivity (Mielke et al., 2016). Considering possible causal mechanisms to account for these relationships, childhood trauma can impair the development of emotion regulation (Beck, Grant, Clapp, & Palyo, 2009), the acquisition of coping skills and capacity to form close interpersonal relationships that can manifest as Borderline Personality Disorder (BPD; Fonagy, Target, Gergely, Allen & Bateman, 2003). Mothers with BPD display less touch and less involvement in children's play (White, Flanagan, Martin, & Silvermann, 2011), more intrusiveness and negativity during mother-infant interactions (Crandell, Patrick, & Hobson, 2003; Hans, Bernstein, & Henson, 1999), and reduced responsiveness to their children (Newman, Stevenson, Bergman, & Boyce, 2007). The high rates of childhood trauma in mothers with BPD (Chiesa, Larsen-Paya, Martino, & Trinchieri, 2016; Patrick, Hobson, Castle, Howard, & Maughan, 1994), suggest that factors associated with the development of BPD may mediate the relationship between childhood trauma and compromised caregiving.

The purpose of the current study was twofold. First to extend the research on quality of caregiving in substance misusing mothers by comparing the quality of caregiving in three groups: mothers recruited from substance misuse treatment services, non-substance misusing mothers matched on key characteristics of socio-environmental risk, and a community sample of mothers who were matched only on maternal age and child age. We hypothesised that there would be a significant difference between the three groups of mothers in their quality of caregiving as well as psycho-social variables including experience of childhood trauma, borderline personality features and socio-environmental risk. The second aim was to investigate a potential pathway in which the relationship between exposure to childhood

trauma and quality of caregiving might be mediated by severity of BPD symptoms and cumulative socio-environmental risk (Bornstein, Hahn, Suwalsky, & Haynes, 2011).

## **Method**

### **Participants and Procedure**

A total sample of 51 Australian mothers and their children (12 – 42 months) participated in the study. The substance misusing group comprised 17 mothers currently in treatment for opioid and/or poly-substance dependence in either a residential or outpatient clinics. Mothers in the comparison group reported that they had not used substances in the last twelve months and had no history of treatment for substance misuse problems. They were matched on years of education, source of income, maternal age and child age. This group consisted of 17 mothers recruited from services providing assistance to socially disadvantaged mothers (e.g., non-government organisations) and located in a socio-economically disadvantaged area. The community group consisted of 17 mothers, who similarly reported no current or history of substance misuse, matched on maternal age and child age only. These mothers were recruited by advertising the study at the University and on social media. Mothers were included if they were able to speak and comprehend English equivalent to a literacy level of approximately a 12-year-old, had no suicidal ideation or apparent psychotic thought process, did not have a diagnosed learning disability, and had a child aged between 12 months and 42 months.

Assessments took place in a consulting room either in the University Psychology Clinic, at a local family support centre or in the participant's home. All ethical issues regarding participant safety, researcher safety and child protection concerns were considered and regular supervision was undertaken weekly during the testing period with the principal supervisor to maintain and facilitate adherence to safe practices. Assessment duration was 90-120 minutes and consisted of completion of measures and videotaping of a 20-minute period

of mother-child interaction to code quality of caregiving. Mothers were asked to “be with your child as you normally would at home”. A standardised age appropriate set of toys were placed on a play mat on the floor next to a comfortable chair and a small table containing magazines. All procedures were approved by university and hospital Human Ethics Committees. Mothers received a \$30.00 gift voucher as compensation for time and travel.

### **Measures**

**Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998)** is a standardized 28-item self-report scale measuring the severity of childhood trauma with five clinical subscales: Emotional Abuse, Physical Abuse, Sexual Abuse, Emotional Abuse, Emotional Neglect and Physical Neglect. Each item is scored using a five-point Likert scale from one to five, with one representing “never” and five “very often”. Example items are: "I thought that my parents wished I had never been born" (Emotional Abuse-item); "I got hit so hard by someone in my family that I had to see a doctor or go to the hospital" (Physical Abuse-item); "Someone tried to touch me in a sexual way, or tried to make my touch them" (Sexual Abuse-item); "I felt loved" (Emotional Neglect-inverse item); "My parents were too drunk or high to take care of the family" (Physical Neglect). Scores are summed with each trauma subscale producing scores ranging from five to 25. The CTQ has good internal consistency ranging from .79 to .96 (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997; Bernstein et al., 1994; Paivio & Cramer, 2004) and convergent validity with the Childhood Trauma Interview (Bernstein et al., 1994). Furthermore, measurement invariance has been found across adult and adolescent clinical inpatients (including substance use) and non-clinical populations (Bernstein et al., 1997; Bernstein et al., 2003). Bernstein and Fink (1998) provided cut off scores that yield good sensitivity and specificity and the following was used to calculate incidence of childhood trauma in this study: Emotional abuse > 9; Physical abuse > 8; Sexual abuse > 6; Physical abuse > 8; and Emotional neglect >10. The total score of the five abuse

subscales was used in this study with a cut off value of 41. Cronbach's  $\alpha$  for the current study was .95.

**Personality Assessment Inventory-Borderline Scale (PAI-BOR)** (Morey, 1991) is a subscale of the PAI which was developed to assess clinical syndromes and personality features. The PAI-BOR is widely used (Gardner & Qualter, 2009; Trull, Stepp, & Solhan, 2006) with high internal consistency  $\alpha = .88$  (Morey, 1991), good reliability ( $\alpha = .93$ ), and evidence for concurrent and incremental validity (Gardner & Qualter, 2009). The PAI-BOR is a 24-item measure that assesses the four major features of BPD: affective instability, identity problems, negative relationships and self-harm. Each feature has six items per subscale, totalling 24 items in the scale overall. Each item is scored on a Likert scale (0 = false, not at all true; 1 = slightly true; 2 = mainly true; 4 = very true). Examples of items from each of the domains are as follows: Affective instability – “Mood shifts” and “Little control over anger”; Identity problems – “Feel empty” and “Can't handle separation”; Negative relationships – “Relationships stormy” and “People let me down”; Self-harm – “I am too impulsive for my own good” and “I am a reckless person”. A set of criteria was developed to identify individuals with symptoms consistent with a diagnosis of BPD, based on the total score (raw score  $\geq 38$ ), which was not used in this current study (Trull, 1995). Cronbach's  $\alpha$  for the current study was .92.

**Assessment of Socio-Environmental Risk.** A composite environmental risk score drawing from the work of Sameroff, Seifer, Baldwin, and Baldwin (1993) and informed by Evans, Li, and Whipple (2013) was calculated. This score was based on ten risk factors scored dichotomously (1 = present; 0 = absent). The ten risk factors consisted of the following: pregnant before age 21; overcrowding (four or more children in the same household); single parent house-hold; receipt of government benefits as major source of income; maternal education less than 12 years; partner alcohol consumption greater than four

standard drinks a day; racial minority status (non-white); living with extended family or without children; high maternal stress - score in the severe range (i.e., greater than 26) on the Stress Scale of Depression Anxiety and Stress Scale: Lovibond and Lovibond (1995): an example of an item from this scale was “I find it difficult to relax”; low social support (i.e., a total score of 48 or less) was operationalised using the Multidimensional Scale of Perceived Social Support: Zimet, Dahlem, Zimet, and Farley (1988): an example of an item from this scale was “There is a special person who is around when I am in need”.

**Emotional Availability Scale (EAS: Biringen, 2008)** was used in this study to assess the quality of caregiving in dyadic interactions between an adult and a child. The videotaped observation of a free play or structured task was coded for four maternal domains (sensitivity, structuring, nonintrusiveness and nonhostility) and two infant domains (responsiveness to mother and involvement of mother). *Sensitivity* refers to a mother’s genuine positive affect, responsiveness and awareness of her infant’s cues, responding appropriately to them and being able to manage and resolve conflict situations; *Structuring* refers to the mother’s ability to structure her infant’s world allowing for the necessary scaffolding to occur for growth and learning; *Nonintrusiveness* describes the ability for the mother to be available to promote scaffolding without interfering with the infant’s own autonomy and space; *Nonhostility* refers to the mother’s responses to her infant being free of impatience, harshness or malice; *Child responsiveness* indicates the infant’s willingness to respond to the efforts and expressions of interest the mother makes in an attempt to engage with her infant; *Child involvement* refers to the degree that the infant makes attempts or cues the mother to engage or interact with them.

Each of the six domains have seven subscales. Two subscales are scored 1 – 7; the remaining five subscales are scored 1 - 3 (range 7 – 29). Each domain score was then converted to a 7-point scale as recommended by Biringen (Biringen, 2008, p. 7) providing a

score from 1- 7 for each six domains that are summed to provide a total score with a range of 6 – 42.

Forty-five percentage of interviews were conducted by the primary author, 55% of remaining interviews were collected by 2 postgraduate students in psychology under the supervision of the first author. All coding was undertaken by the first author. Fifteen percent of the videotaped mother-infant interactions were randomly chosen and recoded by an independent trained coder for inter-rater reliability. Interrater reliability was assessed using a two-way mixed, consistency, single measure intra-class correlation, with correlations for the six scales and caregiving total, ranging from 0.83 to 0.94, which was consistent with Salo et al. (2009) who reported interrater reliabilities ranging between .85 and .92 between the raters and method trainer (Biringen, 2008).

### **Analysis Plan**

Differences between groups on demographic variables were tested using Analysis of Variance (ANOVA) for continuous variables and Chi-squared ( $\chi^2$ ) for categorical variables. ANOVAs were used to test for differences on emotional availability, childhood trauma, borderline features and environmental risk. This was followed by a series of planned comparisons to test for differences between the three groups. These analyses consisted of two planned contrasts to assess differences between 1) the substance misusing mothers group and the group of matched non-substance misusing mothers (i.e., two high-risk groups) and the community control group, and 2) the two high-risk groups of mothers.

To test whether maternal borderline features and socio-environmental risk were mediators of a perceived history of childhood trauma and total scores on emotional availability, a multiple mediation model was conducted according to the procedures described by Hayes (2013). Borderline features and socio-environmental risk were entered simultaneously as parallel mediators. Bias-corrected bootstrap confidence intervals ( $n =$

10000, confidence intervals set at 95%) were used to assess the significance of the indirect effects. An additional advantage of using a bootstrapping approach is that assumptions of normality are not required (Hayes, 2013) and that multiple mediating variables can be tested in one overall model design. This method also takes into account shared variance between the mediators. The significance of the *overall* (total) indirect effects (i.e., via both mediators simultaneously) and the *specific* indirect effects (i.e., via each mediator independent of the other mediator) was tested. Statistical analyses were performed with SPSS for Windows Version 23 in conjunction with the SPSS PROCESS macro version 2.16, model 4 (Hayes, 2013).

## Results

### Sample Characteristics

Table 5.1 displays the demographic characteristics and Table 5.2 shows the differences between the three groups for the socio-environmental risk factors. Substance misusing mothers and matched comparison mothers were more likely to be sole parents, living in unstable accommodation and receiving Government benefits as their major source of income compared to community mothers. It is notable that 58.82%, that is over half of the substance misusing mothers, had four or more risk factors current in their life (refer to Total Risk Scores in Table 5.2), compared to 35.29% in the matched comparison mothers. In contrast, none of the mothers from the community sample were identified as experiencing such severe levels of socio-economic risk. In addition to the above, information on current substance misuse and lifetime use of substances was obtained for the total sample. None of the mothers in the matched comparison group or the community sample reported current (last 12 months) use of heroin, amphetamine, cannabis, opioids or other illicit drugs. Of the mothers in treatment for substance use, 11 reported that their primary drug of use was opioids, with 10 currently on opioid replacement therapy; four reported that their primary

drug of use was methamphetamine and two reported that their primary drug of use was cannabis. Eight (47%) of mothers had been in their current treatment episode for less than 6 months, three (18%) for more than 6 months and less than 4 years and six (35%) for more than four years.

Table 5.1

*Demographic Characteristics*

	Exposure Group						Overall Group Difference <i>F</i> or $\chi^2$
	SUM		MCM		CM		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Maternal Age	31.88	7.02	32.29	5.58	34.35	6.33	.74
Parity	2.47	1.58	2.47	1.58	1.65	.99	.159
Ethnicity %							3.23*
Australian	94.11		82.35		70.59		
Non-Australasian	5.9		17.65		29.41		
Education %							8.21*
<10 years	47		29.4		5.9		
<12 years	11.8		11.8		29.4		
>12 years	41.2		58.8		64.7		
Child age in mths	26.11	9.47	26.76	8.84	25.88	8.32	.04
Child Gender %							.15
Male	53		53		47		
Female	47		47		53		

Note: SUM = Substance using mothers; MCM = matched comparison mothers; CM= Community mothers

\* $p < .05$ . \*\* $p < .01$

Table 5.2

*Environmental Risk Factors and Cut-off Scores*

	Risk cut-off	Number (%) of risk			Overall Group Differences $\chi^2$
		SUM <i>n</i> =17	MCM <i>n</i> =17	CM <i>n</i> =17	
Maternal Age	≤ 21 when pregnant	1 (5.88)	0	0	1.58
Family Size	≥ 4 children	3(17.64)	3(17.64)	2(11.76)	.82
Marital Status	Sole parenting	10(58.82)	9(52.94)	0	15.26***
Income	Receiving Govt benefits	15(88.23)	16(94.11)	0	8.23*
Educational Achievement	< 12 years of education	8(47.05)	5(29.41)	1(5.88)	39.65***
Maternal Life Stress	≥ score of 26 on DASS_Stress	6(35.29)	2(11.76)	3(17.64)	2.90
Maternal Social Support	≤ score of 48 of Social Support	8(47.05)	7(41.17)	2(11.76)	6.06*
Living Situation Stability	Living with extended family or without children	5(29.41)	2(11.76)	0	7.80*
Maternal Race	Non-white	0	4 (23.52)	4 (23.52)	7.20*
Partner Alcohol Consumption	≥ 4 drinks per day	6(35.29)	1(5.88)	3(17.64)	4.95*
TOTAL RISK SCORE	≥ 4 risk factors	10 (58.82)	6 (35.29)	0	33.28***

Note: SUM = Substance using mothers; MCM = matched comparison mothers; CM = Community mother

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Testing of Group Differences**

A one-way between group analysis of variance (ANOVA) with three levels (substance using mothers, matched comparison mothers and community mothers) was performed on measures of emotional availability, perceived history of childhood trauma and borderline personality features. Levene’s test was non-significant for all three measures

(total emotional availability score,  $p = 0.51$ ; borderline personality features,  $p = 0.27$ ; childhood trauma,  $p = 0.69$ ), indicating that for each group the assumption of homogeneity of variance was not violated. As shown in Table 5.3, there was a significant group difference for emotional availability, borderline personality features and childhood trauma. Planned contrasts revealed that substance abusing and matched comparison mothers had significantly poorer scores on all measures compared to community mothers. However, in contrast to our proposed hypothesis, there were no significant difference between the substance misusing mothers group and the non-substance misusing mothers matched on socio-environmental risk factors.

Table 5.3

*Group Differences and Planned Contrasts on Outcome Measures*

Variables	SUM (Group 1) M (SD) n = 17	MCM Group(2) M (SD) n = 17	CM Group(3) M (SD) n = 17	F (2,48) F (1,48) t (48)	Effect sizes $\omega^2$ r	Group Differences
Observed Emotional Availability						
ANOVA	30.29(6.56)	33.70(6.98)	39.06(5.78)	7.98***	0.21	
ANOVA - Linear Contrast				15.64***	0.22	
Planned Contrast 1				-3.68**	0.47	3 > 2,1
Planned Contrast 2				1.54	ns	2 = 1
Borderline Personality Features						
ANOVA	33.23(12.33)	29.35(15.14)	17.52(11.04)	6.78**	0.18	
ANOVA - Linear Contrast				12.49***	0.18	
Planned Contrast 1				3.57***	0.46	3 < 2,1
Planned Contrast 2				-0.87	ns	2 = 1
Childhood Trauma						
ANOVA	56.29(22.29)	52.23(23.59)	37.70(21.93)	3.17*	0.08	
ANOVA - Linear Contrast				5.74*	0.08	
Planned Contrast 1				2.46*	0.33	3 < 2,1
Planned Contrast 2				-0.52	ns	2 = 1
Environmental Risk						
ANOVA	3.64(1.45)	3.00(1.58)	0.88(0.92)	19.46***	0.42	
ANOVA - Linear Contrast				35.58***	0.38	
Planned Contrast 1				6.08***	0.66	3 < 2,1
Planned Contrast 2				-1.39	ns	2 = 1

*Notes.* SUM = Substance using mothers; MCM = matched comparison mothers; CM = Community mothers  
 Planned Contrast 1 = comparison of (SUM & MCM) and CM; Planned Contrast 2 = comparison of SUM and MCM only  
*F* values for group differences using ANOVA. *t* values are provided for planned contrasts 1 and 2.  
 \**p* < .05 \*\**p* < .01 \*\*\**p* < .001 ns = no significant differences

**Tests of Indirect Effects**

Pearson product moment correlations (Table 5.4) were examined to measure the strength of the relationships between a perceived history of childhood trauma, the mediating variables (socio-environmental risk and borderline personality features) and emotional availability. A multiple mediation analysis with the simultaneous entry of both mediators was conducted. Using this method, mediators are able to be simultaneously entered and adjusted for the variance shared between mediators. This method shows the indirect effect of each mediator.

Table 5.4

*Correlations of Means and Standard Deviations of Study Variables*

Variables	1	2	3	4	5	M/(SD)	Range
1. Maternal Sensitivity	-					5.55(1.23)	3-7
2. Child Responsivity	.86***	-				5.70 (1.47)	2-7
3. Observed Emotional Availability	.94***	.92***	-			34.35(7.30)	18-42
4. Borderline Personality Features	-.30*	-.19	-.26	-		26.70 (14.37)	0-58
5. Childhood Trauma	-.30*	-.21	-.27*	.52***	-	48.74 (23.58)	25-117
6. Environmental Risk	-.41***	-.38*	-.40**	.69***	.61***	2.50 (1.78)	0-6

Note: \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

As shown in Figure 5.1, socio-environmental risk factors and borderline personality were entered as parallel mediators. Table 5.5 provides the total and specific indirect effects. A total indirect effect is calculated (i.e., the indirect effect via the two mediators combined), and two specific indirect effects (i.e., the unique indirect effect of each mediator while controlling for the shared effect with the other mediator). For example, path  $a_1 * b_1$  is the specific indirect effect of childhood trauma and emotional availability, via environmental risk factors. Confidence intervals that do not include zero indicate these effects are significant. The overall *total* indirect effect of childhood trauma and emotional availability via the two mediating variables was shown to be significant. With the two mediating variables entered simultaneously, there was a significant *specific* indirect effect via environmental risk but not via borderline personality. In other words, (i.e., when controlling for shared variance between the two mediators) there was a significant indirect effect via socio-environmental risk when controlling for borderline traits, but no significant indirect effect via borderline traits when controlling for socio-environmental risk on observed emotional availability.

### **Post hoc Sample Size Calculation**

In light of the findings above, a post hoc sample size calculation was undertaken. The sample ( $n = 51$ ) is close to the minimum suggested sample size of 54 for a power of .80 when conducting mediation analyses with a large (i.e.,  $r = .59$ ) correlation between the predictor and mediator, and a medium (i.e.,  $r = .39$ ) between the mediators and criterion variables, using percentile-corrected bootstrapping (Fritz & Mackinnon, 2007).

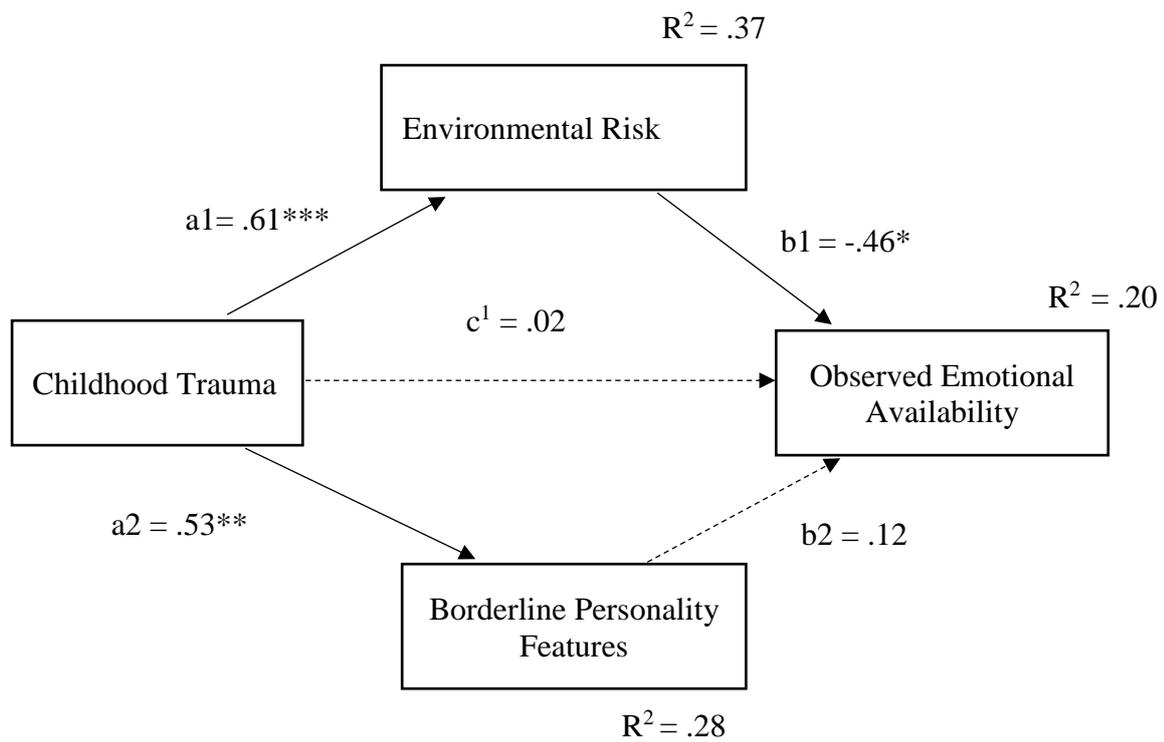


Figure 5.1. Multiple mediation model – Borderline personality and Environmental Risk as mediators of the association between Childhood Trauma and Total scores of Emotional Availability

Note. All values are standardized regression coefficients. Each ‘a’ path is the effect of Childhood Trauma on the mediating variables. The ‘b’ paths present the associations between the mediating variables and Total scores of Emotional Availability. \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$ .

Solid lines indicate significant direct and indirect effects. Broken lines indicated no significant indirect effect.

$R^2$  = variance accounted for the model.

Table 5.5

*Unstandardized Indirect Effects of Childhood Trauma and Emotional Availability via Environmental Risk and via Borderline Personality (N=51)*

	Bootstrap estimate	SE	BC 95% CI lower	BC 95% CI upper
Environmental risk	-.089*	.036	-.171	-.020
Borderline personality	.019	.031	-.032	.093
Total indirect effect	-.070*	.036	-.148	-.003

*Note.* Based on 10000 bootstrap samples. BC = Bias-corrected; CI = confidence interval.

\*Indirect effect is significantly different from zero. Unstandardized indirect effect reported.

## Discussion

The first aim of the research was to compare the quality of caregiving using emotional availability in three groups: mothers recruited from substance misuse treatment services; non-substance misusing mothers matched on key characteristics of socio-environmental risk, and a community sample of mothers who were matched only on maternal age and child age. We hypothesised that there would be a significant difference between the three groups of mothers in their quality of caregiving as well as psycho-social variables including experience of childhood trauma, borderline personality features and socio-environmental risk. Results partially supported our first hypothesis. We found no differences between the two high-risk groups on the quality of the caregiving relationship, experiences of childhood trauma severity of borderline personality features. However, compared to the community sample, both high-risk groups showed lower emotional availability, higher adverse experience of childhood trauma and more features of adult borderline personality disorder. These results are consistent with prior research that has documented the adversity affecting mothers with substance misuse problems (Eiden, Godleski, Colder, & Schuetze, 2014; Kettinger, Nair, & Schuler,

2000; Nair, Schuler, Black, Kettinger, & Harrington, 2003; Suchman, McMahon, Slade, & Luthar, 2005) and suggests that substance misuse per se is not sufficient to explain the poorer quality of caregiving observed in this group of women.

The second aim of this study was to investigate a potential pathway in which the relationship between exposure to childhood trauma and quality of caregiving might be mediated by the severity of borderline personality features and cumulative socio-environmental risk. As expected, maternal childhood trauma, socio-environmental risk and borderline personality features were all strongly correlated with quality of caregiving across the total sample. Importantly, the relationship between childhood trauma and emotional availability was mediated by socio-environmental risk. We found a significant association between childhood trauma and severity of borderline personality features, but no specific indirect effect between childhood trauma and caregiving via severity of borderline personality features. Together these results suggest that the quality of caregiving these mothers provide to their infants is impaired when they are under a high level of stress associated with socio-environmental adversity, but that severity of borderline features is not responsible for the compromised quality of caregiving. Thus, this study once again underscores the relationship between early experiences of trauma and the impact that this has on caregiving (DeOliveira et al., 2004; Fuchs et al., 2015). Importantly, the sample was drawn from diverse sources thereby ensuring that there was a range of risk and clinical characteristics that provided the opportunity to test the mediation model, albeit in a small sample.

These findings have important clinical implications. In recent years, there has been a growing interest in the development of parenting programs that provide support to vulnerable families.

Accompanying this has been a shift away from a focus on the behavioural management of children, to a greater focus on the quality of the caregiving relationship. Some of these programs such as *Minding the Baby* (Sadler et al., 2013), the *Mother and Toddlers Program* (Suchman, DeCoste, Castiglioni, Legow, & Mayes, 2008) and *Parents Under Pressure* (Dawe & Harnett, 2007) have an explicit focus on the quality of caregiving. These programs are developed for high risk women: young first time pregnant mothers and mothers with substance misuse, thus it is highly likely that many of these women will come to programs with a history of childhood trauma. However, childhood trauma was not directly associated with quality of caregiving but was mediated by environmental risk. Thus, programs supporting high risk mothers need to be both cognisant of the potential impact childhood trauma has had on women, in addition to a focus on supporting mothers facing environmental challenges. The extent to which borderline personality features may also be contributing to quality of caregiving cannot be confirmed in the current study as this failed to be a significant mediator. Notably, programs working with the highest risk dyads where there is, for example, current or recent child maltreatment have a central focus on the relationship between mother and infant (e.g., *Attachment and Biobehavioural Catch-Up*: Dozier et al., 2006) and (*Child-parent Psychotherapy*: Lieberman & Van Horn, 2008).

The mediating pathway of environmental risk also draws attention to the ongoing importance of ensuring that interventions targeting vulnerable mothers include an ecological perspective that takes into account the complexity of risk that they live with (Dawe & Harnett, 2013). These mothers often experience financial hardship and social isolation (Suchman et al., 2005) and face ongoing adversity such as domestic violence (Wekerle, Wall, Leung, & Trocmé, 2007). While many of the environmental risks in the current study are historical and therefore unchangeable (e.g., education) others are more malleable and could

potentially be the focus of interventions (e.g., social support, stress and financial disadvantage that may be related in part to poor budgeting and/or unemployment).

### **Limitations**

There are several limitations to this study. The first limitation is related to the relatively small sample size. However, given the large correlations between the predictor (childhood trauma) and mediating variables (environment risk/ borderline personality features) and the medium correlation between environmental risk and maternal sensitivity, the recommended sample size to test the mediated effect (using 95% bias-corrected bootstrapping) with .8 power is approximately 54 participants (Fritz & Mackinnon, 2007). As noted, the lack of a significant indirect effect of borderline traits and maternal sensitivity appears due to the considered shared variance between borderline traits and environmental risk (and consequent reduction in the unique effect of borderline traits and maternal sensitivity with environmental risk). Therefore, it is suggested that to detect the indirect effect via borderline personality features in this study was not possible, as the overlap between environmental risk and borderline personality features was too great and for this group of mothers, environmental risk appears to be the more specific. For this reason, research with larger samples is necessary to further test our proposed model and its predicted associations.

Secondly, as with any cross-sectional study, causal effects cannot be established. Maxwell, Cole, and Mitchell (2011) propose that cross sectional designs fail to capture true mediation processes. However, Preacher and Hayes (2008) support the use of mediational analysis in behavioural research when the proposed indirect effects can be established on theoretical grounds, which is the case in this research. Furthermore, previous research findings support the associations between childhood trauma, psychopathology with specific reference to BPD, socio-environmental risk and poor quality of caregiving over time, hence

suggesting the findings from this cross-sectional study provide a meaningful contribution to research and clinical practice.

Thirdly, inclusion of present trauma, specifically domestic violence, should be considered in future research studies given the complex nature of family dynamics in high risk mothers. This was outside the scope of this current study.

Finally, the potential risk of coding bias needs to be acknowledged as the coding was performed by the author who collected 45% of the data. Whilst this may raise concerns of potential bias, these concerns can be offset by the high interrater reliability obtained between the author and other coders. Nonetheless it still needs to be acknowledged as a limitation for a proportion of this current sample.

## **Conclusions**

Our results demonstrate that high risk mothers with and without substance misuse show compromised caregiving compared to a matched community sample. Further, these two groups were significantly different on measures of childhood trauma and adult psychopathology, i.e., borderline personality features. An indirect pathway from perceived childhood trauma via socio-environmental risk to quality of caregiving was found. This data underscores the importance of addressing perceived childhood trauma in the further development of attachment-focused parenting programs for high-risk mothers and their children. The ongoing exposure to socio-environmental adversity would also suggest that programs need to ensure that case management support that addresses these environmental factors are either included within the program itself or that liaison with other services is undertaken.

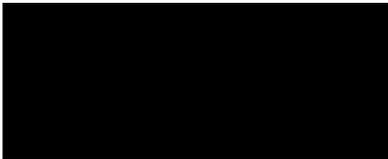
## **Chapter 6: The Mediating Influences of Borderline Personality Features, Environmental Risk and Quality of Caregiving on Child Outcome in Mothers with Childhood Trauma**

### **Statement of Contribution and Co-Authored Manuscript**

**Hatzis, D.**, Dawe, S., Harnett, P., Loxton, N. The mediating influences of borderline personality features, environmental risk and quality of caregiving on child outcomes in mothers with childhood trauma.

This chapter includes a co-authored manuscript paper. The bibliographic details of the co-authored paper, including all authors, are: **Denise Hatzis**, Professor Sharon Dawe, Dr Natalie Loxton and Paul Harnett. The candidate's contribution to the paper involved conception of the study design, literature review, data collection and analyses, and writing of the manuscript. The co-authors provided guidance on direction, assistance with analysis interpretation, review of drafts and supervisory advice.

Name of student: Denise Hatzis



Names of corresponding authors of paper:

Professor Sharon Dawe (Primary Supervisor)

A black rectangular redaction box covering the signature of Professor Sharon Dawe, with some handwritten scribbles above it.

Dr Natalie Loxton (Secondary Supervisor)

A black rectangular redaction box covering the signature of Dr Natalie Loxton, with some handwritten scribbles above it.

Dr Paul Harnett

A black rectangular redaction box covering the signature of Dr Paul Harnett, with a small handwritten mark above it.

### **Foreword to Chapter 6**

As highlighted by previous research, substance misusing mothers often present to support organisations with a range of psycho-social and environmental risk factors, often including maternal childhood maltreatment that ultimately impacts on their ability to provide quality caregiving. Providing sensitive and responsive caregiving is the key to improving child outcomes. However, the detrimental effects of experiencing poor quality caregiving in the form of childhood maltreatment and trauma is not limited to substance misusing mothers. This continuation of intergenerational trauma and abuse is often observed in their offspring through compromised developmental outcomes. Chapter 6 extends the findings of chapter 5 by investigating a potential pathway influencing child cognitive outcomes in mothers, oversampling for risk (see Table 1.1, Chapter 1). Relevant future policy, research and clinical practice implications are highlighted with recommendations for future research.

## Introduction

Childhood maltreatment and early trauma have been associated with a range of adverse outcomes that include poor emotional regulation, mental health problems such as depression and substance misuse, and compromised parenting (see review by Anda et al., 2006; Felitti et al., 1998; Heim, Shugart, Craighead, & Nemeroff, 2010). These risk factors are, in turn, associated with an accumulation of psychosocial risk factors across adulthood that includes poor education attainment, financial disadvantage and ongoing exposure to trauma and higher risk of later personality psychopathology. All of these factors impact on the capacity to provide sensitive and nurturing caregiving (Cyr et al., 2010). Not surprisingly, children raised by mothers who have experienced childhood maltreatment and trauma show a range of difficulties developing in early childhood across cognitive, social and psychological domains (McDonnell & Valentino, 2016). However, while these associations have been well documented across a range of studies, to date there has been relatively little systematic investigation of the potential pathways linking exposure to maternal childhood trauma and children's outcomes. We propose that one pathway to poor child outcomes lies with the mediating role that personality psychopathology and cumulative environmental adversity may have on mothers' capacity to provide sensitive and responsive caregiving. This, in turn, is associated with poor developmental outcomes in infancy and early childhood. This study investigates a potential pathway by testing the relationship between maternal childhood trauma and child developmental outcome. Specifically, we propose that personality psychopathology and the accumulation of psychosocial risk factors in mothers who have been exposed to childhood trauma erodes the capacity for sensitive and responsive caregiving, which in turn, leads to poor developmental outcomes. Importantly, this study draws from a diverse sample of mothers and their children between the ages of 12 months and 3 years, which includes a number of mothers who face significant environmental adversity and stress.

### **Maternal History of Trauma, Adult Outcomes and Compromised Parenting**

Extensive research documents the relationship between early child adversity, including childhood trauma, and a range of deleterious short and long-term outcomes in adulthood (Felitti et al., 1998). These include psychopathology and substance misuse (refer to review by Anda et al., 2006; Ondersma, 2002), parental stress (Martinez-Torteya et al., 2014), emotional dysregulation (Smith, Cross, Winkler, Jovanovic, & Bradley, 2014), and personality difficulties including borderline personality disorder (BPD) (Ball & Links, 2009; Rogosch & Cicchetti, 2005). The impact of BPD appears almost uniformly to affect the quality of caregiving which mothers can provide. This is not surprising. The acquisition of coping skills and the ability to form meaningful interpersonal relationships can be significantly compromised in many women who have experienced childhood trauma, which in turn is strongly predictive of dysregulated affect. Indeed, the developmental roots of BPD begins with poor early attachment experiences (Fonagy et al., 2003) resulting in unstable or reduced mentalizing capacity that influences these individuals' own attachment security style and how they engage with the world around them (Ensink et al., 2016; Fonagy & Bateman, 2007). For some of these women, a pattern of interpersonal instability, poor self-image, and marked emotional dysregulation emerges (Ball & Links, 2009; Rogosch & Cicchetti, 2005), with characteristics associated with BPD emerging. A number of studies indicate that women with BPD struggle with interpersonal relationship with their infant and experience dysregulated emotions in response to infant cues that results in compromised caregiving.

In a recent comprehensive systematic review of published literature between 1980 and 2015, Eyden and colleagues (2016) aimed to discern whether parenting behaviours and child outcomes differed between BPD mothers and mothers without BPD. The literature was synthesised according to four areas of interest: maternal characteristics associated with BPD and caregiving; the dyadic interplay between mother and child; child outcomes; and the

mechanisms underpinning the relationship between BPD and child outcomes. They found that mothers with borderline pathology and/or symptoms were more insensitive (Crandell et al., 2003; Howard et al., 1995; Newman et al., 2007), more intrusive (Crandell et al., 2003; Hobson et al., 2009), more hostile (Elliot et al., 2014; Frankel-Waldheter et al., 2015) and conversely, also engaged in overprotective caregiving behaviours (Elliot et al., 2014). This contrast in caregiving between on the one hand ultra-protective, and on the other, rejecting, hostile, frightening and/or fearful behaviour (Hobson et al., 2009; White et al., 2011) has been observed as uniquely BPD maternal characteristics, with a push/pull dyadic nature (Stepp et al., 2012), which can result in poor child outcomes.

Mothers who have experienced past childhood trauma and have current personality psychopathology also often have chaotic lifestyles that are complicated by poverty (Russell, Harris, & Gockel, 2008), limited social support (Sperry & Widom), teen parenthood (Bert et al., 2009) and domestic violence (Casanueva, Martin, & Runyan, 2009). Furthermore, when a combination of these risk factors coexist, the risk of poor outcomes can increase from 3% when no risk factors present, to 24% when four or more risk factors are present (Brown et al., 1998). Thus, it is the accumulation of risk factors, rather than any one particular risk, that is associated with compromised outcomes (Sameroff, 1998).

Mothers who have experienced a range of childhood adversity and later environmental and psychological stressors also have been associated with compromised caregiving in a range of studies. In one of the early meta-analyses, Van Ijzendoorn and colleagues found that mothers who had experienced significant child adversity, that included significant loss during childhood or trauma, showed insensitive caregiving, and in particular frightening parenting behaviours (e.g., chaotic, unpredictable and harsh). This in turn is associated with a disorganised attachment style (van Ijzendoorn et al. (1999). Since this early review, there has been an accumulation of research showing a link between early childhood

adversity, poor adult outcomes and compromised parenting. For example, Fuchs and colleagues (2015) found that compared to mothers with no childhood adversity, mothers with a history of childhood adversity showed compromised caregiving when their infants were 12 months old. In a narrative review, Vaillancourt and colleagues (2017) investigated the relationship between maternal history of childhood trauma and caregiving quality. Six out of 14 studies found a direct association between maternal childhood trauma and parenting while four studies showed an indirect association. For example, factors that had a direct impact on childhood trauma and caregiving were severity of physical misuse experienced in childhood (Lyons-Ruth & Block, 1996) and poor structuring to scaffold learning due to high levels of intrusiveness impeded child lead play (Driscoll & Easterbrooks, 2007). Other factors such as the presence of cumulative environmental risk, psychopathology and domestic violence (L. Dixon, Browne, & Hamilton-Giachritsis, 2005) and parenting stress (Pereira et al., 2012) were found to mediate this relationship.

### **Poor Parenting Associated with Compromised Child Outcome.**

There is an established literature documenting that compromised caregiving in early childhood is associated with poor child outcome. This has been extensively investigated with a number of systematic reviews and meta-analytic studies that have drawn together a diverse range of research studies (Bakermans-Kranenburg et al., 2005; Cyr et al., 2010; R. Fearon et al., 2010; Groh et al., 2012; van Ijzendoorn et al., 1999). The quality of a child's attachment and subsequently child outcomes is influenced by the way in which a parent and a child relate with each other and most importantly, how the parent responds to the child's cues for engagement. Main and Hesse (1990) found that when parents demonstrated for example a parenting style comprising a combination of both frightened and frightening behaviours, also associated with BPD features (Hobson et al., 2009; White et al., 2011), there was a higher association with these parental behaviours and child disorganised attachment. Also they

noted, these frightened and frightening parenting behaviours were observed in parents who themselves had experienced trauma and loss in their own childhood. Van der Voort and colleagues (2014) proposed it is difficult for a child to not develop some style of relationship with their parent, however in the presence of compromise caregiving/parenting, disorganised attachments often emerge resulting in poor child outcomes.

For example, Fearon et al. (2010), found a significant association between insecure attachment (including disorganised attachment) and child externalising behaviours in a review of 69 studies ( $N = 5,947$ ;  $d = 0.31$ ). A later group (Groh et al., 2012) found overall similar findings, in that insecure attachment styles were again more strongly associated with externalising behaviours, in particular avoidant ( $d = 0.31$ ) and disorganised attachment styles ( $d = 0.34$ ) and added to this literature by finding that insecure attachment was related to the development of internalising symptoms ( $d = 0.15$ ) across 42 studies ( $N = 4,614$ ). Finally, Cyr and colleagues (2010) synthesised literature from 55 studies ( $N = 4,792$ ) to examine attachment security in maltreating and high-risk families. Like other studies, the authors found a significant and large effect size ( $d = 2.10$ ) between poor parenting and the development of insecure attachment in maltreating families, and a lower effect size ( $d = 0.48$ ) for the relationship between parenting and insecure attachment in families that were classified as high-risk but did not have reports of child maltreatment. Within the maltreating families, the effect size was similar for physical abuse ( $d = 2.22$ ) and neglect ( $d = 2.17$ ). The pattern of results was similar when the outcome was a disorganised attachment style; a large effect size ( $d = 2.19$ ) for maltreating families and a lower effect size ( $d = 0.48$ ) for high risk non-maltreated families.

### **The Investigation of Potential Pathways**

There is strong evidence supporting (i) an association between maternal childhood trauma and compromised parenting and (ii) an association between maternal childhood trauma and child outcome.

The most recent research focus has therefore shifted to an investigation of the potential mediators between maternal childhood trauma and child outcomes. Stacks and colleagues (2014) found that maternal sensitivity mediated the relationship between maternal reflective functioning (a process by which parents are able to view their child's experience of life from the child's perspective and respond sensitively), and infant attachment security, in mothers with a history of childhood trauma. Others have identified psychopathology for example depression, negatively impacted the relationship between maternal trauma and child outcomes (i.e., externalising behaviours) at aged 8 -11 years (Meller, Kuperman, McCullough, & Shaffer, 2016). In a more recent study, McDonnell and Valentino (2016) investigated the association between mothers' childhood trauma and childhood household dysfunction on first, perinatal depression and then on infant birth weight and subsequently child socioemotional functioning at 6 months. First, there was a significant association between maternal childhood trauma and changes in perinatal depression. They also found a direct association between maternal childhood trauma and infants' socio-emotional functioning and an indirect association between childhood household dysfunction, and infants' socioemotional functioning via maternal age at first pregnancy and infant birth weight. The authors called for future research to verify the findings of child socioemotional symptoms with other developmental indices, for example, measures of cognitive functioning. Further justification for using a measure of cognitive functioning in this study was also based on the direct link evidenced between maternal interactive behaviours (i.e., sensitive and responsive caregiving, the central focus of this thesis) on cognitive functioning (Landry,

Smith, Swank, Assel, & Vellet, 2001; Lemelin, Tarabulsky, & Provost, 2006; M. D. Lewis, 1993). Also, Gratz et al. (2014) found that a key mechanism mediating the relationship between maternal BPD and a child's dysregulation was indeed a mother's level of emotional dysfunction. Hence the quality of maternal caregiving in BPD mothers matters. In brief, evidence available to date supports the view of BPD mothers as being insensitive, intrusive and at times hostile and/or frightening in their interaction style with their children, which impacts on their ability to bond with their child and provide a safe and secure base for optimal child outcomes. Finally, two current studies have identified poverty and current environmental adversity as mediators in the relationship between maternal childhood trauma and child outcomes (Bouvette-Turcot et al., 2017; Folger et al., 2017). Notably, Martinez-Torteya and colleagues (2014) did not find a direct pathway between maternal childhood trauma and parenting behaviours. However, maternal childhood trauma was associated with both depressive and post-traumatic stress symptoms, and with psychological stress. These all impacted on maternal parenting behaviours which were directed associated with infants' behavioural and emotional regulation.

### **Current Study Aims**

The evidence thus far clearly establishes the association between maternal childhood trauma and a range of infant and child outcomes that include attachment organisation (Stacks); child socio-emotional behaviours (Folger et al., 2017; McDonnell & Valentino, 2016), child externalising behaviours (Meller et al., 2016); poor caregiving quality (see review by van Ijzendoorn et al., 1999) especially in the presence of borderline personality features (Macfie et al., 2014) and cumulative environmental risk factors (see review by Evans et al., 2013). The purpose of the current study was to extend these findings to test the relationship between maternal childhood trauma and child developmental outcomes by investigating the potential role of borderline personality features, current environmental stress

and observed quality of caregiving. We propose that because maternal history of trauma is associated with poor adult psychological functioning and greater current environmental adversity, and greater exposure to environmental adversity is linked with insensitive and poor quality caregiving, maternal childhood trauma will be predictive of children's cognitive development. As such we hypothesised, the association between maternal childhood trauma and child developmental outcome is influenced by firstly, borderline personality features in the presence of current environmental adversity, which in turn impacts on mothers' capacity to provide optimal caregiving. We used a serial mediation pathway model to determine whether maternal child trauma is indirectly associated with child's cognitive development via borderline personality features, environmental risk and caregiving quality (see Figure 6.1.).

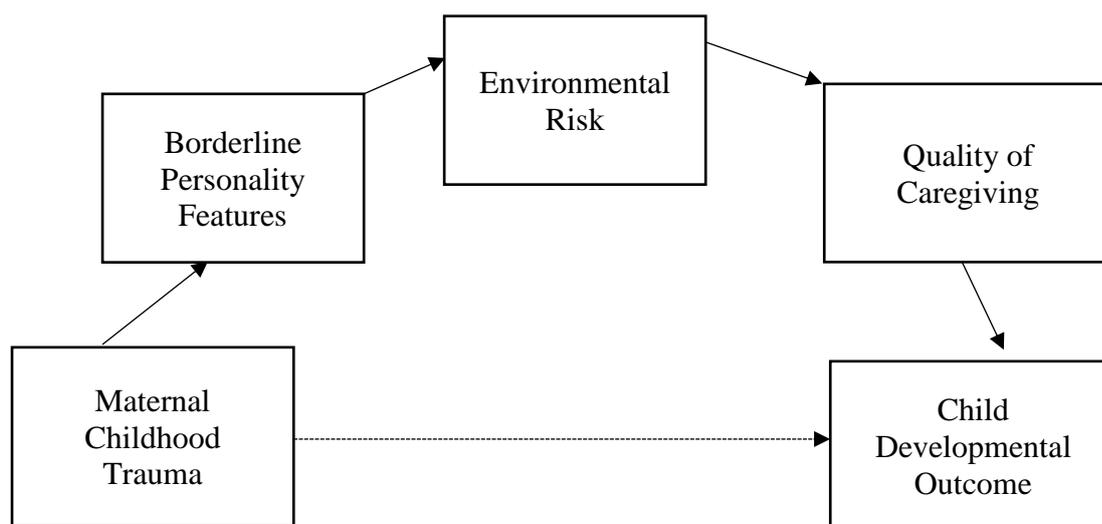


Figure 6.1 Proposed model testing whether borderline personality features, environmental risk and quality of caregiving serve as serial mediators linking maternal childhood trauma with child developmental outcomes

## Method

### Participants and Procedure

The sample consisted of 125 Australian mothers recruited from (i) organisations that provided services to disadvantaged families (ii) advertisement at the University and (iii)

through social media. All dyads were recruited between June 2013 and December 2015. Inclusion criteria were mothers: able to speak and comprehend English equivalent to a literacy level of approximately a 12-year-old; having no suicidal ideation or apparent psychotic thought process; without a diagnosed learning disability; and having a child aged between 12 and 42 months.

Assessment duration was 90-120 minutes and consisted of completion of measures, a child developmental screener and a 20-minute interaction to code quality of caregiving. Mothers were asked to “be with your child as you normally would at home”. A standardised age appropriate set of toys was placed on a play mat on the floor next to a comfortable chair and a small table containing magazines. All procedures were approved by university and hospital ethics departments. All ethical issues regarding participant safety, researcher safety and child protection concerns were considered and regular supervision was undertaken weekly during the testing period with the principal supervisor to maintain and facilitate adherence to safe practices. Mothers received a \$30.00 gift voucher as compensation for time and travel.

## **Measures**

### **Assessment of Maternal Childhood Trauma**

The Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998) is a standardized 28-item self-report scale measuring the severity of childhood trauma with five clinical subscales: emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect. Each item is scored using a five-point Likert scale from one to five, with one representing “never” and five “very often”. Scores are summed with each trauma subscale producing scores ranging from five to 25. The CTQ has good internal consistency ranging from .79 to .96 (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997; Bernstein et al., 1994; Paivio & Cramer, 2004) and convergent validity with the Childhood Trauma Interview (Bernstein et al., 1994). Measurement invariance has been found across adult and adolescent

clinical inpatients (including substance using inpatients) and non-clinical populations (Bernstein et al., 1997; Bernstein et al., 2003). Bernstein and Fink (1998) provided cut off scores that yield good sensitivity and specificity and the following will be used to calculate incidence of childhood trauma in this study: emotional abuse (9); physical abuse (8); sexual abuse (6); physical neglect (8); and emotional neglect (10). The total score of the five abuse subscales was used in this study with a combined cut off value of fortyone. Cronbach's  $\alpha$  for the current study was .86.

### **Assessment of Environmental Risk.**

A composite environmental risk score based on the early work of Sameroff et al. (1993a), and further informed by Evans et al. (2013) was used. Ten risk factors were identified from demographic information and by scores from standardised questionnaires and scored dichotomously (1 = present; 0 = absent). The ten risk factors consisted of the following: pregnant before age 21 years; overcrowding (four or more children in the same household); single parent household; receipt of government benefits as major source of income; maternal education less than 12 years; partner alcohol consumption greater than four standard drinks a day; racial minority status (non-white); living with extended family or without children; high maternal stress with a score in the severe range (i.e., greater than 26) on the Stress Scale of Depression Anxiety and Stress Scale: Lovibond and Lovibond (1995); low social support (i.e., a total score of 48 or less) using the Multidimensional Scale of Perceived Social Support: Zimet, Dahlem, Zimet, and Farley (1988).

### **Assessment of Quality of Caregiving**

This was measured using the Emotional Availability Scales (EA; Biringen, 2008). Maternal-child free-play interactions were videotaped and coded using standardised scoring procedures for four maternal domains (sensitivity, structuring, non-intrusiveness and non-hostility) and two child domains (responsiveness to mother and involvement with mother).

Parental sensitivity refers to a parent's genuine warmth, responsiveness and awareness of their child's cues, responding appropriately and the ability to manage and resolve conflict situations. Parental structuring refers to the parent's ability to structure their child's world to facilitate cognitive growth and learning. Parental non-intrusiveness describes the parent's ability to provide adequate scaffolding without appearing to interfere with the child's sense of autonomy and space. Parental non-hostility refers to how the parent responds to conflict situations. Observing impatience, harshness or malice towards the child would be coded by a low score in this domain. A child's willingness to respond to the efforts of a parent to engage in an activity or interaction is coded as child responsiveness. A child attempts to initiate engagement or cues a parent to interact with him or her this is viewed as child involvement.

Each of the six domains have seven subscales. Two subscales are scored 1 - 7; the remaining five subscales are scored 1 - 3 (range 7 - 29). Each domain score was then converted to a 7-point scale as recommended by Biringen (Biringen, 2008, p. 7) providing a score from 1 - 7 for each six domains that are summed to provide a total score with a range of 6 - 42.

Fifteen percent of the videotaped mother-infant interactions were randomly chosen and recorded by an independent trained coder for inter-rater reliability including 15% coded by the method trainer (Zepnip Biringen). Inter-rater reliability was assessed using a two-way mixed, consistency, single measure intra-class correlation, with correlations for the six scales and caregiving total, ranging between .83 and .94, which was consistent with (Salo et al., 2009) who reported inter-rater reliabilities ranging between .85 and .92 between raters and the method trainer.

### **Assessment of Child Developmental Outcome**

The Bayley Scales of Infant Toddler Development Third Edition Screening Test (Bayley-III Screening Test; Bayley, 2006a) was used to obtain a measure of child cognitive

development. The Bayley-III Screening Test uses test items from the Bayley Scales of Infant Toddler Development, Third Edition (Bayley, 2006b) across five domains: cognitive, receptive language, expressive language, gross motor development, and fine motor development.

Item administration and scoring criteria is consistent across both measures with both reporting high reliability and validity. Item-level information collected are summed to calculate a total raw score for each domain that is then classified into a risk category, which equates to the Bayley-III scaled scores and described as following: Bayley-III scaled scores (1-4) are equivalent to the criterion used to identify children on the Bayley-III Screening test as *At Risk*; Bayley-III scaled scores (5-7) are equivalent to the criterion used to identify children on the Bayley-III Screening test as *Emerging*; Bayley-III scaled scores (8-19) are equivalent to the criterion used to identify children on the Bayley-III Screening test as *Proficient* (Bayley, 2006a, 2006b). Fifteen percent of the videotaped Bayley-III ST administrations were randomly chosen and recoded by an independent trained coder for inter-rater reliability. Interrater reliabilities were assessed using a two-way mixed, consistency, single measure intra-class correlation, with correlations for the five domains ranging from 0.88 to 0.99.

The cognitive domain of the Bayley-III Screener was used as a measure of child outcomes in the present study. There are 33 subtest items which form the Cognitive domain from the Bayley-III Screener that assesses such behaviours as attention, novelty performance, problem solving and concept formation. In accordance with the Bayley-III Screening Manual, cognitive total raw scores were converted to age-corrected  $z$ -scores (which were obtained from NCS Pearson, Inc.) and then used as a continuous measure for analysis purposes. The inter-rater reliability scores across all five domains (Pearson's  $R$ ) ranged from .88 to .99 in the current study.

### **Analysis Plan**

Univariate analyses were conducted to calculate descriptive statistics for demographic characteristics and measures of childhood trauma, borderline personality features, environmental risk, maternal emotional availability total scores and Bayley's Screener cognitive scores. Pearson product correlations were calculated to investigate univariate associations between the study variables. A serial mediation model was used to test whether maternal history of childhood trauma was associated with the mediators, borderline personality features, environmental risk and maternal caregiving quality, in a serial fashion, and in turn, predict children's developmental outcome measured by their cognitive ability (see Figure 6.1). This model simultaneously tests seven indirect effects of maternal childhood trauma and child developmental outcome (i) via borderline personality features alone, (ii) environment risk alone; (iii) via maternal caregiving quality alone; (iv) via borderline personality features and environmental risk; (v) via borderline features and maternal caregiving quality; (vi) via environmental risk and maternal caregiving; and (vii) via borderline personality features, environmental risk and maternal caregiving (Figure 6.1).

The significance of the seven indirect effects, was assessed using bias-corrected bootstrap confidence intervals ( $n = 10000$ , confidence intervals set at 95%) computed using SPSS for Windows Version 23 in conjunction with the SPSS PROCESS Macro Version 2.16, Model 6 (Hayes, 2013). Significant indirect effects are identified when zero does not fall between the confidence intervals reported.

## **Results**

### **Descriptive Statistics**

Demographic characteristics including age, employment status, race and education levels are presented in Table 6.1 and environmental risk factors with cut-off scores are presented in Table 6.2. Variable means, standard deviations and Pearson product moment

correlations are presented in Table 3. A total of 27 (22%) mothers scored above the cut off on one or more of the CTQ scales [emotional abuse (9); physical abuse (8); sexual abuse (6); physical neglect (8); and emotional neglect (10)].

Table 6.21

*Demographic Sample Characteristics as a Percentage of the Sample*

Table 6.1 Demographic sample characteristics as a percentage of the sample

Maternal Characteristics	Mean (SD) N = 125	Number (%), N = 125
Maternal Age	31.33 (5.11)	
Employment status %		
Paid Employment		97 (77.60)
Government Benefits		28 (22.40)
Number of pregnancies (including current) %		
1		55 (44.00)
2		46 (36.80)
3		13 (10.40)
≥4		11 (8.80)
Marital status		
Married		96 (76.80)
Never Married - Single		9 (7.20)
Living with Partner		15 (12.00)
Not Living with Partner - Divorced		4 (3.20)
Widowed		1 (0.80)
Race %		
White		98 (78.40)
Non-White		27 (21.60)
Education %		
<10 years		3 (2.40)
<12 years (High School)		14 (11.20)
>12 years (TAFE or Technical College)		41 (32.80)
University		67 (53.60)
Child Maltreatment		
Scored severe to extreme range	37.35 (15.36)	27 (22)
Child age in mths	23.04 (8.36)	
Child Gender %		
Male		63 (50.40)
Female		62 (49.60)

Table 6.2 Environmental risk factors and cut-off scores

	Risk Cut-off	Number and (%) of Risk Factors <i>N</i> = 125
Maternal Age	≤ 21 when pregnant	11 (8.80)
Family Size	≥ 4 children	11 (8.80)
Marital Status	Sole parenting	9 (7.20)
Income	Receiving Government benefits	28 (22.40)
Educational Achievement	< 12 years of education	17 (13.60)
Maternal Life Stress	≥ score of 26 on DASS_Stress	1 (0.80)
Maternal Social Support	≤ score of 48 of Social Support	14 (11.20)
Living Situation Stability	Living with extended family or without children	7 (5.60)
Maternal Race	Non-white	27 (21.60)
Partner Alcohol Consumption	≥ 4 drinks per day	14 (11.20)

*Note:* DASS = Depression, Anxiety and Stress Scale

Table 6.3 Correlations of means and standard deviations of study variables (*N* = 125)

Variables	1	2	3	4	M/(SD)	Range
Childhood trauma <sup>1</sup>					37.35 (15.36)	25-95
Borderline Personality <sup>2</sup>	.35*				18.68 (9.14)	1-42
Environmental Risk <sup>3</sup>	.18	.35*			1.06 (1.11)	0-5
Maternal caregiving quality <sup>4</sup>	-.19*	-.22*	-.29*		37.06 (5.96)	20-42
Cognitive Development <sup>5</sup>	-.09	-.15	-.31*	.32**	.20 (1.13)	-3.16-3.83

Note:

<sup>1</sup> Emotional Availability Scale - Total

<sup>2</sup> Borderline Personality Features

<sup>3</sup> Child Trauma Questionnaire

<sup>4</sup> Environmental Risk

<sup>5</sup> z Scores Bayley Scales of Infant and Toddler Developmental Screener Test (3<sup>rd</sup> Edition).

\**p* < .05 \*\**p* < .01 \*\*\**p* < .001.

### Tests of Serial Mediation

History of maternal childhood trauma was set as the independent variable, child’s cognitive ability as the dependent variable, and borderline personality features, environmental risk and maternal caregiving quality as serial mediator variables. Results of this analysis are shown in figure 6.2 and the total direct and indirect effects are reported in Table 6.4. This modelling approach tests seven indirect pathways of which two were significant (refer to Table 6.4). The test of the indirect effect of childhood trauma and child’s cognitive ability via (i) borderline personality features and environmental risk (whilst holding maternal caregiving constant) and (ii) borderline personality features, environmental risk and maternal caregiving had confidence intervals that do not include zero, which indicates a significant mediating effect. The relationship between maternal childhood trauma and children’s cognitive ability was not mediated via (i) borderline personality features and maternal caregiving quality (holding environmental risk constant); (ii) environment risk and maternal caregiving (holding borderline personality features constant); (iii) environmental risk (holding borderline

personality features and maternal caregiving constant); (iv) borderline personality features (holding environment risk and maternal caregiving constant) and (v) maternal caregiving (holding borderline personality features and environment risk constant) .

In summary, there were two significant serial indirect pathway of childhood trauma to child's cognitive ability: (i) via borderline personality features and environmental risk; and (ii) via borderline personality features, environmental risk and maternal caregiving quality, shown by an absence of zero in the confidence intervals (refer to Table 6.4). The total model explained 15% of the variance in child's cognitive ability measured by the Bayley-III screener (see Figure 6.2).

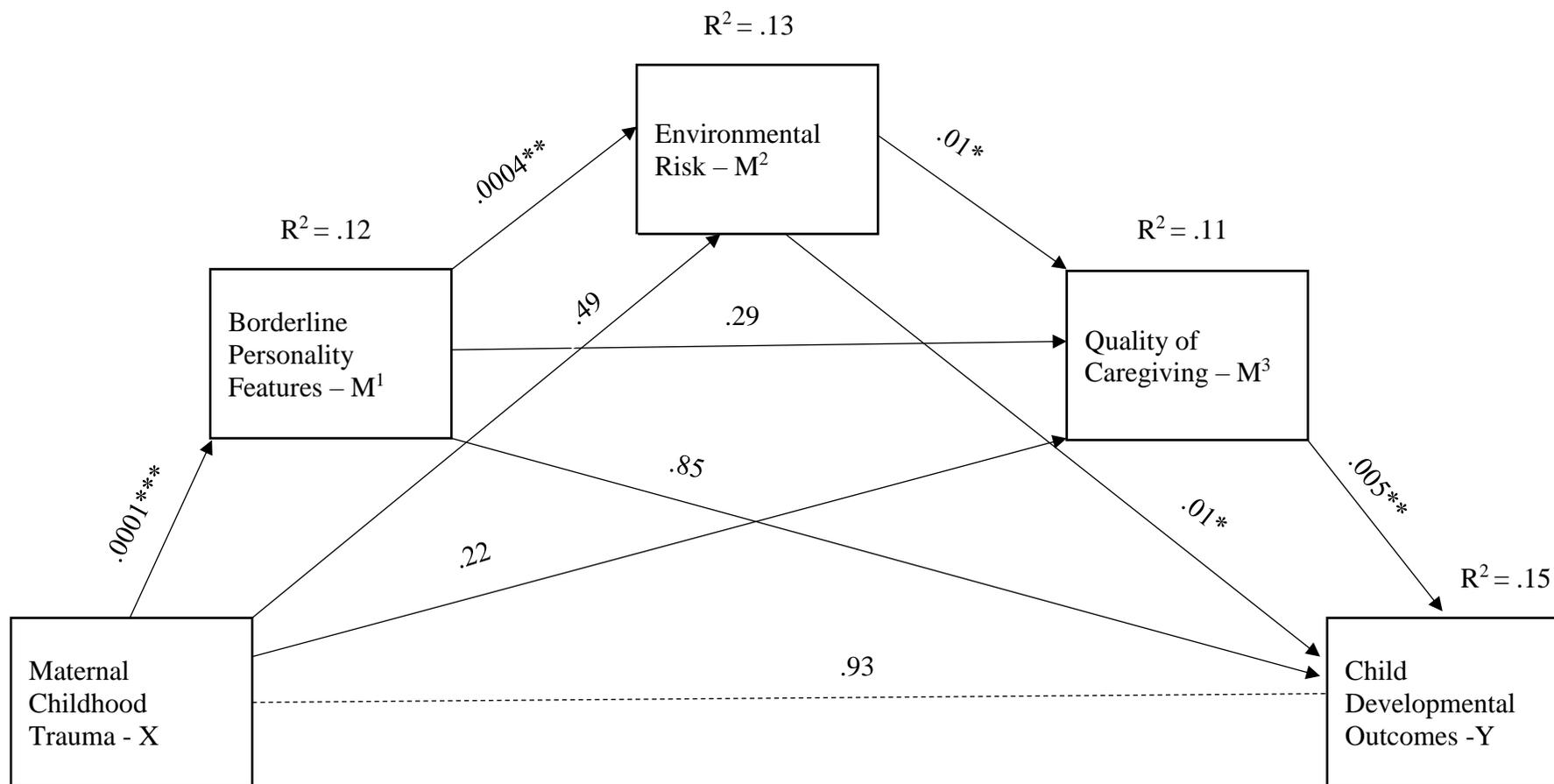


Figure 6.2 *N* = 125. Direct and indirect effects of childhood trauma on child's cognitive ability via environment risk and emotional availability shown as unstandardized coefficients

\**p* = .05 \*\**p* < .05 \*\*\**p* < .001

Table 6.4 Unstandardized Indirect Effect of History of Childhood Trauma on Bayley's cognitive screener via Borderline Personality Features, Environmental Risk and Maternal Caregiving Quality Individually; Environmental Risk and Maternal Caregiving Quality Serially Ordered; and the Total Indirect Effect

	Bootstrap Estimate	SE	BC 95% CI Lower	BC 95% CI Upper
Borderline Personality Features	-.0005	.0025	-.0056	.0046
Borderline and Environmental risk	-.0019	.0010	-.0046	-.0005
Borderline and Maternal caregiving quality	-.007	.0008	-.0028	.0006
Borderline Personality Features and Environmental risk and Maternal caregiving quality (in serial order)	-.0005	.003	-.0016	-.0001
Environmental risk	-.0010	.0018	-.0052	.0018
Environmental risk and Maternal caregiving quality	-.0003	.0005	-.0019	.0004
Maternal caregiving quality	-.0021	.0022	-.0074	.0013
Total	-.0069	.0037	-.0149	-.0000

*Note.* Based on 10000 bootstrap samples. BC = bias corrected; CI = confidence intervals

### Discussion

The aim of the study was to investigate the pathway between maternal history of childhood trauma and child developmental outcomes. A serial mediation model was used to investigate the potential mediational roles of borderline personality features, environmental risk and the impact on maternal caregiving behaviours. We demonstrated that mothers who had higher scores on a measure of childhood trauma reported greater incidence of borderline personality features and lived with increased environmental risk. This impacted on the quality

of caregiving and was, in turn, associated with poorer developmental outcomes in young children.

This study makes an important contribution to the literature as this diverse group were drawn from agencies that provided services to high risk mothers, community play groups from geographical locations associated with deprivation as well as community settings. This use of a nonproportional quota sampling approach (Magnani, Sabin, Saidel, & Heckathorn, 2005; Morrow et al., 2007) ensured that we had a heterogeneous sample of mothers, many of whom were experiencing current environmental adversity with 22% of the sample reporting that they had experience childhood trauma in the severe-to-extreme range.

Consistent with previous studies, the univariate results indicate strong statistical relationships between study variables. However, the strength of the study lies in testing a mediation model using a contemporary bootstrapping approach to testing serial mediation. Thus, this study extends the findings of several recent investigations of the potential mediating influences on child outcomes in mothers who have experienced early childhood trauma. Firstly, the link between maternal childhood trauma and environmental risk adds to a substantive body of literature documenting the relationship between exposure to childhood adversity results and a range of compromised adult outcomes that include internalising and externalising disorders in childhood (Kerker et al., 2015), adult depression (Widom et al., 2008), personality psychopathology (Ball & Links, 2009) and poor social support. The significant pathway from environmental risk to child cognitive outcome provides important information about the potential impact these risk factors have on child outcome (e.g., Lemelin et al., 2006).

However, the finding that borderline personality features, environmental risk and the capacity to provide sensitive and nurturing caregiving serving as a serial mediator between maternal childhood trauma and child cognitive outcomes emphasises the importance of a

range of contextual risk factors that, in the current study at least, comprising both historical risk factors (e.g., years of education) and current risk factors (e.g. single parent status, stress, income, social support and personality psychopathology).

Finally, there was a clear link between maternal caregiving behaviour and child cognitive outcomes. This is a well-established finding in the literature (e.g., van Ijzendoorn et al., 1995; Lemelin et al., 2006), and the current study adds to these findings, by emphasising the importance of personality psychopathology and environmental factors that impact on maternal sensitivity such as: stress, poor social support and financial disadvantage, poor housing (overcrowding), limited employment opportunities, and poor educational attainment.

The failure to find a direct pathway between maternal childhood trauma and infant outcomes is inconsistent with a range of other studies. For example, Meller and colleagues found an association between maternal history of emotional maltreatment and child externalising problems. Folger et al. found a direct association between maternal interpersonal trauma and child socioemotional outcomes, and McDonnell and Valentino (2016) found a direct association between maternal childhood abuse and infant socioemotional development at 6 months. Furthermore, dissociative symptoms in children, which impact on normal developmental functioning, have been shown to be a direct response to hostile or withdrawing parenting practices which are consistent with mother who have experienced childhood trauma (see review by Lyons-Ruth, 2003). Martinez-Torteya et al. (2014) however, did not find a direct association between maternal history of childhood abuse and infant outcomes that included behavioural and infant stress reactivity measures. While a direct path between predictor and outcome variables is not a requirement for testing serial mediation (Hayes, 2013), the findings of the current study are difficult to reconcile with many previous reports. It is possible that choosing a measure of cognitive development rather than socioemotional development may have been a factor, although impaired social-

emotional development is associated with poor child cognitive development (Moreno, Klute, & Robinson, 2008).

These findings have important implications for the further development of parenting support programs for high risk families. First and foremost, the absence of a direct link between maternal childhood trauma and child outcome emphasises the importance of developing a nuanced approach to the incorporation of processes to support mothers who have experienced childhood trauma and especially given the high association of experiences of childhood trauma and borderline personality features and poor caregiving quality (Ball & Links, 2009; Hobson et al., 2009). In recent years there has been a growing focus on the inclusion of trauma-focused approaches within home visiting and family support programs in many countries. For example, initiatives in the US such as those described in the HV-ImpACT Trauma-Informed Home Visiting Program (Cairone, Rudick, & Mcauley, 2017), have outlined principles underpinning a trauma-informed approach across program, organisation and systems levels (SAMHSA; Substance Abuse and Mental Health Services Administration, 2014; p. 9). Importantly, these documents underscore the need to assess how (i) childhood trauma is impacting on current parenting capacity and (ii) that the mother is ready and/or willing to address these issues within the context of a family support or parenting program.

The finding that environmental risk then further impacts on maternal sensitivity for mothers who have experienced childhood trauma has important implications for service provision and policy development. Reducing environmental risk is most likely to be effective by helping to reduce financial disadvantage and increasing social support. Indeed, families who are able to break the cycle of poverty, show a reduced number of stressors in their life, decreased depressive symptoms and are able to foster a supportive social network (Dixon, Browne, & Hamilton-Giachritsis, 2009; Jaffee et al., 2013) and, in turn, improvements in

parental and child outcomes. Importantly positive social support networks have been shown to buffer the adverse effects of early childhood trauma (Folger et al., 2017; Schumm, Briggs-Phillips, & Hobfoll, 2006). Thus, family support and parenting programs may need to address potential environmental adversity by helping to reduce much of the distress and stress associated with extreme financial disadvantage and life situations such as housing and impoverished neighbourhoods. These issues can be tackled at an individual practitioner level: organisations may choose to ensure that their services are provided within a case management context that helps families overcome some of these obstacles. Finally, the importance of focusing on maternal caregiving quality is underscored. There is growing acknowledgement in the literature that focusing on the management of child behaviour within the context of parenting programs fails to capture the essential precursor to effective parenting: namely a sensitive and nurturing relationship between a parent and child. These findings add weight to this literature emphasising the importance of attachment-based programs when mother's own experiences include abusive or neglectful caregiving as these experiences may prevent a mother from recognising and responding to her child's cues (e.g., Suchman, Decoste, McMahon, Rounsaville, & Mayes, 2011).

There are a number of strengths and two significant limitations in the current study that could inform future research. The strengths include the diversity of study population with purposive sampling of high risk mothers. The mothers were recruited from a range of sources with the intention to over sample for risk (that is targeting low income and areas known for social disadvantage). Importantly, 22% (that is almost one in four mothers) experienced severe to extreme childhood adversity. Further work could investigate a sample recruited from an area of extreme social disadvantage using services such as family support and family crisis centres as potential recruitment sites. The measures used to assess the potential mediators and the final outcome variable were well validated. A particular strength was the

use of observational measures of maternal caregiving quality using the emotional availability scales (Biringen, 2008). This is one of the most reliable measures of quality of caregiving (see review by Biringen et al., 2014) and in the current study combined six domains of caregiving (sensitivity; structuring, nonhostility, intrusiveness and child responsiveness and involvement) to derive a total score. The use of a well-established measure of cognitive development, the Bayley-III Screener, also provides an objective and well validated measure of child developmental outcome. Taken together, these measures extend previous studies that have relied on self-report measures of at least one of these constructs.

There are limitations with the study. Firstly, the potential impact of additional trauma on the capacity to provide sensitive parenting needs further investigation. Exposure to childhood adversity is associated with increased rates of adult victimisation including domestic violence (Casanueva et al., 2009). The potential impact of ongoing adult exposure to trauma may therefore play a key role in determining both the impact on caregiving quality and the extent to which such mothers may require modified or different treatment approaches. Secondly, while we used a serial mediation model, the importance of prospective investigations cannot be understated.

In summary, this serial mediation model has furthered the literature's understanding of the mechanisms by which experiences of childhood trauma impacts on their own children's cognitive functioning. Further research is needed to investigate potential mechanisms of change prospectively, particularly in the context of parenting support or parenting programs that are trauma-informed.

## **Chapter 7: General Discussion**

The broad overarching goal of the present thesis was to investigate the relationship between the quality of caregiving and factors that have been associated with compromised caregiving in high-risk mothers, with a focus on substance misusing mothers. The secondary aim was to identify mechanisms via which these risk factors contribute to poor quality caregiving and child outcomes. In this final chapter, the key findings from each study are summarised including their methodological limitations. Consideration is given to the implications for policy and clinical practice, and recommendations for future research are suggested.

### **Summary of Results**

There has been considerable investigation of the relationship between child outcomes and maternal quality of caregiving. Moreover, there has been extensive investigation of the risk factors associated with diminished capacity to provide optimal caregiving. This thesis aimed to extend this body of research by examining the potential underlying mechanisms implicated in the pathway to compromised maternal caregiving and child outcomes. The thesis began with a focus on a particularly high-risk population: mothers with substance misuse problems.

An initial narrative review of the research evidence (Chapters 2 and 3) highlighted diverse findings in terms of the quality of caregiving in mothers with substance misuse problems. This was further highlighted by a review of the relatively few studies investigating the quality of attachment relationships in mother-infant dyads. For example, studies reported rates of secure attachment ranging from 19% to 65% (Seifer et al., 2004). Taken together, these findings indicated that a systematic review and meta-analysis were warranted and this formed the basis for Study 1 (Chapter 4).

A systematic review and meta-analytic approach provided the opportunity to: (i) determine the overall effect size for the relationship between the quality of caregiving and maternal substance misuse; and (ii) ascertain whether there were potential moderators to further our understanding of the quality of caregiving in substance misusing mothers. Criteria for inclusion in the systematic review were that the studies had a comparison group of non-substance misusing mothers and that an observational measure for maternal quality of caregiving was used.

A total of 24 studies used an observational measure of caregiving quality, focusing on maternal sensitivity, and a subset of 16 studies also included an observational measure of child responsiveness. The study quality of these 24 included studies was assessed using a pre-established rating scale for observational cohort and cross-sectional studies. Relatively little variability in study quality on 5 of the 9 quality assessment items was found. The notable exception related to study design, whereby 14 studies were rated as methodologically rigorous due to matched comparison groups, while the remaining 10 formed the unmatched sampling subgroup.

Overall, the meta-analyses on the 24 studies reporting maternal sensitivity and 16 studies reporting child responsiveness found that substance misusing mothers displayed more insensitive caregiving compared to mothers who did not use substances but who were experiencing similar psycho-social and environmental adversity. Furthermore, it appears that child responsiveness was also negatively impacted by psycho-social and environmental adversity, irrespective of whether their mothers were substance abusing or not.

It should be noted that the findings from the meta-analysis could not be considered conclusive due to the significant heterogeneity in the distribution of effect sizes across studies. Three potential sources of heterogeneity were proposed: (i) study design, (ii) age of the child, and (iii) whether the sample was recruited from a treatment setting or not.

The subgroup analysis for study design compared the effect of substance misuse on maternal sensitivity for studies that matched substance abusing women with non-substance abusing women on key sociodemographic variables. It was hypothesised that studies with matching would provide a more precise and homogeneous estimate of the effect by controlling for other sources of between-group variability. This subgroup analysis was statistically significant. Although the effect of substance misuse on maternal sensitivity was significant for both study designs, the overall effect size and the confidence intervals were smaller and heterogeneity dropped below statistical significance for the matched studies in comparison to the unmatched studies. This suggests that when studies attempt to control for other factors that may impact maternal sensitivity, the limited effect of substance misuse on maternal sensitivity becomes more apparent.

A slightly different pattern of results was found for child responsiveness whereby the overall effect size was not significantly different for matched and non-matches studies. There were also no differences in the effect of substance misuse on maternal sensitivity or child responsiveness when comparing studies with children aged 0 – 12 months versus studies with children 12 months and older. Treatment was not tested as a moderator, given that most of the studies of mothers classified as “in treatment” were also included in the “unmatched” subgroup.

The relatively small effect size found for maternal sensitivity, in combination with the findings from the literature review (Chapters 2 and 3) suggest that while maternal substance misuse is involved in compromised caregiving, factors such as maternal trauma, comorbid psychopathology and environmental adversity may be equally or more important factors contributing to caregiving quality in this population. However, to date, there had been no study in which substance misusing mothers had been compared to mothers matched on demographics associated with risk and to mothers drawn from a community setting.

Consequently, Study 2 had two aims. The first was to extend findings from the meta-analysis by comparing the quality of caregiving in three groups: mothers recruited from substance misuse treatment services, non-substance using mothers matched on key characteristics of socio-environmental risk and a community sample of mothers who were matched only on maternal age and child age. The second was to investigate a potential pathway in which the relationship between the quality of caregiving and exposure to childhood trauma might be mediated by the severity of borderline personality disorder (BPD) symptoms and cumulative socio-environmental risk (Bornstein, Hahn, Suwalsky, & Haynes, 2011).

Contrary to the findings of the systematic review and meta-analysis, there was no difference between the substance misusing mothers in treatment and the matched comparison mothers on all measures (caregiving quality, borderline symptoms, maternal childhood trauma and environmental risk). There are two possible explanations for this finding. First, it is possible that as the substance misusing mothers were all in treatment at the time of testing, they were functioning better than substance misusing mothers who were not in treatment (Thomas & Zimmer-Gembeck, 2011; Timmer et al., 2011). Second, it is possible that there was insufficient power to detect differences between the two high-risk groups with the current sample size (see Section 7.2 for further discussion of this point).

Investigation of potential pathways was undertaken by combining all three groups to ascertain whether there was an association between maternal childhood trauma and quality of caregiving and whether this was mediated by environmental adversity and BPD features. Borderline personality disorder symptoms were not a significant mediator; however, environmental adversity was a significant mediator.

The final study (Study 3) utilised a larger cohort of mothers oversampled for psychosocial risk to extend Study 2 to examine (1) the influence of maternal childhood

trauma on child developmental outcomes and (2) whether environmental risk and quality of caregiving mediate the relationship between childhood trauma and child developmental outcomes (i.e., cognitive ability). A serial mediation model demonstrated that there was a significant indirect pathway from maternal childhood trauma to child developmental outcomes via environmental risk and quality of caregiving. Although there was a significant direct pathway from environmental risk to child developmental outcomes, the results also illustrate that the presence of poor developmental outcomes is also influenced by compromised caregiving.

Studies 2 and 3 clearly meet the recommendations by De Wolff and Van Ijzendoorn (1997), who highlight the importance of identifying and understanding the mechanisms that impact quality caregiving and child outcomes in high-risk families. This, in turn, informs how interventions can be designed and underscores the importance of early intervention to counteract the impact of environmental adversity and maternal childhood trauma on quality of caregiving (Martinez-Torteya et al., 2014; Ziv et al., 2000).

Table 7.1 Summary of Aims, Key Findings, and Implications of Each Study

Chapter/Study and Aims	Key Findings	Methodological and Theoretical Implications	Policy and Clinical Implications	Implications Research
<p><b>Chapter 4: Study 1</b></p> <p><b>Aims:</b> To better understand the inconsistency in the current literature of substance misusing mothers and compromised caregiving by (i) providing a comprehensive systematic review and (ii) conducting a meta-analysis to examine factors (moderators) that could explain the heterogeneity in study results for factors that influence maternal sensitivity and child responsiveness.</p>	<p><b>Meta-analysis:</b> Subgroup analysis found (i) reduced heterogeneity for the group matched on key demographic variables for both maternal sensitivity and child responsiveness. (ii) For the matched group, substance abusing mothers were still significantly poorer in maternal sensitivity but the effect size was small. (iii) For the matched group for child responsiveness, there was no significant difference between substance misusing and non-substance misusing mothers, and the effect size was small.</p> <p><b>Systematic Review:</b> Comorbid psycho-pathology exists between childhood trauma, BPD and substance misuse</p>	<p><b>Methodological:</b> In order to make meaningful comparisons between substance misusing and non-substance misusing mothers, there is a need to match mothers on key socio-demographic variables.</p> <p><b>Theoretical:</b> Use of a cumulative risk model to investigate mechanisms influencing quality of caregiving.</p>	<p><b>Policy:</b> (i) Substance misuse should not be viewed as a specific risk factor to be addressed in isolation, but within a cumulative risk model where it is one of many risk factors that impoverished families face. (ii) There needs to be a review of policies where substance use is a key reason for child protection interventions, both in pregnancy and postnatally, without assessment of caregiving capacity</p> <p><b>Clinical:</b> It is important to provide parenting support for substance misusing families using an attachment-based theoretical framework to (i) improve maternal sensitivity; (ii) improve maternal and child emotion regulation; (ii) assist with wider ecological issues e.g., housing and material resources.</p>	<p><b>Research:</b> Conduct a systematic review and meta-analysis focusing on how caregiving quality is influenced by other drugs e.g., “ice”, “crystal meth” and cannabis.</p>
<p><b>Chapter 5: Study 2</b></p>			<p><b>Policy:</b> What are the implications of a maternal</p>	

<p><b>Aims:</b> To extend existing research by (i) comparing quality of caregiving and associated risk factors in three groups of mother-infant dyads: mothers recruited from substance misuse treatment services; mothers matched on key characteristics of environmental risk, maternal age and child age; and a community sample of mothers who were matched on maternal age and child age only and (ii) testing whether environmental risk and borderline personality features served as mediators between maternal childhood trauma and quality of caregiving.</p>	<p><b>Findings:</b>                  (i) No difference was found between the two high-risk groups of mothers on key psycho-social risk factors; (ii) a significant difference between the 2 groups of high-risk mothers and community mothers on key psycho-social and environmental risk factors; and (iii) there was a significant indirect effect of maternal history of childhood trauma on caregiving quality via socio-environmental risk when controlling for BPD traits, but no significant indirect effect via BPD traits when controlling for socio-economic risk.</p>	<p><b>Methodological:</b> Recruiting in a very hard to access population i.e., substance misusing mothers meant the sample size was not large enough, therefore there was a lack of power to show a significant effect of BPD traits on caregiving quality due to shared variance between BPD and environmental risk.</p>	<p>history of childhood trauma in high-risk families for assessment and intervention planning for caregiving quality?   <b>Clinical:</b> (i) It is important to deliver attachment-based interventions for high-risk families; (ii) interventions with high-risk families need to take on board the association between childhood adversity and later psychopathology (e.g., substance misuse) which may perpetuate the presenting problem; (iii) with attachment-based interventions there has been a shift away from behaviour based child management to focus more on the quality of the caregiving relationship.</p>	<p><b>Research:</b> (i) Replicate this study with a larger sample size in each group; (ii) inclusion of present trauma, specifically domestic violence should be considered in future research, given the complex nature of family dynamics in high-risk mothers.</p>
<p><b>Chapter 6: Study 3</b></p>			<p><b>Policy:</b> What are the policy implications for promoting intervention strategies with a trauma focus for high-risk families for (i) initial assessment of trauma; (ii) the client and their needs; (iii) recommended intervention strategies with a</p>	<p><b>Research:</b> (i) Replicate this model with other studies for validation in different clinical populations; (ii) inclusion of present trauma, specifically domestic violence should be</p>

---

maternal childhood trauma, environmental risk, quality of caregiving and child development outcomes.

and caregiving quality, in order to optimise child developmental outcomes.

trauma focus; and (iv) child protection services and their assessment of risk?  
 What is the cost of not acting to promote intervention strategies with a trauma focus for such high-risk families?

considered in future research, given the complex nature of family dynamics in high-risk mothers.

**Clinical:** (i) Interventions with high-risk families should have an ecological framework (e.g., Parents under Pressure); (ii) Interventions with high-risk families should include a trauma-informed approach (iii) Individualised case plans and collaborative goal setting with families should be enacted to address the individual needs of the family

---

### **Methodological Considerations**

Some methodological issues need to be acknowledged regarding the current research. Firstly, Study 2 was based on a relatively small sample size, a common problem when conducting research with “hard-to-reach” populations (see review by Mirick, 2016). In order to improve participant involvement in hard to reach populations buy-in is required across three different levels. The first, is at the agency level. The organisation approached must see some benefit of the research for their own organisation. This could be the provision of a report of preliminary results specific to that organisation which is de-identified. This approach was taken in this current thesis, whereby during the testing period I would provide them with details regarding percentages of mothers experiencing increased levels of psychopathology (e.g., depression, anxiety and stress) and how this was impacting on their child’s cognitive ability. It was observed that the children in low socio-economic areas were experiencing difficulties with regard to expressive language and fine motor abilities, which supported their applications for funding as an early child intervention service. Also acknowledging the organisations and participants (e.g., Study 2) when publishing results which have come directly from that organisation.

Secondly, engaging with the gatekeeper is crucial. The organisation where I recruited most participants came from organisations where by staff could see the benefit of my research for their clientele and would not only champion it and advocate for it, but would actively assist with recruitment. I was very fortunate to have a number of staff within the organisations I approached that could see the value and assisted me to reach my target participants. Conversely, staff that were sceptical or saw the research as “intrusive” I gained no buy in and no participants. I would strongly suggest to other researchers in a similar position to engage in relationship building with the gatekeepers and I found this to be the most important way to gain their assistance. One way of doing this was by making myself

available to them. I was willing to provide in-service seminars with staff to educate them on the theoretical underpinnings of my research and how it would benefit clinical practice in the long term. Also, I was willing to test siblings at the staff member's request, using the Bayley's screener if the participant had two children.

Finally, the actual participant. The participants need to be convinced that the research study is relevant, worthy of their time and that they receive something from the research themselves if possible. Ensuring that the participant themselves receive some benefit for their time and energy was crucial. In this study, this was done in two ways: (i) by receiving a gift voucher of \$30 for their time and effort; and (ii) each participant received a summary report within 48 hours after completing the Bayley's screener. I found from feedback from the participants themselves and direct referrals from other participants, gaining a report of their child's cognitive functioning was a major enticement to participant in my research. Mothers want to know their children are doing well. Also, if they fear their children are not doing well, having some document that supports their fears when discussing with professionals (e.g., gaining a referral from a general practitioner) was invaluable. I received feedback from mothers who used our summary cognitive report to gain referral for speech therapy, and to paediatrician for diagnosis of Autism. Hence, my advice to other researchers is to think how your research can value add to the participants themselves.

Also, being flexible in your testing approach. I did this in two ways. Firstly, using electronic devices for the collection of measures. This was invaluable in numerous ways (i) security of data; (ii) increasing the likelihood of true responses given their responses are uploaded instantly to a secure location and you as a research does not have the ease of access to that data; (iii) young participants prefer using electronic devices to pen and paper; (iii) reduction of missing data, as they cannot proceed to the next measure until all questions are answered. Also, providing the availability to do testing in their own home. A great deal of my

hard to access participants had limited funds to travel and being mobile increased the possibility of them consenting to testing.

Furthermore, the sensitive nature of data collected (i.e., requiring a video-taped mother-child interaction) added a further layer of difficulty. On reflection, I could have included a self-report measure of emotional availability/maternal sensitivity for all participants who were concerned with the video-taped component. By having both an observational and self-report measure, I could have also validated the use of both. To increase sample size appropriate for the required statistical analyses, the sample was collected from three different sites (McMahon, Tortu, Torres, Pouget, & Hamid, 2003; Morrow et al., 2007). A power analysis was also conducted to ascertain the recommended sample size to test the mediation model (Fritz & Mackinnon, 2007) and the sample size obtained for Study 2 was at the minimal range required. Hence, it is possible that with a larger sample of substance misusing mothers, additional factors may also be found to mediate the relationship between maternal childhood trauma and quality of caregiving in the same manner as environmental risk does. For example, borderline personality pathology may impact the maternal quality of caregiving given the well-established association between childhood trauma and borderline personality features (Fonagy et al., 2003). For this reason, research with larger samples is necessary to replicate and extend the Study 2 model.

Secondly, the cross-sectional nature of Studies 2 and 3 reduces their ability to establish causal effects or capture true mediation processes (Maxwell, Cole, & Mitchell, 2011). Nevertheless, Preacher and Hayes (2008) support the use of mediational analysis in behavioural research when the proposed indirect effects can be established on theoretical grounds. Importantly, Studies 2 and 3 are supported by a strong theoretical and empirical research base. Previous research findings support the associations between childhood trauma, psychopathology with specific reference to BPD and socio-environmental risk. In addition,

poor quality of caregiving over time is associated with poor child outcomes. Therefore, although not prospective in nature, the results from Studies 2 and 3 provide a meaningful contribution to research and clinical practice.

Lastly, inclusion of present trauma (e.g., domestic violence), should be considered in future research due to the complex nature of family dynamics in high-risk mothers. Research finds an association between domestic violence and substance misuse (Quinlivan & Evans, 2005) and also a link between re-victimisation during their adult life when there is a history of childhood abuse (Widom, Weiler, & Cottler, 1999). Furthermore, being exposed to domestic violence or being the victim of violence as a child (either physically, sexually or emotionally) has long lasting consequences extending into adulthood. When transitioning to motherhood, women with past trauma may have difficulties or limited capacity to develop a warm and sensitive relationship with their own child (Malone, Levendosky, Dayton, & Bogat, 2010), possibly continuing the intergenerational cycle of abuse (Bartlett, Kotake, Fauth, & Easterbrooks, 2017; Bert et al., 2009). These authors, as well as others, refer to this trauma and violence as the “ghosts in the nursery” (Fraiberg, Adelson, & Shapiro, 1975; Newman & Stevenson, 2005).

### **Policy and Clinical Practice Implications**

The findings from the thesis point to a number of important implications for policy makers and the clinicians in the field (see Table 7.1 for an overview). In the sections below, these policy and practice implications will be explored in greater depth.

#### **The Cost of Not Acting**

Beyond the personal cost of childhood adversity and later physical and mental health issues, there is also an economic cost. Until now there have been two areas for which costed data has been reported: substance misuse and child maltreatment. With specific reference to

illicit substance use, in the U.S. the estimated costs of associated crime, reduced work productivity and health care are more than US\$700 billion dollars annually (National Institute of Drug Abuse, 2015). Similar calculations for Australia suggest figures in the order of AUD\$55.2 billion (Collins & Lapsley, 2008) with alcohol, tobacco and illicit substance use accounting for 27.3%, 56.2% and 14.6% of this total respectively. However, when we look at the most likely precursor to substance use (i.e., childhood adversity in the form of child maltreatment) the costs increase. McCarthy and colleagues (2016) estimate a cost factor of approximately \$176,437 per annum per maltreated child, with a total burden per year of \$9.3 billion. For the lifetime monetary cost of all reported cases of maltreatment during 2012-2013, taking into account reduced quality of life and premature death, the estimated cost to the Australian community is \$17.4 billion or \$328,757 per child maltreated.

To counteract the increasing economic costs to the national budget of illicit substance use and of the intergenerational transmission of misuse, it is imperative that prevention and intervention programs continue to be funded. Collins and Lapsley (2002) reported that the implementation of effective public health campaigns targeting drug misusers saved the Australian community approximately \$5 billion dollars in the 1998-1999 period. Dalziel, Dawe, Harnett, and Segal (2015) estimated that the use of an attachment-based parenting program, Parents Under Pressure (PUP), designed to prevent maltreatment in vulnerable families (e.g., opioid-dependent parents in receipt of methadone maintenance) could present a mean lifetime saving of approximately AU\$3.1 million per 100 families.

Hence given these savings, there is a sound economic rationale to firstly, continue funding programs which provide early intervention services to vulnerable families, and secondly, support continued research into the aetiology, prevention and intervention support for treatment of substance misuse and child victims of maltreatment within the context of vulnerable families.

### **Early Intervention and Screening**

Currently in Australia, the National Framework for Protecting Children 2009-2020 (COAG; Council of Australian Governments, 2009) aims to provide the policy context to ensure Australian children are safe and well. This national framework provides guidelines for a series of 3-year action plans, and is currently into the third action plan (Council of Australian Governments, 2015) for 2015-2018. This plan has a major focus on prevention and early intervention support (particularly the first 1000 days of a child's life) for communities and families who have a high risk of child protection services involvement (especially supporting Aboriginal and Torres Strait Islander families and communities).

The three strategies proposed (see a copy of summary strategy action plan in Appendix E) focus on: 1) improving new and vulnerable families' access to evidence-based family support that can assist with the complexity of issues some families face, including illicit and non-illicit substance misuse issues, mental health issues and domestic and family violence; 2) assisting young people in out-of-home care to reach their potential; and 3) providing support organisations with the appropriate tools to assist in responding to child safety concerns to assess parenting capacity and measure progress of any action taken.

Hence, it appears that early intervention is an important focus in Australia for vulnerable families, but given the current findings of this research, the next logical question to ask is: to what extent do early interventions include a focus on trauma within the evidenced based programs currently recommended by Australian policy makers? The findings from the current thesis add to a corpus of literature linking early childhood trauma to adverse outcomes for children, the implications of which are increasingly given voice in policy and practice across Australia (Bateman, Henderson, & Kezelman, 2013; Newman, 2015) and the U.S. (Centers for Disease Control and Prevention, 2016; National Council for Community Behavioral Healthcare, 2011).

In 2016 the U.S. Department of Health and Human Services provided \$13 million over five years to support the Maternal and Child Health Bureau Division of Home Visiting and Early Childhood Systems. One action taken was to form the HV-Improvement Action Center Team (HV-ImpACT) aimed to provide evidenced-based care to at-risk pregnant mothers and families, to assist them in raising children who are socially, physically and emotionally healthy to achieve optimal outcomes in school and beyond. Furthermore, in January 2017, the HV-ImpACT Trauma-Informed Home Visiting Program (Cairone et al., 2017) was funded, charged with the task of developing a more trauma-focused statewide network of home visiting programs for high-risk families. They acknowledge “becoming a trauma-informed organization can be a lengthy, gradual process and one that requires ongoing effort” (p.3) and funding for research.

However, central to this process involves: exploring what it means to be trauma-focused; using appropriate screening tools – developmentally and for trauma; training staff appropriately to recognise symptoms of trauma and then how to talk with the families about it; using evidenced based programs when working with these families; and, importantly, supporting the staff working with at-risk families to prevent staff experiencing vicarious trauma and burn out (Cairone et al., 2017). These principles are in line with the definition of a trauma-informed approach: “a program, organization, or system that is trauma-informed realizes the widespread impact of trauma and understands potential paths for recovery; recognizes the signs and symptoms of trauma in clients, families, staff, and others involved with the system; and responds by fully integrating knowledge about trauma into policies, procedures, and practices, and seeks to actively resist re-traumatization.” (SAMHSA; Substance Abuse and Mental Health Services Administration, 2014; p. 9).

From an Australian perspective, there has been growing consideration given to the importance of including trauma-informed practices within our existing mental health care and

community support networks. This was recognised by Bateman and colleagues (2013) in the National Trauma-Informed Care and Practice Advisory Working Group Position Paper and Recommendations, who quoted Professor Louise Newman as saying:

Failure to acknowledge the reality of trauma and abuse in the lives of children, and the long term impact this can have in the lives of adults, is one of the most significant clinical and moral deficits of current mental health approaches. Trauma in the early childhood shapes brain and psychological development, sets up vulnerability to stress and to the range of mental health problems. Trauma survivors still experience stigma and discrimination and unempathic systems of care. Clinicians and mental health workers need to be well informed about the current understanding of trauma and trauma-informed interventions. (p. 1)

It is beyond the scope of this document to undertake a critical analysis of all services provided to vulnerable families, however, currently there are 32 evidence-based intervention programs recommended by the Child Family Community Australia (2016). However, it appears no program advocates having an explicit “trauma” focus. Only two programs appear to have an application to complex and vulnerable families. Firstly, Parents Under Pressure (PUP) (Dawe & Harnett, 2007) (using an ecological perspective of family functioning that acknowledges mental health issues, including substance misuse and domestic violence) and Parent-Child Interaction Therapy (PCIT) (Kauffman Best Practices Project, 2004, March) which has been reviewed as suitable to be adapted for children exposed to trauma (Gurwitch, Messer, & Funderburk, 2017). Notably, PCIT can only be delivered by licensed mental health care providers (e.g., psychologists or social workers) and hence this limits its application in community-based settings (with minimal staffing budgets) with vulnerable families, in contrast to PUP which can be delivered by trained support workers doing home-based support. Hence PUP has a major advantage for uptake by not-for-profit organisations where

often non-tertiary educated staff are charged with the responsibilities to assist at-risk families at the grassroots level.

So if we propose intervention programs to have a trauma focus, what does that mean? Should all parenting programs routinely address trauma issues in conjunction with managing the complexities of these families, including environmental risk and compromised caregiving? What do we in Australia actually mean by trauma-informed? How do other programs address trauma history and the trauma narrative? Does the level of trauma make a difference to trauma-informed processes? Are staff in non-government organisations equipped to discuss the trauma narrative with clients with complex trauma intermingled with mental health problems, poverty, homelessness and parenting issues? And finally, and critically, how does displacement from land and culture create a sense of isolation, disengagement and ultimately a sense of powerlessness and helplessness (J. Atkinson, 2013)?

We also need to be careful and not over-pathologise, as we know from early attachment literature and as supported by Studies 2 and 3, a reasonable proportion of mothers given the appropriate supports are able to escape psycho-social adversity and provide sensitive caregiving and as a consequence a reasonable proportion of their children have secure attachment (van der Voort et al., 2014). So, are we going to create a screening process and triage system to inform the content and focus of family support and intervention programs?

The purpose of assessment is to identify areas of concern that are amenable to change and can be meaningfully measured (Harnett, 2007). Hence, as early childhood adversity is associated with substance misuse (Lindberg & Zeid, 2017) should trauma assessment be routinely conducted at every drug and alcohol clinic? Substance abusing mothers are often insensitive parents (Espinosa et al., 2001) and their children may end up in the child protection system (Salo et al., 2010), being in some instances insensitively parented and further traumatised (Tucci, Mitchell, Holmes, Hemsworth, & Hemsworth, 2014). At what

point can we start breaking this intergenerational cycle? Would trauma and caregiving quality assessments, in addition to current practices, help practitioners in this process to demonstrate clients' capacity for change, especially when child protection services are involved? Are there strategies that we need to implement at a broader social policy level or even at a community level that might help break this intergenerational problem?

Yes, the problem is complex, but its addressing by policy makers is long overdue. However, we all have a part to play, as Neal Horen, the director of the Early Childhood Division of Georgetown University Center for Child and Human Development offers in the following quote:

You can't be trauma-informed by yourself. Everyone needs to be trauma-informed in order to have an impact on children and families. This type of trauma-informed system of care comes from the top down as well as the ground up. High-level decision-makers and policy makers are important, but so are local agencies and organizations doing direct work with high-need children and families. (Cairone et al., 2017; p. 9)

Will this be the future approach Australian policy makers take? Perhaps the COAG 2018-2020 initiatives may include early interventions with a trauma focus? Only time will tell.

### **Future Research**

In reviewing the literature, a number of authors have influenced the development of trauma-informed care as defined by SAMHSA (2014) (Elliott, Bjelajac, Falot, Markoff, & Reed, 2005; Harris, 1996; Heckman, Hutchins, Thom, & Russell, 2005; Herman, 1992). Herman's view is that the process to recovery for trauma survivors is within a context of relationships (i.e., giving rise to the understanding that at every organisational level, staff

must have an understanding of the trauma process). Herman proposed that the core experiences associated with trauma were disempowerment and disconnection from others. Consequently, she argues, the essential primary elements within the recovery process must include: safety, empowerment, choice and voice for trauma survivors. In turn, these core principles have informed trauma-focused care (Substance Abuse and Mental Health Services Administration, 2014).

Harris (1996) highlighted the complexity of problems associated with being a victim of abuse and trauma. Most of these women initially present to services because of their comorbid conditions, that is substance misuse, mental health issues or homelessness, and in most instances the question of trauma history is not being accounted for within routine intakes. Given recent epidemiology studies reported after controlling for demographics, an individual is 3.6 times more likely to experience mental health issues, including substance misuse, when having experienced childhood trauma compared with those not having experienced a traumatic childhood (Barrett et al., 2015). Thus not screening for a trauma history may indeed hinder the recovery process. Therefore, Harris pointed to the need for more holistic services that synthesise philosophies and ultimately coordinate service delivery that integrates treatment approaches that are flexible and foster personal empowerment to alleviate the challenge of negotiating multiple organisations, resulting in improved client outcomes. This service delivery approach was qualitatively evaluated by Heckman and colleagues (2005) in one of nine sites in the U.S. participating in SAMHSA's Women, Co-occurring Disorders and Violence Study. This SAMHSA project aimed to develop, implement, and evaluate comprehensive, integrated, trauma-informed and trauma-specific services for women with alcohol/other drug use and mental disorders and physical and/or sexual abuse histories. The authors noted there were both achievements and challenges. Positive changes were reported by clients. However, despite sophisticated planning and initial

extensive training, within the organisation there was resistance, staff turnover and limited community resources for optimal client outcomes.

Elliot and colleagues (2005) in their narrative review aimed to bridge the gap between practice (i.e., what happens at the grassroots level) and theoretical perspectives (i.e., trauma theory, empowerment and relational theory). They espoused 10 principles defining trauma-focused care and have formed the foundations of subsequent organisational bodies, including Australian ones, in conceptualising how they propose trauma-focused service delivery to occur. These principles were drawn from information gained from the experiences of all nine sites participating in SAMHSA's Women, Co-occurring Disorders and Violence Study (see Table 7.2 for a summary).

In summary, Elliot and colleagues reported the following regarding lessons learnt from the implementation of trauma-focused care: 1) it can be delivered in all service settings though may be articulated differently given the needs of the community; and it is important to recognise 2) the holistic nature of the service delivery; 3) flexibility in delivery to foster individualised goal and treatment planning; 4) client empowerment, that is each woman is the expert of her own life; 5) fostering a therapeutic relationship between provider and survivor using a collaboration model versus an expert model; 6) using an organisation and systems approach versus a therapist intervention.

Having a holistic approach also allows practitioners to facilitate collaborative goal setting in order to address the presenting issues influencing poor child outcomes (i.e., environmental risk and insensitive parenting). Elliot and colleagues finally propose that this model is a respectful way to interact with all clients, irrespective of whether they have a trauma history or not.

The concept of providing trauma-informed care is therefore not new by any means. The current guidelines for implementing a trauma-informed service in Australia (Bateman et

al., 2013) had indeed been influenced by the work of these previous authors indicated above. Despite this work is still in the early stages of development and implementation, there does appear to be a level of consistency with previous approaches with regard to principles defining trauma-informed care by SAMSHA (please refer to Table 7.2). In the opinion of Quadara and Hunter (2016), charged with providing a discussion paper to the Royal Commission into Institutional Responses to Child Sexual Abuse, the status of application of a trauma-informed process in Australia is described as:

- Emergent: practice wisdom and evaluation knowledge have not yet coalesced sufficiently to guide how the principles are put into practice in different settings.
- Enthusiastic: there is significant interest across a range of sectors in becoming trauma-informed.
- Opaque: there is a lack of publicly available, coordinated material on the trauma-informed care programs and models being developed and the formats they take.
- Piecemeal: without strong, collaborative national leadership, the development of trauma-informed care models is driven by individual services. (p. 8)

Hence, given the findings of this research (i.e., trauma → environmental risk → caregiving capacity → child developmental outcomes) and appreciating the understanding of the challenges that SAMHSA's Women, Co-occurring Disorders and Violence Study encountered (Heckman et al., 2005), and the status of the current Australian application (Quadara & Hunter, 2016) of trauma-focused care, prior to changes in government funding and broad stroke policy and service delivery initiatives, research needs to be undertaken in targeted organisations in order to answer the suggested following research questions:

1. What does it mean to be trauma informed in Australia, what are the issues and implications at an organisational level and how does being trauma informed impact on policies, procedures and practice delivery in comparison to current traditional practice models?
2. What does it mean to be trauma informed and incorporate a trauma-focused approach within an organisational setting?
3. How does this influence the work one does with families and what child outcomes should be expected as a consequence of such a delivery framework in comparison to current traditional practice models in fostering optimal child outcomes?

In summary, the development and implementation of trauma-informed care is indeed a paradigm shift for Australian policy makers and organisations charged with service delivery in two ways: 1) families with trauma histories present with complex needs including mental health issues, often including substance misuse, social issues including homelessness and poverty, and poor parenting practices; and 2) holistic frameworks need to be developed at an organisational and service delivery level that can provide the appropriate services with an understanding of the complexity of needs trauma survivors bring to services (Quadara & Hunter, 2016). These important changes will ultimately improve family functioning for all parents, and, in turn, improve child outcomes. As the Council of Australian Governments (2009) documents “protecting children is everyone’s business”.

### **Conclusion**

Overall, the current thesis advances the substance misuse, childhood adversity, trauma and attachment literature in several important ways. Firstly, the thesis presented a comprehensive review and meta-analysis of the available studies examining caregiving quality in mothers using illicit substances (Study 1). This review highlighted the potential for

future research to investigate the potential mechanisms that underpin the development of poor caregiving in a population of mothers sampled for high risk including substance misuse, conducted via Study 2. Study 3 extended on findings from Study 2, investigating the potential underlying mechanisms or causal pathways that may be implicated in the development of compromised caregiving and child outcomes.

Collectively, these findings have important implications for intervention, policy practices and future research within at-risk populations, indicating that for vulnerable and at-risk families, maternal experiences of adverse childhood events play a key role in influencing caregiving quality. The important roles of co-occurring environmental risk combined with comorbid mood disorders need further consideration in future research.

Table 7.2 Principles of Trauma-Informed Care

Elliot et al. (2005)	SAMSHA (2014)	MHCC (2013)
<p>Recognise the impact of violence and victimisation on development and coping strategies</p> <p>Identify recovery from trauma as a primary goal</p> <p>Employ an empowerment model</p> <p>Strive to maximise a woman’s choices and control over her recovery</p> <p>Base services in relational collaboration</p> <p>Create an atmosphere that is respectful of survivors’ needs for safety, respect and acceptance</p> <p>Emphasise women’s strengths, highlighting adaptations over symptoms and resilience over pathology</p> <p>Aim to minimise the possibilities of re-traumatisation</p> <p>Strive to be culturally competent and to understand each woman in the context of her life experiences and cultural background</p> <p>Solicit consumer input and involve consumers in designing and evaluating services ( pp. 465–469).</p>	<p>Safety: Throughout the organization, staff and the people they serve, whether children or adults, feel physically and psychologically safe; the physical setting is safe and interpersonal interactions promote a sense of safety.</p> <p>Trustworthiness and Transparency: Organizational operations and decisions are conducted with transparency with the goal of building and maintaining trust with clients and family members, among staff, and others involved in the organization.</p> <p>Peer Support: Peer support and mutual self-help are key vehicles for establishing safety and hope, building trust, enhancing collaboration, and utilizing their stories and lived experience to promote recovery and healing.</p> <p>Collaboration and Mutuality: Importance is placed on partnering and the levelling of power differences between staff and clients and among organizational staff from clerical and housekeeping personnel to professional staff to administrators, demonstrating that healing happens in relationships and in the meaningful sharing of power and decision-making. The organization recognizes that everyone has a role to play in a trauma-informed approach.</p> <p>Empowerment, Voice and Choice: Throughout the organization and among the clients served, individuals’ strengths and experiences are recognized and built upon.</p> <p>Cultural, Historical, and Gender Issues: The organization actively moves past cultural</p>	<p>Understanding trauma and its impact</p> <p>Promoting safety</p> <p>Ensuring cultural competence</p> <p>Supporting consumer control, choice and autonomy</p> <p>Sharing power and governance</p> <p>Integrating care</p> <p>Healing happens in relationships</p> <p>Recovery is possible (Bateman et al., 2013, pp. 10-11)</p>

---

stereotypes and biases (e.g. based on race, ethnicity, sexual orientation, age, religion, gender-identity, geography, etc.); offers access to gender responsive services; leverages the healing value of traditional cultural connections; incorporates policies, protocols, and processes that are responsive to the racial, ethnic and cultural needs of individuals served; and recognizes and addresses historical trauma. (p.11)

---

**Appendix A: Summary of EA Empirical Studies***Summary of Empirical Studies using EA in At-risk Samples in Alphabetical Order*

Authors	Sample Characteristics	Age of Child Assessed	EAS Context	At-Risk Indicators	Results
Belt, Kouvo, et al. (2012)	Finland Case study of one dyad	4 & 12 mths	7 – 10 mins free play interaction	AAI -maternal attachment style – Maternal history of trauma SSP - child attachment style	Qualitative reports of improvement in maternal non-intrusiveness and child responsiveness EAS scores at 12 mths (i.e., post treatment) were within normal ranges
Belt, Flykt, et al. (2012)	Finland 26 drug-using mother-child dyads in PGT 25 drug-using mother-child dyads in PSS 50 control mother-child dyads	4 T(2) & 12 mths T(3) post intervention	7-10 min at T(2) and T(3) free play interaction	Substance use Depression - EPDS & CES-D	Significant decrease in maternal hostility in the PGT group at T(3) Significant decrease in maternal intrusiveness in both PGT & PSS groups at T(3) Significant lower scores on EA sensitivity, structuring, child responsiveness & involvement for PGT & PSS groups compared with control mothers at T(3)
Cassibba et al. (2011)	Italy 20 mothers with clinical infant 20 healthy comparison dyads	14 mths	3 min free play interaction	AAI - maternal attachment style - Maternal history of trauma SSP - child attachment style	Scores on all EA domains did not differ between clinical and comparison scores Results did not validate a hypothesised intergenerational transmission of insecure attachment and poor EA in the clinical group
Chaudhuri et al. (2009)	US – 39% from non-European backgrounds 313 adolescent first-time mothers and toddlers	14 & 20 mths	5 min free play and structured interactions	Low SES	Income was positively associated with EAS scores of sensitivity, structuring, non-hostility and non-intrusiveness Low income was associated with insensitive and directive mothering

Authors	Sample Characteristics	Age of Child Assessed	EAS Context	At-Risk Indicators	Results
Dombrowski, Timmer, Blacker, and Urquiza (2005)	US Case study of one mother-child dyad	23 mths	5 min child directed play	Low SES Substance use Child in foster care until 22 mths of age	Qualitative report that mother's scores on EA improved from non-optimal to optimal pre-to-post treatment of PCAT
Easterbrooks et al. (2000)	US 43 mother-child dyads	7 yrs	5 – 10 mins mother-child reunion after an hour separation	Low SES SSP - child attachment style at 18 mths Depression Single parent	Mothers of disorganised infants compared with mothers of secure infants at 18 mths, were significant less sensitive and showed poorer structuring at 7 yrs on EAS
Easterbrooks, Chaudhuri, and Gestsdottir (2005)	US 80 adolescent mother-child dyads	10 mths	5 min free play interaction	Low SES Depression Health risk behaviours - YRBS	4 groups identified: low functioning; average; average parent/disengaged children; and high-functioning Low functioning dyads were significantly lower on all EAS compared with other groups
Espinet et al. (2013)	Canada 34 mother-child dyads	12 – 40 months	20 min free play interaction	Substance use	Validation study – EAS ratings compared with PIR-GAS & PSI-SF Convergent validity evidenced between adult measures of EAS and PIR-GAS
Flykt et al. (2012)	Finland 51 substance using mother-infant dyads 50 comparison non-using dyads	4 & 12 mths	7 – 10 min free play interaction	Substance use High environmental risk Comorbid psychopathology	Intervention study – PGT & PSS Qualitative report of significant group differences in EA scores between PGT & PSS mothers, who scored lower compared with control mothers at T(3)

Authors	Sample Characteristics	Age of Child Assessed	EAS Context	At-Risk Indicators	Results
Fuchs et al. (2015)	Germany 58 mother-infant dyads with maternal trauma history 61 comparison mother-infant dyads	5 & 12 mths	Not stated	Maternal history of childhood abuse (CTQ) Maternal psychopathology (SCL-90-R)	No difference on EAS between trauma and comparison group at 5 mths At 12 mths trauma mothers compared to comparison mothers were significantly poorer on all EAS scales with the exception of child involvement
Fraser et al. (2010)	US 21 mother-infant dyads in substance use treatment 27 comparison mother-infant dyads	2 – 5 mths	10 min free play interaction	Substance use Depression (SCL-90-R) Psychosocial stress (LSC-R)	Significantly poorer EA sensitivity scores only in substance treatment mothers compared with matched comparison mothers
Howes and Obregon (2009)	US - Mexican-American 78 mother-child dyads	8, 14, 24 & 36 mths	5 mins (response to invitation to play with puppet)	Psycho-social stress (PSI) Depression (CEDSSF) Family Environment Scale	EA sensitivity was negatively associated with family conflict at both 24 & 36 mths EA hostility was positively associated with family conflict at 24 mths but not 36mths EA child responsiveness/involvement was negatively associated with parental distress at 14 mths & 36mths
Kertes et al. (2009)	US 72 mother-infant dyads	3 – 5 yrs	10 min free play & 20 min structured play interaction	Community sample Child emotional regulation – Cortisol levels	Children identified as socially inhibited with higher biological responses rate had parents with lower scores on EA
Kogan and Carter (1996)	US 29 mother-infant dyads	4 mths	5 min free play pre F-T-F SFP	Low SES SSP at child attachment style at 12 mths	Maternal sensitivity was the strongest predictor of infant re-engagement during a still face sequence (an adaption of SSP) over scores of infant responsiveness and infant negativity

Authors	Sample Characteristics	Age of Child Assessed	EAS Context	At-Risk Indicators	Results
Mingo and Easterbrooks (2015)	US 226 adolescent mother-infant dyads	12 mths	5 min free play & 5 min teaching task	High social risk	Mothers assigned to 4 groups according to functioning: low; high; low with non-hostile dyads; insensitive mothers with responsive children Low functioning mothers were significantly less sensitive and more hostile during compared with other three groups High functioning mothers were significantly more sensitive and less hostile compared with other three groups
Moehler et al. (2007)	Germany 58 mothers with a history of trauma with infant 61 matched comparison mother-infant dyads	5 mths	10 min play session	Maternal history of childhood abuse (CTQ) Psychosocial status	Mothers with a history of childhood trauma were more intrusive in their play interaction than comparison mothers with no history of childhood trauma
Moreno et al. (2008)	US 661 mother-child dyads	15 mths	Not stated duration of free-play interaction	Low SES & low income RAND health battery Child – toddler empathy Language development assessment at 21 mths BSID-II at 24mths	Pathways models examined: A child’s cognitive and social development mediated the relationship between maternal sensitivity and the development of empathy at 2 yrs in high risk mothers

Authors	Sample Characteristics	Age of Child Assessed	EAS Context	At-Risk Indicators	Results
Olds et al. (2002)	US 245 mother-infant dyads treated by paraprofessional 235 mother-infant dyads treated by nurse 255 Control mother-infant dyads	12 & 21 mths	10 min free play interaction	Low SES Numerous health and socio-demographic information gathered Child – language, emotional & behavioural assessment	RCT aimed to improve maternal and child mental health during pregnancy and postnatal Mothers in the control group scored significantly lower compared with the treatment groups on all EA scores No difference in EAS observed between the two treatment groups
Oyen et al. (2000)	Canada 28 mother-infant dyads	18 – 42 mths	15 min free play & 15 min structured play interaction	Low SES Maternal attachment - AAI	Maternal sensitivity was negatively correlated with greater number of risk factors Maternal sensitivity was positively correlated with greater number of years in education Securely attached mothers had fewer risk factors and greater maternal sensitivity compared with insecurely attached mothers
Perry et al. (2015)	Australia 11 mother-infant dyads receiving opiate substitution treatment 14 comparison mother-infant dyads	3 – 6 mths	15 min unstructured play interaction	Substance use Psychosocial assessment CTQ ZAN-BPD Reflective functioning	High risk mothers scored significantly higher on CTQ and ZAN-BPD No significant difference between the opiate-treated and comparison mothers on all domains of EAS However, there were no child protection concerns in the comparison group compared with 73% in the mothers in opiate treatment

Authors	Sample Characteristics	Age of Child Assessed	EAS Context	At-Risk Indicators	Results
Porreca, DePalo, Simonelli, and Capra (2014)	Italy 12 mother-infant dyads in residential therapeutic community	2 – 22mths <i>M</i> = 12 (.76) EAS assessed 4 times over a period of 7 mths at 2 month intervals	5 min free play & 15 mins semi-structured play interaction	Substance use Low SES	In treatment with programs aimed to improve parenting and affect quality in dyadic exchanges No statistical comparisons between the time points were made All EA domains remained in the mid-range over the 7 mths of treatment Qualitative report that children T(2) were less involved with mothers during semi-structured play and mothers were less sensitive and more intrusive
Salo et al. (2009)	Finland 7 opiate-exposed dyads 14 foster carers 13 non-exposed mother-infant dyads	3 yrs	5 min free play interaction	Substance use Child – cognitive development assessed	Children of substance abusing mothers scored lower on cognitive and language measures and significantly lower on EA child responsiveness and involvement compared with non-exposed children Opiate-exposed mothers scored significantly less than non-exposed mothers on maternal sensitivity and non-hostility
Salo et al. (2010)	Finland 15 opiate-exposed dyads 15 maternally depressed 57 non-exposed mother-infant dyads	5-12 mths	4 min free play interaction	Substance use Socio-developmental status Child – Cognitive development assessed – Bayley-III	Opiate-exposed mothers were more likely than the other two groups to have their children removed from their custody At 13 mths opiate exposed-children showed some development delay (13.3% to nil respectively) and were subject to child abuse (13.3% to nil respectively) Opiate-exposed dyads scored significantly less on all EA domains

Authors	Sample Characteristics	Age of Child Assessed	EAS Context	At-Risk Indicators	Results
Stack et al. (2012)	US Study 1: 109 mother-child dyads Study 2: 35 mother-child dyads	Infancy, preschool & middle childhood	15 min free play interaction	Low SES-childhood history of aggression HOME PSI PSSI	Mothers with childhood histories of aggression and social withdrawal predicted maternal hostility during a free play interaction at pre-school age
Swanson et al. (2000)	US 51 mother-child dyads	18 mths	5 min free play interaction and 5 min teaching task	Substance use SSP - child attachment style	Higher incidence of children with disorganised attachment (45%) in comparison to only 37% secure Toddlers with disorganised attachment style were significantly associated with mothers who were insensitive and intrusive measured by EA
Thomas and Zimmer-Gembeck (2011)	Australia 150 mother-child dyads	2 – 7 yrs	10 min play interaction	PSI Child maltreatment - CAPI Child behaviour problems - CBCL	RCT – effectiveness for PCIT Mean scores of maternal sensitivity improved over the course of treatment from some risk to no risk
Timmer et al. (2011)	US 54 clinical levels of depression in mother-child dyads 78 low levels of depression in mother-child dyads	2 – 7 yrs	15 min semi-structured play interaction	Maternal psychopathology (SCL-90-R) Child behaviour problems - CBCL	Mother-child dyads referred to PCIT Improvement observed in both groups on scores of EA over course of treatment
Timmer, Thompson, Culver, Urquiza, and Altenhofen (2012)	US 63 mother-child dyads with reports of physical abuse 169 mother-child dyads with no reports of physical abuse	2 – 7 yrs	15 min semi-structured play including a clean-up activity	Socio-demographic History of interpersonal violence and maltreatment PSI-SF	Children who were exposed to interpersonal violence and physically abuse scored more poorly on child responsiveness and involvement during a clean-up activity

Authors	Sample Characteristics	Age of Child Assessed	EAS Context	At-Risk Indicators	Results
Trupe (2013)	US 35 mother-child dyads	4 – 7 yrs	20 min free play interaction	Maternal psychopathology PAI & SCID-II	Maternal borderline features (affective instability and negative relationships) predicted poorer results on child responsiveness and child involvement during play activity
Ziv et al. (2000)	Israel 687 mother-child dyads	12 mths	6 min free play interaction	Diverse SES community sample Maternal depression – BDI Child attachment – SSP & AQS	All EA scales were positively associated with secure attachment with the exception of hostility which was negatively associated with secure attachment Lower SES group were more hostile and less sensitive than higher SES group

Note: AQS: Attachment Q-Set; BDI: Beck Depression Inventory); BSID-II: Bayley scales of Infant Development-II; Bayley-III: Bayley scales of Infant Development-III; CAPI – The Child Abuse Potential Inventory; CBCL: Child Behaviour Checklist; CESD-SF: Center for Epidemiological Studies Depression Scale–Short Form; CES-D: Center for Epidemiological Studies Depression Scale; F-T-F SFP: CTQ: Child Trauma Questionnaire; EPDS: Edinburgh Postnatal Depression Scale; Face-to-face Still Face Paradigm; HOME: Home Observation for Measurement of the Environment; LSC-R: Life Stressor Checklist-Revised; PAI: Personality Assessment Inventory; PCIT: Parent-child Interaction Therapy; PIR-GAS: Parent–Infant Ratings Global Assessment Scale; PSI-SF: Parenting Stress Index-Short Form; PSI: Parenting Stress Index; PSSI: The Parenting Social Support Index; RCT: Randomized Control Trial; SCID-II: Structured Clinical Interview -II; SCL-90-R: German Version of the Symptom Checklist 90-Revised; SES: Socio-Economic Status; ZAN-BPD: Zanarini Rating Sale for Borderline Personality Disorder.

**Appendix B: Ethics Approval**

GRIFFITH UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE

23-Oct-2014

Dear Mrs Hatzis

I write further to your application for a variation to your approved protocol "Taking time for baby: A study of mother wellbeing and child development" (GU Ref No: PSY/34/13/HREC). This request has been considered by the Office for Research.

The OR resolved to approve the requested variation:

Add services to our existing Ethics application - Biala and Melauca (Drug Treatment Services).

Provided copy of approval from Metro North Mental Health Alcohol and Drug Services

This decision is subject to ratification at the next meeting of the HREC. However, you are authorised to immediately commence the revised project on this basis. I will only contact you again about this matter if the HREC raises any additional questions or comments about this variation.

Regards

Rick Williams  
Manager, Research Ethics  
Office for Research  
Bray Centre, N54 Room 0.15 Nathan Campus  
Griffith University  
ph: 07 3735 4375  
fax: 07 373 57994  
email: rick.williams@griffith.edu.au  
web:

Cc:

Researchers are reminded that the Griffith University Code for the Responsible Conduct of Research provides guidance to researchers in areas such as conflict of interest, authorship, storage of data, & the training of research students.

You can find further information, resources and a link to the University's Code by visiting  
<http://policies.griffith.edu.au/pdf/Code%20for%20the%20Responsible%20Conduct%20of%20Research.pdf>

PRIVILEGED, PRIVATE AND CONFIDENTIAL

This email and any files transmitted with it are intended solely for the use of the addressee(s) and may contain information which is confidential or privileged. If you receive this email and you are not the addressee(s) [or responsible for delivery of the email to the addressee(s)], please disregard the contents of the email, delete the email and notify the author immediately

### Appendix C: Final Project Approval

Enquiries to: R&ETPCH@health.qld.gov.au  
 Office Ph: (07) 3139 4198  
 (07) 3139 4500  
 Our Ref: HREC Final Approval



19 December 2014

**Human Research Ethics Committee**  
 Metro North Hospital and Health Service  
 The Prince Charles Hospital  
 Building 14  
 Rode Road, Chermiside QLD 4032

Mrs Denise Hatzis  
 School of Applied Psychology  
 Mt Gravatt Campus  
 176 Messines Ridge Road  
 Mt Gravatt, QLD 4122

Dear Mrs Hatzis

**RE: HREC/14/QPCH/249: The contribution of social support, childhood experiences and current emotional well being in high risk mothers on quality of caregiving relationship and infant outcomes.**

Thank you for submitting the requested documents for the above project for further review which was received on 18 December 2014 . This project was considered by Metro North Hospital and Health Service - The Prince Charles Hospital Human Research Ethics Committee (HREC).

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research (2007)*, *NHMRC and Universities Australia Australian Code for the Responsible Conduct of Research (2007)* and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.

I am pleased to advise that the Human Research Ethics Committee has granted final approval of this research project. The documents reviewed and approved for the above mentioned project include:

Document	Version	Date
Application (AU/1/6BAB111)		
Protocol	1	06 November 2014
Patient Information Sheet and Consent Form	2	16 December 2014
Response to Request for Further Information		15 December 2014
Brochure: PDF of Flyer	1	30 October 2014
Brochure: Screen Shot of Facebook page Front page	1	29 October 2014
Brochure: PDF of Poster	1	29 October 2014
Questionnaire: Copy of coding material for video recording of dyadic interaction (EAS)	1	04 November 2014
Questionnaire: Copy of Bayley's Infant Developmental Screener	1	04 November 2014
Questionnaire: Electronic Survey Tool with all self report	1	04 November 2014

Office  
 Research, Ethics & Governance Office  
 The Prince Charles Hospital

Postal  
 Building 14  
 Rode Road, Chermiside Q 4032

Phone  
 (07) 3139 4500  
 (07) 3139 4198

maternal measures		
-------------------	--	--

This information will be tabled at the next meeting on 22 January 2015 for noting.

Please note the following conditions of approval:

1. The Principal Investigator will immediately report anything which might warrant review of ethical approval of the project in the specified format, including:
  - a. Unforeseen events that might affect continued ethical acceptability of the project.
  - b. Serious Adverse Events that materially impact on the continued ethical acceptability of the project. In addition the Investigator must provide, at least six monthly, a summary of serious adverse events, in the specified format, including a comment as to suspected causality.
2. Amendments to the research project which may affect the ongoing ethical acceptability of a project must be submitted to the HREC for review. Major amendments should be reflected in a cover letter from the principal investigator, providing a description of the changes, the rationale for the changes, and their implications for the ongoing conduct of the study. Hard copies of the revised amendments, the cover letter and all relevant updated documents with tracked changes must also be submitted to the HREC coordinator as per standard HREC SOP. Further advice on submitting amendments is available from [http://www.health.qld.gov.au/ohmr/html/regu/regu\\_home.asp](http://www.health.qld.gov.au/ohmr/html/regu/regu_home.asp)
3. Amendments to the research project which only affect the ongoing site acceptability of the project are not required to be submitted to the HREC for review. These amendment requests should be submitted directly to the Research Governance Office/r (by-passing the HREC).
4. Proposed amendments to the research project which may affect both the ethical acceptability and site suitability of the project must be submitted firstly the HREC for review and, once HREC approval has been granted, submitted to the RGO.
5. Amendments which do not affect either the ethical acceptability or site acceptability of the project (e.g. typographical errors) should be submitted in hard copy to the HREC coordinator. These should include a cover letter from the principal investigator providing a brief description of the changes and the rationale for the changes, and accompanied by all relevant updated documents with tracked changes.
6. The HREC will be notified, giving reasons, if the project is discontinued at a site before the expected date of completion.
7. The Principal Investigator will provide an annual report to the HREC and at completion of the study in the specified format.
8. The Hospital & Health Service Administration and the Human Research Ethics Committee may inquire into the conduct of any research or purported research, whether approved or not and regardless of the source of funding, being conducted on hospital premises or claiming any association with the Hospital; or which the Committee has approved if conducted outside The Prince Charles Hospital & Health Services.

HREC approval is valid until 31 December 2016.

3

Should you have any queries about the HREC's consideration of your project please contact the Executive Officer on the above phone numbers or email addresses. The HREC terms of Reference, Standard Operating Procedures, membership and standard forms are available from [http://www.health.qld.gov.au/ohmr/html/regu/regu\\_home.asp](http://www.health.qld.gov.au/ohmr/html/regu/regu_home.asp)

*You are reminded that this letter constitutes ethical approval only. You must not commence this research project at a site until separate authorisation from the Hospital & Health Services CEO or Delegate of that site has been obtained.*

**A copy of this approval must be submitted to the relevant Hospital & Health Services Research Governance Officer/s or Delegated Personnel with a completed Site Specific Assessment (SSA) Form for authorisation from the CEO or Delegate to conduct this research at the site/s.**

Once authorisation to conduct the research has been granted, please complete the Commencement Form [http://www.health.qld.gov.au/tpch/documents/form\\_notification.dot](http://www.health.qld.gov.au/tpch/documents/form_notification.dot) and return to the office of the Human Research Ethics Committee.

The HREC wishes you every success in your research.

Yours faithfully



Dr Russell Denman  
 Chair  
**HUMAN RESEARCH ETHICS COMMITTEE  
 METRO NORTH HOSPITAL AND HEALTH SERVICE**

**List of approved Sites:**

No.	Site
1.	Biala City Community Health Centre

The members present at the Metro North Hospital & Health Services, Human Research and Ethics Committee meeting on the 26 November 2014 when the approval was granted for HREC/14/QPCH/249 is listed in the table below.

Attendees	Present	Apology
(Chair) Medical Representative Cardiology (a/f) [M]	X	
Layman (b) [M]	X	
Research Scientist (c) [F]	X	
Pharmacy Representative [M]	X	
Medical Representative Psychiatry (f) [M]	X	
Laywoman (b) [F]		X
Medical Representative - Critical Care & Anaesthetics (f) [F]	X	
Executive Director, Medical Services [M]		X
Senior Researcher (f) [M]	X	
Executive Officer - Research and Ethics [M]	X	
Legal Representative (e) [F]	X	
Nursing Representative (c) [M]	X	
Religious Representative (d) [M]		X
Medical Representative - Emergency Medicine (f) [F]	X	
Medical Representative - Geriatrics (f) [F]	X	
Religious Representative (d) [F]		X
Thoracic Representative (f) [M]	X	
Medical Representative - Obstetrics & Gynaecology		X

This is also to certify that TPCHMNHSHREC is a NHMRC accredited Ethics Committee. Our Registered Number is EC00168.

Our accredited Ethics Committee is organised, complies and operates within the GCP and ICH Guidelines.

**Note: The composition of the HREC is constituted in accordance with the NHMRC National Statement on Ethical Conduct in Human Research (March 2007).**

Please be advised that in the instance of an investigator being a member of the HREC, they are absented from the decision making process relating to that study.

For further information please contact the Research, Ethics & Governance Office on (07) 3139 4198.

**Appendix D: Online Assessment Package to Assess Mothers**

---

7/28/2014 Griffith University Research Survey Centre (Production Environment VL8) -

Collect data

There are 97 questions in this survey

**Demographics**

**Date of completion:**

Please enter a date:

**Site:**

Please choose only one of the following:

- ATOD
- Logan House
- Mirikai
- Mareeba
- Logan
- Benevolent Society - Eagleby
- Benevolent Society - Coomera Springs
- Benevolent Society - Nerang
- Benevolent Society - Labrador
- Facebook
- Other

**What is your current age, in years?**

Please write your answer here:

**What is your postcode?**

Please write your answer here:

<https://prodsurvey.rcs.griffith.edu.au/prodsurvey/admin/admin.php?action=showprintablesurvey&id=42265>

/54

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0x) -

**What is your country of birth?**

Please write your answer here:

**What is the country of birth of the father of your child being tested?**

Please write your answer here:

**What is your mother's country of birth?**

Please write your answer here:

**What is your father's country of birth?**

Please write your answer here:

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0x) -

**What are the languages predominately spoken at home?**

Please choose only one of the following:

- English only
- English and language other than English
- English and languages other than English
- English NOT the predominate language spoken at home

Make a comment on your choice here:

If languages other than English spoken at home, please indicate other languages in the comment box.

**How many children are you a biological parent of?**

Please write your answer here:

**What is your marital status?**

Please choose only one of the following:

- Single, never married
- Engaged
- Living with partner
- Married/Defacto
- Separated/divorced
- Widowed
- Other

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0a) -

**What is your partner's relationship to your child?**

Only answer this question if the following conditions are met:

\* Answer was 'Living with partner' or 'Married/Defacto' at question '11 [Marital\_Status] (What is your marital status? ) and Answer was 'Living with partner' or 'Married/Defacto' at question '11 [Marital\_Status] (What is your marital status? ) and Answer was 'Living with partner' or 'Married/Defacto' at question '11 [Marital\_Status] (What is your marital status? )

Please choose only one of the following:

- Biological parent
- Adoptive parent
- Stepparent
- Parent's partner (living in household)
- Other adult relative
- Foster parent
- Other

**Which statement best describes your living situation?**

Please choose only one of the following:

- I live with my partner and my child/children
- It's just me and the kids at home
- We live with extended family
- I do not currently live with my children
- Other

**Within the last year, what has been your main source of income?**

Please choose only one of the following:

- Paid employment
- Unemployment benefits
- Disability pension
- Sole parenting allowance
- Other

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.9a) -

**What is your highest level of education?**

Please choose only one of the following:

- Primary school
- High school, to year 10 or less
- High school, to year 11 or 12
- Training course/TAFE
- University

**As a child, did the Department of Child Safety ever remove you from your parents for any period of time?**

Please choose only one of the following:

- No
- Yes

**Have you ever had contact with the Department of Child Safety about any of your children?**

**If yes, please select the following outcome/s that apply, and write in the box provided whether this outcome applied to the child involved in this study (Primary child), or one of your other children (Other child)**

Please choose only one of the following:

- Yes
- No

**Only answer this question if the following conditions are met:  
 \* Answer was 'Yes' at question '17 [Child\_safety]' ( Have you ever had contact with the Department of Child Safety about any of your children? If yes, please select the following outcome/s that apply, and write in the box provided whether this outcome applied to the child involved in this study (Primary child), or one of your other children (Other child) )**

Please choose all that apply and provide a comment:

- Support Service (Child determined not in need of protection; short term support provided)
- Intervention with parental

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.8) -

<p>agreement (IPA) (Parents consent for child safety workers to work intensively with the child and family while the child remains in the family home)</p>	
<p><input type="checkbox"/> Assessment care agreement (Parents consent for child safety workers to assess child protection concerns for up to 30 days)</p>	
<p><input type="checkbox"/> Child protection care agreement (Agreement that parents may be asked to sign when their child has been assessed as in need of protection)</p>	
<p><input type="checkbox"/> Short-term child protection order (Guardianship of the child has been given to the Department of Child Safety for a maximum of 2 years)</p>	
<p><input type="checkbox"/> Long-term child protection order (Guardianship of the child has been given to the Department of Child Safety until the child turns 18 years old)</p>	
<p><input type="checkbox"/> Court assessment order (The court authorises Department of Child Safety to investigate whether a child is in need of protection)</p>	
<p><input type="checkbox"/> Temporary assessment order (The court overrides a parents objections to certain assessment/investigation processes that the Department of Child Safety wishes to carry out e.g. child safety officers having contact with child or child being</p>	

7/29/2014

Griffith University Research Survey Centre (Production Environment V1.0q) -

seen by doctor)

**Have you ever received support from a community support service, or centre? (e.g. Salvation Army, Rehabilitation services)**

Please choose only one of the following:

- Yes
- No

**If yes, please indicate how beneficial this service was for your needs.**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '19 [Community\_Support]' ( Have you ever received support from a community support service, or centre? (e.g. Salvation Army, Rehabilitation services) )

Please choose the appropriate response for each item:

	Very beneficial	Somewhat beneficial	Neutral	Not helpful	Extremely disappointed
If yes, how beneficial did you find this service?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Have you ever had a mental health problem?**

Please choose only one of the following:

- Yes
- No

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.9) -

**If yes, please indicate if you CURRENTLY have any of the following mental health problems:**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '21 [Mental\_Health]' ( Have you ever had a mental health problem? )

Please choose all that apply.

- Anxiety
- Depression
- Schizophrenia/Bipolar
- Other:

**If yes, please indicate if you are CURRENTLY RECEIVING MEDICATION for any of the following:**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '21 [Mental\_Health]' ( Have you ever had a mental health problem? )

Please choose all that apply.

- Anxiety
- Depression
- Schizophrenia/Bipolar
- Other:

**Has anyone in your immediate family (your parents/brothers/sisters) ever had a mental health problem?**

Please choose only one of the following:

- Yes
- No
- Unsure

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0) -

**Has anyone in your immediate family had a substance abuse problem?**

Please choose only one of the following:

- Yes
- No
- Unsure

**How often does your partner have a drink containing alcohol?**

Please choose the appropriate response for each item:

	Never	Monthly, or less	2-4 times a month	2-3 times a week	4 or more times a week
How often does your partner have a drink containing alcohol?	<input type="radio"/>				

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0x) -

**Some information about your child...**

**What gender is your child? (child involved in this study)**

Please choose only one of the following:

- Female
- Male

**What was your child's birth weight? (please enter in grams)**

Please write your answer here:

**Was your child born prematurely?**

**If your child was born prematurely, what was the expected birth date?**

Please enter a date:

**Did you have any of the following conditions during pregnancy?**

Please choose all that apply:

- Pre-eclampsia
- Pre-term labour
- Haemorrhage
- Gestational diabetes
- Fetal distress

Other:

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0b) -

**Was your birth:**

Please choose all that apply:

- Vaginal
- Caeserian section
- Forceps/Vacuum extraction

**Did your child spend any time in the Neonatal Intensive Care Unit post-delivery?**

Please choose only one of the following:

- Yes
- No

**If yes, please indicate whether medications were received, and which medications (If known)**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '40 [Birth\_Comp]' ( Did your child spend any time in the Neonatal Intensive Care Unit post-delivery? )

Please choose only one of the following:

- Yes
- No

Make a comment on your choice here:

**This rating form contains statements about 12- to 35-month old children. Many**

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.9) -

### Alcohol Screen

Because alcohol use can affect health and interfere with certain medications and treatments, it is important that we ask you some questions about your use of alcohol. Your answers will remain confidential, so please be as accurate as possible. Try to answer the questions in terms of "standard drinks", and select the option that best fits your drinking. Please ask for clarification if required.

Please choose the appropriate response for each item:

	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week
How often do you have a drink containing alcohol?	<input type="radio"/>				

Please choose the appropriate response for each item:

	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
How many standard drinks do you have on a typical day when you are drinking?	<input type="radio"/>				

Please choose the appropriate response for each item:

	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
How often do you have six or more standard drinks on one occasion?	<input type="radio"/>				

7/29/2014

Griffith University Research Survey Centre (Production Environment V1.9) -

**Drug and Alcohol Use**

Please write your answer(s) here:

How old were you when you had your first full serve (standard drink) of alcohol?

How old were you when you started drinking alcohol on a regular weekly basis?

How old were you when you first drank alcohol to the point of intoxication?

In the last 30 days, how many days have you drunk alcohol?

**Have you ever used methamphetamine?**

Please choose only one of the following:

- Yes
- No

Only answer this question if the following conditions are met:  
 \* Answer was 'Yes' at question '66 [Methamphetamine]' ( Have you ever used methamphetamine? )

Please write your answer(s) here:

How old were you when you first used Methamphetamine?

How old were you when you started using Methamphetamine on a regular weekly basis?

Have you ever injected Methamphetamine?

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.9) -

**In the last 12 months, how often did you use Methamphetamines/Amphetamines (Speed) for non-medical purposes?**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '66 [Methamphetamine] ( Have you ever used methamphetamine? )

Please choose only one of the following:

- Every day
- Once a week or more
- About once a month
- Every few months
- Once or twice a year
- Haven't used in the last 12 months

**Have you ever used Heroin?**

Please choose only one of the following:

- Yes
- No

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '69 [Heroin] ( Have you ever used Heroin? )

Please write your answer(s) here:

How old were you when you first used Heroin?

How old were you when you started using Heroin on a regular weekly basis?

Have you ever injected Heroin?

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0b) -

**In the last 12 months, how often did you use Heroin for non-medical purposes?**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '69 [Heroin]' ( Have you ever used Heroin? )

Please choose only one of the following:

- Every day
- Once a week or more
- About once a month
- Every few months
- Once or twice a year
- Haven't used in the last 12 months

**Have you ever used other Opiates? (e.g. morphine, pethidine, codeine, physeptone, methadone)**

Please choose only one of the following:

- Yes
- No

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '72 [Other\_Opiates]' ( Have you ever used other Opiates? (e.g. morphine, pethidine, codeine, physeptone, methadone) )

Please write your answer(s) here:

How old were you when you first started using opiates?

How old were you when you started using opiates on a regular weekly basis?

Have you ever injected an opiate?

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0b) -

**In the last 12 months, how often did you use opiates for non-medical purposes?**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '72 [Other\_Opiates]' ( Have you ever used other Opiates? (e.g. morphine, pethidine, codeine, physoptone, methadone) )

Please choose only one of the following:

- Every day
- Once a week or more
- About once a month
- Every few months
- Once or twice a year
- Haven't used in the last 12 months

**Have you ever used ecstasy?**

Please choose only one of the following:

- Yes
- No

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '75 [Ecstasy]' ( Have you ever used ecclasy? )

Please write your answer(s) here:

What age were you when you started using ecstasy?

What age were you when you started using ecstasy on a regular weekly basis?

7/29/2014

Griffith University Research Survey Centre (Production Environment V1.0a) -

**In the last 12 months, how often did you use ecstasy for non-medical purposes?**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '75 [Ecstasy]' ( Have you ever used eclasy? )

Please choose only one of the following:

- Every day
- Once a week or more
- About once a month
- Every few months
- Once or twice a year
- Haven't used in the last 12 months

**Have you ever used hallucinogens? (e.g. LSD, acid, magic mushrooms)**

Please choose only one of the following:

- Yes
- No

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '78 [Hallucinogens]' ( Have you ever used hallucinogens? (e.g. LSD, acid, magic mushrooms) )

Please write your answer(s) here:

How old were you were you first used hallucinogens?	
How old were you when you started using hallucinogens on a regular basis?	
Have you ever injected hallucinogens?	

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0) -

**In the last 12 months, how often did you use hallucinogens for non-medical purposes?**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '78 [Hallucinogens]' ( Have you ever used hallucinogens? (e.g. LSD, acid, magic mushrooms) )

Please choose only one of the following:

- Every day
- Once a week or more
- About once a month
- Every few months
- Once or twice a year
- Haven't used in the last 12 months

**Have you ever used cocaine?**

Please choose only one of the following:

- Yes
- No

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '81 [Cocaine]' ( Have you ever used cocaine? )

Please write your answer(s) here:

How old were you when you first used cocaine?

How old were you when you started using cocaine on a regular weekly basis?

Have you ever injected cocaine?

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0) -

**In the last 12 months, how often did you use cocaine for non-medical purposes?**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '81 [Cocaine]' ( Have you ever used cocaine? )

Please choose only one of the following:

- Every day
- Once a week or more
- About once a month
- Every few months
- Once or twice a year
- Haven't used in the last 12 months

**Have you ever used cannabis?**

Please choose only one of the following:

- Yes
- No

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '84 [Cannabis]' ( Have you ever used cannabis? )

Please write your answer(s) here:

How old were you when you first used cannabis?

How old were you when you started using cannabis on a regular weekly basis?

7/26/2014

Griffith University Research Survey Centre (Production Environment V1.9) -

**In the last 12 months, how often did you use cannabis for non-medical purposes?**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '84 [Cannabis]' ( Have you ever used cannabis? )

Please choose only one of the following:

- Every day
- Once a week or more
- About once a month
- Every few months
- Once or twice a year
- Haven't used in the last 12 months

**Have you ever used inhalants? (e.g. amyl/rush, laughing gas/bulbs, glue, petrol)**

Please choose only one of the following:

- Yes
- No

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '87 [Inhalants]' ( Have you ever used inhalants? (e.g. amyl/rush, laughing gas/bulbs, glue, petrol) )

Please write your answer(s) here:

How old were you when you first used inhalants?

How old were you when you started using inhalants on a regular weekly basis?

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.9) -

**In the last 12 months, how often did you use inhalants for non-medical purposes?**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '87 [Inhalants]' ( Have you ever used inhalants? (e.g. amyl/rush, laughing gas/bulbs, glue, petrol) )

Please choose only one of the following:

- Every day
- Once a week or more
- About once a month
- Every few months
- Once or twice a year
- Haven't used in the last 12 months

**Have you ever used tobacco?**

Please choose only one of the following:

- Yes
- No

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '90 [Tobacco]' ( Have you ever used tobacco? )

Please write your answer(s) here:

How old were you when you first used tobacco?

How old were you when you started using tobacco on a regular weekly basis?

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0x) -

**In the last 12 months, how often did you use tobacco for non-medical purposes?**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '90 [Tobacco]' ( Have you ever used tobacco? )

Please choose only one of the following:

- Every day
- Once a week or more
- About once a month
- Every few months
- Once or twice a year
- Haven't used in the last 12 months

**Are you currently receiving any treatment for a substance misuse problem?**

Please choose only one of the following:

- Yes
- No

**If yes, please indicate which of these:**

Only answer this question if the following conditions are met:

\* Answer was 'Yes' at question '93 [SubstanceAbuse\_Treat]' ( Are you currently receiving any treatment for a substance misuse problem? )

Please choose all that apply:

- Rehabilitation program
- Outpatient support/counselling
- Alcoholics Anonymous
- Narcotics Anonymous
- Oplate replacement therapy
- Other:

7/26/2014

Griffith University Research Survey Centre (Production Environment V1.0x) -

**If you selected opiate replacement therapy, please indicate which of the following, and your current DOSE:**

Only answer this question if the following conditions are met:

\* Answer was at question 'Q4 (SA\_Treat\_specify)' ( If yes, please indicate which of these: )

Please choose all that apply and provide a comment:

<input type="checkbox"/> Methadone	<input type="text"/>
<input type="checkbox"/> Suboxone	<input type="text"/>
<input type="checkbox"/> Buprenorphine	<input type="text"/>
Other: <input type="text"/>	<input type="text"/>

7/29/2014

Griffith University Research Survey Centre (Production Environment V1.8) -

**Who am I...**

Please give your own opinion of yourself. Be sure to answer every statement as it applies to you NOW by selecting the appropriate option.

<b>Who am I?</b>				
Please choose the appropriate response for each item:				
	Not at all true of me	Slightly true of me	Fairly true of me	Very true of me
My mood can shift.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My attitude about myself changes a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My relationships have been stormy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I sometimes do things so impulsively that I get into trouble.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My moods get quite intense.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sometimes I feel terribly empty inside.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I want to let certain people know how much they've hurt me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I typically do something to hurt myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My mood is very steady.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry a lot about other people leaving me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People once close to me have let me down.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm too impulsive for my own good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have little control over my anger.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often wonder what I should do with my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I rarely feel very lonely.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.9) -

I spend money too easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've always been a pretty happy person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can't handle separation from those close to me very well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've made some real mistakes in the people I've picked as friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm a reckless person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've had times when I was so mad I couldn't do enough to express all my anger.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't get bored very easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Once someone is my friend, we stay friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm careful about how I spend my money.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0) -

### How have you been feeling recently...

These statements concern how you have been feeling in the past week. Please respond to each statement by selecting the appropriate number from the scale below to indicate how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

#### How have you been feeling recently?

Please choose the appropriate response for each item:

	Not at all	To some degree, or some of the time	To a considerable degree, or a good part of the time	Very much, or most of the time
I found it hard to wind down	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was aware of dryness of my mouth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I couldn't seem to experience any positive feeling at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found it difficult to work up the initiative to do things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tended to over-react to situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I experienced trembling (e.g. in the hands)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that I was using a lot of nervous energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was worried about situations in which I might panic and make a fool of myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that I had nothing to look forward to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found myself getting agitated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.9) -

I found it difficult to relax	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt down-hearted and blue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was intolerant of anything that kept me from getting on with what I was doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt I was close to panic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was unable to become enthusiastic about anything	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt I wasn't worth much as a person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that I was rather touchy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was aware of the action of my heart in the absence of physical exertion (e.g. a sense of heart rate increase, heart missing a beat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt scared without any good reason	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that life was meaningless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0) -

### How can others help me...

The statements below concern how you perceive you are supported by others in a variety of situations. Respond to each statement by selecting the appropriate option to indicate how much you agree or disagree with the statement.

How can others help me?							
Please choose the appropriate response for each item:							
	Strongly Disagree	2	3	Neutral	5	6	Strongly Agree
There is a special person who is around when I am in need	<input type="radio"/>						
There is a special person with whom I can share my joys and sorrows	<input type="radio"/>						
My family really tries to help me	<input type="radio"/>						
I get the emotional help and support I need from my family	<input type="radio"/>						
I have a special person who is a real source of comfort to me	<input type="radio"/>						
My friends really try to help me	<input type="radio"/>						
I can count on my friends when things go wrong	<input type="radio"/>						
I can talk about my problems with my family	<input type="radio"/>						
I have friends with whom I can share joys and sorrows	<input type="radio"/>						
There is a special person in my life who cares about my feelings	<input type="radio"/>						
My family is willing to help me make decisions	<input type="radio"/>						
I can talk about my problems with my friends	<input type="radio"/>						

### Your childhood experiences

These questions relate to your childhood. Please indicate the answer that best describes the experience of your childhood.

Please choose the appropriate response for each item:

	Never true	Rarely true	Sometimes true	Often true	Very often true
I didn't have enough to eat	<input type="radio"/>				
I knew that there was someone to take care of me and protect me	<input type="radio"/>				
People in my family called me things like "stupid", "lazy" or "ugly"	<input type="radio"/>				
My parents were too drunk or high to take care of the family	<input type="radio"/>				
There was someone in my family who helped me feel that I was important or special	<input type="radio"/>				
I had to wear dirty clothes	<input type="radio"/>				
I felt loved	<input type="radio"/>				
I thought that my parents wished I had never been born	<input type="radio"/>				
I got hit so hard by someone in my family that I had to see a doctor or go to the hospital	<input type="radio"/>				
There was nothing I wanted to change about my family	<input type="radio"/>				
People in my family hit me so hard that it left me with bruises or marks	<input type="radio"/>				
I was punished with a belt, a board, a cord, or some other hard object	<input type="radio"/>				
People in my family looked out for each other	<input type="radio"/>				
People in my family said hurtful or	<input type="radio"/>				

7/28/2014

Griffith University Research Survey Centre (Production Environment V1.0x) -

Insulting things to me					
I believe that I was physically abused	<input type="radio"/>				
I had the perfect childhood	<input type="radio"/>				
I got hit or beaten so badly that it was noticed by someone like a teacher, neighbour, or doctor	<input type="radio"/>				
I felt that someone in my family hated me	<input type="radio"/>				
People in my family felt close to each other	<input type="radio"/>				
Someone tried to touch me in a sexual way, or tried to make me touch them	<input type="radio"/>				
Someone threatened to hurt me or tell lies about me unless I did something sexual with them	<input type="radio"/>				
I had the best family in the world	<input type="radio"/>				
Someone tried to make me do sexual things or watch sexual things	<input type="radio"/>				
Someone molested me	<input type="radio"/>				
I believe that I was emotionally abused	<input type="radio"/>				
There was someone to take me to the doctor if I needed it	<input type="radio"/>				
I believe that I was sexually abused	<input type="radio"/>				
My family was a source of strength and support	<input type="radio"/>				

## Appendix E: Study 1 Published Paper

## Quality of Caregiving in Mothers With Illicit Substance Use: A Systematic Review and Meta-analysis

Denise Hatzis<sup>1</sup>, Sharon Dawe<sup>1,2</sup>, Paul Harnett<sup>3</sup> and Jane Barlow<sup>4</sup>

<sup>1</sup>School of Applied Psychology, Griffith University, Mt Gravatt, QLD, Australia. <sup>2</sup>Australian Centre for Child Protection, University of South Australia, Adelaide, SA, South Australia. <sup>3</sup>School of Psychology, The University of Queensland, St Lucia, QLD, Australia. <sup>4</sup>Department of Social Policy and Intervention, University of Oxford, Oxford, UK.

Substance Abuse: Research and Treatment  
Volume 11: 1–15  
© The Author(s) 2017  
Reprints and permissions:  
sagepub.co.uk/journalsPermissions.nav  
DOI: 10.1177/1178221817694038



### ABSTRACT

**BACKGROUND:** The quality of caregiving in mothers with substance abuse problems appears to be compromised. However, divergent findings, methodological variability, and sample characteristics point to the need for research synthesis.

**METHODS:** A comprehensive systematic search was undertaken. Studies were eligible if they (1) compared substance-misusing mothers with non-substance-misusing mothers, (2) involved children from birth to 3 years, and (3) maternal sensitivity and child responsiveness were measured using observational methodology.

**RESULTS:** A global meta-analysis for maternal sensitivity ( $n = 24$  studies) and child responsiveness ( $n = 16$  studies) on 3433 mother-infant dyads yielded significant population effect sizes and significant heterogeneity. Subgroup analyses found reduced heterogeneity when the meta-analysis was conducted on studies where groups were matched on key demographic characteristics; although the effect size was small, it was still significant for maternal sensitivity but not child responsiveness.

**CONCLUSIONS:** Compromised quality of caregiving is found in high-risk, substance-misusing mothers, emphasising the importance of early intervention that draws from attachment-based interventions.

**KEYWORDS:** Caregiving, substance, abuse, dependence, women, mothers

RECEIVED: November 16, 2016 ACCEPTED: January 25, 2017

**PEER REVIEW:** Eight peer reviewers contributed to the peer review report. Reviewers' reports totaled 2725 words, excluding any confidential comments to the academic editor.

**TYPE:** Original Research

**FUNDING:** The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The author Denise Hatzis gratefully acknowledges receiving a Griffith University Postgraduate Research Scholarship awarded

to her during the period 2011–2014 (CRICOS provider number: 00233E), which was provided to support candidature in the Doctor of Philosophy in Clinical Psychology (062206F) in the Applied School of Psychology.

**DECLARATION OF CONFLICTING INTERESTS:** The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**CORRESPONDING AUTHOR:** Sharon Dawe, Griffith University, 176 Measnes Ridge, Mt Gravatt, QLD 4111, Australia. Email: s.dawe@griffith.edu.au

### Introduction

The developmental outcomes of children living in families with illicit parental substance use are significantly compromised with difficulties initially identified in early infancy extending throughout childhood and into adolescence.<sup>1</sup> Many areas of children's functioning are compromised, including early interaction with caregivers resulting in elevated rates of insecure and disorganised attachment,<sup>2,3</sup> and performance on tests of cognitive functioning<sup>4–6</sup> and language.<sup>7,8</sup> The compromised caregiving seen in mother-infant dyads<sup>9</sup> has been implicated in poor outcome and high rates of disorganised and insecure attachment.<sup>10</sup> These difficulties extend into childhood with evidence of difficulties in a range of executive functions<sup>11</sup> and higher-than-normal rates of internalising and externalising disorders.<sup>12–14</sup>

Extensive research indicates that many of these difficulties are influenced by exposure to an early caregiving environment that lacks sensitive, contingent, and responsive maternal caregiving behaviour.<sup>15</sup> For example, maternal insensitivity is associated with long-term difficulties,<sup>16,17</sup> including conflict within parent-child relationships<sup>18,19</sup> and internalising and externalising disorders at 5 years of age<sup>20</sup> and beyond.<sup>21</sup>

There has been considerable investigation of the quality of caregiving in substance-misusing mothers, although there is also wide variability in the way in which the quality of caregiving has been measured across studies. Substantial

variability in sample size, populations studied, and quality of the study design has contributed to mixed findings. An early narrative review of research studies published between 1990 and 1999 by Johnson<sup>9</sup> provided an integrative synthesis of 23 studies in which mother-infant interaction had been measured. Fifteen of these studies were longitudinal or cross-sectional in design and focused on correlational associations between maternal characteristics and quality of caregiving. Notably, only 8 studies were included where there had been a direct comparison of mother-infant interaction in substance-misusing and non-substance-misusing mothers. Although 6 of these studies found poorer quality caregiving in the substance-misusing mothers, 2 found that substance-misusing mothers did not differ from a nonsubstance comparison group in their interactional style,<sup>22,23</sup> with both studies using a comparison group that was matched on demographic characteristics.

Since Johnson's<sup>9</sup> review, studies have continued to show differences in the quality of caregiving.<sup>24,25</sup> LaGasse and colleagues<sup>24</sup> found that cocaine-using mothers were significantly poorer on 3 of 5 measures of maternal behaviour during feeding with their 1-month-old infant compared with non-substance-using mothers. Prenatal cocaine exposure was associated with poorer ratings of mother-child interactions measured at 3 years of age.<sup>26</sup> Mother-child interactions were poorest for children with prenatal cocaine exposure whose mothers continued



Creative Commons Attribution-NonCommercial 3.0 License (http://www.creativecommons.org/licenses/by-nc/3.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (http://juc.sagepub.com/open-access-at-sage).

cocaine use postnatally, compared with children whose mothers did not use cocaine during pregnancy or at a 3-year follow-up visit. Poorer emotional availability was observed in a study of opioid-dependent mothers and their 7-month-old children compared with non-substance using mothers.<sup>27</sup> Women who were polydrug and cocaine users during pregnancy have also shown greater dyadic conflict during feeding interactions.<sup>28</sup> Contrary findings by Ukeje and colleagues<sup>29</sup> found compromised care in both substance-misusing mothers and a matched comparison group. Thus, it is possible that the poor-quality caregiving relationship found in some studies may be more related to the accumulation of adverse environmental risk than maternal substance use per se.<sup>30,31</sup>

In summary, there is inconsistency in the results of studies addressing the quality of caregiving in mothers who have used illicit substances. One methodological issue that emerges from our reading of the literature that may potentially help explain discrepant results relates to study design. Studies with greatest methodological rigour have compared substance-misusing mothers with mothers facing similar environmental adversity, whereas those that are less methodologically robust have drawn the comparison group from a general population of mothers. However, studies also varied on other factors, such as the age of children, when the quality of caregiving was assessed. Finally, mothers who are engaged in treatment, and particularly residential treatment, may show less compromised caregiving as many treatment services, particularly residential programmes, may have addressed parenting as part of the treatment process. Thus, associated improvements in well-being<sup>32,33</sup> and parenting practices<sup>34</sup> may influence the quality of caregiving.

The aim of this study is to assess the extent to which mothers with substance misuse have compromised caregiving. This builds on existing narrative reviews and extends this literature by providing a comprehensive systematic review and meta-analysis of studies that have compared the quality of parent-child interactions (maternal sensitivity and child responsiveness) in illicit substance-misusing and nonmisusing groups. Illicit substance use was the focus of this review as there is a range of legal, environmental, and lifestyle risks accompanying illicit substance use in women which makes them qualitatively different from women with tobacco or alcohol problems.<sup>35</sup> The primary aim of this study was to investigate the quality of caregiving relationship in mothers with substance use problems (including those on opioid replacement therapy) by comparing measures of maternal sensitivity and child responsiveness with mothers who did not have a substance misuse problem. The second aim was to examine factors (moderators) that could influence the quality of the caregiving relationship.

## Methods

### Studies

Studies were included in the review if they included all of the following elements: mothers of children aged birth to 3 years,

mothers who were current illicit substance misusers and/or were on opioid replacement therapy due to a history of opioid dependence and/or were in residential treatment due to a history of illicit substance use, and a comparison group of non-substance-using mothers; there was an assessment of maternal-child interactions using an observational method that was videotaped and subsequently coded to assess the quality of maternal caregiving.

### Outcomes

The primary outcome measure was maternal sensitivity. This was operationalised as a maternal response to infant or child cues related to maternal warmth in situations of low frustration rather than during situations of frustration or negative affect.<sup>36</sup> The measure of maternal sensitivity was extracted from a range of observational tasks that included free play, structured play, and infant feeding observations. Thus, we selected scores on observational coding systems that explicitly measured maternal behaviour and affect using terms such as 'talks to infant', 'shows pleasure towards infant' and 'appears cheerful',<sup>37(p4)</sup> 'responding to the child's activity and interests (sensitivity/pacing), positive feelings shown to the child',<sup>38(p557)</sup> The secondary outcome measure was child responsiveness. This was also required to have been explicitly included as a scale or construct measured in the observational system that rated infant or child responsiveness directly, such as 'involvement with the mother, positive feelings shown to mother',<sup>38(p557)</sup> and 'child responsiveness indicates how well infant responds to maternal bids and expressions'.<sup>27(p250)</sup>

Given the diversity of study populations, we identified 3 potential sources of heterogeneity across studies to test in subgroup analyses: (1) study design (groups matched on key demographic variables vs studies comparing substance-misusing mothers with a general population group), (2) age of child (less than 12 months vs more than 12 months and up to 40 months), and (3) treatment (not in treatment vs currently in outpatient treatment, including opioid replacement therapy and/or residential treatment).

### Search strategy

Search terms were identified by (1) an examination of indexing terms in relevant databases, and (2) a preliminary scoping of eligible studies prior to the systematic search. Search terms were combined together with Boolean OR and each set of search terms was then combined with Boolean AND to search across title, abstract, and keywords in each search location. There were no restrictions placed on document type. Search terms were ('maternal substance use' OR 'maternal drug use' OR 'substance-using mothers' OR 'drug-using mothers') AND ('caregiving' OR 'care giving' OR 'interaction'). Studies were included if they were in English-language publications and the date range was from 1995 to 2015 (updated April 2016; see

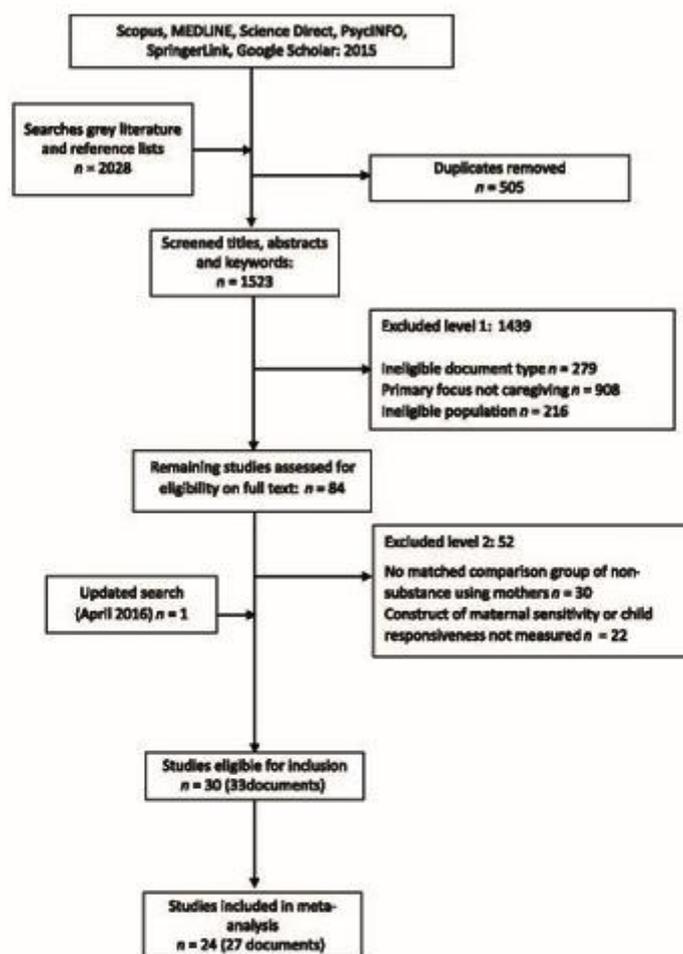


Figure 1. Selection process for eligible papers for systematic review and meta-analysis (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) 2009 flow diagram.

Figure 1) as this 20-year period reflects the steady increase in the use of cannabis and the growing use of crack cocaine and heroin that began in the early 1990s.<sup>39</sup> Studies were identified by searching the following electronic databases: Scopus, MEDLINE, ScienceDirect, PsycINFO, SpringerLink, and Google Scholar. The reference lists of existing reviews and eligible studies were harvested after completion of systematic screening to ensure capture of all eligible studies.

*Study selection and data extraction*

The literature search identified 2028 studies. Figure 1 provides a description of the complete selection and exclusion process using Preferred Reporting Items for Systematic

Reviews and Meta-Analysis (PRISMA)<sup>40</sup> guidelines. The PRISMA Statement was developed to enhance clarity and transparency of reporting in systematic reviews. It includes a detailed 27-item checklist that provides explanations of the key components that need to be determined in a systematic review and an additional 4-phase flow diagram that documents the decision-making process in the selection of studies for the review.<sup>41</sup> Search results were exported into EndNote Version X7 for Windows, and duplicates and ineligible document types (eg, books) were removed. The remaining records were imported into systematic review management software, *SysReview*,<sup>42</sup> for initial eligibility screening. Titles/abstracts/keywords were screened and the record was excluded if the title and/or abstract and/or keyword indicated that the

document was not an eligible document type. Following the completion of title and abstract screening, a full-text review was undertaken and data were extracted in a standardised format following the PRISMA guidelines.<sup>40</sup> Of the remaining 84 articles, a further 52 documents were eliminated (level 2 exclusion), reducing the pool to 32 documents. One further study was identified during an updated literature search (April 2016) and included (see Figure 1).

These 33 documents reported the results of 30 unique research studies as 3 studies had reported on maternal sensitivity across different research reports. Finally, 6 studies were not included in the meta-analysis as data were not reported or not available from authors due to the passage of time (descriptive characteristics are included in Table 1). Therefore, data from 24 studies were included in the final analysis.

#### *Data synthesis, study quality appraisal, and analyses*

Study quality was assessed using 9 items from the 14-item Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Institute of Health).<sup>45</sup> The excluded items related to aspects of study quality that required a follow-up component (eg, attrition, number of follow-up points). The retained items are listed in Supplementary Table 1. All meta-analytical calculations were performed using Review Manager 5.<sup>66</sup> Standardised effect sizes (*d*) were calculated for the included studies. When data on maternal sensitivity were reported at 2 time points in the same document, data from the second time point were used (ie, 3 and 6 months<sup>54</sup>; 3 and 12 months<sup>57</sup>). On both occasions, the second time point was used as this was closer to the mean age of children across all studies. Two studies<sup>24,25</sup> divided their sample into 'heavy' and 'some use', and we selected data from the heavy group as this reflected substance use patterns reported in other papers.

A random-effects model was used to calculate effect size due to expected heterogeneity in the studies.<sup>67</sup> Three potential sources of heterogeneity were identified a priori and 2 were subsequently investigated. The latter were as follows: (1) study design (groups matched on key demographic variables vs studies comparing substance-misusing mothers with general population) and (2) age of child (less than 12 vs more than 12 months and up to 40 months) in accordance with recommendations regarding subgroup analyses (Cochrane Handbook; Chapter 9.6.6).<sup>68</sup> It was not possible to test whether treatment was a moderator as most of the studies that were classified as 'in treatment' were also included in the subgroup 'unmatched'.

A forest plot was calculated in Review Manager 5 (version: 5.3.5), and the heterogeneity between studies was assessed using the *Q* statistic and *I*<sup>2</sup> index. Subgroup analyses were conducted to investigate sources of heterogeneity. Finally, sensitivity analyses using a priori weight functions were conducted to determine whether the estimates of effect size were likely to be influenced by publication bias.<sup>69,70</sup>

## Results

### *Study characteristics and quality appraisal*

Twenty-four studies that included a total of 3433 mother-child dyads met final inclusion for the meta-analysis. Of these, 15 studies reported that the mother's primary drug of use was cocaine or a combination of cocaine and other drugs, whereas 9 studies reported that the primary drug was an opioid. Studies did not typically use diagnostic nomenclature to describe the study population. Thirteen studies provided information on quantity and frequency plus urine toxicology, hair analysis, and/or meconium testing; 1 study used clinical assessment to arrive at a diagnosis; 9 studies reported that mothers were being prescribed opioid replacement therapy as either an outpatient or were currently in a residential treatment facility; and 1 study used prenatal maternal urine toxicology reports to verify substance use. Of all the 17 studies reporting maternal substance use conducted in the United States, only 3 studies had a focus on mothers in treatment. Conversely, all studies conducted outside the United States were conducted in either residential treatment or outpatient opioid replacement clinics (ie, Finland, 4 studies; Norway, 2 studies; Australia, 1 study). The timing, identification, and assessment of substance use also differed between studies. Twelve studies identified and assessed mothers for substance misuse antenatally, 2 studies reported assessment of substance use both antenatally and postnatally, and the remaining (*n* = 10) assessed substance use postnatally. Studies were divided relatively equally between infants less than 1 year (*n* = 13) and infants more than 1 year (*n* = 11). The observational measures all included a measure of the construct of maternal sensitivity and consisted of Ainsworth's Maternal Sensitivity Measure (*n* = 2),<sup>71</sup> the Parent-Child Early Relational Assessment (*n* = 6) (PC-ERA),<sup>72</sup> the Emotional Availability Scales (*n* = 4) (EAS),<sup>73</sup> and Still-Face Paradigm (*n* = 1),<sup>25</sup> and 11 studies used purposely designed measures of maternal sensitivity (see Table 1 for a description of studies).

There was relatively little variability in study quality, with all studies scoring a YES on key elements of design (eg, clearly stated research question, clearly defined population, and clearly defined independent and dependent variables (see Supplementary Table 1). The 1 item that showed variability related to study design, namely, were participants recruited from the same or similar populations. Fourteen studies scored a YES indicating that the samples have been drawn from the same population. However, 10 of the studies reported variations in sample characteristics and thus scored NO. This item was subsequently used to classify studies on the basis of matched or unmatched samples for later subgroup analyses.

### *Global analyses of maternal sensitivity and child responsiveness*

A global meta-analysis of the 24 studies reporting maternal sensitivity yielded an overall population effect size of 0.46

**Table 1.** Participant characteristics including primary drug used, age, race, recruitment site, and description of maternal sensitivity and child responsiveness measures.

AUTHOR	SUBSTANCE USING MOTHERS	COMPARISON OF NON-SUBSTANCE USING MOTHERS	DIAGNOSTIC ASSESSMENT AND MEASURES OF SUBSTANCE USE	AGE OF INFANT	MEASURE OF MATERNAL SENSITIVITY TO CHILD	MEASURE OF CHILD RESPONSIVENESS TO MOTHER
<b>Groups matched on demographic characteristics</b>						
Eidin et al <sup>10</sup>	<p>Mean age: 31.6 (5.6) y (USA)</p> <p>Cocaine use screened – excluded if positive for opioids and benzodiazepines</p> <p>Total sample</p> <p>72% African American</p> <p>70% family assistance</p> <p>Recruited from hospital post delivery</p>	<p>Mean age: 28.2 (5.2) y</p> <p>No illicit drug use – THC use declined post delivery</p> <p>Matched on same hospital recruitment site, maternal education, age, race, and infant gender</p>	<p>Cocaine use measured by TLFB for quantity and frequency, confirmed by urine toxicology 95% and hair analysis 75%</p>	1-2 mo	<p>MIFS: derived a factor score of maternal sensitivity during feeding</p>	Not measured
Eidin et al <sup>10</sup>	<p>Mean age: 30.9 (6.0) y (USA)</p> <p>Excluded on screening if positive for drugs other than cocaine and THC</p> <p>Total sample</p> <p>74% African American</p> <p>71% family assistance</p> <p>Recruited from hospital post delivery</p>	<p>Mean age: 28.6 (5.6) y</p> <p>Matched on same hospital recruitment site, maternal education, age, race, and infant gender</p>	<p>Cocaine use measured by TLFB for quantity and frequency, confirmed for 10% of sample using urine toxicology and hair analysis</p>	7 mo	<p>5 min free play coded using the Clark et al (1986) sensitivity measure</p>	Not measured
Eidin et al <sup>14</sup>	<p>Mean age: 31.1 (6.0) y (USA)</p> <p>Excluded on screening if positive for drugs other than cocaine and THC</p> <p>Total sample</p> <p>70% African American</p> <p>81% family assistance</p> <p>Recruited from 2 local hospitals post delivery</p>	<p>Mean age: 27.9 (5.6) y</p> <p>Matched on same hospital recruitment site, maternal education, age, race, and infant gender</p>	<p>Cocaine use measured by TLFB for quantity and frequency, confirmed by urine toxicology 55% and 76% hair analysis</p>	13 mo	<p>10 min free play coded using PC-ERA, sensitivity measure</p>	PC-ERA responsiveness
Fraser et al <sup>16</sup>	<p>Mean age: 27.0 y (USA)</p> <p>Total sample</p> <p>60% African American</p> <p>100% Medicaid eligible</p> <p>Recruited from services aimed to support substance-using mothers</p>	<p>Recruited from same 2 recruitment sites – no differences on age, race, and education</p>	<p>Clinical assessment to arrive at substance use disorder: 95% substance-related disorder, 67% cocaine-related disorder, and 67% reported polysubstance use</p>	3-5 mo	<p>10 min free play coded using EAS, sensitivity measure</p>	EAS responsiveness
French et al <sup>14</sup>	<p>Age &gt;20 y (USA)</p> <p>66% alcohol, THC and/or cocaine</p> <p>THC only (33%)</p> <p>Total sample</p> <p>67% African American</p> <p>97% single</p> <p>Recruited at initial prenatal visit</p>	<p>Recruited from same antenatal clinic – matches on parity, age, race, marital status, and education</p>	<p>Prenatal urine drug toxicology</p>	Within 24 h after delivery	<p>Feeding observation using NCAFS prior to intervention; total sensitive scale</p>	NCAFS: total responsiveness
Goodman et al <sup>16</sup>	<p>Age range: 18 to 35 y (USA) OMT</p> <p>Total sample</p> <p>100% African American</p> <p>Recruited from prenatal clinics</p>	<p>Recruited from same prenatal clinics – no differences on race, age, SES, years of education, parity</p>	<p>Self-report of methadone maintained for a minimum period of 6 mo prior to pregnancy</p>	12 mo	<p>40 min of structured and unstructured activities; composite score of caregiver communication</p>	PCOG: composite score of infant communication

(Continued)

Table 1. (Continued)

Author	Substance Using Mothers	Comparison of Non-Substance Using Mothers	Diagnosis, Assessment and Measures of Substance Use	Age of Infant	Measure of Maternal Sensitivity to Child	Measure of Child Responsiveness to Mother
Hans et al. <sup>17</sup>	Mean age: 27.7 (3.9) y (USA) OMT Total sample 100% African American Recruited from prenatal clinic	Mean age: 25.7 (3.9) y Recruited from same prenatal clinic — no differences on race and SES	Chic records identified mothers receiving methadone maintenance	Authors report: standardized and summed 4, 12, and 24 mo	40-min structured and unstructured age appropriate activities: sensitivity responsiveness measure	PCOG: child perception of mother accepting
Minnes et al. <sup>18</sup>	Mean age: 29.3 (5.0) y (USA) 100% cocaine + alcohol (87%), THC (53%), amphetamine (1%) Total sample — 81% 'nonwhite' All mothers recruited prenatally from a large urban county hospital	Mean age: 25.8 (5.0) y Alcohol (68%), THC (10%), and amphetamine (1%) Recruited from same prenatal clinic — no differences on race, SES status, and education attained	Severity of substance use assessed by maternal report and toxicology; heavy use = maternal report >17.5 units of use or >70th percentile cocaine metabolite in meconium sample	12 mo	Feeding session videoed and coded using NCAFS — sensitive to cues measured	No means provided
Schulz et al. <sup>19</sup>	Mean age: 27.2 (5.4) y (USA) 100% cocaine + 45% heroin + 36% THC 80% African American 65% single Total sample recruited from same postnatal wards	Mean age: 24.5 (3.9) y 90% African American 90% single Did not differ on age, race, education, and marital status	Maternal self-report and infant urine toxicology results	2 wk	From play mother infant interaction coded using PC-ERA, composite scores on positive maternal involvement	PC-ERA, composite scores on positive infant involvement
Singh et al. <sup>20</sup>	Mean age: 27.1 (4.9) y (USA) 100% cocaine + alcohol (46%), THC (36%), and barbiturates (12%) Total sample 100% African American 63% in care of biological mother All recruited from infant admission to NICU for VLBW	Mean age: 25.6 (8.0) y Alcohol (6%), THC (0%), and barbiturates (0%) 65% in care of biological mother No differences on age, race, and SES	Maternal self-report and infant urine toxicology	Close to 40 wk (gestational age)	Feeding interaction was coded using NCAFS: sensitive to cues	NCAFS: responsiveness
Tronick et al. <sup>21</sup>	70.3% aged between 26 and 35 y (USA) Predominantly cocaine 77.5% African American 81.4% single 89.8% Medicaid Total sample recruited from 4 maternity hospitals (MLS study)	4.6% aged between 26 and 35 y 75.2% African American 70.3% single 74.3% Medicaid No differences on race, sex, and gestational age	Maternal self-report and meconium sampling for cocaine or opiate metabolites	4 mo	6-7 min FFSF paradigm: structured interactions coded for maternal engagement	FFSF: reported infant distancing (avoidance)
Unihorn et al. <sup>22</sup>	68.8% aged between 26 and 35 y (USA) 100% cocaine + alcohol (71%), THC (36%) 72.0% African American 81.3% single Total sample Recruited from 4 maternity hospitals (MLS study)	36.0% aged between 26 and 35 y Alcohol (35%), THC (4%), and barbiturates (4%) 80.5% African American 71.4% single No differences on education level, marital status, SES, or race	Maternal self-report or meconium toxicology for cocaine metabolites	18 mo	10-min unstructured play coded using Ainsworth's Sensitivity/Falling Scale (1974); maternal sensitivity	Ainsworth: positivity
Usieto et al. <sup>23</sup>	No mean provided (USA) Predominantly cocaine Total sample 100% African American Recruited from 2 prenatal maternity hospital clinics or just after delivery	Recruited from same demographics: no difference on race	Maternal report of substance use via a structured interview (quantity and frequency) confirmed by meconium toxicology	12 mo	5-min free play interaction, then 2-min separation and 2-min reunion. Adapted from Ainsworth (1978): maternal warmth	Ainsworth: positive affect

Table 1. (Continued)

AUTHOR	SUBSTANCE USE IN MOTHERS	COMPARISON OF NON-SUBSTANCE USING MOTHERS	DIAGNOSTIC ASSESSMENT AND MEASURES OF SUBSTANCE USE	AGE OF INFANT	MEASURE OF MATERNAL SENSITIVITY TO CHILD	MEASURE OF CHILD RESPONSIVENESS TO MOTHER
Voika et al <sup>24</sup>	Mean age: 31.0 (6.9) y (USA) Predominantly cocaine use. Total sample 74% African American 71% receive welfare support 60% single All recruited from 2 maternally hospitals after delivery	Mean age: 27.7 (5.6) y Closest matching/comparison family recruited matched on maternal education, maternal race, and infant gender	Maternal self-report 2% and 98% via hair sampling	Authors report a mean of 7, 13, and 24 mo	10-min free play interaction coded using Clark et al (1980), maternal sensitivity	Not measured
<b>Groups not matched on demographic characteristics</b>						
Johnson et al <sup>25</sup>	Mean age: 32.0 (4.8) y (USA) 100% cocaine + alcohol (45%), THC (28%) Total sample 100% African American Recruited from hospital post delivery 81% unemployed	Mean age: 27.2 (5.6) y Alcohol (40%), THC (11%) 64% unemployed	Structured and standardized interview conducted for quantity and frequency. Confirmed by meconium infant urine and metabolites	Mean age: 40 mo	15-min semistructured play interaction using Egeland et al (1990) quality of instruction	Not measured
LaGasse et al <sup>26</sup>	Mean age: 30.5 (4.8) y (USA) Predominantly cocaine 83% African American Total sample Recruited after hospital discharge by 4 major universities 90.1% single 78.6% below poverty line 48.4% education > high school 19.7% no antenatal care	Mean age: 26.4 (3.8) y 78.8% African American 78.2% single 63.2% below poverty line 32.1% education > high school 4.3% no antenatal care	Mothers completed the MSU and ASI. Substance use exposure confirmed by maternal self-report, structured interview, and meconium toxicology for metabolites	1 mo	15 min of a feeding session and coded using maternal flexibility	Not measured
Moller and Mayya <sup>23</sup>	Mean age: 29.3 (4.2) y (USA) Cocaine + alcohol, THC 92.5% African American 100% receiving welfare support 69.5% single 69.2% education >12 y Total sample Recruited during routine prenatal appointments	Mean age: 25.6 (4.9) y 76.0% African American 83.2% incoming welfare 85% single 77.8% education >12 y	Maternal self-report (lifetime exposure, frequency, and quantity), urine toxicology	18 mo	5-min child play without mother's attention and 5-min free play with mother coded using RSES; maternal interactive competence	RSES responsiveness
Pajulo et al <sup>27</sup>	Mean age: 25.4 (5.6) y (Finland) Residential treatment for drug (THC, amphetamine, and heroin) or alcohol misuse Recruited from 3 treatment units 58% single 17% education >12 y 92% unemployed	Mean age: 27.3 (3.4) y Recruited from child health care centres in South Finland 0% single 100% education >12 y 25% unemployed	Admission to a residential treatment for severe substance use	3 and 6 mo	Feeding and a free play interaction were videotaped and coded using PC-EPA; total score of maternal sensitivity	Not measured

(Continued)

Table 1. (Continued)

AUTHOR	SUBSTANCE-USING MOTHERS	COMPARISON OF NON-SUBSTANCE-USING MOTHERS	DIAGNOSTIC ASSESSMENT AND MEASURES OF SUBSTANCE USE	AGE OF INFANT	MEASURE OF MATERNAL SENSITIVITY TO CHILD	MEASURE OF CHILD RESPONSIVENESS TO MOTHER
Perry et al <sup>61</sup>	Mean age: 29.2 (4.3) y (Australia) OMT 61% homeless 6% Aboriginal 45% single 63.6% homeless Total sample Recruited during routine prenatal appointments	Mean age: 28.8 (4.9) y 0% homeless 0% Aboriginal 7% single 0% homeless	Structured interview for history of substance use (psychosocial assessment interview) and supported by treatment for heroin addiction with opioid substitution	Less than 18 mo	15-min unstructured free play interaction was videotaped and coded using EAS; total score of maternal sensitivity	EAS: responsiveness
Salo et al <sup>62</sup>	Mean age: 28 (2.8) y (Finland) ORT Recruited during pregnancy from maternity hospital 100% children had child welfare involvement	Mean age: 29.06 (3.20) y Recruited through well-baby clinics 0% children had child welfare involvement	Current treatment for opioid dependence with buprenorphine	38 mo	5-min free play interaction and coded using EAS; maternal sensitivity	EAS: responsiveness
Salo et al <sup>63</sup>	Mean age: 28.3 (3.4) y (Finland) ORT + THC (40%), alcohol 40%, amphetamine 40%, 66.7% has criminal record 40% mother fostered as child Recruited during pregnancy from maternity hospital	Mean age: 29.9 (3.2) y 0% criminal record 0% mother fostered Recruited randomly through well-baby clinics	Current treatment for opioid dependence with buprenorphine	7 mo	4-min free play interaction coded using EAS; maternal sensitivity	EAS: responsiveness
Sævi et al <sup>64</sup>	Mean age: 32.4 y (Norway) All on ORT 34% unemployed 10 y of education 38.8% single Recruited during pregnancy while in treatment	Mean age: 32.5 y Volunteered 0% unemployed 16 y of education 0% single Recruited via leaflets at local health centres	Prenatal assessment using European ASI with pregnant women enrolled in OMT programmes	6 mo	15-min free play coded using NICHD modified by Cox and Crnic (2003); maternal style	Not measured

Table 1. (Continued)

AUTHOR	SUBSTANCE-USING MOTHERS	COMPARISON OF NON-SUBSTANCE-USING MOTHERS	DIAGNOSTIC ASSESSMENT AND MEASURES OF SUBSTANCE USE	AGE OF INFANT	MEASURE OF MATERNAL SENSITIVITY TO CHILD	MEASURE OF CHILD RESPONSIVENESS TO MOTHER
Savolainen et al <sup>16</sup>	Mean age: 26.7 y (Finland) Residential treatment 69% unemployed 76% single 86% <12 y education Recruited during pregnancy while in treatment from 3 sites	Mean age: 27.3 y 0% unemployed 0% single 0% <12 y education Recruited from well-baby clinics	Admission to a residential treatment for severe substance use	6 mo	5-min feeding and free play interactions videotaped and coded using PC-ERA; compatible score of dyadic interactive capacity	PC-ERA; mutuality of affect in play situation
Sigvald and Mow <sup>15</sup>	Mean age: 26 y (Norway) Residential treatment and detoxified during pregnancy 77% single Recruited prenatally from residential treatment centres	Mean age: 33.3 y Voluntary participation 0% single Recruited from well-baby clinics	Prenatal assessment using European ASI with pregnant women admitted to residential treatment for severe substance use and detoxified during pregnancy	3 and 12 mo	15-min semistructured play interactions at 12 mo coded using PC-ERA; expressed affect	PC-ERA; child involvement
<b>Studies not included in meta-analysis</b>						
Mayer et al <sup>17</sup>	Mean age: 25.6 (4.4) y (USA) Predominantly cocaine 58.7% completed high school Total sample 86% African American 90% single parents 100% receiving welfare support Recruited prior to and post delivery	Mean age: 26.6 (3.3) y No drug use 85.7% completed high school	Maternal report and urine toxicology	3 and 6 mo	3-min interaction with infant with infant seated facing mother coded using Clark and Seiler – RISIS; maternal attentiveness	RISIS; infant readiness
Barns et al <sup>18</sup>	Mean age: 27.3 (4.45) y (USA) Recruited clinics for substance-using mothers 11.2 mean years of education 70% African American Total sample Family income: <\$15 000	Mean age: 26.1 (6.3) y Recruited from a public health clinic 12.6 y of education 89% African American	Maternal report and/or toxicology records	Mean age: 10 mo	2 x 5 min (structured and unstructured) coded using PC-ERA; sensitivity and responsiveness to cues	PC-ERA; responsiveness to maternal social behaviour

(Continued)



(95% confidence interval [CI]: 0.31-0.61,  $Z = 5.99$ ,  $P < .00001$ ), indicating that maternal sensitivity was higher in non-substance-using mothers compared with substance-misusing mothers. Notably, however, the proportion of total variability explained by heterogeneity was high ( $Q(23) = 73.53$ ,  $P < .00001$ ;  $I^2 = 69\%$ ).

Similar findings were obtained for a second global meta-analysis of the 16 studies reporting child responsiveness. The overall population effect size was 0.32 (95% CI: 0.06-0.59,  $Z = 2.37$ ,  $P = .02$ ), once again indicating that child responsiveness was higher in non-substance-using mothers compared with substance-misusing mothers. There was also significant heterogeneity across studies ( $Q(15) = 65.05$ ,  $P < .00001$ ), and the proportion of total variability explained by heterogeneity was high ( $I^2 = 77\%$ ).

#### *Moderation analyses to identify sources of heterogeneity*

The significant heterogeneity did not allow any meaningful interpretation of the distribution of effect sizes across studies.<sup>77</sup> To investigate potential sources of heterogeneity, subgroup analyses were undertaken. The first of these was design, as the precision of effect sizes is related to methodological quality, including the matching of study groups.<sup>78</sup> Subgroup analysis for study design found that the overall effect size of maternal sensitivity for the matched subgroup was statistically significant ( $Z = 5.60$ ,  $P < .00001$ ) but small (0.28, 95% CI: 0.18-0.38; see Figure 2), whereas for the nonmatched subgroups, the overall effect size remained large (0.85, 95% CI: 0.48-1.22) and also statistically significant ( $Z = 4.47$ ,  $P < .00001$ ). A test for subgroup differences found that the lower estimate of effect size within the matched subgroup was statistically significant ( $Q(1) = 8.27$ ,  $P = .004$ ), and heterogeneity within the matched subgroup was significantly reduced and no longer statistically significant ( $Q(13) = 13.88$ ,  $P = .38$ ;  $I^2 = 6\%$ ), whereas heterogeneity within the nonmatched subgroup remained high and statistically significant ( $Q(9) = 53.54$ ,  $P < .00001$ ;  $I^2 = 83\%$ ).

A similar but nonsignificant pattern was found for child responsiveness. The overall effect size of child responsiveness for the matched subgroup was not statistically significant ( $Z = 1.59$ ,  $P = .11$ ) and small (0.13, 95% CI: -0.03-0.29; see Figure 3), whereas for the nonmatched subgroup, the overall effect size remained large (0.79, 95% CI: 0.00-1.58) and statistically significant ( $Z = 1.96$ ,  $P = .05$ ). A test for subgroup differences found that the lower estimate of effect size within the matched subgroup was not statistically significant ( $Q(1) = 2.57$ ,  $P = .11$ ). Although heterogeneity within the matched subgroup was reduced, it was not statistically significant ( $Q(9) = 12.19(9)$ ,  $P = .20$ ;  $I^2 = 26\%$ ) and heterogeneity within the nonmatched subgroup remained high and statistically significant ( $Q(5) = 36.82(5)$ ,  $P < .00001$ ;  $I^2 = 86\%$ ).

Overall, these results show significantly reduced levels of heterogeneity for estimates of effect size for both maternal

sensitivity and child responsiveness when samples of substance-misusing mothers were compared with mothers matched on factors such as socioeconomic status, level of education, and (for US studies) eligibility for Medicaid. However, when substance-misusing mothers were compared with mothers drawn from the general population, the differences between the groups on maternal sensitivity and child responsiveness were observed to be significantly larger.

There were no effects of age on heterogeneity. Furthermore, consideration of the variable treatment (mothers in treatment vs not in treatment) was not pursued as the studies of mothers in treatment were also those with nonmatched design, indicating that any finding relating to heterogeneity would be confounded by design.

#### *Publication bias*

The existence of publication bias was evaluated by inspection of the funnel plots for maternal sensitivity and child responsiveness. A funnel plot is a scatterplot of effect size ( $x$ -axis) graphed against sample size ( $y$ -axis) centred on the true population effect size. In the absence of publication bias, studies with larger sample sizes would be expected to be closer to the true population effect size with greater variability of effect size estimates in studies with smaller sample sizes. Thus, when the values of effect size estimates are plotted, the values will be symmetrically distributed around the population effect size in the shape of a funnel. Visual inspection of the funnel plot for maternal sensitivity showed that 3 studies did not fall within the expected funnel shape. The Kendall  $\tau$ , a test to detect the presence of publication bias, was found to be significant ( $\tau(N = 24) = .38$ ,  $P = .01$ ), suggesting publication bias. To assess whether the publication bias would differ when adjusted for publication bias, we used the procedure by Vevea and Woods<sup>79</sup> as described in Field and Gillett.<sup>59</sup> This procedure assesses how effect size estimates would change if selection bias was present using several models of possible selection bias. Adjusted parameter estimates ranged from .52 to .58, suggesting slightly lower overall effect size for maternal sensitivity after adjusting for publication bias.

#### **Discussion**

This systematic review and meta-analysis examined 24 studies with a combined total of 3433 mother-child dyads to compare quality of caregiving in mothers who were using illicit substances or were currently in treatment and/or prescribed opioid replacement therapy with the quality of caregiving in non-substance-using women. These findings provide a synthesis of the literature on the quality of caregiving in substance-misusing mothers and is the first quantitative analysis of caregiving quality in substance-misusing mothers.<sup>9</sup>

Overall, the composite effect size based on the meta-analysis of all 24 studies indicated that maternal sensitivity and child responsiveness were higher in mothers who had not used illicit

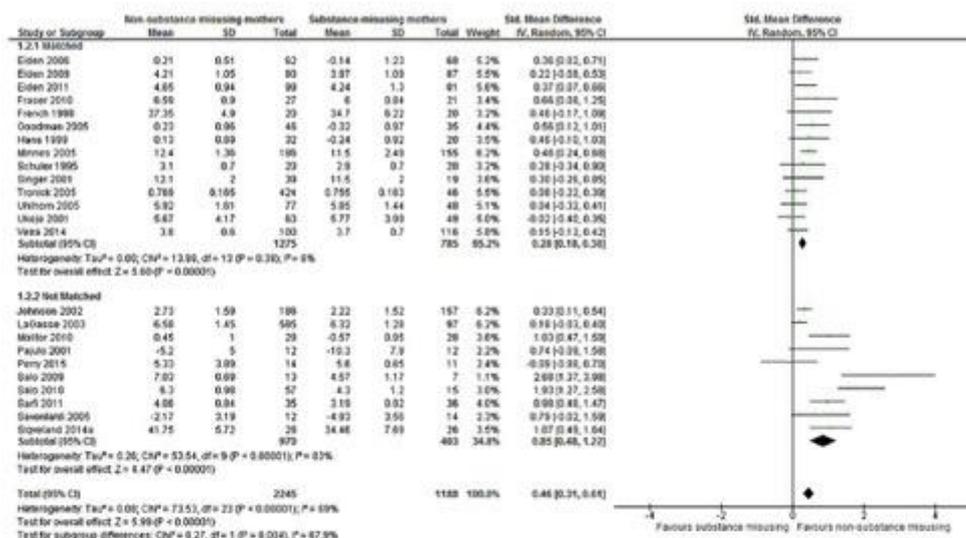


Figure 2. Forest plot of maternal sensitivity for total sample (n = 24) grouped by study design (matched and nonmatched).

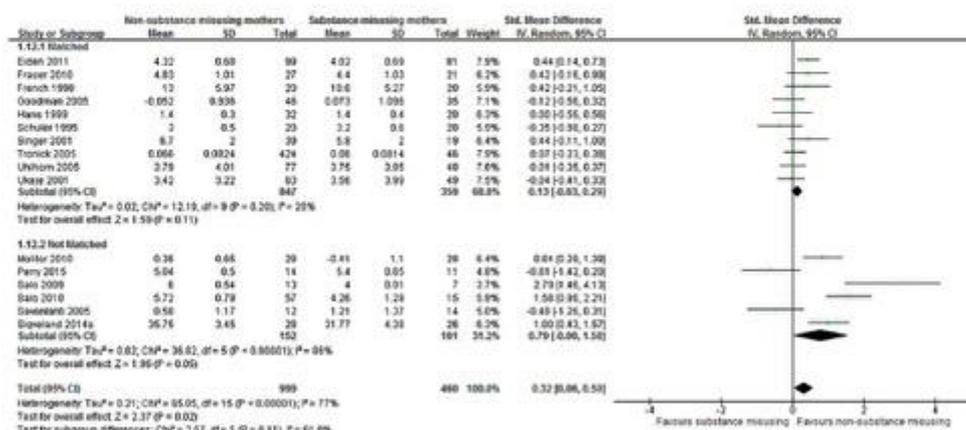


Figure 3. Forest plot of child responsiveness for total sample (n = 16) grouped by study design (matched and nonmatched).

substances. However, we found considerable heterogeneity that limited meaningful interpretation of the results.<sup>79</sup> Therefore, we undertook an examination of potential moderators that might be influencing the variability in effect sizes between studies using subgroup analyses. The first moderator to be tested was design. Smaller effect size values were observed for maternal sensitivity but not for child responsiveness in studies in which substance-misusing mothers were drawn from the same population and thus shared similar demographic characteristics such as socioeconomic status, single parenthood, level of education, and eligibility for Medicaid compared with those studies that

were not matched groups. This finding raises important questions about the interplay between environmental risk and maternal substance use on a key moderator of child outcome: the quality of the caregiving relationship.<sup>80</sup> It is clear that the participants in the matched group of studies were recruited from high-risk populations: they were all of low income, drawn from geographical areas associated with severe financial disadvantage, had low levels of education, and in the case of the US studies, were predominantly from ethnic minority groups who were in receipt of Medicaid. All of these are well-recognised risk factors that have a cumulative rather than additive effect on

child outcome.<sup>81,82</sup> Thus, these families are at high risk of poor child outcome. The addition of maternal illicit substance use appeared to increase risk; there was still a significant, albeit small, difference in the quality of caregiving that favoured the non-substance-using group for maternal sensitivity. Thus, the additional risk of maternal substance use is likely to confer even greater vulnerability for these children who are already exposed to a significant number of socioenvironmental risks.<sup>23,24</sup>

We also tested age of child as a potential moderator. Typically, maternal sensitivity and associated constructs are relatively stable across time.<sup>85</sup> However, family stress and adversity have been found to influence a range of maternal behaviours, including sensitivity.<sup>86</sup> Thus, it is plausible that for families with maternal substance use, and at least for those matched in sociodemographic features, age of the child may be associated with poorer sensitivity and child responsiveness. The third moderator that we had aimed to assess was whether mothers who were currently in treatment for opioid replacement therapy and/or residential treatment differed from mothers who were not in treatment. However, it is notable that most of the studies that met this criterion were also nonmatched. As design took precedence over testing treatment as a moderator, we are unable to answer the question. Thus, the question remains one for further research.

#### *Implications for research, practice, and policy*

These results have important research, practice, and policy implications. First, the quality of the caregiving relationship in substance-misusing mothers is poorer than for mothers facing similar environmental adversity. Although these differences are not large, they underscore the potential impact substance misuse has on a mother's capacity to provide sensitive and nurturing caregiving.

What is also striking, however, is the number of risk factors present in the matched non-substance-using group of mothers. The extensive literature linking multiple risk exposure to poor child outcomes dates from the seminal work of Rutter and colleagues.<sup>81</sup> More contemporary models of socioenvironmental risk emphasise the importance of cumulative risk rather than the identification of specific risk factors.<sup>87</sup> Thus, within this model, maternal substance misuse should be viewed as one further risk that, in combination with a range of other risk factors such as poverty,<sup>88</sup> will be associated with compromised child outcome. This leads us to question whether there is a disproportionate focus on maternal substance use as a risk factor independent of the broader contextual environment of impoverished families. Substance use is one of the key reasons families are referred to child protection services in both pregnancy and the postnatal period.<sup>89</sup> Although women with substance use problems have complex lives and histories, making them a high-risk group, these meta-analysis results raise issues about the potential failure to identify families where the quality of caregiving is poor, but maternal substance misuse is not necessarily present.<sup>90</sup>

Second, results highlight the importance of providing parenting support to substance-misusing mothers that focuses on enhancing maternal sensitivity and responsiveness to maximise child outcomes. This is an area of growing research and clinical focus, and a number of studies have shown the benefits of providing attachment-based interventions for high-risk mothers and their children.<sup>91-93</sup> However, improving maternal sensitivity will also require a focus on helping mothers develop emotional regulation skills and additional support to address real-world problems such as housing and access to material resources. Contemporary parenting programmes, such as the Parents Under Pressure,<sup>91,94</sup> draw from conceptual models of affect regulation and integrate these within a parenting framework.

Third, it is notable that most of the studies identified have focused on cocaine (sometimes in combination with other drugs of abuse), with only a few focusing on opioids but in the context of replacement therapy. Drug use patterns across much of Europe, Australia, and North America are changing with a growing use of psychomotor stimulants such as 'ice' and 'crystal meth'.<sup>95</sup> These substances may influence the quality of caregiving in qualitatively different ways. For example, amphetamine abuse is more likely to be associated with a pattern of interaction with the child that may be hostile and/or unpredictable, given that these are both behaviours associated with ongoing amphetamine abuse.<sup>96</sup> This environment may be qualitatively different due to the direct effects of the substance, compared, for example, with cannabis and could result in poorer outcomes, including insecure/disorganised attachment strategies that occur in the context of hostile and unpredictable parent-child relationships,<sup>15</sup> leading to even greater risk of psychopathology.<sup>12</sup> Thus, future research should be conducted that investigates the relationship between the type of substances, combination of substances, and child outcome, ensuring that adverse environmental risk is controlled for by careful matching of comparison groups.

#### **Conclusions**

This meta-analysis is the first study to bring together literature spanning 20 years to assess both the impact of maternal substance use on quality of caregiving and factors that might moderate this relationship. The clear operationalisation of maternal sensitivity and child responsiveness enabled us to systematically identify and meta-analyse data from 24 studies and undertake subgroup analyses that enabled us to look at the potential impact of study design and infant age. The results show that maternal illicit substance use is significantly related to caregiving quality in the first 3 years of a child's life. The subgroup analyses have highlighted that this difference, although significant, is nonetheless a small effect. These findings highlight the importance of addressing the quality of caregiving for substance-using mothers and draw attention to the need for future studies to ensure that substance-using mothers are compared with mothers who also face a range of environmental adversity.

**Acknowledgements**

All contributions to the authorship of this paper have been acknowledged.

**Author Contributions**

The systematic review as presented was designed and conducted by the first author DH who produced the first draft of the manuscript. DH, SD, and JB coded identified articles for inclusion into the meta-analysis. The second author SD provided constructive critical feedback and revision of the manuscript. PH contributed by assisting with analysing the data for the meta-analysis. JB made critical revisions and approved the final version. All authors reviewed and approved the final manuscript.

**Disclosures and Ethics**

As a requirement of publication, author(s) have provided to the publisher signed confirmation of compliance with legal and ethical obligations including, but not limited to, the following: authorship and contributorship, conflicts of interest, privacy and confidentiality, and (where applicable) protection of human and animal research subjects. The authors have read and confirmed their agreement with the ICMJE authorship and conflict of interest criteria. The authors have also confirmed that this article is unique and not under consideration or published in any other publication, and that they have permission from rights holders to reproduce any copyrighted material. Any disclosures are made in this section. The external blind peer reviewers report no conflicts of interest.

**REFERENCES**

1. Dawe S, Frye BA, Best D, et al. *Drug Use in the Family: Impacts and Implications for Children*. Canberra, ACT: Australian National Council on Drugs; 2007.
2. Begun C, McCollough P. Attachment in substance-exposed toddlers: the role of caregiving and exposure. *Inf Mental Health J*. 2009;30:407-423.
3. Beeghly M, Frank DA, Rose-Jacobs R, Cabral H, Tronick E. Level of prenatal cocaine exposure and infant-caregiver attachment behavior. *Neurotoxicol Teratol*. 2003;25:25-38.
4. Arendt RE, Short EJ, Singer LT, et al. Children prenatally exposed to cocaine: developmental outcomes and environmental risks at seven years of age. *J Dev Behav Pediatr*. 2004;25:81-90.
5. Chiriboga CA. Fetal alcohol and drug effects. *Neurologist*. 2003;9:267-279.
6. Tronick E, Beeghly M. Prenatal cocaine exposure, child development, and the compensating effects of cumulative risk. *Child Perspect*. 1999;26:151-171.
7. Bandstra ES, Morrow CE, Vogel AL, et al. Longitudinal influence of prenatal cocaine exposure on child language functioning. *Neurotoxicol Teratol*. 2002;24:297-308.
8. Bandstra ES, Vogel AL, Morrow CE, Xue L, Anthony JC. Severity of prenatal cocaine exposure and child language functioning through age seven years: a longitudinal latent growth curve analysis. *Subst Use Misuse*. 2004;39:25-59.
9. Johnson MO. Mother-infant interaction and maternal substance use/abuse: an integrative review of research literature in the 1990s. *Online J Knowl Syst Res*. 2001;8:2.
10. Van Ijzendoorn MH, Schuengel C, Bakermans-Kranenburg MJ. Disorganized attachment in early childhood: meta-analysis of precursors, concomitants, and sequelae. *Dev Psychopathol*. 1999;11:225-250.
11. Reidgett DJ, Mayes LC. Development of inhibitory control among prenatally cocaine exposed and non-cocaine exposed youths from late childhood to early adolescence: the effects of gender and risk and subsequent aggressive behavior. *Neurotoxicol Teratol*. 2011;33:47-60.
12. Bennett DS, Marini VA, Bersenki SR, Carmody DF, Lewis M. Externalizing problems in late childhood as a function of prenatal cocaine exposure and environmental risk. *J Pediatr Psychol*. 2013;38:296-308.

13. Dixon DR, Kurtz PF, Chin MD. A systematic review of challenging behaviors in children exposed prenatally to substances of abuse. *Res Dev Disabil*. 2008;29:483-502.
14. Fearon RP, Bakermans-Kranenburg MJ, van Ijzendoorn MH, Lapsley AM, Roisman GI. The significance of insecure attachment and disorganization in the development of children's externalizing behavior: a meta-analytic study. *Child Dev*. 2010;81:435-456.
15. Bakermans-Kranenburg M, Van Ijzendoorn MH, Juffer F. Disorganized infant attachment and preventive interventions: a review and meta-analysis. *Inf Mental Health J*. 2005;26:191-216.
16. Skovgaard AM. Mental health problems and psychopathology in infancy and early childhood. *Dev Med Child Neurol*. 2010;52:E4193.
17. Skovgaard AM, Olsen EM, Christiansen E, et al. Predictors (0-10 months) of psychopathology at age 16 years - a general population study in The Copenhagen Child Cohort CCC 2000. *J Child Psychol Psychiatry*. 2008;49:550-562.
18. DeGangi GA. *Pediatric Disorders of Regulation in Affect and Behavior*. San Diego, CA: Academic Press; 2000.
19. DeGangi GA, Beinbauser C, Roosevelt JD, Foges S, Greenpan S. Prediction of childhood problems at three years in children experiencing disorders of regulation during infancy. *Inf Mental Health J*. 2000;21:156-175.
20. Keenan K, Shaw D, Delliquadri E, Giovannelli J, Walsh B. Evidence for the continuity of early problem behaviors: application of a developmental model. *J Abnorm Child Psychol*. 1998;26:441-452.
21. Henmi MH, Walke D, Schneider S. Associations between problems with crying, sleeping and/or feeding in infancy and long-term behavioural outcomes in childhood: a meta-analysis. *Arch Dis Child*. 2011;96:622-629.
22. Schaler ME, Black MM, Starr J, Raymond H. Determinants of mother-infant interaction: effects of prenatal drug exposure, social support, and infant temperament. *J Clin Child Psychol*. 1995;24:397-405.
23. Newport DR, Hamel SC, Hochberg E, Greene J, Campbell D. Maternal cocaine use and infant behavior. *Neurotoxicol Teratol*. 1991;13:229-233.
24. LaGasse L, Messinger D, Lester B, et al. Prenatal drug exposure and maternal and infant feeding behaviour. *Arch Dis Child Fetal Neonatal Ed*. 2003;88:F391-F399.
25. Tronick E, Messinger D, Weinberg M, et al. Cocaine exposure is associated with subtle compromises of infants' and mothers' social-emotional behavior and dyadic features of their interaction in the face-to-face still-face paradigm. *Dev Psychol*. 2005;41:711.
26. Johnson AL, Morrow CE, Accornero VH, Xue L, Anthony JC, Bandstra ES. Maternal cocaine use: estimated effects on mother-child play interaction in the preschool period. *J Dev Behav Pediatr*. 2002;23:191-202.
27. Salo S, Kivisto K, Koja R, et al. Emotional availability, parental self-efficacy beliefs, and child development in caregiver-child relationships with hypertrophine-exposed 3-year-olds. *Foresight*. 2009;9:244-259.
28. Eiden R. Maternal substance use and mother-infant feeding interaction. *Inf Mental Health J*. 2001;22:497-511.
29. Ukeje I, Bendzsky M, Lewis M. Mother-infant interaction at 12 months in prenatally cocaine-exposed children. *Am J Drug Alcohol Abuse*. 2001;27:203-224.
30. Eiden R, Godleski S, Colder CR, Schuetz P. Prenatal cocaine exposure: the role of cumulative environmental risk and maternal harshness in the development of child internalizing behavior problems in kindergarten. *Neurotoxicol Teratol*. 2014;44:1-10.
31. Kettinger LA, Nalt P, Schuler ME. Exposure to environmental risk factors and parenting attitudes among substance-abusing women. *Am J Drug Alcohol Abuse*. 2000;26:7-11.
32. Amato L, Davoli M, Peracci C, Ferri M, Faggiano F, Mattick R. An overview of systematic reviews of the effectiveness of opiate maintenance therapies: available evidences to inform clinical practice and research. *J Subst Abuse Treat*. 2005;28:321-329.
33. Mattick RF, Breen C, Kimber J, Davoli M. Methadone Maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database Syst Rev*. 2009;3:CD002209.
34. Niccols A, Milligan K, Smith A, Sword W, Thabane L, Henderson J. Integrated programs for mothers with substance abuse issues and their children: a systematic review of studies reporting on child outcomes. *Child Abuse Neglect*. 2012;36:308-322.
35. Powis B, Goscop M, Bury C, Payne K, Griffiths P. Drug-using mothers: social, psychological and substance use problems of women opiate users with children. *Drug Alcohol Rev*. 2000;19:171-180.
36. Lohaus A, Keller H, Ball J, Elben C, Voelker S. Maternal sensitivity: components and relations to warmth and contingency. *Foresight*. 2001;1:267-284.
37. Eiden R, Stevens A, Schuetz P, Dombkowski LE. A conceptual model for maternal behavior among polydrug cocaine-using mothers: the role of postnatal cocaine use and maternal depression. *Psychol Addict Behav*. 2006;20:11-27.
38. Goodman G, Hans SL, Bernstein VJ. Mother expectation of her and infant attachment behaviors as predictors of mother and child communication at 24

months in children of methadone-maintained women. *Inf Mental Health J*. 2005;26:549-569.

39. United Nations Office on Drugs and Crime. World drug report. [http://www.unodc.org/doc/wdr2016/WORLD\\_DRUG\\_REPORT\\_2016\\_web.pdf](http://www.unodc.org/doc/wdr2016/WORLD_DRUG_REPORT_2016_web.pdf) Published 2016. Accessed December 20, 2016.

40. Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *Ann Intern Med*. 2009;151:W65-W94.

41. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*. 2009;6:e1000097.

42. *SpiceReview [Systematic Review Management Software]* [computer program]. Brisbane, QLD, Australia: The University of Queensland; 2014.

43. Eiden R, McAuffe S, Kachadourian L, Coles C, Colder C, Schuetz P. Effects of prenatal cocaine exposure on infant reactivity and regulation. *Neurosci Lett*. 2009;31:60-68.

44. Eiden R, Schuetz P, Coles CD. Maternal cocaine use and mother-infant interaction: direct and moderated associations. *Neurosci Lett*. 2011;33:120-128.

45. Fraser JG, Harris-Britt A, Thakkallapalli EL, Kurts-Coster B, Martin S. Emotional availability and psychosocial correlates among mothers in substance-abuse treatment and their young infants. *Inf Mental Health J*. 2010;31:1-15.

46. French ED, Pitsch M, Brandt J, Pohorecki S. Improving interactions between substance-abusing mothers and their substance-exposed newborns. *J Obstet Gynecol Neonatal Nurs*. 1998;27:262-269.

47. Hans SL, Bernstein VJ, Henson LG. The role of psychopathology in the parenting of drug-dependent women. *Devol Psychopathol*. 1999;11:957-977.

48. Minnes S, Singer LT, Arendt R, Satyapatham S. Effects of prenatal cocaine/polydrug use on maternal-infant feeding interactions during the first year of life. *J Dev Behav Pediatr*. 2005;26:194-200.

49. Schuler ME, Black MM, Star JRH. Determinants of mother-infant interaction: effects of prenatal drug exposure, social support, and infant temperament. *J Clin Child Psychol*. 1995;24:397-405.

50. Singer LT, Hawkins S, Huang J, Davillier M, Baley J. Developmental outcomes and environmental correlates of very low birthweight, cocaine-exposed infants. *Early Hum Dev*. 2001;64:91-103.

51. Uhlhron SB, Messinger DS, Bauer CR. Cocaine exposure and mother-toddler social play. *Infant Behav Dev*. 2005;28:62-73.

52. Veira Y, Finger B, Schuetz P, Colder CR, Goddick S, Eiden R. Child behavior problems: role of cocaine use, parenting, and child exposure to violence. *Psychol Women*. 2014;4:266-280.

53. Molitor A, Mayes LC. Problematic dyadic interaction among toddlers and their polydrug-cocaine-using mothers. *Inf Mental Health J*. 2010;31:121-140.

54. Pajulo M, Savonlahti E, Sorander A, Ahlqvist S, Helenius H, Piha J. An early report on the mother-baby interactive capacity of substance-abusing mothers. *J Subst Abuse Treat*. 2001;20:143-151.

55. Peery N, Newman LK, Hunter M, Dunlop A. Improving antenatal risk assessment in women exposed to high risks. *Clin Child Psychol Psychiatry*. 2015;20:84-105.

56. Salo S, Politi J, Topola S, et al. Early development of opioid-exposed infants born to mothers in buprenorphine-replacement therapy. *J Reprod Infant Psych*. 2010;28:169-179.

57. Saffi M, Smith L, Wad H, Sander JM. Risks and realities: dyadic interaction between 6-month-old infants and their mothers in opioid maintenance treatment. *Infant Behav Dev*. 2011;34:578-589.

58. Savonlahti E, Pajulo M, Ahlqvist S, et al. Interactive skills of infants with their high-risk mothers. *Neuropsychiatry*. 2005;9:139-147.

59. Sigveland TS, Moe V. Longitudinal development of mother-infant interaction during the first year of life among mothers with substance abuse and psychiatric problems and their infants. *Child Psychiatry Hum Dev*. 2014;45:408-421.

60. Mayes LC, Feldman R, Granger R, Haynes O, Bornstein MH, Schottenfeld R. The effects of polydrug use with and without cocaine on mother-infant interaction at 3 and 6 months. *Infant Behav Dev*. 1997;20:489-502.

61. Burns K, Chertik L, Burns WJ, Clark R. The early relationship of drug abusing mothers and their infants: an assessment at eight to twelve months of age. *J Clin Psychol*. 1997;53:279-287.

62. Ball SA, Mayes LC, DeToso JA, Schottenfeld RS. Maternal attentiveness of cocaine abusers during child-based assessments. *Am J Addict*. 1997;6:135-143.

63. Belt RH, Flykt M, Pananaki RL, Pajulo M, Posa T, Tuunainen T. Psychotherapy groups and individual support to enhance mental health and early dyadic interaction among drug-abusing mothers. *Inf Mental Health J*. 2012;33:520-534.

64. Lewis MW, Phillips C, Bowser M, DeLuca S, Johnson HL, Rosen TS. Cocaine-exposed infant behavior during Still-Face: risk factor analyses. *Am J Orthopsychiatry*. 2009;79:60-70.

65. National Heart Lung and Blood Institute. Quality assessment tool for observational cohort and cross-sectional studies. <http://www.nhlbi.nih.gov/health-pro/guidelines/in-develop/cardiovascular-risk-reduction/tools/cohort>. Published 2014. Accessed December 19, 2016.

66. *Review Manager (RevMan)* [computer program] Version 5.3. Copenhagen, Denmark: The Nordic Cochrane Centre, The Cochrane Collaboration; 2014.

67. Bornstein M, Hedges LV, Higgins JPT, Rothstein HR. A basic introduction to fixed-effect and random-effects models for meta-analysis. *Res Synth Methods*. 2010;1:97-113.

68. Higgins JPT, Green S, eds. *Cochrane Handbook for Systematic Reviews of Interventions: Version 5.1.0*. <http://handbook.cochrane.org>. Published March 2011. Accessed December 20, 2016.

69. Field AP, Gillett R. How to do a meta-analysis. *Brit J Math Stat Psy*. 2010;63:665-694.

70. Vevea JL, Woods CM. Publication bias in research synthesis: sensitivity analysis using a priori weight functions. *Psychol Methods*. 2005;10:428-443.

71. Ainsworth M, Blehar M, Waters E, Wall S. *Patterns of Attachment*. Hillsdale, NY: Lawrence Erlbaum; 1978.

72. Clark R. *The Parent-Child Early Relational Assessment Manual*. Madison, WI: Department of Psychiatry, Medical School, University of Wisconsin; 1985.

73. Biringen Z. *The Emotional Availability (EA) Scales*. 4th ed. Boulder, CO: Emotional Availability; 2008.

74. Clark R, Manick J, Scott F, Klehr K. *The mother's project rating scale of mother-child interaction*. Unpublished manuscript; 1980.

75. Egeland B, Weinfield N, Heister M, et al. *Teaching Task Administration and Scoring Manual*. University of Minnesota; May, 1995.

76. Cox M, Crnic K. *Qualitative ratings for parent-child interaction at 3-15 months of age*. Unpublished manuscript; 2003.

77. Higgins J, Thompson S. Quantifying heterogeneity in a meta-analysis. *Stat Med*. 2002;21:1539-1558.

78. Rose S, Laan MJ. *Why match? Investigating matched case-control study designs with causal effect estimation*. *Stat J Biomet*. 2009;5:1.

79. Greenwald R, Rovers M, Lubben J, Heijden G. Subgroup effects despite homogeneous heterogeneity test results. *BMC Med Res Methodol*. 2010;10:43.

80. Bakermans-Kranenburg M, Van IJzendoorn MH, Juffer F. Less is more: meta-analyses of sensitivity and attachment interventions in early childhood. *Psychol Bull*. 2003;129:195-215.

81. Rutter M. Protective factors in children's responses to stress and disadvantage. In: Kent MW, Rolf JE, eds. *Primary Prevention of Psychopathology: Social Competence in Children*. Vol 3. Hanover, NH: University of New England Press; 1979:49-74.

82. Sameroff AJ, Seifer R, Barocas R, Zax M, Greenspan S. Intelligence quotient scores of 4-year-old children: social-environmental risk factors. *Pediatrics*. 1987;79:343-350.

83. Roy AL, Raver CC. Are all risks equal? early experiences of poverty-related risk and children's functioning. *J Fam Psychol*. 2014;28:391-400.

84. Yamoto C, Jacobson SW, Jacobson JL. Fetal substance exposure and cumulative environmental risk in an African American cohort. *Child Dev*. 2008; 79:1761-1775.

85. Kumpulainen K, Kumpulainen K, Raita-Haa J, Mäkeläinen I, Ebeling H. The continuity of maternal sensitivity from infancy to toddler age. *J Reprod Infant Psych*. 2006;24:199-212.

86. Belsky J, Fearon R. Infant-mother attachment security, contextual risk, and early development: a moderational analysis. *Dev Psychopathol*. 2002;14:293-310.

87. Sameroff AJ. Environmental risk factors in infancy. *Pediatrics*. 1998; 102:1287-1292.

88. Evans GW. The environment of childhood poverty. *Am Psychol*. 2004; 59:77-92.

89. McClade A, Wise R, Crawford M. Child protection outcomes for infants of substance-using mothers: a matched-cohort study. *Pediatrics*. 2009;124: 285-293.

90. Daniel B, Taylor J, Scott J. Recognition of neglect and early response: overview of a systematic review of the literature. *Child Fam Soc Work*. 2010;15:248-257.

91. Dawe S, Harnett P. Reducing potential for child abuse among methadone-maintained parents: results from a randomized controlled trial. *J Subst Abuse Treat*. 2007;32:381-390.

92. Pajulo M, Suchman N, Kalland M, Mayes L. Enhancing the effectiveness of residential treatment for substance abusing pregnant and parenting women: focus on maternal reflective functioning and mother-child relationship. *Inf Mental Health J*. 2006;27:448-465.

93. Suchman N, Pajulo M, Decore C, Mayes L. Parenting interventions for drug-dependent mothers and their young children: the case for an attachment-based approach. *Fam Relat*. 2006;55:211-226.

94. Barlow J, Semb S, Gardner F, et al. An evaluation of the parents under pressure programme: a study protocol for an RCT into its clinical and cost effectiveness. *Trials*. 2013;14:230.

95. Chonchai C, Chonchai S. Global patterns of methamphetamine use. *Curr Opin Psychiatry*. 2015;28:269-274.

96. Dawe S, Davis F, Lapworth K, McKetin R. Mechanisms underlying aggressive and hostile behavior in amphetamine users. *Curr Opin Psychiatry*. 2009; 22:269-273.

**Appendix F: Summary of Strategies and Areas for Action in the Third Action Plan**

# Summary of Strategies and Areas for Action in the Third Action Plan

THIRD ACTION PLAN STRATEGIES	AREAS FOR ACTION
<p><b>Cross-cutting focus area – Aboriginal and Torres Strait Islander children and families</b> Sustained attention will be given to improving outcomes for Aboriginal and Torres Strait Islander children to reduce the number needing child protection services.</p>	<p>States and Territories commit to continuing to fully implement the Aboriginal and Torres Strait Islander Child Placement Principle (ATSICPP). <b>Action:</b> All parties agree to ensure the five domains of the ATSICPP (prevention, partnership, placement, participation and connection) are applied to the implementation of strategies and actions identified in the Third Action Plan. <b>Action:</b> A new Aboriginal and Torres Strait Islander working group will be established to provide advice and expertise on the implementation of actions and strategies, and report to the National Forum for Protecting Australia’s Children on progress and outcomes, to ensure a sustained focus on results.</p>
<p><b>Strategy 1: Early intervention with a focus on the early years, particularly the first 1000 days for a child</b> Actions will focus on Aboriginal and Torres Strait Islander children, and support families to address factors that contribute to vulnerability (such as mental health, domestic and family violence, substance misuse, homelessness and disability).</p>	<p><b>1.1 Increase community awareness of the importance of child development and parenting, and normalise families asking for help.</b> <b>Action:</b> Commonwealth to initiate community awareness raising activities focused on effective parenting practices and strategies to enhance safe and supportive environments in the early years, at both national and local levels.</p> <p><b>1.2 Improve access to evidence based family support services, especially for expectant, new and vulnerable parents where alcohol and other drug, mental health, and domestic and family violence issues combine.</b> <b>Action:</b> Identify locations with high incidences of domestic and family violence and improve resource co-ordination of services and activities to better meet the needs of vulnerable expectant parents and parents of young children. <b>Action:</b> Commonwealth to develop and trial an effective model of services and support focused on the first 1000 days to better support Aboriginal and Torres Strait Islander families and communities.</p> <p><b>1.3 Implement joined up responses for families with young children, across agencies and sectors, with a focus on Aboriginal and Torres Strait Islander communities.</b> <b>Action:</b> Examine place-based models to identify critical success factors to inform future work. <b>Action:</b> Commonwealth to support integration of child care, maternal and child health, and family support services in a number of disadvantaged Aboriginal and Torres Strait Islander communities, through the Community Child Care Fund.</p>

THIRD ACTION PLAN STRATEGIES	AREAS FOR ACTION
<p><b>Strategy 2: Helping young people in out-of-home care to thrive in adulthood</b></p> <p>Direct actions to break the cycle of disadvantage for these young people, and their future children. Work under this strategy will also contribute to the issues raised in the recommendations from the Senate Inquiry into Out-of-Home Care.</p>	<p>2.1 Develop and strengthen support for young people in care transitioning to adulthood and improve priority access to support services.</p> <p><b>Action:</b> Commonwealth to continue to support eligible young people to access services through the Youth Employment Strategy, Growing Jobs and Small Business Package.</p> <p><b>Action:</b> Commonwealth to trial ways of improving support to young people by better utilising available data, and delivering intensive case management including wrap-around services linking to education, health and housing, working with jurisdictions. All parties to use findings to guide future interventions for young people.</p> <p><b>Action:</b> Examine 2014 reforms to the Transition to Independent Living Allowance to ensure it continues to target those who need it most and improve efficiency.</p> <p><b>Action:</b> Evaluate impact of jurisdictions' policy changes to extend statutory responsibility and access to services to young people who exit out-of-home care over the age of 18 years.</p>
<p><b>Strategy 3: Organisations responding better to children and young people to keep them safe</b></p> <p>Build on the <i>National Framework: Creating Safe Environments for Children (2005)</i> to enable organisations to incorporate child safety into the way they operate.</p>	<p>3.1 Develop tools and resources to help services to move from a 'reporting' culture to a 'responding' culture to improve child safety and wellbeing.</p> <p><b>Action:</b> Review and implement the <i>National Framework: Creating Safe Environments for Children – Organisations, Employees and Volunteers (2005)</i>.</p> <p><b>Action:</b> Strategy working group to produce a work plan to identify resources to support best practice on child safe standards.</p> <p>3.2 Address barriers to information sharing within and across jurisdictions for government and non-government agencies where there are concerns about child wellbeing.</p> <p><b>Action:</b> Share jurisdictional approaches to develop a best practice model of information exchange.</p>
<p><b>Cross-cutting focus area – Research and reporting under the Third Action Plan</b></p> <p>Embed and build on previous achievements, improve the evidence base and report on progress.</p>	<p><b>Action:</b> Explore capacity to develop targets and progress markers for Third Action Plan to measure progress, and if viable, identify appropriate targets and markers, to assist with reporting, by June 2016.</p> <p><b>Action:</b> Examine how to continue full implementation of, and give best effect to, the <i>National Standards for out-of-home care</i> in light of the Senate Inquiry into Out-of-Home Care recommendations.</p> <p><b>Action:</b> Revitalise the Research Advisory Committee of the National Forum to develop a new research agenda.</p>

### References

- Afifi, T. O., Mather, A., Boman, J., Fleisher, W., Enns, M. W., MacMillan, H., & Sareen, J. (2011). Childhood adversity and personality disorders: Results from a nationally representative population-based study. *Journal of Psychiatric Research, 45*(6), 814-822. doi:10.1016/j.jpsychires.2010.11.008
- Ainsworth, M., Blehar, M., Walters, E., & Wall, S. (1978). *Patterns of Attachment*. Hillsdale, NY: Erlbaum.
- Ainsworth, M., Blehar, M., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale, NJ: Erlbaum.
- Alink, L. R. A., Mesman, J., Van Zeijl, J., Stolk, M. N., Juffer, F., Bakermans-Kranenburg, M. J., . . . Koot, H. M. (2009). Maternal sensitivity moderates the relation between negative discipline and aggression in early childhood. *Social Development, 18*(1), 99-120. doi:10.1111/j.1467-9507.2008.00478.x
- 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. doi:10.1080/10502551003597782
- Amato, L., Davoli, M., Perucci, C., Ferri, M., Faggiano, F., & Mattick, R. (2005). An Overview of Systematic Reviews of the Effectiveness of Opiate Maintenance Therapies: Available Evidence to Inform Clinical Practice and Research. *Journal of Substance Abuse Treatment, 28*(4), 321-329. doi:10.1016/j.jsat.2005.02.007
- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders. (4th ed., text revision)*. Washington, DC: APA.
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (5 ed.)*. Arlington, VA American Psychiatric Publishing.

- Ammerman, R. T., Kolko, D. J., Kirisci, L., Blackson, T. C., & Dawes, M. A. (1999). Child abuse potential in parents with histories of substance use disorder. *Child Abuse & Neglect*, 23(12), 1225-1238. doi:10.1016/S0145-2134(99)00089-7
- Ammerman, R. T., Shenk, C. E., Teeters, A. R., Noll, J. G., Putnam, F. W., & Van Ginkel, J. B. (2013). Multiple mediation of trauma and parenting stress in mothers in home visiting *Infant Mental Health Journal*, 34(3), 234-241. doi:10.1002/imhj.21383
- Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., . . . Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood. A convergence of evidence from neurobiology and epidemiology. *European archives of psychiatry and clinical neuroscience*, 256. doi:10.1007/s00406-005-0624-4
- Appleyard, K., Egeland, B., Dulmen, M. H., & Alan Sroufe, L. (2005). When more is not better: The role of cumulative risk in child behavior outcomes. *Journal of Child Psychology and Psychiatry*, 46(3), 235-245.
- Arendt, R. E., Short, E. J., Singer, L. T., Minnes, S., Hewitt, J., Flynn, S., . . . Flannery, D. (2004). Children Prenatally Exposed to Cocaine: Developmental Outcomes and Environmental Risks at Seven years of age. *Journal of Develpemental and Behavioral Pediatrics*, 25(2), 83-90. doi:10.1097/00004703-200404000-00002
- Atkinson, J. (2013). *Trauma-informed services and trauma-specific care for Indigenous Australian children. Resource sheet no.21 produced for the Closing the Gap Clearinghouse*. Canberra, ACT: Australian Institute of Health and Welfare Retrieved from <http://www.aihw.gov.au/uploadedFiles/ClosingTheGap/Content/Publications/2013/ctg-rs21.pdf>.

- Atkinson, L., Paglia, A., Coolbear, J., Niccols, A., Parker, K. C. H., & Guger, S. (2000). Attachment security: A meta-analysis of maternal mental health correlates. *Clinical Psychology Review, 20*(8), 1019-1040. doi:10.1016/S0272-7358(99)00023-9
- Australian Bureau of Statistics. (2016). *3301.0 - Births, Australia, 2015*. Canberra: Australian Bureau of Statistics.
- Australian Institute of Health and Welfare. (2005). *Child protection Australia 2003–04. AIHW cat. no. CWS 24*. Canberra: Australian Institute of Health and Welfare.
- Australian Institute of Health Welfare. (2014). *National Drug Strategy Household Survey detailed report 2013* (Vol. no. 28). Canberra, ACT: Australian Institute of Health and Welfare.
- Bakermans-Kranenburg, M., & van Ijzendoorn, M. H. (2009). The first 10,000 Adult Attachment Interviews: Distributions of adult attachment representations in clinical and non-clinical groups. *Attachment and Human Development, 11*(3), 223-263. doi:10.1080/14616730902814762
- Bakermans-Kranenburg, M., Van Ijzendoorn, M. H., & Juffer, F. (2003). Less is More: Meta-Analyses of Sensitivity and Attachment Interventions in Early Childhood. *Psychological Bulletin, 129*(2), 195-215.
- Bakermans-Kranenburg, M., van Ijzendoorn, M. H., & Juffer, F. (2005). Disorganized infant attachment and preventive interventions: A review and meta-analysis. *Infant Mental Health Journal, 26*(3), 191-216. doi:10.1002/imhj.20046
- Ball, J. S., & Links, P. S. (2009). Borderline personality disorder and childhood trauma: Evidence for a causal relationship. *Current Psychiatry Reports, 11*(1), 63-68. doi:10.1007/s11920-009-0010-4
- Ball, S. A., Mayes, L. C., DeTeso, J. A., & Schottenfeld, R. S. (1997). Maternal attentiveness of cocaine abusers during child-based assessments. *American Journal on Addictions,*

6(2), 135-143. doi:<http://www.scopus.com/inward/record.url?eid=2-s2.0->

0030911479&partnerID=40&md5=73b1322044cc05c3fc3161fe8fb5f789

Bandstra, E. S., Morrow, C. E., Vogel, A. L., Fifer, R. C., Ofir, A. Y., Dausa, A. T., . . .

Anthony, J. C. (2002). Longitudinal Influence of Prenatal Cocaine Exposure on Child Language Functioning. *Neurotoxicology and Teratology*, *24*(3), 297-308.

doi:10.1016/S0892-0362(02)00192-7

Bandstra, E. S., Vogel, A. L., Morrow, C. E., Xue, L., & Anthony, J. C. (2004). Severity of prenatal cocaine exposure and child language functioning through age seven years: A longitudinal latent growth curve analysis. *Substance Use & Misuse*, *39*(1), 25-59.

doi:10.1081/JA-120027765

Barlow, J., Sembi, S., Gardner, F., Macdonald, G., Petrou, S., Parsons, H., . . . Dawe, S.

(2013). An evaluation of the Parents under Pressure programme: A study protocol for an RCT into its clinical and cost effectiveness. *Trials*, *14*(1), 210.

Barrett, E. L., Teesson, M., Chapman, C., Slade, T., Carragher, N., & Mills, K. (2015).

Substance use and mental health consequences of childhood trauma: An epidemiological investigation. *Drug & Alcohol Dependence*, *146*, e217-e218.

doi:10.1016/j.drugalcdep.2014.09.059

Bartlett, J. D., Kotake, C., Fauth, R., & Easterbrooks, M. A. (2017). Intergenerational transmission of child abuse and neglect: Do maltreatment type, perpetrator, and substantiation status matter? *Child Abuse & Neglect*, *63*, 84-94.

doi:<http://dx.doi.org/10.1016/j.chiabu.2016.11.021>

Bateman, J., Henderson, C., & Kezelman, C. (2013). *Trauma-Informed Care and Practice: Towards a cultural shift in policy reform across mental health and human services in Australia, A National Strategic Direction, Position Paper and Recommendations of the National Trauma-Informed Care and Practice Advisory Working Group.*

- Lilyfield, NSW: Mental Health Coordinating Council Retrieved from [http://www.mhcc.org.au/media/32045/ticp\\_awg\\_position\\_paper\\_\\_v\\_44\\_final\\_\\_\\_07\\_1\\_1\\_13.pdf](http://www.mhcc.org.au/media/32045/ticp_awg_position_paper__v_44_final___07_1_1_13.pdf).
- Bayley, N. (2006a). *Bayley Scales of Infant and Toddler Development Screening Test* (3rd ed.). San Antonio, USA: Pearson.
- Bayley, N. (2006b). *Bayley Scales of Infant and Toddler Development, Third edition (Bayley-III)*. Texas, US: Harcourt Assessment.
- 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. doi:10.1016/j.janxdis.2008.09.001
- Beckwith, L., Howard, J., Espinosa, M., & Tyler, R. (1999). Psychopathology, mother-child interaction, and infant development: Substance-abusing mothers and their offspring. *Development and Psychopathology, 11*(04), 715-725. doi:10.1017/S095457949900228X
- Beeghly, M., Frank, D. A., Rose-Jacobs, R., Cabral, H., & Tronick, E. (2003). Level of prenatal cocaine exposure and infant-caregiver attachment behavior. *Neurotoxicology and Teratology, 25*(1), 23-38. doi:10.1016/s0892-0362(02)00323-9
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development, 55*(1), 83-96.
- Belsky, J., & Fearon, R. (2002). Infant-mother attachment security, contextual risk, and early development: a moderational analysis. *Development and Psychopathology, 14*, 293-310.
- Belt, R., 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. doi:10.1002/imhj.21348
- Belt, R., Kouvo, A., Flykt, M., Punamäki, R.-L., Haltigan, J. D., Biringen, Z., & Tamminen, T. (2012). 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*. doi:10.1177/1359104512444116
- Bennett, D. S., Marini, V. A., Berzenski, S. R., Carmody, D. P., & Lewis, M. (2013). Externalizing Problems in Late Childhood as a Function of Prenatal Cocaine Exposure and Environmental Risk. *Journal of Pediatric Psychology*, 38(3), 296-308. doi:10.1093/jpepsy/jss117
- Bergin, C., & McCollough, P. (2009). Attachment in substance-exposed toddlers: The role of caregiving and exposure. *Infant Mental Health Journal*, 30(4), 407-423.
- Bernstein, D., Ahluvalia, T., Pogge, D., & Handelsman, L. (1997). Validity of the Childhood Trauma Questionnaire in an adolescent psychiatric population. *J Am Acad Child Adolesc Psychiatry*, 36(3), 340-348. doi:10.1097/00004583-199703000-00012
- Bernstein, D., & Fink, L. (1998). *Childhood Trauma Questionnaire: A retrospective self-report manual* San Antonio, TX: The Psychological Corporation.
- Bernstein, D., Fink, L., Handelsman, L., Foote, J., Lovejoy, M., Wenzel, K., . . . Ruggiero, J. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *Am J Psychiatry*, 151(8), 1132-1136. doi:10.1176/ajp.151.8.1132
- Bernstein, D., Stein, J., 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. doi:10.1016/S0145-2134(02)00541-0

- Bert, S. C., Guner, B. M., & Lanzi, R. G. (2009). The influence of maternal history of abuse on parenting knowledge and behavior. *Family Relations, 58*(2), 176-187.  
doi:0.1111/j.1741-3729.2008.00545.x
- Biringen, Z. (2008). *The Emotional Availability (EA) Scales* (4th ed.). Boulder, Colorado: Emotionalavailability.com.
- 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.  
doi:http://dx.doi.org/10.1016/j.dr.2014.01.002
- Biringen, Z., & Easterbrooks, M. A. (2012). Emotional availability: Concept, research, and window on developmental psychopathology. *Development and Psychopathology, 24*(1), 1-8. doi:http://dx.doi.org/10.1017/S0954579411000617
- 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
- Blackwell, P., Lockman, J. J., & Kaiser, M. (1999). Mother-Infant Interaction in Drug-Affected Dyads Over the First 9 Months of Life. *Applied Developmental Science, 3*(3), 168-177. doi:10.1207/s1532480xads0303\_3
- Bohlin, G., Hagekull, B., & Rydell, A. M. (2000). Attachment and Social Functioning: A Longitudinal Study from Infancy to Middle Childhood. *Social Development, 9*(1), 24-39.
- Borelli, J., West, J. L., Decoste, C., & Suchman, N. (2012). Emotionally avoidant language in the parenting interviews of substance-dependent mothers: Associations with reflective functioning, recent substance use, and parenting behavior. *Infant Mental Health Journal, 33*(5), 506-519. doi:10.1002/imhj.21340

- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2010). A basic introduction to fixed-effect and random-effects models for meta-analysis. *Research Synthesis Methods, 1*(2), 97-111. doi:10.1002/jrsm.12
- Bornovalova, M. A., Lejuez, C. W., Daughters, S. B., Rosenthal, M. Z., & Lynch, T. R. (2005). Impulsivity as a common process across borderline personality and substance use disorders. *Clinical Psychology Review, 25*(6), 790-812. doi:10.1016/j.cpr.2005.05.005
- Bouvette-Turcot, A.-A., Unternaehrer, E., Gaudreau, H., Lydon, J. E., Steiner, M., & Meaney, M. J. (2017). The joint contribution of maternal history of early adversity and adulthood depression to socioeconomic status and potential relevance for offspring development. *Journal of Affective Disorders, 207*, 26-31. doi:http://dx.doi.org/10.1016/j.jad.2016.08.012
- Bowlby, J. (1969). *Attachment: Attachment and Loss Volume 1*. London: Hogarth Press.
- Bowlby, J. (1973). *Attachment and loss. Vol. 2, Separation*. New York: Basic Books.
- Bridgett, D. J., & Mayes, L. C. (2011). Development of Inhibitory Control Among Prenatally Cocaine Exposed and Non-Cocaine Exposed Youths From Late Childhood to Early Adolescence: The Effects of Gender and Risk and Subsequent Aggressive Behavior. *Neurotoxicology and Teratology, 33*(1), 47-60. doi:10.1016/j.ntt.2010.08.002
- Bronfenbrenner, U. (1979). Contexts of child rearing: Problems and prospects. *American Psychologist, 34*(10), 844-850. doi:10.1037/0003-066X.34.10.844
- Brown, J., Cohen, P., Johnson, J. G., & Salzinger, S. (1998). A longitudinal analysis of risk factors for child maltreatment: findings of a 17-year prospective study of officially recorded and self-reported child abuse and neglect. *Child Abuse & Neglect, 22*(11), 1065-1078. doi:10.1016/S0145-2134(98)00087-8

- Burns, K., Chethik, L., Burns, W. J., & Clark, R. (1997). The early relationship of drug abusing mothers and their infants: An assessment at eight to twelve months of age. *Journal of Clinical Psychology, 53*(3), 279-287. doi:10.1002/(sici)1097-4679(199704)53:3<279::aid-jclp11>3.0.co;2-f
- Cairone, K., Rudick, S., & Mcauley, E. (2017). *Home visiting issues and insights. Creating a trauma-informed home visiting program*. U.S. Department of Health and Human Services.
- Callaghan, T., Crimmins, J., & Schweitzer, R. D. (2011). Children of substance-using mothers: Child health engagement and child protection outcomes. *Journal of Paediatrics and Child Health, 47*(4), 223-227. doi:10.1111/j.1440-1754.2010.01930.x
- Cancian, M., Slack, K., & Yang, M. (2010). *The effect of family income on risk of child maltreatment. Discussion Paper no. 1385-10*. Madison: University of Wisconsin.
- Casanueva, C., Martin, S. L., & Runyan, D. K. (2009). Repeated reports for child maltreatment among intimate partner violence victims: Findings from the National Survey of Child and Adolescent Well-Being. *Child Abuse & Neglect, 33*(2), 84-93. doi:10.1016/j.chiabu.2007.04.017
- Cassibba, R., van Ijzendoorn, M. H., & Coppola, G. (2011). Emotional availability and attachment across generations: Variations in patterns associated with infant health risk status. *Child: Care, Health and Development*. doi:10.1111/j.1365-2214.2011.01274.x
- Cassidy, J., & Berlin, L. J. (1994). The insecure/ambivalent pattern of attachment: Theory and research. *Child Development, 65*(4), 971-991. doi:10.1111/j.1467-8624.1994.tb00796.x
- Cassidy, J., & Shaver, P. R. (2008). *Handbook of attachment: Theory, research and clinical applications* (2nd ed.). New York: Guilford Press.

Centers for Disease Control and Prevention. (2011). *Healthy people 2010*. USA: U.S.

Department of Health and Human Services Retrieved from

[https://www.cdc.gov/nchs/data/hpdata2010/hp2010\\_final\\_review.pdf](https://www.cdc.gov/nchs/data/hpdata2010/hp2010_final_review.pdf).

Centers for Disease Control and Prevention. (2016). About the CDC-Kaiser ACE Study.

Retrieved from <https://www.cdc.gov/violenceprevention/acestudy/about.html>

Chapple, C. L. (2003). Examining intergenerational violence: Violent role modeling or weak

parental controls? *Violence and Victims*, 18(2), 143-162.

doi:10.1891/vivi.2003.18.2.143

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), 277 - 299.

Chiesa, M., Larsen-Paya, M., Martino, M., & Trinchieri, M. (2016). The relationship between

childhood adversity, psychiatric disorder and clinical severity: results from a multi-centre study. *Psychoanalytic Psychotherapy*, 30(1), 79.

doi:10.1080/02668734.2016.1145131

Child Family Community Australia. (2016). *Communities for children facilitating partners*

*evidence-based programme profiles*. Canberra: Australian Institute of Family Studies

Retrieved from <https://apps.aifs.gov.au/cfca/guidebook/>.

Chiriboga, C. A. (2003). Fetal Alcohol and Drug Effects. *The Neurologist*, 9(6), 267-279.

doi:10.1097/01.nrl.0000094941.96358.d1

Clark, R. (1985). *The parent-child early relational assessment manual*. Madison: University

of Wisconsin, Medical School, Department of Psychiatry.

Collins, D. J., & Lapsley, H. M. (2002). *Counting the cost: Estimates of the social costs of*

*drug abuse in Australia in 1998-9*. Canberra: Commonwealth department of Health

and Aged Care.

- Collins, D. J., & Lapsley, H. M. (2008). *The costs of tobacco, alcohol and illicit drug abuse to Australian society in 2004/05*. Canberra: Commonwealth Department of Health and Aged Care.
- Council of Australian Governments. (2009). *Protecting Children is Everyone's Business National Framework for Protecting Australia's Children 2009–2020*. Canberra, ACT: Commonwealth of Australia Retrieved from [https://www.dss.gov.au/sites/default/files/documents/child\\_protection\\_framework.pdf](https://www.dss.gov.au/sites/default/files/documents/child_protection_framework.pdf)
- Council of Australian Governments. (2015). *Driving change: Intervening Early. National Framework for Protecting Australian's Children 2009-2020*. Canberra: Commonwealth of Australia Retrieved from [https://www.dss.gov.au/sites/default/files/documents/12\\_2015/pdf\\_third\\_action\\_plan\\_for\\_protecting\\_australias\\_children.pdf](https://www.dss.gov.au/sites/default/files/documents/12_2015/pdf_third_action_plan_for_protecting_australias_children.pdf).
- Crandell, L. E., Patrick, M. P. H., & Hobson, R. P. (2003). 'Still-face' interactions between mothers with borderline personality disorder and their 2-month-old infants. *The British Journal of Psychiatry*, 183(3), 239-247. doi:10.1192/03-74
- Crittenden, P. M. (2003). *Care Index for Infants and Toddlers. Coding manual*. Miani, FL: Family Relations Institute.
- Cyr, C., Euser, E. M., Bakermans-Kranenburg, M., & van Ijzendoorn, M. H. (2010). Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development and Psychopathology*, 22(1), 87-108. doi:10.1017/s0954579409990289
- Dalziel, K., Dawe, S., Harnett, P. H., & Segal, L. (2015). Cost-Effectiveness Analysis of the Parents under Pressure Programme for Methadone-Maintained Parents. *Child Abuse Review*, 24(5), 317-331. doi:10.1002/car.2371

- Daniel, B., Taylor, J., & Scott, J. (2010). Recognition of neglect and early response: overview of a systematic review of the literature. *Child & Family Social Work, 15*(2), 248-257. doi:10.1111/j.1365-2206.2009.00670.x
- Dawe, S., Davis, P., Lapworth, K., & McKetin, R. (2009). Mechanisms underlying aggressive and hostile behavior in amphetamine users. *Current Opinion in Psychiatry, 22*(3), 269-273. doi:10.1097/YCO.0b013e32832a1dd4
- Dawe, S., Frye, S., Best, D., Moss, D., Atkinson, J., Evans, C., . . . Harnett, P. (2007). Drug Use in the Family: Impacts and Implications for Children. In Australian National Council on Drugs (Ed.). Canberra, ACT: Australian National Council on Drugs.
- Dawe, S., Gullo, M. J., & Loxton, N. J. (2004). Reward drive and rash impulsiveness as dimensions of impulsivity: Implications for substance misuse. *Addictive Behaviors, 29*(7), 1389-1405. doi:10.1016/j.addbeh.2004.06.004
- Dawe, S., & Harnett, P. (2007). Reducing potential for child abuse among methadone-maintained parents: Results from a randomized controlled trial. *Journal of Substance Abuse Treatment, 32*(4), 381-390.
- Dawe, S., Harnett, P. H., & Frye, S. (2008). *Improving outcomes for children living in families with parental substance misuse: What do we know and what should we do.* Australia: Australian Institute of Family Studies.
- De Wolff, M., & Van Ijzendoorn, M. (1997). Sensitivity and attachment: a meta-analysis on parental antecedents of infant attachment. *68*, 571-591.
- DeGangi, G. A. (2000). *Pediatric Disorders of Regulation in Affect and Behavior.* San Diego: Academic Press.
- DeGangi, G. A., Breinbauer, C., Roosevelt, J. D., Porges, S., & Greenspan, S. (2000). Prediction of Childhood Problems at Three Years in Children Experiencing Disorders

- of Regulation During Infancy. *Infant Mental Health Journal*, 21(3), 156-175.  
doi:10.1002/1097-0355(200007)21:3<156::AID-IMHJ2>3.0.CO;2-D
- DeOliveira, C., Wolfe, V., & Bailey, H. (2004). *The effect of childhood maltreatment on the parent-child relationship: Project summary*. London, Ontario, CANADA Centre for Research on Violence Against Women and Children.
- DiLillo, D., & Damashek, A. (2003). Parenting characteristics of women reporting a history of childhood sexual abuse. *Child Maltreatment*, 8(4), 319-333.  
doi:10.1177/1077559503257104
- Dixon, D. R., Kurtz, P. F., & Chin, M. D. (2008). A systematic review of challenging behaviors in children exposed prenatally to substances of abuse. *Research in Developmental Disabilities*, 29(6), 483-502.
- Dixon, L., Browne, K., & Hamilton-Giachritsis, C. (2005). Risk factors of parents abused as children: a mediational analysis of the intergenerational continuity of child maltreatment (Part I). *Journal of Child Psychology and Psychiatry*, 46(1), 47-57.  
doi:10.1111/j.1469-7610.2004.00339.x
- Dixon, L., Browne, K., & Hamilton-Giachritsis, C. (2009). Patterns of Risk and Protective Factors in the Intergenerational Cycle of Maltreatment. *Journal of Family Violence*, 24(2), 111-122. doi:10.1007/s10896-008-9215-2
- 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*, 14(2), 132-151. doi:10.1002/car.888
- Dozier, M., Peloso, E., Lindhiem, O., Gordon, M. K., Manni, M., Sepulveda, S., . . . Levine, S. (2006). Developing evidence-based interventions for foster children: An example of a randomized clinical trial with Infants and toddlers. *Journal of Social Issues*, 62(4), 767-785. doi:10.1111/j.1540-4560.2006.00486.x

- 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, 16*(6), 649-670. doi:10.1002/icd.515
- Dube, S. R., Felitti, V. J., Dong, M., Chapman, D. P., Giles, W. H., & Anda, R. F. (2003). Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the adverse childhood experiences study. *Pediatrics, 111*(3), 564-572.
- Dunn, M. G., Tarter, R. E., Mezzich, A. C., Vanyukov, M., Kirisci, L., & Kirillova, G. (2002). Origins and consequences of child neglect in substance abuse families. *Clinical Psychology Review, 22*(7), 1063-1090.
- Dutra, L., Bureau, J. F., Holmes, B., Lyubchik, A., & Lyons-Ruth, K. (2009). Quality of early care and childhood trauma: A prospective study of developmental pathways to dissociation. *Journal of Nervous and Mental Disease, 197*(6), 383-390. doi:10.1097/NMD.0b013e3181a653b7
- 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. doi: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. doi:10.1080/14616730050085518
- Easterbrooks, M., Chaudhuri, J. H., & Gestsdottir, S. (2005). Patterns of emotional availability among young mothers and their infants: A dyadic, contextual analysis. *Infant Mental Health Journal, 26*(4), 309-326. doi:10.1002/imhj.20057
- Egeland, B., Jacobvitz, D., & Sroufe, L. A. (1988). Breaking the Cycle of Abuse. *Child Development, 59*(4), 1080-1088.

- Eiden, R. (2001). Maternal substance use and mother-infant feeding interactions. *Infant Mental Health Journal, 22*(4), 497-511. doi:10.1002/imhj.1013
- Eiden, R., Foote, A., & Schuetze, P. (2007). Maternal cocaine use and caregiving status: Group differences in caregiver and infant risk variables. *Addictive Behaviors, 32*(3), 465-476.
- Eiden, R., Godleski, S., Colder, C. R., & Schuetze, P. (2014). Prenatal cocaine exposure: The role of cumulative environmental risk and maternal harshness in the development of child internalizing behavior problems in kindergarten. *Neurotoxicology and Teratology, 44*, 1-10. doi:10.1016/j.ntt.2014.04.002
- Eiden, R., Granger, D., Schuetze, P., & Veira, Y. (2011). Child behavior problems among cocaine-exposed toddlers: Indirect and interactive effects. *Development and Psychopathology, 23*(02), 539-550. doi:doi:10.1017/S0954579411000058
- Eiden, R., Schuetze, P., Colder, C., & Veira, Y. (2011). Maternal cocaine use and mother-toddler aggression. *Neurotoxicology and Teratology, 33*(3), 360-369. doi:http://dx.doi.org/10.1016/j.ntt.2011.03.001
- Eiden, R., Schuetze, P., & Coles, C. D. (2011). Maternal cocaine use and mother-infant interactions: Direct and moderated associations. *Neurotoxicology and Teratology, 33*(1), 120-128. doi:http://dx.doi.org/10.1016/j.ntt.2010.08.005
- Eiden, R., Stevens, A., Schuetze, P., & Dombkowski, L. (2006). A conceptual model for maternal behavior among polydrug cocaine-using mothers: The role of postnatal cocaine use and maternal depression. *Psychology of Addictive Behaviors, 20*(1), 11-27. doi:10.1037/0893-164x.20.1.11
- Eiden, R. D., Godleski, S., Colder, C. R., & Schuetze, P. (2014). Prenatal cocaine exposure: The role of cumulative environmental risk and maternal harshness in the development

- of child internalizing behavior problems in kindergarten. *Neurotoxicology and Teratology*, 44, 1-10.
- Eiden, R. D., McAuliffe, S., Kachadourian, L., Coles, C., Colder, C., & Schuetze, P. (2009). Effects of prenatal cocaine exposure on infant reactivity and regulation. *Neurotoxicology and Teratology*, 31(1), 60-68.
- Elliot, R. L., Campbell, L., Hunter, M., Cooper, G., Melville, J., McCabe, K., . . . Loughland, C. (2014). When I look into my baby's eyes . . . Infant emotion recognition by mothers with borderline personality disorder. *Infant Mental Health Journal*, 35(1), 21-32. doi:10.1002/imhj.21426
- Elliott, D. E., Bjelajac, P., Fallot, R. D., Markoff, L. S., & Reed, B. G. (2005). Trauma - informed or trauma - denied: Principles and implementation of trauma - informed services for women. *Journal of Community Psychology*, 33(4), 461-477. doi:10.1002/jcop.20063
- Emde, R. (1980). Emotional availability: A reciprocal reward system for infants and parents with implications for prevention of psychosocial disorders. In E. Golson (Ed.), *Parent-infant relationships* (pp. 87-115). Orlando, FL: Grune & Stratton.
- Enoch, M.-A. (2011). The role of early life stress as a predictor for alcohol and drug dependence. *Psychopharmacology*, 214(1), 17-31. doi:10.1007/s00213-010-1916-6
- Ensink, K., Normandin, L., Plamondon, A., Berthelot, N., & Fonagy, P. (2016). Intergenerational Pathways From Reflective Functioning to Infant Attachment Through Parenting. *Canadian Journal of Behavioural Science-Revue Canadienne Des Sciences Du Comportement*, 48(1), 9-18. doi:10.1037/cbs0000030
- Espineta, S. D., Jeong, J. J., Motz, M., Racine, N., Major, D., & Pepler, D. (2013). Multimodal Assessment of the Mother-Child Relationship in a Substance-Exposed Sample:

- Divergent Associations with the Emotional Availability Scales. *Infant Mental Health Journal*, 34(6), 496-507. doi:10.1002/imhj.21409
- Espinosa, M., Beckwith, L., Howard, J., Tyler, R., & Swanson, K. (2001). Maternal psychopathology and attachment in toddlers of heavy cocaine-using mothers. *Infant Mental Health Journal*, 22(3), 316-333. doi:10.1002/imhj.1004
- Evans, G. W. (2004). The Environment of Childhood Poverty. *American Psychologist*, 59(2), 77-92. doi:10.1037/0003-066X.59.2.77
- Evans, G. W., Li, D., & Whipple, S. S. (2013). Cumulative risk and child development. *Psychological Bulletin*, 139(6), 1342-1396. doi:10.1037/a0031808
- Eyden, J., Winsper, C., Wolke, D., Broome, M. R., & MacCallum, F. (2016). A systematic review of the parenting and outcomes experienced by offspring of mothers with borderline personality pathology: Potential mechanisms and clinical implications. *Clinical Psychology Review*, 47, 85-105. doi:10.1016/j.cpr.2016.04.002
- 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. doi:10.1111/j.1467-8624.2009.01405.x
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., . . . Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245-258.
- Field, A. P., & Gillett, R. (2010). How to do a meta-analysis. *The British Journal of Mathematical and Statistical Psychology*, 63(3), 665-694. doi:10.1348/000711010x502733

- Fineman, N. R., Beckwith, L., Howard, J., & Espinosa, M. (1997). Maternal ego development and mother-infant interaction in drug-abusing women. *Journal of Substance Abuse Treatment, 14*(4), 307-317. doi:10.1016/s0740-5472(97)00028-7
- 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. doi:10.1002/imhj.21313
- Folger, A. T., Putnam, K. T., Putnam, F. W., Peugh, J. L., Eismann, E. A., Sa, T., . . . Ammerman, R. T. (2017). Maternal Interpersonal Trauma and Child Social-Emotional Development: An Intergenerational Effect. *Paediatric and Perinatal Epidemiology, 31*(2), 99-107. doi:10.1111/ppe.12341
- Fonagy, P. (2003). The development of psychopathology from infancy to adulthood: The mysterious unfolding of disturbance in time. *Infant Mental Health Journal, 24*(3), 212-239. doi:10.1002/imhj.10053
- Fonagy, P., & Bateman, A. W. (2007). Mentalizing and borderline personality disorder. *Journal of Mental Health, 16*(1), 83-101. doi:10.1080/09638230601182045
- Fonagy, P., Leigh, T., Steele, M., Steele, H., Kennedy, R., Mattoon, G., . . . Gerber, A. (1996). The relation of attachment status, psychiatric classification, and response to psychotherapy. *Journal of Consulting & Clinical Psychology, 64*(1), 22-31.
- Fonagy, P., Luyten, P., & Strathearn, L. (2011). Borderline personality disorder, mentalization, and the neurobiology of attachment. *Infant Mental Health Journal, 32*(1), 47-69. doi:10.1002/imhj.20283
- Fonagy, P., & Target, M. (1996). Playing with reality: I. Theory of mind and the normal development of psychic reality. *International Journal of Psychoanalysis, 77* ( Pt 2), 217-233.

- Fonagy, P., & Target, M. (2002). Early Intervention and the Development of Self-Regulation. *Psychoanalytic Inquiry*, 22(3), 307-335. doi:10.1080/07351692209348990
- Fonagy, P., Target, M., Gergely, G., Allen, J. G., & Bateman, A. W. (2003). The developmental roots of borderline personality disorder in early attachment relationships: A theory and some evidence. *Psychoanalytic Inquiry: A Topical Journal for Mental Health Professionals*, 23(3), 412 - 459. doi:10.1080/07351692309349042
- Fraiberg, S., Adelson, E., & Shapiro, V. (1975). Ghosts in the nursery. A psychoanalytic approach to the problems of impaired infant-mother relationships. *Journal of Amer Acad Child Psychiatry*, 14(3), 387-421.
- Frankel-Waldheter, M., Macfie, J., Strimpfel, J. M., & Watkins, C. D. (2015). Effect of maternal autonomy and relatedness and borderline personality disorder on adolescent symptomatology. *Personality Disorders-Therory Research and Treatment*, 6(2), 152-160. doi:10.1037/per0000109
- Fraser, J. G., Harris-Britt, A., Thakkallapalli, E. L., 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*, 31(1), 1-15. doi:10.1002/imhj.20239
- French, E. D., Pituch, M., Brandt, J., & Pohorecki, S. (1998). Improving Interactions Between Substance-Abusing Mothers and Their Substance-Exposed Newborns. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 27(3), 262-269. doi:10.1111/j.1552-6909.1998.tb02648.x
- Fritz, M. S., & Mackinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychol Sci*, 18(3), 233-239.

- 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.  
doi:<http://dx.doi.org/10.1016/j.chiabu.2015.05.023>
- Gardner, K., & Qualter, P. (2009). Reliability and validity of three screening measures of borderline personality disorder in a nonclinical population. *Personality and Individual Differences*, 46(5-6), 636-641. doi:10.1016/j.paid.2009.01.005
- Goodman, G., Hans, S. L., & Bernstein, V. J. (2005). Mother expectation of bother and infant attachment behaviors as predictors of mother and child communication at 24 months in children of methadone-maintained women. *Infant Mental Health Journal*, 26(6), 549-569. doi:10.1002/imhj.20070
- Gratz, K. L., Kiel, E. J., Latzman, R. D., Elkin, T. D., Moore, S. A., & Tull, M. T. (2014). Maternal borderline personality pathology and infant emotion regulation: Examining the influence of maternal emotion-related difficulties and infant attachment. *Journal of Personality Disorders*, 28(1), 52-69.
- Groenwold, R., Rovers, M., Lubsen, J., & Heijden, G. (2010). Subgroup effects despite homogeneous heterogeneity test results. *BMC Medical Research Methodology*, 10(1), 43.
- 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. doi:10.1111/j.1467-8624.2011.01711.x
- Gunnar, M. R., & Quevedo, K. (2007). The Neurobiology of Stress and Development. *Annual Review of Psychology*, 58(1), 145-173.  
doi:doi:10.1146/annurev.psych.58.110405.085605

- Gurwitch, R. H., Messer, E. P., & Funderburk, B. W. (2017). Parent-Child Interaction Therapy. In M. A. Landolt, M. Cloitre, & U. Schnyder (Eds.), *Evidence-Based Treatments for Trauma Related Disorders in Children and Adolescents* (pp. 341-361). Cham: Springer International Publishing.
- Haller, D. L., & Miles, D. R. (2004). Personality disturbances in drug-dependent women: Relationship to childhood abuse. *American Journal of Drug and Alcohol Abuse, 30*(2), 269-286. doi:10.1081/ada-120037378
- Hans, S. L., Bernstein, V. J., & Henson, L. G. (1999). The role of psychopathology in the parenting of drug-dependent women. *Development and Psychopathology, 11*(04), 957-977. doi:doi:null
- Harnett, P. H. (2007). A procedure for assessing parents' capacity for change in child protection cases. *Children and Youth Services Review, 29*(9), 1179-1188. doi:10.1016/j.childyouth.2007.04.005
- Harris, M. (1996). Treating sexual abuse trauma with dually diagnosed women. *Community Mental Health Journal, 32*(4), 371-385. doi:10.1007/bf02249455
- Hatzis, D., Dawe, S., Harnett, P., & Barlow, J. (2017). Quality of caregiving in mothers with illicit substance use: A systematic review and meta-analysis. *Substance Abuse: Research and Treatment, 11*, 1-15. doi:10.1177/1178221817694038
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: a regression-based approach*. New York: The Guilford Press.
- Heckman, J. P., Hutchins, F. A., Thom, J. C., & Russell, L. A. (2005). Allies: Integrating women's alcohol, drug, mental health and trauma treatment in a county system. *Alcoholism Treatment Quarterly, 22*(3-4), 161-180. doi:10.1300/J020v22n03\_09

- Heim, C., Shugart, M., Craighead, W. E., & Nemeroff, C. B. (2010). Neurobiological and psychiatric consequences of child abuse and neglect. *Developmental Psychobiology*, 52(7), 671-690. doi:10.1002/dev.20494
- Hemmi, M. H., Wolke, D., & Schneider, S. (2011). Associations Between Problems with Crying, Sleeping and/or Feeding in Infancy and Long-Term Behavioural Outcomes in Childhood: A Meta-Analysis. *Archives of Disease in Childhood*, 96(7), 622-629. doi:10.1136/adc.2010.191312
- Herman, J. (1992). *Trauma and recovery. From domestic abuse to political terror*. Hammersmith, London: HarperCollins Publishers Inc.
- Herrenkohl, T. I., Hong, S., Klika, J. B., Herrenkohl, R. C., & Russo, M. J. (2013). Developmental impacts of child abuse and neglect related to adult mental health, substance use, and physical health. *Journal of Family Violence*, 28(2), 191-199. doi:10.1007/s10896-012-9474-9
- Hesse, E., & Main, M. (1999). Second-generation effects of unresolved trauma in nonmaltreating parents: Dissociated, frightened, and threatening parental behavior. *Psychoanalytic Inquiry: A Topical Journal for Mental Health Professionals*, 19(4), 481 - 540.
- Higgins, J. P., & Thompson, S. G. (2002). Quantifying heterogeneity in a meta-analysis. *Statistics in Medicine*, 21(11), 1539-1558. doi:10.1002/sim.1186
- Higgins, J. P. T., Green, S., & (editors). (2011). *Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]*. Retrieved from <http://handbook.cochrane.org>.
- Higginson, A., & Neville, R. (2014). *SysReview [Systematic Review Management Software]*. Brisbane, Australia The University of Queensland..

- Hill, J. (2009). Developmental perspectives on adult depression. *Psychoanalytic Psychotherapy*, 23(3), 200-212. doi:10.1080/02668730903227263
- Hobson, R. P., Patrick, M., Crandell, L., Garcia-Perez, R., & Lee, A. (2005). Personal relatedness and attachment in infants of mothers with borderline personality disorder. *Development and Psychopathology*, 17(02), 329-347.  
doi:10.1017/S0954579405050169
- Hobson, R. P., Patrick, M. P. H., Hobson, J. A., Crandell, L., Bronfman, E., & Lyons-Ruth, K. (2009). How mothers with borderline personality disorder relate to their year-old infants. *British Journal of Psychiatry*, 195(4), 325-330.  
doi:10.1192/bjp.bp.108.060624
- Howard, J., Beckwith, L., Espinosa, M., & Tyler, R. (1995). Development of infants born to cocaine-abusing women: Biologic/maternal influences. *Neurotoxicology and Teratology*, 17(4), 403-411. doi:http://dx.doi.org/10.1016/0892-0362(94)00077-Q
- Howes, C., & Obregon, N. B. (2009). Emotional Availability in Mexican-Heritage low-income mothers and children: Infancy through preschool. *Parenting*, 9(3-4), 260-276.  
doi:10.1080/15295190902844589
- Huang, S., Trapido, E., Fleming, L., Arheart, K., Crandall, L., French, M., . . . Prado, G. (2011). The long-term effects of childhood maltreatment experiences on subsequent illicit drug use and drug-related problems in young adulthood. *Addictive Behaviors*, 36(1-2), 95-102. doi:10.1016/j.addbeh.2010.09.001
- Huang, Y., Kotov, R., De Girolamo, G., Preti, A., Angermeyer, M., Benjet, C., . . . Kessler, R. C. (2009). DSM-IV personality disorders in the WHO World Mental Health Surveys. *British Journal of Psychiatry*, 195(1), 46-53. doi:10.1192/bjp.bp.108.058552
- Human Services Community Services. (2010). *Research to practice notes: Working with parental substance misuse*. NSW: NSW Government.

- Jaffee, S. R., Bowes, L., Ouellet-Morin, I., Fisher, H. L., Moffitt, T. E., Merrick, M. T., & Arseneault, L. (2013). Safe, stable, nurturing relationships break the intergenerational cycle of abuse: a prospective nationally representative cohort of children in the United Kingdom. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*, 53(4 Suppl), S4-S10. doi:10.1016/j.jadohealth.2013.04.007
- Johnson, A. L., Morrow, C. E., Accornero, V. H., Xue, L., Anthony, J. C., & Bandstra, E. S. (2002). Maternal Cocaine Use: Estimated Effects on Mother-Child Play Interaction in the Preschool Period. *Journal of Developmental and Behavioral Pediatrics*, 23(4), 191-202. doi:0196-206X/00/2304-0191
- Johnson, M. O. (2001). Mother-infant interaction and maternal substance use/abuse: An integrative review of research literature in the 1990s. *Online Journal of Knowledge Synthesis for Nursing*, 8(2), art. no.-2. doi:10.1111/j.1524-475X.2001.00019.x
- Kauffman Best Practices Project. (2004, March). *Closing the quality chasm in child abuse treatment: Identifying and disseminating best practices: Findings of the Kauffman best practices project to help children heal from child abuse*. Charleston, SC: National Crime Victims Research and Treatment Center.
- Keenan, K., Shaw, D., Delliquadri, E., Giovannelli, J., & Walsh, B. (1998). Evidence for the Continuity of Early Problem Behaviors: Application of a Developmental Model. *Journal of Abnormal Child Psychology*, 26(6), 441-452. doi:10.1023/A:1022647717926
- Kemppinen, K., Kumpulainen, K., Raita-Hasu, J., Moilanen, I., & Ebeling, H. (2006). The continuity of maternal sensitivity from infancy to toddler age. *Journal of Reproductive and Infant Psychology*, 24(3), 199-212. doi:10.1080/02646830600821249

- Kerker, B. D., Zhang, J., Nadeem, E., Stein, R. E. K., Hurlburt, M. S., Heneghan, A., . . . McCue Horwitz, S. (2015). Adverse Childhood Experiences and Mental Health, Chronic Medical Conditions, and Development in Young Children. *Academic Pediatrics*. doi:<http://dx.doi.org/10.1016/j.acap.2015.05.005>
- 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*, *51*(7), 521-532. doi:10.1002/dev.20390
- Kessler, R. C. (2000). Posttraumatic stress disorder: the burden to the individual and to society. *Journal of Clinical Psychiatry*, *61 Suppl 5*, 4-12; discussion 13-14.
- Kettinger, L. A., Nair, P., & Schuler, M. E. (2000). Exposure to environmental risk factors and parenting attitudes among substance-abusing women. *American Journal of Drug and Alcohol Abuse*, *26*(1), 1-11. doi:10.1081/ada-100100586
- Kingston, R. E. F., Marel, C., & Mills, K. L. (2016). A systematic review of the prevalence of comorbid mental health disorders in people presenting for substance use treatment in Australia: Comorbidity in substance use treatment. *Drug and Alcohol Review*. doi:10.1111/dar.12448
- 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. doi:10.1016/S0163-6383(96)90034-X
- LaGasse, L. L., Messinger, D., Lester, B. M., Seifer, R., Tronick, E. Z., Bauer, C. R., . . . Liu, J. (2003). Prenatal drug exposure and maternal and infant feeding behaviour. *Archives of disease in childhood. Fetal and neonatal edition*, *88*(5), F391-399. doi:10.1136/fn.88.5.F391

- Landry, S. H., Smith, K. E., Swank, P. R., Assel, M. A., & Vellet, S. (2001). Does early responsive parenting have a special importance for children's development or is consistency across early childhood necessary? *Developmental Psychology, 37*(3), 387-403. doi:10.1037/0012-1649.37.3.387
- Lemelin, J.-P., Tarabulsy, G. M., & Provost, M. A. (2006). Predicting preschool cognitive development from infant temperament, maternal sensitivity, and psychosocial risk. *Merrill-Palmer Quarterly, 52*(4), 779-806. doi:10.1353/mpq.2006.0038
- Lewis, M. D. (1993). Early socioemotional predictors of cognitive competency at 4 years. *Developmental Psychology, 29*(6), 1036-1045. doi:10.1037/0012-1649.29.6.1036
- Lewis, M. W. P., Phillips, G. M. A. S., Bowser, M. M. L. S. W., DeLuca, S. M. S. W. L. S. W., Johnson, H. L. P., & Rosen, T. S. M. D. (2009). Cocaine-exposed infant behavior during still-face: Risk factor analyses. *American Journal of Orthopsychiatry, 79*(1), 60-70. doi: 10.1037/a0014931
- Liberati, A., Altman, D. G., Tetzlaff, J., & et al. (2009). The prisma statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *Annals of Internal Medicine, 151*(4), W-65-W-94. doi:10.7326/0003-4819-151-4-200908180-00136
- Lieberman, A. F., & Van Horn, P. (2008). *Psychotherapy with Infants and Young Children: Repairing the Effects of Stress and Trauma on Early Attachment*. New York, NY: Guilford.
- Lindberg, M. A., & Zeid, D. (2017). Interactive pathways to substance abuse. *Addictive Behaviors, 66*, 76-82. doi:10.1016/j.addbeh.2016.11.016
- Links, P. S., Heslegrave, R. J., Mitton, J. E., Van Reekum, R., & Patrick, J. (1995). Borderline personality disorder and substance abuse: Consequences of comorbidity. *Canadian Journal of Psychiatry, 40*(1), 9-14.

- Lohaus, A., Keller, H., Ball, J., Elben, C., & Voelker, S. (2001). Maternal Sensitivity: Components and Relations to Warmth and Contingency. *Parenting, 1*(4), 267-284. doi:10.1207/S15327922PAR0104\_1
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression, Anxiety Stress Scale*. Sydney: Psychology Foundation Monograph.
- Loxley, W., Toumbourou, J. W., Stockwell, T., B., H., Scott, K., Godfrey, C., & al., e. (2004). *The prevention of substance use, risk and harm in Australia: A review of the evidence*. Canberra: Australian Government Department of Health and Ageing  
Retrieved from [http://www.health.gov.au/internet/main/publishing.nsf/Content/health-publth-publicat-document-mono\\_prevention-cnt.htm/\\$FILE/mono\\_prevention.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/health-publth-publicat-document-mono_prevention-cnt.htm/$FILE/mono_prevention.pdf).
- Lyons-Ruth, K. (2003). Dissociation and the parent-infant dialogue: A longitudinal perspective from attachment research. *Journal of the American Psychoanalytic Association, 51*(3), 883-911.
- 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, 17*(3), 257-275. doi:10.1002/(SICI)1097-0355(199623)17:3<257::AID-IMHJ5>3.0.CO;2-L
- Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999). Atypical attachment in infancy and early childhood among children at developmental risk: Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. In J. Vondra & D. Barnett (Eds.), *Atypical patterns of infant attachment: Theory research and current directions. Monographs of the Society for Research in Child Development* (Vol. 64, pp. 67-96).
- Lyons-Ruth, K., Bureau, J.-F., Easterbrooks, M. A., Obsuth, I., Hennighausen, K., & Vulliez-Coady, L. (2013). Parsing the construct of maternal insensitivity: distinct longitudinal

- pathways associated with early maternal withdrawal. *Attachment & Human Development*, *15*(5-6), 562-582. doi:10.1080/14616734.2013.841051
- Macfie, J., & Swan, S. A. (2009). Representations of the caregiver–child relationship and of the self, and emotion regulation in the narratives of young children whose mothers have borderline personality disorder. *Development and Psychopathology*, *21*(3), 993-1011. doi:10.1017/S0954579409000534
- Macfie, J., Swan, S. A., Fitzpatrick, K. L., Watkins, C. D., & Rivas, E. M. (2014). Mothers with borderline personality and their young children: Adult Attachment Interviews, mother-child interactions, and children's narrative representations. *Development and Psychopathology*, *26*(2), 539-551. doi:10.1017/S095457941400011X
- Magnani, R., Sabin, K., Sidel, T., & Heckathorn, D. (2005). Review of sampling hard-to-reach and hidden populations for HIV surveillance. *AIDS*, *19*(Supplement 2), S67-S72. doi:10.1097/01.aids.0000172879.20628.e1
- Main, M., & Hesse, E. (1990). Parents' unresolved traumatic experiences are related to infant disorganised attachment status: is frightened and/or frightening parental behaviour the linking mechanism? In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the Preschool Years: Theory, Research, and Intervention* (pp. 161-182). Chicago, IL,: The University of Chicago Press.
- Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment During the Preschool Years: Theory, Research and Intervention* (pp. 121-160). Chicago, IL: University of Chicago Press.
- Malone, J. C., Levendosky, A. A., Dayton, C. J., & Bogat, G. A. (2010). Understanding the “ghosts in the nursery” of pregnant women experiencing domestic violence: Prenatal

- maternal representations and histories of childhood maltreatment. *Infant Mental Health Journal*, 31(4), 432-454. doi:10.1002/imhj.20264
- Martinez-Torteya, C., Dayton, C. J., Beeghly, M., Seng, J. S., McGinnis, E., Broderick, A., . . . Muzik, M. (2014). Maternal parenting predicts infant biobehavioral regulation among women with a history of childhood maltreatment. *Development and Psychopathology*, 26(02), 379-392.
- Marvin, R., & Britner, P. (1999). Normative development: The ontogeny of attachment. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications*. New York: The Guilford Press.
- Mattick, R. P., Breen, C., Kimber, J., & Davoli, M. (2009). Methadone Maintenance Therapy Versus No Opioid Replacement Therapy for Opioid Dependence. *Cochrane database of systematic reviews (Online)*(3), CD002209-CD002209. doi:10.1002/14651858.CD002209.pub2
- Maxwell, S. E., Cole, D. A., & Mitchell, M. A. (2011). Bias in Cross-Sectional Analyses of Longitudinal Mediation: Partial and Complete Mediation Under an Autoregressive Model. *Multivariate Behavioral Research*, 46(5), 816-841. doi:10.1080/00273171.2011.606716
- Mayes, L., Bornstein, M., Chawarska, K., & Granger, R. H. (1995). Information processing and developmental assessments in 3-month-old infants exposed prenatally to cocaine. *Pediatrics*, v95(n4), p539(537).
- Mayes, L. C., Feldman, R., Granger, R., Haynes, O., Bornstein, M. H., & Schottenfeld, R. (1997). The effects of polydrug use with and without cocaine on mother-infant interaction at 3 and 6 months. *Infant Behavior & Development*, 20(4), 489-502.

- McCarthy, M. M., Taylor, P., Norman, R. E., Pezzullo, L., Tucci, J., & Goddard, C. (2016). The lifetime economic and social costs of child maltreatment in Australia. *Children and Youth Services Review, 71*, 217-226. doi:10.1016/j.childyouth.2016.11.014
- McDonnell, C. G., & Valentino, K. (2016). Intergenerational effects of childhood trauma: Evaluating pathways among maternal ACEs, perinatal depressive symptoms, and infant outcomes. *Child Maltreatment, 21*(4), 317-326.  
doi:10.1177/1077559516659556
- McGlade, A., Ware, R., & Crawford, M. (2009). Child protection outcomes for infants of substance-using mothers: a matched-cohort study. *Pediatrics, 124*(1), 285-293.  
doi:10.1542/peds.2008-0576
- McMahon, J. M., Tortu, S., Torres, L., Pouget, E. R., & Hamid, R. (2003). Recruitment of heterosexual couples in public health research: a study protocol. *BMC Medical Research Methodology, 3*(1), 24-24. doi:10.1186/1471-2288-3-24
- Meller, S., Kuperman, K. L., McCullough, C., & Shaffer, A. (2016). Adverse effects of childhood emotional maltreatment on child behavioral outcomes. *Journal of Aggression, Maltreatment & Trauma, 25*(2), 127-144.  
doi:10.1080/10926771.2016.1101034
- Mielke, E. L., Neukel, C., Bertsch, K., Reck, C., Mohler, E., & Herpertz, S. C. (2016). Maternal sensitivity and the empathic brain: Influences of early life maltreatment. *Journal of Psychiatric Research, 77*, 59-66. doi:10.1016/j.jpsychires.2016.02.013
- Millon, T. (1994). *Millon Clinical Multiaxial Inventory* (3rd ed.). Minneapolis, MN: National Computer Systems, Inc.
- 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. doi:10.1002/imhj.21529

- Minnes, S., Singer, L. T., Arendt, R., & Satayatham, S. (2005). Effects of prenatal cocaine/polydrug use on maternal-infant feeding interactions during the first year of life. *Journal of Developmental and Behavioral Pediatrics, 26*(3), 194-200. doi:10.1097/00004703-200506000-00005
- Mirick, R. G. (2016). Challenges in recruiting parents to participate in child welfare research: implications for study design and research practice. *Child & Family Social Work, 21*(4), 484-491. doi:10.1111/cfs.12165
- 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
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med, 6*(7), e1000097. doi:10.1371/journal.pmed.1000097
- Molitor, A., & Mayes, L. (2010). Problematic dyadic interaction among toddlers and their polydrug-cocaine-using mothers. *Infant Mental Health Journal, 31*(2), 121-140. doi:10.1002/imhj.20248
- Moore, B. C., Easton, C. J., & McMahon, T. J. (2011). Drug abuse and intimate partner violence: A comparative study of opioid-dependent fathers. *The American Journal of Orthopsychiatry, 81*(2), 218-227. doi:10.1111/j.1939-0025.2011.01091.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. doi:10.1111/j.1467-9507.2007.00441.x
- Morey, L. C. (1991). *Personality assessment Inventory*. Florida: PAR Psychological Assessment Resources, INC.

Morrow, K. M., Vargas, S., Rosen, R. K., Christensen, A. L., Salomon, L., Shulman, L., . . .

Fava, J. L. (2007). The utility of non-proportional quota sampling for recruiting at-risk women for microbicide research. *AIDS and Behavior, 11*(4), 586-595.

doi:10.1007/s10461-007-9213-z

Muzik, M., Bocknek, E. L., Broderick, A., Richardson, P., Rosenblum, K. L., Thelen, K., &

Seng, J. S. (2013). Mother–infant bonding impairment across the first 6 months postpartum: the primacy of psychopathology in women with childhood abuse and neglect histories. *Archives of Women's Mental Health, 16*(1), 29-38.

doi:10.1007/s00737-012-0312-0

Nair, P., Schuler, M. E., Black, M. M., Kettinger, L., & Harrington, D. (2003). Cumulative environmental risk in substance abusing women: Early intervention, parenting stress, child abuse potential and child development. *Child Abuse and Neglect, 27*(9), 997-1017. doi:10.1016/S0145-2134(03)00169-8

National Council for Community Behavioral Healthcare. (2011). *Breaking the silence:*

*Trauma-informed behavioral healthcare*. National Council Magazine Retrieved from <https://www.thenationalcouncil.org/wp-content/uploads/2012/11/NC-Mag-Trauma-Web-Email.pdf>.

National Heart Lung and Blood Institute. (2014). Quality Assessment Tool for Observational

Cohort and Cross-Sectional Studies. Retrieved from

<https://www.nhlbi.nih.gov/health-pro/guidelines/in-develop/cardiovascular-risk-reduction/tools/cohort>

National Institute of Drug Abuse. (2015). Trends and statistics. Retrieved from

<https://www.drugabuse.gov/related-topics/trends-statistics#costs>

- Negele, A., Kaufhold, J., Kallenbach, L., & Leuzinger-Bohleber, M. (2015). Childhood trauma and its relation to chronic depression in adulthood. *Depression Research and Treatment, 2015*, 11. doi:10.1155/2015/650804
- Neuspiel, D. R., Hamel, S. C., Hochberg, E., Greene, J., & Campbell, D. (1991). Maternal cocaine use and infant behavior. *Neurotoxicology and Teratology, 13*(2), 229-233. doi:10.1016/0892-0362(91)90015-O
- Newman, L. (2015). Parents with Borderline Personality Disorder - approaches to early intervention. *Australasian Psychiatry : Bulletin of Royal Australian and New Zealand College of Psychiatrists, 23*(6), 696-698. doi:10.1177/1039856215614988
- Newman, L., & Stevenson, C. (2005). Parenting and borderline personality disorder: Ghosts in the nursery. *Clinical Child Psychology and Psychiatry, 10*(3), 385-394. doi:10.1177/1359104505053756
- Newman, L., Stevenson, C. S., Bergman, L. R., & Boyce, P. (2007). Borderline personality disorder, mother-infant interaction and parenting perceptions: Preliminary findings. *Australian and New Zealand Journal of Psychiatry, 41*(7), 598-605. doi:10.1080/00048670701392833
- Niccols, A., Milligan, K., Smith, A., Sword, W., Thabane, L., & Henderson, J. (2012). Integrated Programs for Mothers with Substance Abuse Issues and Their Children: A Systematic Review of Studies Reporting on Child Outcomes. *Child Abuse and Neglect, 36*(4), 308-322. doi:10.1016/j.chiabu.2011.10.007
- Oh, W., Muzik, M., McGinnis, E. W., Hamilton, L., Menke, R. A., & Rosenblum, K. L. (2016). Comorbid trajectories of postpartum depression and PTSD among mothers with childhood trauma history: Course, predictors, processes and child adjustment. *Journal of Affective Disorders, 200*, 133-141. doi:10.1016/j.jad.2016.04.037

- Olds, D. L., Robinson, J., O'Brien, R., Luckey, D. W., Pettitt, L. M., Henderson, C. R., Jr., . . . Talmi, A. (2002). Home visiting by paraprofessionals and by nurses: A randomized, controlled trial. *Pediatrics, 110*(3), 486-496. doi:10.1542/peds.110.3.486
- Ondersma, S. J. (2002). Predictors of neglect within low-SES families: The importance of substance abuse. *American Journal of Orthopsychiatry, 72*(3), 383-391. doi:10.1037//0002-9432.72.3.383
- 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
- Paivio, S. C., & Cramer, K. M. (2004). Factor structure and reliability of the Childhood Trauma Questionnaire in a Canadian undergraduate student sample. *Child Abuse & Neglect, 28*(8), 889-904. doi:http://dx.doi.org/10.1016/j.chiabu.2004.01.011
- Pajulo, M., Pyykkönen, N., Kalland, M., Sinkkonen, J., Helenius, H., Punamäki, R. L., & Suchman, N. (2012). Substance-abusing mothers in residential treatment with their babies: Importance of pre- and postnatal maternal reflective functioning. *Infant Mental Health Journal, 33*(1), 70-81. doi:10.1002/imhj.20342
- Pajulo, M., Pyykkönen, N., Kalland, M., Sinkkonen, J., Helenius, H., & Punamki, R. L. (2011). Substance abusing mothers in residential treatment with their babies: Postnatal psychiatric symptomatology and its association with motherchild relationship and later need for child protection actions. *Nordic Journal of Psychiatry, 65*(1), 65-73. doi:10.3109/08039488.2010.494310
- Pajulo, M., Savonlahti, E., Sourander, A., Ahlqvist, S., Helenius, H., & Piha, J. (2001). An early report on the mother-baby interactive capacity of substance-abusing mothers. *Journal of Substance Abuse Treatment, 20*(2), 143-151. doi:10.1016/s0740-5472(00)00161-6

- Pajulo, M., Suchman, N., Kalland, M., & Mayes, L. (2006). Enhancing the effectiveness of residential treatment for substance abusing pregnant and parenting women: Focus on maternal reflective functioning and mother-child relationship. *Infant Mental Health Journal, 27*(5), 448-465. doi:10.1002/imhj.20100
- Pajulo, M., Suchman, N., Kalland, M., Sinkkonen, J., Hans Helenius, M., & Mayes, L. (2008). Role of maternal reflective ability for substance abusing mothers. *Journal of Prenatal & Perinatal Psychology & Health, 23*(1), 13-31.  
doi:<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3200528/>
- Patrick, M., Hobson, R. P., Castle, D., Howard, R., & Maughan, B. (1994). Personality disorder and the mental representation of early social experience. *Development and Psychopathology, 6*(2), 375-388. doi:10.1017/S0954579400004648
- Pereira, J., Vickers, K., Atkinson, L., Gonzalez, A., Wekerle, C., & Levitan, R. (2012). Parenting stress mediates between maternal maltreatment history and maternal sensitivity in a community sample. *Child Abuse and Neglect, 36*(5), 433-437.  
doi:10.1016/j.chiabu.2012.01.006
- Perry, N., Newman, L. K., Hunter, M., & Dunlop, A. (2015). Improving antenatal risk assessment in women exposed to high risks. *Clinical Child Psychology and Psychiatry. doi:10.1177/1359104513499355*
- Porreca, A., DePalo, F., Simonelli, A., & Capra, N. (2014). Quality of mother-child interactions in a group of substance addicted mothers. *Journal of Education, Psychology and Social Sciences, 2*(2), 105--114.
- Powis, B., Gossop, M., Bury, C., Payne, K., & Griffiths, P. (2000). Drug-using mothers: social, psychological and substance use problems of women opiate users with children. *Drug and Alcohol Review, 19*(2), 171-180. doi:10.1080/713659321

- Quadara, A., & Hunter, C. (2016). *Principles of Trauma-informed approaches to child sexual abuse: A discussion paper*. Sydney: Royal Commission into Institutional Responses to Child Sexual Abuse Retrieved from <https://www.childabuseroyalcommission.gov.au/getattachment/594fc020-e89b-4ba7-8343-0e1e6ae34d9a/Principles-of-trauma-informed-approaches-to-child>.
- Quinlivan, J. A., & Evans, S. F. (2005). Impact of domestic violence and drug abuse in pregnancy on maternal attachment and infant temperament in teenage mothers in the setting of best clinical practice. *Archives of Women's Mental Health*, 8(3), 191-199. doi:10.1007/s00737-005-0079-7
- Review Manager (RevMan). (2014). Review Manager (RevMan) (Version 5.3). Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration.
- Riggs, S. A. (2010). Childhood emotional abuse and the attachment system across the life cycle: What theory and research tell us. *Journal of Aggression, Maltreatment and Trauma*, 19(1), 5-51. doi:10.1080/10926770903475968
- Rogosch, F. A., & Cicchetti, D. (2005). Child maltreatment, attention networks, and potential precursors to borderline personality disorder. *Development and Psychopathology*, 17(4), 1071-1089. doi:10.1017/s0954579405050509
- Rose, S., & Laan, M. J. (2009). Why match? Investigating matched case-control study designs with causal effect estimation. *International Journal of Biostatistics*, 5(1), Article 1. doi:10.2202/1557-4679.1127
- Roy, A. L., & Raver, C. C. (2014). Are all risks equal? Early experiences of poverty-related risk and children's functioning. *Journal of Family Psychology*, 28(3), 391-400. doi:10.1037/a0036683

- Russell, M., Harris, B., & Gockel, A. (2008). Parenting in poverty: Perspectives of high-risk parents. *Journal of Children and Poverty, 14*(1), 83-98.  
doi:10.1080/10796120701871322
- Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M. W. Kent & J. E. Rolf (Eds.), *Primary Prevention of Psychopathology, : Social Competence in Children* (Vol. 3, pp. 49–74). Hanover, NH: University of New England Press.
- Salo, S., Kivisto, 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, 9*(3-4), 244-259. doi:10.1080/15295190902844563
- Salo, S., Politi, J., Tupola, S., Biringen, Z., Kalland, M., Halmesmaki, E., . . . Kivitie-Kallio, S. (2010). Early development of opioid-exposed infants born to mothers in buprenorphine-replacement therapy. *Journal of Reproductive and Infant Psychology, 28*(2), 161-179. doi:10.1080/02646830903219109
- Sameroff, A. (1998). Environmental risk factors in infancy. *Pediatrics, 102*(5 Suppl E), 1287-1292.
- Sameroff, A., Seifer, R., Baldwin, A., & Baldwin, C. (1993a). Stability of intelligence from preschool to adolescence: the influence of social and family risk factors. *Child Development, 64*. doi:10.2307/1131438
- Sameroff, A., Seifer, R., Baldwin, A., & Baldwin, C. (1993b). Stability of Intelligence from Preschool to Adolescence: The Influence of Social and Family Risk Factors. *Child Development, 64*(1), 80-97. doi:10.2307/1131438

- Sameroff, A., Seifer, R., Barocas, R., Zax, M., & Greenspan, S. (1987). Intelligence quotient scores of 4-year-old children: social-environmental risk factors. *Pediatrics*, *79*(3), 343-350.
- Sansone, R. A., & Sansone, L. A. (2011). Substance use disorders and borderline personality: Common bedfellows. *Innovations in Clinical Neuroscience*, *8*(9), 10-13.  
doi:<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3196330/>
- Sarfi, M., Smith, L., Waal, H., & Sundet, J. M. (2011). Risks and realities: Dyadic interaction between 6-month-old infants and their mothers in opioid maintenance treatment. *Infant Behavior and Development*, *34*(4), 578-589. doi:10.1016/j.infbeh.2011.06.006
- Sarlos, S. (2003). Public parenting: A review of home-based care in Victoria *The Child, Youth and Family Work Journal*(8), 68-71.
- Savonlahti, E., Pajulo, M., Ahlqvist, S., Helenius, H., Korvenranta, H., Tamminen, T., & Piha, J. (2005). Interactive skills of infants with their high-risk mothers. *Nordic Journal of Psychiatry*, *59*(2), 139-147. doi:10.1080/08039480510022990
- Schuler, M. E., Black, M. M., & Starr, J. R. H. (1995). Determinants of mother-infant interaction: Effects of prenatal drug exposure, social support, and infant temperament. *Journal of Clinical Child Psychology*, *24*(4), 397-405.  
doi:10.1207/s15374424jccp2404\_4
- 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 Trauma and Stress*, *19*(6), 825-836.  
doi:10.1002/jts.20159
- Sedlak, A. J., Mettenburg, J., Basena, M., Petta, I., McPherson, K., Greene, A., & Li, S. (2010). *National Incidence Study of Child Abuse and Neglect (NIS-4): Report to*

*Congress*. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families.

Seifer, R., LaGasse, L. L., Lester, B., Bauer, C. R., Shankaran, S., Bada, H. S., . . . Liu, J. (2004). Attachment Status in Children Prenatally Exposed to Cocaine and Other Substances. *Child Development, 75*(3), 850-868. doi:10.1111/j.1467-8624.2004.00710.x

Singer, L. T., Hawkins, S., Huang, J., Davillier, M., & Baley, J. (2001). Developmental outcomes and environmental correlates of very low birthweight, cocaine-exposed infants. *Early Human Development, 64*(2), 91-103. doi:doi:10.1016/S0378-3782(01)00182-7

Siqveland, T., Smith, L., & Moe, V. (2012). The impact of optimality on maternal sensitivity in mothers with substance abuse and psychiatric problems and their infants at 3 months. *Infant Behavior and Development, 35*(1), 60-70. doi:10.1016/j.infbeh.2011.09.004

Siqveland, T. S., & Moe, V. (2014). Longitudinal development of mother-infant interaction during the first year of life among mothers with substance abuse and psychiatric problems and their infants. *Child Psychiatry and Human Development, 45*(4), 408-421.

Skovgaard, A. M. (2010). Mental Health Problems and Psychopathology in Infancy and Early Childhood. *Danish Medical Bulletin, 57*(10).

Skovgaard, A. M., Olsen, E. M., Christiansen, E., Houmann, T., Landorph, S. L., Jørgensen, T., & the, C. C. C. S. G. (2008). Predictors (0–10months) of Psychopathology at Age 1½years – a General Population Study in The Copenhagen Child Cohort CCC 2000. *Journal of Child Psychology and Psychiatry, 49*(5), 553-562. doi:10.1111/j.1469-7610.2007.01860.x

- Slade, A. (2005). Parental reflective functioning: An introduction. *Attachment & Human Development, 7*(3), 269-281. doi:10.1080/14616730500245906
- 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. doi:10.1007/s10896-014-9606-5
- Sperry, D. M., & Widom, C. S. Child abuse and neglect, social support, and psychopathology in adulthood: A prospective investigation. *Child Abuse & Neglect*(0). doi:http://dx.doi.org/10.1016/j.chiabu.2013.02.006
- Sroufe, L. A., Coffino, B., & Carlson, E. A. (2010). Conceptualizing the role of early experience: Lessons from the Minnesota longitudinal study. *Developmental Review, 30*(1), 36-51. doi:10.1016/j.dr.2009.12.002
- Stack, D. M., Serbin, L. A., Girouard, N., Enns, L. N., Bentley, V. M. N., 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. doi:10.1017/S095457941100068X
- Stacks, A. M., Muzik, M., Wong, K., Beeghly, M., Huth-Bocks, A., Irwin, J. L., & Rosenblum, K. L. (2014). Maternal reflective functioning among mothers with childhood maltreatment histories: links to sensitive parenting and infant attachment security. *Attachment & Human Development, 16*(5), 515-533. doi:10.1080/14616734.2014.935452
- Stepp, S. D., Whalen, D. J., Pilkonis, P. A., Hipwell, A. E., & Levine, M. D. (2012). Children of mothers with borderline personality disorder: Identifying parenting behaviors as

potential targets for intervention. *Personality Disorders: Theory, Research, and Treatment*, 3(1), 76-91. doi:10.1037/a0023081

Substance Abuse and Mental Health Services Administration. (2014). *SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach*. HHS Publication No. (SMA) 14-4884. Rockville, MD: Substance Abuse and Mental Health Services  
Retrieved from <http://store.samhsa.gov/shin/content/SMA14-4884/SMA14-4884.pdf>.

Suchman, N., Decoste, C., McMahon, T. J., Rounsaville, B., & Mayes, L. (2011). The Mothers and Toddlers program, an attachment-based parenting intervention for substance-using women: Results at 6-week follow-up in a randomized clinical pilot. *Infant Mental Health Journal*, 32(4), 427-449. doi:10.1002/imhj.20303

Suchman, N., McMahon, T. J., Slade, A., & Luthar, S. (2005). How early bonding, depression, illicit drug use, and perceived support work together to influence drug-dependent mothers' caregiving. *American Journal of Orthopsychiatry*, 75(3), 431-445. doi:10.1037/0002-9432.75.3.431

Suchman, N., Pajulo, M., Decoste, C., & Mayes, L. (2006). Parenting interventions for drug-dependent mothers and their young children: The case for an attachment-based approach. *Family Relations*, 55(2), 211-226. doi:10.1111/j.1741-3729.2006.00371.x

Swanson, K., Beckwith, L., & Howard, J. (2000). Intrusive caregiving and quality of attachment in prenatally drug-exposed toddlers and their primary caregivers. *Attachment and Human Development*, 2(2), 130-148.

Teesson, M., & Proudfoot, H. (2003). *Comorbid mental disorders and substance use disorders: Epidemiology, prevention and treatment*. Canberra: Population Health Division, Department of Health and Ageing Retrieved from [http://www.nspresearch.unimelb.edu.au/pods/episode3\\_docs/mono\\_comorbid.pdf](http://www.nspresearch.unimelb.edu.au/pods/episode3_docs/mono_comorbid.pdf).

- Teicher, M. H., & Samson, J. A. (2016). Annual Research Review: Enduring neurobiological effects of childhood abuse and neglect. *Journal of Child Psychology and Psychiatry*, 57(3), 241-266. doi:10.1111/jcpp.12507
- 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. doi:10.1111/j.1467-8624.2010.01548.x
- Timmer, S. G., Ho, L. K. L., Urquiza, A. J., Zebell, N. M., Fernandez y Garcia, E., & 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. doi:10.1007/s10578-011-0226-5
- Timmer, S. G., Thompson, D., Culver, M. A., Urquiza, A. J., & Alenhofen, S. (2012). Mothers' physical abusiveness in a context of violence: effects on the mother-child relationship. *Developmental Psychopathology*, 24(1), 79-92. doi:10.1017/s0954579411000678
- Tronick, E. (1982). Affectivity and sharing. In E. Z. Tronick (Ed.), *Social interchange in infancy: Affect, cognition and communication* (pp. 1 - 6). Baltimore: University Park.
- Tronick, E., Als, H., & Brazelton, T. (1978). The infant's responses to entrapment between contradictory messages in face-to-face interactions. *Journal of American Academy of Child and Adolescent Psychiatry*, 17, 1-13.
- Tronick, E., & Beeghly, M. (1999). Prenatal Cocaine Exposure, Child Development, and the Compromising Effects of Cumulative Risk. *Clinics in Perinatology*, 26(1), 151-171.
- Tronick, E., Messinger, D., Weinberg, M. K., Seifer, R., Shankaran, S., Wright, L. L., . . . Liu, J. (2005). Cocaine exposure is associated with subtle compromises of infants' and mothers' social-emotional behavior and dyadic features of their interaction in the face-

- to-face still-face paradigm. *Developmental Psychology*, 41(5), 711-722.  
doi:10.1037/0012-1649.41.5.711
- Trull, T. J. (1995). Borderline Personality Disorder Features in Nonclinical Young Adults: 1. Identification and Validation. *Psychological Assessment*, 7(1), 33-41.
- Trull, T. J., Sher, K. J., Minks-Brown, C., Durbin, J., & Burr, R. (2000). Borderline personality disorder and substance use disorders: A review and integration. *Clinical Psychology Review*, 20(2), 235-253. doi:10.1016/s0272-7358(99)00028-8
- Trull, T. J., Stepp, S. D., & Solhan, M. (2006). Borderline personality disorder. In M. Hersen & J. C. Thomas (Eds.), *Comprehensive handbook of personality and psychopathology: Adult psychopathology* (Vol. 2). New Jersey: John Wiley & Sons.
- Trupe, R. (2013). The effects of maternal borderline personality disorder and social support on patterns of emotional availability in mother-child interactions. Retrieved from [http://trace.tennessee.edu/cgi/viewcontent.cgi?article=3248&context=utk\\_graddiss](http://trace.tennessee.edu/cgi/viewcontent.cgi?article=3248&context=utk_graddiss)
- Tucci, J., Mitchell, J., Holmes, D., Hemsworth, C., & Hemsworth, L. (2014). Constructing a child protection policy to support a safeguarding children culture in organisations and institutions. *Children Australia*, 40(1), 78-86. doi:10.1017/cha.2014.42
- Tyler, R., Howard, J., Espinosa, M., & Doakes, S. S. (1997). Placement with substance-abusing mothers vs placement with other relatives: Infant outcomes. *Child Abuse & Neglect*, 21(4), 337-349. doi:http://dx.doi.org/10.1016/S0145-2134(96)00175-5
- Uhlhorn, S. B., Messinger, D. S., & Bauer, C. R. (2005). Cocaine exposure and mother-toddler social play. *Infant Behavior and Development*, 28(1), 62-73.  
doi:http://dx.doi.org/10.1016/j.infbeh.2004.11.001
- Ukeje, I., Bendersky, M., & Lewis, M. (2001). Mother-infant interaction at 12 months in prenatally cocaine exposed children. *The American Journal of Drug and Alcohol Abuse*, 27(2), 203-224. doi:doi:10.1081/ADA-100103706

- United Nations Office on Drugs and Crime. (2016). World Drug Report. Retrieved from [http://www.unodc.org/doc/wdr2016/WORLD\\_DRUG\\_REPORT\\_2016\\_web.pdf](http://www.unodc.org/doc/wdr2016/WORLD_DRUG_REPORT_2016_web.pdf)
- Vaillancourt, K., Pawlby, S., & Fearon, R. M. P. (2017). History of childhood abuse and mother-infant interaction: A systematic review of observational studies. *Infant Mental Health Journal*, n/a-n/a. doi:10.1002/imhj.21634
- van der Voort, A., Juffer, F., & Bakermans-Kranenburg, M. (2014). Sensitive parenting is the foundation for secure attachment relationships and positive social-emotional development of children. *Journal of Children's Services*, 9(2), 165-176. doi:doi:10.1108/JCS-12-2013-0038
- van Ijzendoorn, M., Schuengel, C., & Bakermans-Kranenburg, M. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, 11(02), 225-250. doi:doi:null
- Veira, Y., Finger, B., Schuetze, P., Colder, C. R., Godleski, S., & Eiden, R. (2014). Child behavior problems: Role of cocaine use, parenting, and child exposure to violence. *Psychology of Violence*, No Pagination Specified. doi:10.1037/a0036157
- Vevea, J. L., & Woods, C. M. (2005). Publication bias in research synthesis: Sensitivity analysis using a priori weight functions. *Psychological Methods*, 10(4), 428-443. doi:10.1037/1082-989X.10.4.428
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- White, H., Flanagan, T. J., Martin, A., & Silvermann, D. (2011). Mother–infant interactions in women with borderline personality disorder, major depressive disorder, their co-occurrence, and healthy controls. *Journal of Reproductive and Infant Psychology*, 29(3), 223-235. doi:10.1080/02646838.2011.576425

- White, H. R., & Widom, C. S. (2008). Three potential mediators of the effects of child abuse and neglect on adulthood substance use among women. *Journal of Studies on Alcohol and Drugs*, 69(3), 337-347. doi:10.15288/jsad.2008.69.337
- Widom, C. S., Czaja, S. J., & Dutton, M. A. (2008). Childhood victimization and lifetime revictimization. *Child Abuse & Neglect*, 32(8), 785-796.
- Widom, C. S., Weiler, B. L., & Cottler, L. B. (1999). Childhood victimization and drug abuse: A comparison of prospective and retrospective findings. *Journal of Consulting and Clinical Psychology*, 67(6), 867-880. doi:10.1037//0022-006X.67.6.867
- Widom, C. S., & White, H. R. (1997). Problem behaviours in abused and neglected children grown up: Prevalence and co-occurrence of substance abuse, crime and violence. *Criminal Behaviour and Mental Health*, 7(4), 287-310. doi:10.1002/cbm.191
- Winnicott, D. W. (1965). *Maturational processes and the facilitating environment*. New York: International Universities
- Yumoto, C., Jacobson, S. W., & Jacobson, J. L. (2008). Fetal Substance Exposure and Cumulative Environmental Risk in an African American Cohort. *Child Development*, 79(6), 1761-1776. doi:10.1111/j.1467-8624.2008.01224.x
- Zalewski, M., Cyranowski, J. M., Cheng, Y., & Swartz, H. A. (2013). Role of maternal childhood trauma on parenting among depressed mothers of psychiatrically ill children. *Depression and Anxiety*, 30(9), 792-799. doi:10.1002/da.22116
- Zalewski, M., Stepp, S. D., Scott, L. N., Whalen, D. J., Beeney, J. F., & Hipwell, A. E. (2014). Maternal Borderline Personality Disorder Symptoms and Parenting of Adolescent Daughters. *Journal of Personality Disorders*, 1-14. doi:10.1521/pedi\_2014\_28\_131
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52(1), 30.

doi:<http://libraryproxy.griffith.edu.au/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=6380172&site=ehost-live&scope=site>

Ziv, 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. doi:10.1080/14616730050085536