Facilitators of Maternal Affective Attachment Bonds in Various Family Contexts

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Abstract

The main objective of this thesis was to identify facilitators of strong maternal affective attachment bonds to children. First, a systematized review of the literature was conducted to gather and synthesize all the research over the last 25 years that has identified correlates and predictors of maternal affective attachment. The review found 26 articles relevant to the research question, and main findings from the existing literature were summarized. The main study of the thesis was built upon the findings of the review using data collected through an online survey of Canadian mothers. First, a latent profile analysis (LPA) was used to cluster mothers into maternal profiles based on their patterns of responses to measures of previously identified correlates and predictors of the maternal affective attachment; symptom distress related to symptoms of depression and anxiety, the dimensions of avoidance and anxiety in mothers' adult romantic attachment, and mothers' sense of parental efficacy and satisfaction in the maternal role. Then, a MANOVA was conducted to determine whether profile membership would account for a significant portion of the variance in the maternal affective attachment bond to children. Results indicated that maternal profiles characterized by lower symptom distress, lower romantic attachment avoidance and anxiety, and higher efficacy and satisfaction in the parental role reported higher affective attachment, and perceived more closeness and less conflict in their relationships with their children. The results of this thesis help to inform the scholarship of motherhood by identifying salient maternal experiences associated with positive family outcomes.

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Chapter I

Introduction

In the six decades since John Bowlby presented his theory of attachment to the British Psychoanalytic Society in three classic papers (Bowlby; 1958; 1959; 1960) it has become the focus of a large body of research in psychology and has found strong empirical support. Through rigorous and intensive research initiated by Mary Ainsworth (Ainsworth & Bell, 1970; Ainsworth & Whittig, 1969) and proliferated by hundreds more researchers over the years (Behrens, Hesse, & Main, 2007; Jacobsen & Hoffman, 1997; Kobak, Cole, Feren-Gillies, Flemming, & Gamble, 1993; Main & Cassidy, 1988), we can now feel confident in Bowlby's (1982) assertion that an infant's attachment to their primary caregiver is incredibly important to their social and emotional development and that attachment lays the foundation for their relationships throughout life.

Bowlby's emphasis on the mutuality of this attachment between parent and child has often been overlooked. He was clear in his initial proposal that the attachment behaviours displayed by the infant "serve the function of binding the child to mother and contribute to the reciprocal dynamic of binding mother to child" (Bowlby, 1958, p. 351). Despite this, the maternal side of the attachment relationship has been the focus of considerably less research in comparison to the volumes of studies that have been conducted on infant attachment to mothers (Condon, 2012; Condon & Corkindale, 1998).

In the literature to date, researchers have conceptualized the maternal perspective of the attachment experience in several ways. First, a large body of research has focused on mothers' state of mind with respect to attachment, elicited through reminiscence about their childhood experiences with their own mothers (Benoit & Parker, 1994; Crandell, Fitzgerald, & Whipple, 1997; George, Kaplan, & Main, 1985; Main, Kaplan, & Cassidy, 1985; van Ijzendoorn, 1995). A second body of research has focused on mothers' caregiver-attachment experiences in the

context of their relationships with their infants or children. Researchers have taken three main approaches to the conceptualization and measurement of the maternal attachment bond to children. Some researchers have focused on observable behaviours of mothers with their infants, mirroring the approach taken in the study of infant attachment, focusing on sensitivity and responsiveness (Bernier, Matte-Gagne, Belanger, & Whipple, 2014; Kennedy, 2008; Susman-Stillman, Kalkose, Egeland, & Waldman, 1996; Vondra, Shaw, & Kevenides, 1995). Other researchers have studied maternal self-representations and maternal representations of their infants; similar to the research on adult attachment that examines self and other representations (Koren-Karie, Oppenheim, Dolev, Sher, & Etzion-Carasson, 2002; Korja et al., 2010; Laranjo, Bernier, & Meins, 2008; Meins, Bureau, & Fernyhough, 2017; Meins & Fernyhough, 2012; Solomon & George, 1999). Finally, some researchers have examined the affective component of attachment; exploring the bond a mother feels to her child using self-report measures. These maternal feelings of attachment have received the least amount of attention from researchers.

The focus of this thesis is the maternal affective attachment bond, which has been defined as "the emotional bond or tie of affection experienced by the parent toward the infant" (Condon & Corkindale, 1998, p. 57). A variety of terms have been used to describe this concept in the literature to date. For the sake of clarity, consistency, and readability, this aspect of the maternal attachment bond will be referred to as "maternal affective attachment" throughout the remainder of this document.

Thesis Aims and Scope

The general aim of this thesis was to better understand what helps a mother to feel attached to her children. We sought to identify the facilitators of a strong maternal affective attachment bond, and to better understand how those facilitators co-exist within mothers. In other

words, we intended to learn how a subset of mothers' internal experiences work together within individual mothers to explain differences in their perspectives of their maternal affective attachment bond to their children, and in their perceptions of conflict and closeness in the mother-child relationship. This was accomplished in two related steps consisting of a systematized review of the literature, and an original data collection that builds on the findings of the review.

The purpose of the systematized review was to consolidate and organize all available research conducted between 1990 and 2015 on the topic of facilitators of maternal affective attachment bonds, in order to elucidate the findings that have received the strongest empirical support. Drawing on the findings of the systematized review, the purpose of the main study was to learn whether there are patterns in the expression of some of these facilitators of maternal affective attachment bonds that would allow us to identify distinct profiles of maternal experiences. Once these profiles were identified, we determined whether maternal affective attachment bonds differed between maternal profiles and identified which of the maternal profiles best predicted strong positive maternal affective attachment bonds and perceptions of closeness and conflict in the mother-child relationship. The results of this thesis help to inform the scholarship of motherhood by identifying salient motherhood experiences associated with more positive family outcomes across family constellations, from the mothers' own perspective.

The Importance of Maternal Affective Attachment

The prevalence of maternal bonding difficulties reinforces the importance of increased attention to this area of research. A recent survey conducted in the UK found that nearly one third (32%) of new mothers reported they experienced difficulty bonding with their babies (National Childbirth Trust, 2016). Furthermore, 12% of new mothers reported feeling

embarrassed to speak to a health professional about these issues, leaving open the question of whether social desirability concerns may be shrouding an even higher prevalence of these difficulties. Indeed, researchers have found evidence for a significant link between social desirability and self-reported maternal affective attachment bonds across three different measures (van Bussel, Spitz, & Demyttenaere, 2010). This very high number of mothers who are struggling suggests a need for research aimed at identifying facilitators of stronger bonds.

The lack of research to date on maternal affective attachment limits our ability to demonstrate its' importance. It is difficult to empirically justify the importance of something so understudied, because we have so little to refer to from past research that would allow us to argue that it is important to understand. This is where a systematized review can be vital, as it can summarize what has been found so far, what areas have received more attention and how and where to focus future research. More research is needed to learn about the relationship between maternal affective attachment and other components of the maternal attachment experience (e.g. maternal behaviours, representations of self and infant), as well as to relationships between mothers' affective attachment and infant attachment security.

Theoretically, infants engage in attachment behaviours (e.g. crying, smiling, clinging, vocalizing, eye contact) to attain and maintain proximity to an attachment figure (Bolwby, 1969). It could be argued that infants are more likely to display secure attachment behaviours as a result of their mother's warmth, affection, and availability to them (Ainsworth et al., 1978) or that the infant attachment behaviours increase feelings of warmth and affection in mothers, and motivate them to be available to the child. It is most likely that parental feelings of attachment and infant attachment behaviours are part of a reciprocal feedback loop. The mother sets the stage for her child's primary attachment experience. If she does not feel particularly bonded with her child, we

could hypothesize that this would have a negative impact on the interaction, while if she does feel strongly bonded, this would have a positive impact on the interaction.

We also assert that it is important to learn about facilitators of maternal affective attachment because mothers' feelings matter in their own right, regardless of whether they translate into behaviours or facilitate children's outcomes. Mothers are tasked with the enormous responsibility of raising children from infancy to adulthood; an undertaking that requires significant energy and time and entails sacrificing sleep, work, social time and other involvements. Mothers' feelings of attachment to the children in her care are likely to largely determine the quality of their experience of childrearing. For this reason alone, it can be argued that researchers should focus on learning about facilitators of this important bond.

Mothers in Canada: A Demographic Profile

The purpose of the main study of this thesis is to learn about the experiences of Canadian mothers. A review of the latest Canadian demographic data reveals that the maternal experience is becoming ever more heterogeneous as the diversity of family forms increases over time (Statistics Canada, 2006; 2011). Between 2006-2011, the number of married couples increased by only 3.1%, while the number of lone-parent families increased by 8.0%, and the number of common law couples increased by 13.9%. The number of same-sex married couples increased dramatically by 42.4% over the same period (reflecting the first period in which same-sex marriage was legal across Canada) and the number of same-sex common law couples rose by 15%. It is not possible to report on changes over time in the number of stepfamilies, as it only first became possible to classify families with children as stepfamilies in 2011.

Of the 5,212,515 families with children in Canada in 2011, a total of 1,527,840 are lone parent families and the vast majority of those lone parents are mothers (1,201,881), making up

23.06% of all census families with children. Of the 3,684,675 couples with children, 464,269 are stepfamilies, making up 8.91% of all census families with children. A total of 4848 lesbian couples had a child at home in 2011 (16% of all lesbian couples, and 0.09% of all census families with children). Adoption statistics are not included in the Canadian census, so it is not possible to report on the exact number of adoptive mothers in Canada. However, estimates of the Adoption Council of Canada suggest that approximately 2,600 domestic adoptions and 2,000 international adoptions occur each year (Adoption Council of Canada, 2008). In what has been described by demographers as the Second Demographic Transition (Furstenberg, 2014), similar trends have been observed across most countries with advanced economies who are seeing multitude of changes to family life, including the decline of importance of virginity at marriage, the deinstitutionalization of marriage, an increase in non-marital childbirths, later childbearing and increasing social and economic inequalities. As such, it would appear crucial for research on motherhood experiences to include participants who parent in a variety of family constellations in order to make ecologically valid inferences about the experience of motherhood in general.

Choosing a Conceptual Framework

We wanted to select a conceptual framework for our research that would guide us in the process of respectfully understanding the many different experiences of our participants. Family researchers have described two different models that have been used in previous research.

Deficit family model. The deficit family model refers to research that is focused primarily on difficulties and challenges, studying families from a problem oriented or deficit-comparison perspective (Coleman, Ganong, & Fine, 2000). This model generally tends to emphasize the deficits associated with stepfamilies, single parent families, and other family constellations by comparing them to nuclear families, rather than drawing attention to those

factors that may promote positive family outcomes across family structures (Ganong & Coleman, 1987; Sweeney, 2010). It is rooted in a structural functionalist view of the 'family' which posits that the family represents a social unit that strives to meet the needs of its members and ensures the stability of society as a whole. In this paradigm, traditional heterosexual marriage is viewed as the norm that should be espoused by all families, and other families are presented as deviant from the norm- a theoretical assumption that has been widely criticized by feminist family researchers. For example, from this perspective, single parent families tend to be viewed as 'broken' or not stable compared to two-parent families, and research on divorced mothers tends to focus on the impact or damage on the mother and children that results from divorce (Morrison, 1995). Research also tends to compare the wellbeing of children from divorced families with that of children from continuously intact families (Amato & Keith, 1991), putting the former at an economic and social disadvantage. Finally, research on lesbian parents often focuses on the absence of a father or male role model and its potential impacts on children's developmental outcomes (Clarke & Kitzinger, 2005; MacCallum & Golombok, 2004). However, early family researchers Marotz-Baden, Adams, Bueche, Munro, and Munro (1979) conducted a review of the literature focused on effects of alternative family forms (such as divorced, single parent, remarried, and working mother families) on children's outcomes. They concluded that it is more useful to study family process variables such as social interactional dynamics than to use family form as the independent variable. More recently, researchers have restated the importance of exploring relational processes and the family environment rather than simply highlighting differences between family forms (Freistadt & Strohschien, 2013; Wise, 2003). For example, in a study that looked for other explanations for child mental health problems in children from separated families, researchers found that the differences in child

mental health by family configuration were fully explained by family process variables of inter-parental conflict and the mental health and socioeconomic factors of mothers and fathers. To a lesser extent, parenting practices also partially explained the differences in children's mental health. (Lucas, Nicholson, & Erbas, 2013). This finding suggests that it would be more valuable to explore individual experiences within families than to compare families based on their structural configurations.

Normative adaptive perspective. An alternative to the deficit family model is to conceptualize family functioning from a normative-adaptive perspective (Visher & Visher, 1979). Research from a normative-adaptive perspective aims to describe and understand the relationships within the family unit with a focus on understanding why some families function better than others (Ganong & Coleman, 1994). The normative adaptive perspective does not attempt to ignore problems and challenges, and it doesn't prohibit research that compares families in different configurations. It simply allows families to be explored and understood without assuming that they are at a deficit to begin with. For example, from this perspective, divorce and remarriage are seen as normative life choices, not social problems or the unavoidable result of pathological behaviours.

Some families do face more challenges than others, and it is important to know what these challenges are. However, it is also important for researchers and clinicians to remember and emphasize that these challenges are not inevitable, and they do not mean that any family is dysfunctional by default.

For the purposes of the present thesis, we elected to use a normative adaptive perspective to guide our research design. This perspective allowed and encouraged us to focus on increasing our understanding of mothers' perspectives of the mother-child relationship and maternal

affective attachment bonds to children in different family contexts, without assuming that any family configuration is necessarily at a deficit. For this reason, we endeavoured to include as many motherhood experiences as possible within our sampling procedures, and use a person-centered analysis that will cluster mothers into profiles based on their self-reported experiences rather than sorting mothers into groups based on their demographic characteristics or family configuration.

Thesis Objectives

The main objective of this thesis is to identify facilitators of strong maternal affective attachment bonds to children, and to understand how those variables co-exist within mothers. In order to achieve this aim, we first reviewed the literature conducted over the last 25 years to synthesize the findings and identify correlates and predictors of maternal affective attachment. Using the results of the review to identify variables of interest for further study, we then conducted an online survey of Canadian mothers. We used a latent profile analysis to discover profiles of maternal experiences based on their patterns of responses to measures of previously identified correlates and predictors of maternal affective attachment. These maternal experience profiles served as the grouping variable, allowing us to use family process rather than family structure for our predictive statistical models. We finally used a MANOVA to determine whether mothers' profile membership accounted for a significant portion of the variance in their maternal affective attachment bond to children.

Chapter II

Systematized Review of the Literature on Maternal Affective Attachment Bonds

While research has been conducted to explore mothers' affective attachment bonds to their children for at least 25 years, no one has yet reviewed this literature to synthesize and organize the findings. In a review of a decade of research on motherhood, Arendell (2000) highlighted an important shift in the literature; moving from focusing only on children's outcomes to focusing on mothers' activities, understandings, and experiences. This shift suggests the experience of mothers has become increasingly recognized as important in its own right, not only for its impact on children. Arendell observed two predominant streams in the literature; one of theorizing about mothering and motherhood, and another of empirical study of the mothering experience, including maternal well-being, emotional work, maternal satisfaction and distress, social support, and employment. Surprisingly, the maternal bond to children was absent from this review. However, Arendell closed her review with four recommendations for further study of motherhood, and one was a call for attention to mother's experiences of their relationships with children, asking specifically, "how and why do mothering relationships diverge across mother-child units and also across time for individuals?" (p. 1201). In this review, we aim to respond to this question by gathering all research to date that has explored the differences between mothers pertaining to their feelings about their children.

Other researchers have suggested that increased attention be given to the investigation of the affective component of the bond experienced by parents toward their children. For example, Muller (1996) recommended that increasing our understanding of mothers' perspectives of attachment would help support positive long-term mother-child attachment relationships. Condon and Corkindale argued that the affective, experiential dimension of attachment "lies at the core of the psychology of human parenting" (Condon & Corkindale, 1998, p. 60). While a number of researchers have begun to respond to this important call (Davies et al., 2008; Evans, et

al., 2012; Mason, Briggs, & Silver, 2011; Perry, Ettinger, Mendelson, & Le, 2011; Tikotzky, Chambers, Kent, Gaylor, & Manber,, 2012), this area of research remains in its infancy and, so far, lacks unity and organization.

The purpose of this systematized review is to gather and organize all of the available research conducted over the last 25 years that has identified facilitators, predictors, and covariates of maternal affective attachment bonds to children. We aim to create a clear portrait of the literature and highlight the most widely supported findings. The secondary purpose is to determine which methods and measures have been most widely used in this area of research. We hope this review will provide a solid and comprehensive foundation for further research that will allow for more concerted efforts in the continued exploration of this important topic.

A systematized review incorporates as many elements of a systematic review as possible when resources are not available for the full procedure of a systematic review (Grant & Booth, 2009). For example, a comprehensive search may be conducted, but the results might simply include a catalogue of the identified studies, or the search might only be conducted on one or more databases, while the coding or analysis of the articles is conducted in a systematic manner. The search process for this review was conducted using the strictly defined selection criteria appropriate for systematic reviews, and coding of the articles was conducted systematically, as will be described in the methods section. However, the search was conducted on only one database. While systematized reviews do not require removal of articles based on assessments of the quality or methods and measures used, in our case we have still used a small number of criteria to limit our review to studies that used previously validated measures, so as to ensure a minimal level of methodological quality in hopes of highlighting the most promising findings. In this systematized review, the summary provided will be a mixture of narrative and tabular

presentation of findings. Commentary in this review will be limited to what is known and what uncertainty remains. It will not be possible to make recommendations for practice based on the limited findings to date. However, suggestions about directions for future research in this area will be provided.

Methods

The primary research question for this systematized review was "What factors have been found to facilitate, predict, or correlate with strong, positive maternal affective attachment bonds to children?" Our operational definition of the construct of maternal affective attachment was the mother's feeling of connection to her child in the here and now, or "the emotional bond or tie of affection experienced by the parent toward the infant" (Condon & Corkindale, 1998, p. 57). Our purpose was to gather all research that has identified factors that might explain differences in how connected, bonded, or emotionally attached mothers feel to their children.

Phase I: Literature Search

We followed the method used in Hudon-ven der Buhs & Gosselin (2017) when conducting the literature review and when excluding and coding articles.

Database search. The database used for this systematic review was PsycInfo. This database was selected because it is the largest database for psychology and the behavioural and social sciences, with over 4 million references that are professionally indexed by APA experts. Only one database was used because two previous versions of this review that used additional databases found no articles in other databases that were not also found by PsycInfo. We developed search terms by identifying the major constructs of the research question and entering them into PsycInfo's search page to find related search terms in the database's thesaurus (called "controlled terms"). Each of the controlled terms, their scope notes, and their year of entry were

recorded. In addition to the controlled terms, we also developed a number of keywords. We followed the recommendation of Lefebvre, Manhiemer, and Glanville, (2008) and used a wide variety of search terms and keywords combined with "Or" for each main construct. For the maternal affective attachment construct we used the following search terms: Mother Child Relations, bonding.mp., maternal bond.mp., maternal bonding.mp., maternal attachment.mp., maternal feelings of attachment.mp., maternal feelings.mp., maternal love.mp., maternal postnatal attachment.mp., and mother-child relationship.mp. To capture the many different types of maternal experiences we hoped to find research about, we included: mothers.mp., Mothers/, single mothers.mp., Single Mothers/, stepmothers.mp., Stepparents/, adoptive mothers.mp., Adoptive Parents/, lesbian mothers.mp., Homosexual Parents/. We combined the maternal affective attachment terms using "Or", and then combined the mother-type terms using "Or", and then combined both sets of terms together using "And". These search terms are included in Appendix A.

We decided the span of the search would be from 1990-2015 (when the search was conducted). As Arendell's (2000) review of a decade of research did not include any reference to maternal affective attachment and she concluded by calling for researchers to explore the topic, we determined that there must be very little on the topic published before the year 2000. Nevertheless, we opted to include the time period from 1990-2000 in our review as well, to ensure that we would not miss any early research on the topic. Although the review was limited to human populations and the language was limited to English, the geographic scope of the research was not limited, in order to allow for a cross-national understanding of the topic.

Phase II: Classification of Articles

A codebook was developed for the project that specified the criteria for inclusion in the review and a step-by-step method for exclusion of articles not relevant to the research question. This codebook was created by the first author and was used for training the coding volunteers and as a detailed reference during the coding process. A copy of the codebook can be found in Appendix B.

The search results were exported from PsycInfo to Endnote, a bibliographic management program that helps to organize articles and code inclusion or exclusion at each step of the classification process. Five volunteers, all psychology undergraduate students with demonstrated interest in this research area, were trained to code the first three steps of the exclusion process using the codebook during individual training sessions with the first author. The volunteers were instructed to err on the side of inclusion if they were unsure about any code, and were also encouraged to ask questions to clarify their understanding throughout the process.

Volunteers were assigned folders weekly containing approximately 130-140 references. The first author provided oversight throughout the coding, either by being present in the lab during their coding times or by being available to respond to emails when they had questions. At the end of each week the first author randomly selected 13 or 14 (10%) of the references in each folder to code independently, the low end of the range of between 10-25% suggested by Wimmer & Dominick (1991). Discrepancies between coding were flagged for the volunteer to review. If, after reviewing the first author's code, the volunteer still felt that their code was correct they were encouraged to inform the first author so that there could be a discussion in order to come to an agreement on the final code. Discrepancies between the coding of the volunteers and the first

author were recorded and trends in volunteer coding errors were monitored to ensure that no volunteer was consistently misunderstanding any step in the process.

At week 6, it became apparent that one of the four volunteer was consistently coding the second step (mothers as participants) incorrectly. She had been excluding articles at this step when mothers were included as participants but were not asked to complete a measure (e.g. the mothers were observed in interactions with their babies). While this would have resulted in exclusion at the third step of the process, the importance of consistency and accuracy was prioritized. She was re-trained on that coding step and then returned to the beginning of her folders and re-coded all of the articles. The first author then randomly selected articles from these folders using the same standard procedure reported above. The information for this volunteer from the second round of coding is the one reported in the results.

Exclusion Criteria

1) Article type. This review was concerned with finding original research and reviews of research. All other types of work (e.g. opinion columns, comments, editorials, erratums, letters, obituaries, poetry, book reviews, media reviews, and software reviews) were excluded at this step.

2) Participant type. As the focus of this review was to gain an understanding of maternal perceptions of their affective attachment bonds, all articles that did not include mothers as participants were excluded at this step.

3) Maternal affective attachment. This review was concerned with finding research in which maternal affective attachment was measured in some way. This type of mother-to-infant attachment has been defined as "the emotional bond or tie of affection experienced by the parent toward the infant" (Condon & Corkindale, 1998, p. 57). Articles were retained at this step if any

information was gathered from mothers about their feelings, bond, connection or relationship to their child. This information could be collected using a measurement instrument, questionnaire, interview, or even a single question to the mother. Volunteers were instructed to consult the methods section of each article in order to determine if information about maternal affective attachment was elicited from mothers.

This last coding step was challenging for a few reasons. First, the concept of maternal affective attachment has been described in the literature using a wide variety of terms (including "postnatal attachment", "feelings of connection", "maternal bond", "feelings of attachment", etc.) and measured by a long list of different instruments. Furthermore, there are a number of closely related concepts, as well as a number of measures that use similar terms but do not describe maternal affective attachment bonds. For example, the widely used Adult Attachment Interview (AAI; George et al., 1985) does not ask the mother how connected or bonded she feels to her own child, but rather looks at the level of organization of her attachment experiences from her own childhood and across her history. Articles that use the AAI as the measure of "maternal attachment" were therefore excluded from the project at this phase.

To address concerns about the complexity of coding at this step, volunteers were provided with an additional coding option. Along with their usual choice (exclude, retain), at this step they were also provided with the option to "maybe retain" articles if they were unsure. This decision was made to ensure we did not lose any relevant articles. Every article that was coded as "maybe retain" at this step of coding was reviewed by the first author and flagged for review by all volunteers to facilitate increased understanding.

Phase III: Review and Final Coding

Predicting mother's affective attachment. In Phase III, the first author read the full text of articles retained in Phase II. At this point, articles were coded to indicate what measure was used to assess maternal affective attachment bonds. Articles were only retained at this phase when the maternal affective attachment bond was measured using a validated instrument. Our inclusion criteria were that measures had face validity, used Likert scale format for responses, and reported acceptable internal consistency to ensure a basic level of validity to our reported findings.

Furthermore, our operational definition of the construct of maternal affective attachment was the mother's feeling of connection to her child in the here and now, defined as "the emotional bond or tie of affection experienced by the parent toward the infant" (Condon & Corkindale, 1998, p. 57). Articles were excluded at this step if the instrument was clearly intended to measure something other than maternal affective attachment according to our operational definition. For example, the Mother-Infant Bonding Scale (Taylor, Atkins, Kuman, Adams, & Glover, 2005) is an eight-item scale consisting of a list of words describing emotions that a mother may experience toward her infant, (including "resentful", "joyful", "aggressive", and "protective"). These one-word items did not capture the essence of our operational definition, as they did not refer to the tie of affection or bond felt by the mother, so articles using this measure were excluded at this phase. Similarly, the Postpartum Bonding Questionnaire measures impairment in early mother-child bonding relationships and is used as a screening questionnaire to assess for disorders in mother-child attachment (Brockington et al., 2001). Since impaired bonding is a separate construct that differs from our operational definition, studies that used measures of impaired or disordered bonding were excluded.

Also at this step, the maternal affective attachment bond was coded as an independent or dependent variable in the study. Articles were only retained at this step when affective attachment was identified as a dependent or outcome variable. We wanted to learn about facilitators of maternal affective attachment; we were not interested in findings in which the maternal affective attachment was being used as the independent variable.

Reference lists of all remaining articles were reviewed in a search for more potentially relevant articles. The final set of articles were then coded for the following:

a) The number of participants included.

b) The ages of the mothers included.

c) The ages of the children included.

d) Mothers' relation to the child (biological, step, or adoptive).

e) Sexual orientation of the mothers included.

f) Relationship status of the mothers included (partnered or single).

g) Ethnicity of the mothers included.

h) Measure used to assess maternal affective attachment bonds.

i) Research design.

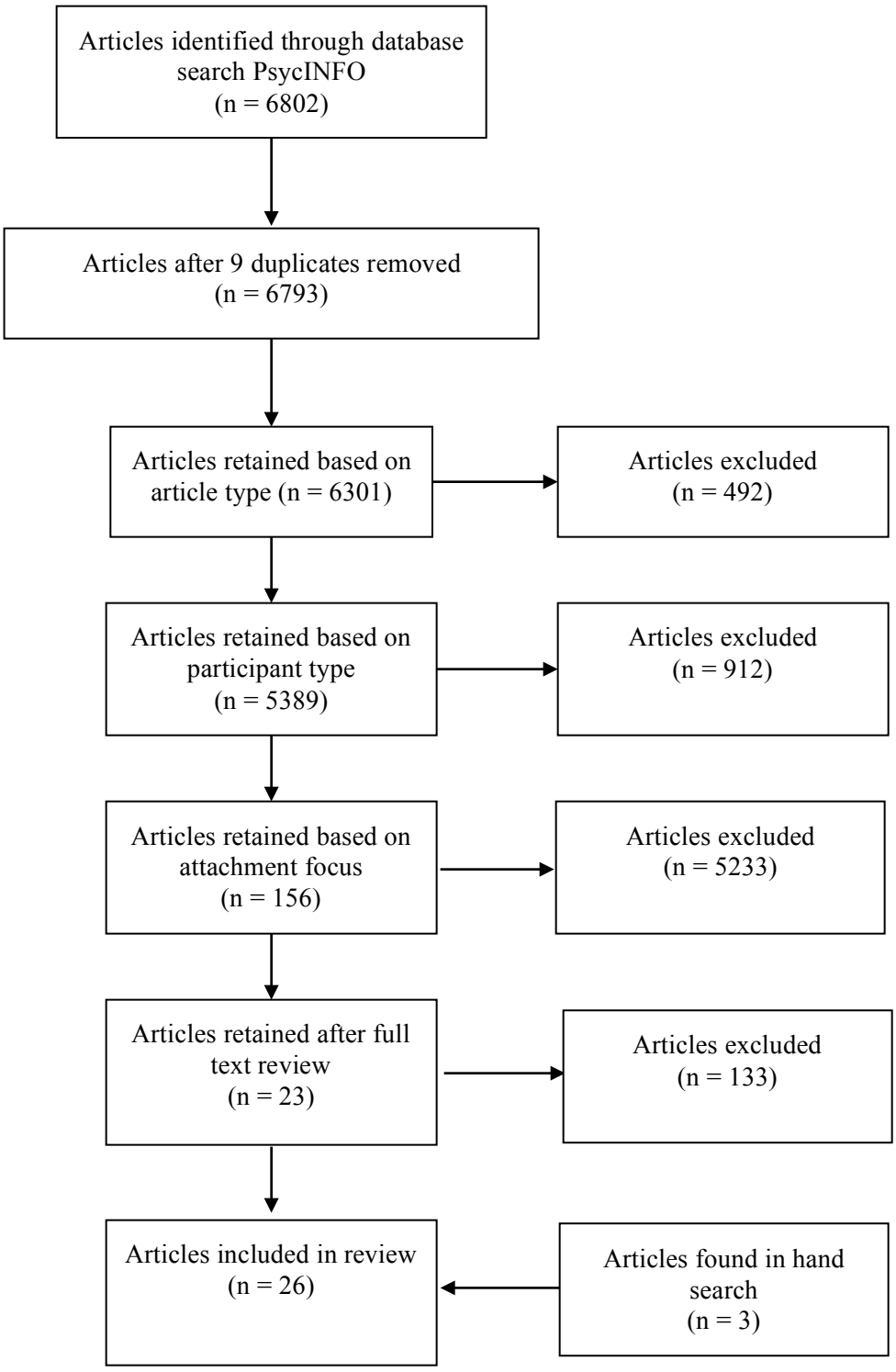
j) Type of analysis conducted.

k) Facilitating factors (correlates, predictors, and independent variables) tested in the study.

Hand search. A hand search is recommended in order to uncover relevant articles that were indexed poorly, inaccurately, or not at all. This helps to increase the likelihood that relevant studies are not overlooked. In our review, we conducted a hand search of the reference lists of the final sample of studies.

Results

The database search in Phase I turned up a total of 6802 articles to be reviewed. The flow chart below reveals the articles excluded at each step of coding.



Nine articles were excluded because they were duplicates, 492 more were excluded on the basis of their article type, 912 were excluded on the basis of their participant type, and a further 5233 were excluded because they lacked a focus on the mother's maternal affective attachment, bond, feeling of attachment, or connection with her child. In Phase III the full text of the remaining 156 articles were reviewed to determine if a valid measure of maternal affective attachment was used in the research, and was the dependent variable in the study. After this final review, 133 articles that did not measure attachment explicitly with a validated measure were excluded, leaving a final sample of 23 studies. Three additional relevant articles were found by hand searching reference lists of the final sample of studies, leaving a final total of 26 relevant articles. A flow chart of the exclusion and inclusion of articles in the review is included in Appendix C. The references of included studies are indicated with an asterisk in the reference list.

As mentioned, to ensure that the volunteers were coding the articles effectively, the first author coded a randomly selected 10% of the articles from each weekly folder. Agreement between volunteer and first author was defined as perfect agreement on the codes at each step of coding. Disagreement was defined as a disagreement about at least one code at any step of the coding process. Articles coded as "maybe retain" were not counted as a disagreement between the volunteer and the first author for inter-rater agreement calculations. Rates of agreement and disagreement between each of the volunteers and the first author are reported in Table 1. The percentages of agreement between each of the volunteers and the first author ranged from 92.8% to 93.9%, with an overall agreement rate of 93.5% (646/691) across all double coded articles.

Participant Demographics

In the articles that included the mean ages of mothers (88.4% of the studies), the means ranged from 16 to 48 years of age. One study included mothers with mean age in adolescence (19 years of age or younger), fourteen studies included at least one group of mothers with a mean age in the 20s, ten studies included at least one group of mothers with a mean age in the 30s, one study included mothers with a mean age in the 40s. Three studies did not report the mean ages of mothers, and four studies had groups of mothers whose means fell in different age ranges and were therefore accounted for more than once.

The children of the mothers studied covered the age range from infancy to a mean of 15 years of age. Eighteen of the studies included mothers of infants (aged less than 1 year), three of the studies included mothers of toddlers (1-2 years), four studies included mothers of preschoolers (2-5 years), two of the studies included mothers of elementary school-age children (5-10 years), one study included mothers of adolescents (13-18 years). In two studies, there were infants who fell into more than one age category, and were therefore reported here twice.

In twenty-three of the included studies the participants reported on their biological children, while in a single study participants reported on adoptive children. Two studies did not indicate the nature of the relationship between mother and child, though it is assumed that these were likely biological relationships.

With regards to sexual orientation of the participants, in only one study did the researchers specifically ask single mothers in their sample about the gender of the partner they would parent their child with, revealing a sample of women planning to parent with male partners. In two studies, researchers described their samples as married and referred to “fathers”

when describing the partners of the mothers. In the remaining studies, researchers did not ask about the sexual orientation of their participants.

Across all included studies there was a grand total of 4982 participants. Marital status of participants was not reported in five of the studies. The majority (89.0%) of participants (n = 3580) were married or cohabiting, while a smaller proportion were single (n = 441).

Four of the studies included in the review did not report the ethnicity of their participants at all (a total of 1245 participants). In the remaining studies where ethnicity was reported (a total of 3737 participants), 37.7% of participants (n = 1410) were Caucasian or of Anglo-European descent, 3.2% (n = 120) were Black or of African origin, 28.8% (n = 1075) were of Asian origin (a total of 1041 of these participants came from three studies conducted in Japan and one conducted in Taiwan), 7.7% (n = 288) were Hispanic or Latino, 0.9% (n = 33) were Indigenous/Aboriginal to Australia or North America, 11.5% (n = 430) were Middle Eastern, and 10.2% (n = 381) reported an ethnicity of "other" or an ethnicity was not specified by the participant or author. Studies in this review were conducted across nine different countries. Twelve studies were conducted in the United States (46.2%), four in Australia (15.3%), three in Jordan (11.5%), two in Turkey (7.7%), and one each in the United Kingdom, Taiwan, Jordan, Germany, and Belgium. The demographic information for all included studies is reported in Tables 2 and 3.

Measures of Maternal Affective Attachment Bond

Maternal affective attachment bond was measured by a variety of instruments across the studies included in our review. A description of each is provided here to facilitate better understanding of the results that will follow. Information about the measures, research design

and analyses, and correlates or predictors in each of the included studies can be found in Table 4. A glossary of all the measures' acronyms is also available in Appendix D.

Maternal Postnatal Attachment Scale. Nine studies used the Maternal Postnatal Attachment Scale (MPAS; Condon & Corkindale, 1998). The scale is designed to assess the mother's subjective experience of her bond to her infant with 19 items. The scale produces a total attachment score ranging from 19 to 95, where higher scores indicate higher attachment, as well as three subscales: 1) quality of attachment with nine items (e.g. "*Over the last two weeks I would describe my feelings for the baby as: 1 = dislike* to *5 = intense affection"*), 2) pleasure in interaction with five items (e.g. "*when I have to leave the baby: 1 = I usually feel rather relieved* to *5 = I usually feel rather sad*"), and 3) absence of hostility with five items (e.g. "*When I am caring for the baby I get feelings of annoyance or irritation: 1 = very frequently* to *5 = never*"). The scores for each of the subscales are determined using the average of each of the items from that subscale, providing a range of scores for each subscale between 1 and 5.

Condon and Corkindale (1998) reported acceptable internal consistency for the full scale at four weeks ($\alpha = .78$), four months ($\alpha = .79$), and eight months ($\alpha = .78$). Test-retest reliability was acceptably high according to an interclass correlation coefficient of $r = .70$, and a significant Pearson correlation coefficient between the assessments of ($r = .86$, $p < .001$). The scale demonstrated high face validity by reflecting various facets of emotions mothers experience toward their child (Condon & Corkindale, 1998). The MPAS is also significantly related to the Attachment Q-Set, an observational measure of parent and infant attachment behaviours (Feldstein, Hane, Morrison, & Huang, 2004). Goodman and Glenwick (2012) reported equivalent acceptable internal consistency of the scale ($\alpha = .77$) used with mothers of children between 2 and 10 years of age.

Maternal Attachment Inventory. Seven studies used the Maternal Attachment Inventory (MAI; Muller, 1994), a scale designed to measure maternal affectionate attachment. With 26 items that measure thoughts, feelings, and situations experienced by new mothers (e.g. "*my thoughts are full of my baby*", "*I feel love for my baby*", and "*I look forward to being with my baby*"). Participants answer using a 4 point Likert scale where *1 = almost never* and *4 = almost always* resulting in a total summed score ranging from 26-104, with higher scores indicating greater feelings of attachment toward the infant.

Muller (1994) reported good internal consistency for the scale in the first month (α = .85) acceptable internal consistency in the fourth month (α = 76), and good internal consistency in the eight month (α = .85). Other researchers using the measure have since found excellent internal consistency (α = .95; Wilkinson & Mulcahy, 2010; α = .90; Wilkinson & Scherl, 2006). Translated versions of the scale have also been validated (Kavlak & Sirin, 2009; Yilmaz, Kavlak, Isler, Liman, & Van Sell, 2011; Chen, Chen, Sung, Kuo, & Wang, 2011). The Turkish version of the measure found acceptable internal consistency with 1-month old infants (α = .77), and good internal consistency with 4-month-old infants (α = .82) (Kavlak & Sirin, 2009). Another study found it to have excellent internal validity of .90 with infants between 1 and 8 months of age (Yilmaz et al., 2011). The Taiwanese version (Chen et al., 2011) was found to have excellent internal consistency (α = .97), good test-retest reliability ($r = .87$, $p < .05$), and content validity index of .85. Four items were excluded from the Taiwanese version due to having inappropriate meanings, leaving a final total of 22 items (Chen et al., 2011).

Child Parent Relationship Scale. Four studies used the short form of the Child Parent Relationship Scale (CPRS; Pianta, 1994) a measure of parent child relationship quality, with 15 items comprising two subscales: closeness with 7 items (e.g. "*I share an affectionate, warm*

relationship with this child"), and conflict with 8 items (e.g. "*This child and I always seem to be struggling with each other*"). Participants respond using a 5-point Likert scale where *1 = definitely does not apply* and *5 = definitely applies*. There is a low correlation between each subscale, indicating that they represent two distinct domains of the parent-child relationship (Pianta, 1998).

Pianta (1998) reported good internal consistency for the conflict subscale when the child was 54-months-old (α = .84), and when the child was in first grade (α = .84), and lower internal consistency for the closeness subscale when the child was 54 months old (α = .69), and when the child was in first grade (α = .64). Driscoll and Pianta (2011) assessed the validity of the scale through associations with coded videotaped interactions between parents and children. They reported correlations between CPRS closeness and observer ratings of supportive presence, sensitivity, and positive caregiving, and between CPRS conflict and observer ratings of hostility.

Postpartum Maternal Attachment Scale. Three studies used the Postpartum Maternal Attachment Scale (PMAS; Nagata et al., 2000), a measure of maternal attachment to infants. With 19 items, the scale comprises two subscale scores: core maternal attachment, with 11 items (e.g. "*I enjoy interacting with my child*"), and anxiety regarding children, with 8 items (e.g. "*I don't know how to interact with my baby*"). Participants answer using a 4-point Likert scale where *1 = not at all* and *4 = always.*

In development of the scale, Nagata and colleagues (2000) identified two factors to the scale using principal component analysis and varimax rotation, and these factors became the subscales of the measure. They reported good internal consistency for the core maternal attachment subscale (α = .81), and for the anxiety regarding children subscale (α = .80). Nagata and colleagues (2003) reported good internal consistency for the core maternal attachment

subscale (α = .86), but lower internal consistency for the anxiety regarding children subscale (α = .69). In a sample of mothers with children in the Neonatal Intensive Care Unit, Nagata and colleagues (2004) reported good internal consistency for the core maternal attachment subscale (α = .83) and acceptable internal consistency for the anxiety regarding children subscale (α = .79). Content validity of the scale was evaluated individually by two psychologists and one child psychiatrist (Nagata et al., 2000).

How I Feel About My Baby Now. Two studies used the How I Feel About My Baby Now (FAB; Leifer, 1977) scale, a measure of a mother's feelings toward her baby with 10 items (e.g. *"I feel protective towards my baby", "I feel disinterested in my baby"*). Participants respond using a 4-point Likert scale, where *1 = never* and *4 = often*. The scale produces a total maternal affective attachment score ranging from 10 to 40, with items reverse scored such that higher scores indicate a higher level of maternal affective attachment.

Content validity of the measure was reported by Leifer (1997). Mercer and Ferketich (1990) reported lower internal consistency with a sample of women with high risk pregnancies at 1 week (α = .64) and good internal consistency at 8 months (α =.80), and with a sample of women with low risk pregnancies, internal consistency was acceptable at 1 week (α = .70) and at 8 months (α = .77).

Parenting Stress Inventory. A final study used the attachment subscale of the Parenting Stress Inventory (PSI; Abidin, 1983), which measures maternal feelings of closeness with their child. The 11 items of the subscale examine mothers' feelings of connection/disconnection to the child (e.g. *"I expected to have closer and warmer feelings for my child than I do and this bothers me"*, feelings of acceptance/criticisms of the child (e.g. *"my child is not able to do as much as I expected"*), and feelings that interactions with the child are rewarding/unrewarding (e.g. *"my*

child rarely does things that make me feel good"). Higher scores on the measure indicate more feelings of closeness.

The Parenting Stress Inventory is a validated measure that was initially developed based on literature review that was conducted to identify a comprehensive list of dimensions, and clinical experience was used to construct items to assess these dimensions (Burke & Abidin, 1978, as cited in Loyd & Abidin, 1985). Content validity was assessed by a panel of six professionals in the area of early parent-child relationships. For the attachment subscale, Rholes, Simpson, and Blakely (1995) reported acceptable internal consistency ($\alpha = .72$) and found that the 11 items load onto a single factor reflecting maternal feelings of closeness with the child.

Facilitators of Maternal Affective Attachment Bonds

For ease of presentation, the facilitators, covariates and predictors that were examined in each study were labeled and sorted into 9 primary categories. Eleven of the studies examined at least one demographic characteristic of the participant (maternal age, income, education, employment, marital status, number of children). Fifteen of the studies included at least one maternal health variable, and the vast majority (13) of these were focused on maternal depressive symptoms. Fourteen of the studies examined an attachment variable (including the mothers' attachment histories, adult attachment orientations, early affective attachment bonding to the infant or fetus, and the child's attachment to the mother). Five of the studies examined variables that pre-dated the mother's pregnancy, and seven were relevant to the pregnancy or delivery experience. Eleven of the studies explored variables relevant to the child (including demographics, temperament, and health). Twelve studies examined various features of parenting (including parenting stress, maternal sense of competence, perceptions/beliefs, as well as behaviours/orientation, feeding, and sleep issues). Nine studies examined features of the

mothers' partners (including relationship quality, parenting support, and partner's relationship with the child). Finally, seven studies examined other variables (including negative life events, interventions, social desirability, and maternal separation anxiety).

Maternal Demographics

Maternal age. Four of the studies included in this review examined maternal age as a variable linked to maternal affective attachment. Germo, Goldberg, and Keller (2009) found that mother-child closeness was positively correlated with maternal age ($r = .26$, $p < .01$), and Nelson and O'Brien (2012) found that mother-child conflict with a first-born child was negatively correlated with maternal age ($r = -.13$, $p < .05$). However, in the Nelson and O'Brien (2012) study, maternal age was not found to correlate with mother-child closeness with a first-born child, nor with conflict or closeness with a second born child. Nagata and colleagues (2000) found that maternal age was significantly negatively correlated with the anxiety regarding children subscale ($r = -.20$, $p < .001$), but not correlated with the core maternal attachment subscale. Finally, Sierau, Jungmann and Herzberg (2013) found no significant correlations between age and any of the subscales of the maternal postnatal attachment scale: pleasure in interaction, absence of hostility, or quality of attachment. Thus, findings suggest that when aspects of affective attachment bonds differ by maternal age, it is higher maternal age that is associated with more positive outcomes: increases in mother-child closeness, decreases in conflict with a first-born child, and decreases in anxiety about children.

Income. Five of the studies included in this review considered the variable of income. While Yilmaz and colleagues (2011) found that mothers with incomes greater than their expenses reported closer attachments to their children (measured with the MAI; Muller, 1994) than those with expenses greater than their incomes ($t = 2.100$, $p = .039$, Cohen $d = 0.48$), and

Nelson and O'Brien (2012) found significant correlations between the average ratio of income-to-needs and mothers' reports of closeness ($r = .10$, $p < .05$) and conflict ($r = -.20$, $p < .01$) in their relationship with a first born child (measured with the CPRS; Pianta, 1994), they did not find significant correlations between income-to-needs ratios and closeness or conflict in their relationship with a second born child.

Furthermore, when Mercer and Ferketich (1990) used exploratory model respecification to predict mother-infant attachment (measured with the FAB; Leifer, 1977) for high obstetrical risk mothers in the early postpartum period, they found that socioeconomic status uniquely explained 12% of the variance in maternal affective attachment bonds, and a model that included socioeconomic status, parental competence, fetal attachment, and antepartal worry (measured with a 9-item measure from Curry and Snell, 1985; a measure of worry occurring before birth, consisting of nine items designed to capture hospitalization concerns for mothers with high risk infants, including worries like "concern about the baby's wellbeing" and that "something will happen to me") explained a total of 31% of the variance in maternal affective attachment bonds. However, Muller (1996) did not find a significant correlation between income and maternal affective attachment (measured with the MAI; Muller, 1994). In a study by Quinlivan and Evans (2005), social class was not found to be a significant variable in a MANOVA predicting maternal affective attachment bonds (measured with the MPAS; Condon & Corkindale, 1998). Maternal drug use in pregnancy and domestic violence were the only two significant variables in their multivariate analysis.

The findings across these studies suggest that higher incomes are generally associated with more positive outcomes, though when more high maternal risks factors are included in a model, social class does not appear to be significant.

Education. Results from four studies that examined maternal education revealed mixed findings. van Bussel and colleagues (2010) found that women without a post secondary degree had higher scores on the total MPAS compared to women who completed a post secondary degree (t = -2.21, p = .02), indicating stronger attachment in mothers with lower education. Mercer and Ferketich (1994) conducted multiple regressions predicting maternal affective attachment (measured with the FAB; Leifer, 1977) for inexperienced mothers at 8 months. They found significance for mothers' education level (F = 5.07, p = .027, Unique R^2 = .036). Together in a model that also included postpartum complications, intrapartal complications, and mastery, these variables explained 29.5% of the variance in maternal affective attachment bonds. However, Muller (1996) found no significant correlation between years of education and maternal affective attachment (measured with the MAI; Muller, 1996) and found no significance for years of education in a regression analysis to predict maternal affective attachment. Nagata and colleagues (2000) also found no significant correlation between mothers' education level and their core maternal attachment or anxiety regarding children subscale scores (measured with the PMAS; Nagata et al., 2000).

Employment. Maternal employment was considered in three of the included studies, with no significant findings. In ANOVAs conducted to determine whether personal characteristics would influence maternal affective attachment (measured with the MAI; Muller, 1994), Muller (1996) did not find significance for maternal employment. In a multivariate analysis of variance, Quinlivan and Evans (2005) found that mothers' return to work or school was not significantly associated with their maternal affective attachment bond (measured with total scores on the MPAS, Condon & Corkindale, 1998). Nagata and colleagues (2000) found no

significant correlation between mothers' employment status and their core maternal attachment or anxiety regarding children subscale scores (measured with the PMAS; Nagata et al., 2000).

Marital/Partner status. Four of the included studies considered mothers' relationship status or living situation. Nelson and O'Brien (2012) found that the proportion of time that mothers were partnered during the first three years of their baby's life was significantly negatively correlated with their reports of conflict in their relationships with both first born (r = -.15, p < .01) and second born (r = -.13, p < .01) children (measured with CPRS; Pianta, 1994), but did not correlate with their reports of closeness with their first or second born children. In other words, having been with a partner for a greater proportion of time was associated with lower conflict in relationships with children.

Mercer and Ferketich (1990) used respecified models to predict maternal affective attachment bonds (measured with the FAB, Leifer, 1977) for low obstetrical risk mothers in the early postpartum period. They found that a model that included marital status (married or unmarried but planning to parent together with the father), along with anxiety, parental competence, received support, fetal attachment, and relationship with own mother as a child explained 41% of the variance in maternal affective attachment bonds.

Muller (1996) conducted ANOVAs to determine if personal characteristics of mothers would influence maternal affective attachment bonds (measured with the MAI; Muller, 1994) and found that marital status was significant for maternal affective attachment scores, with single women reporting higher maternal affective attachment than mothers living with a partner.

In the only study to examine whether mothers lived in a nuclear family or with extended family, Gharaibeh and Hamlan (2012) conducted a multivariate analysis of variance and found

no significant differences in maternal affective attachment bonds (measured with MAI; Muller, 1994) between mothers who lived with extended family and those who lived in a nuclear family.

Interestingly, while single mothers reported higher attachment to their children, and no difference was found between mothers living with nuclear or extended families, the only adverse outcome (perceptions of conflict with children) was related to a smaller proportion of time with a partner in the first three years of a child's life, suggesting that it may be the transition of a partner in or out of the family, rather than the martial status itself, that contributes to difficulties.

Maternal Mental Health

Depression. Half (13) of the included studies examined the relationship between maternal affective attachment bonds and depressive symptoms in the mother, and results showed strong and consistent support for a relationship between these two variables.

Perry and colleagues (2011) found significant negative correlations between depression in early (r = -.26, p < .0001) and late (r = -.40, p < .0001) pregnancy (measured with the Beck Depression Inventory; BDI-II; Beck, Steer, & Brown, 1996) and maternal affective attachment bonds (measured by the MPAS; Condon & Corkindale, 1998) at 2 months. van Bussel and colleagues (2010) found significant negative correlations between maternal depressive symptoms measured with a Dutch version (Pop, Komproe, & van Son, 1992) of the EPDS; (Cox, Holden, & Sagovsky, 1987) and maternal affective attachment bonds (measured with the total score of the MPAS; Condon & Corkindale, 1998) at 8-12 weeks postpartum (r = -.30, p < .0001) and at 20-25 weeks postpartum (r = -.32, p < .0001). Furthermore, Tikotzky and colleagues (2012) found that depression, measured at 3 months, was significantly negatively correlated with 6 month measures of maternal affective attachment (measured with the total score on the MPAS; Condon & Corkindale, 1998) (r = -.42, p < .005); pleasure in proximity (r = -.36, p < .005);

acceptance/tolerance (r = -.36, p < .005); and competence (r = -.42, p < .005). The relationships were stronger between depression measured at 6 months and attachment measured at 6 months; depression was again significantly negatively correlated with maternal affective attachment (r = -.52, p < .005); pleasure in proximity (r = -.42, p < .005); acceptance/tolerance (r = -.49, p < .005); and competence (r = -.48, p < .005). The consistent relationships indicate that as depression increases, maternal affective attachment decreases.

Nagata and colleagues (2004) found that within the first month after birth, depression (measured with ZSDS; Zung, 1965) was negatively correlated with core maternal attachment subscale scores (measured with the PMAS; Nagata et al., 2000) for mothers whose babies were in the NICU (r = -.27, p < .001), and for control group mothers (r = -.30, p < .001). Depression was also significantly positively correlated with anxiety regarding children subscale scores (measured with the PMAS; Nagata et al., 2000) for NICU mothers (r = .33, p < .001), and for control group mothers (r = .39, p < .001).

Nagata and colleagues (2003) also found that the core maternal attachment subscale (measured with the PMAS; Nagata et al., 2000) in the puerperium, correlated significantly with ‘maternity blues’ (measured with the ZSDS; Zung, 1965) in the puerperium (r = -.30, p < .001), as well as with maternal depression (again measured with the ZSDS; Zung, 1965) at 1 year (r = .32, p < .001). The other subscale of the PMAS, anxiety regarding children, measured in the puerperium correlated with ‘maternity blues’ in the puerperium (r = 86, p < .001) and with maternal depression at 1 year (r = .38, p < .001). There was also a significant relationship between maternal depression at 1 year and both core maternal attachment scores at 1 year (r = -.44, p < .001), and anxiety regarding children scores at 1 year (r = .93, p < .001). However, core maternal attachment scores at 1 year did not correlate significantly with maternity blues in the

puerperium. Using a regression analysis to predict core maternal attachment scores in mothers after 1 year, they found significance for core maternal attachment scores in the puerperium (t = 8.53, $p < .001$) and mothers' depression at 1 year (t = -6.05, $p < .001$). These two variables together explained 42% of the variance in core maternal attachment. Their regression for predicting anxiety regarding children after 1 year found significance for maternity blues in the puerperium (t = 38.34, $p < .001$), explaining 86% of the variance in anxiety regarding children.

When groups of mothers who were depressed were compared with groups of mothers who were not, findings showed better affective attachment outcomes for mothers in the non-depressed groups. Mason and colleagues (2011) found that depressed mothers (with scores above a cut-off of 10 on the EPDS; Cox et al.,1987) had significantly lower affective attachment scores (total scores on the MPAS; Condon & Corkindale, 1998) (M = 79.3) than mothers who were not depressed (M = 87.2), F (1,271) = 45.797, $p < .001$). Wilkinson and Mulcahy (2010) found that depressed mothers (scores above a cutoff of 12 on EPDS; Cox et al., 1987) reported significantly lower levels of maternal affective attachment to their infant (measured by the MAI; Muller, 1994) than did the mothers in the nondepressed group (t = -5.55, $p < .001$).

A study by Quinlivan and Evans (2005) did not find depression (scores above 12 on the EPDS; Cox et al., 1987) to have a significant effect on maternal affective attachment bonds (measured with the MPAS; Condon & Corkindale, 1998) in a MANOVA. This study was unique in the review in that it focused on adolescent mothers. The study also examined domestic violence exposure and drug use during pregnancy. Of the variables included in the MANOVA, the ones that were found to be significant were maternal drug use in pregnancy, domestic violence exposure, and maternal breastfeeding at 6 months.

Perry and colleagues (2011) found that a regression model that included prenatal depression prevention intervention group, depressive symptoms in early and late pregnancy (measured with the BDI-II; Beck et al.,1996), pregnancy intention, and feelings about pregnancy accounted for 25% of variance in maternal affective attachment bonds (measured with the MPAS; Condon & Corkindale, 1998) at 2 months ($F = 5.81$, $p < .001$). The only significant predictor of attachment was depression symptoms later in pregnancy; higher levels of depression in late pregnancy were associated with lower attachment scores at 2 months B(SE) = -.33(.08), $p < .0001$).

Tikotzky and colleagues (2012) conducted multiple regression analyses with the following predictors: infant negative affectivity, depression at 3 and 6 months, total sleep time at 3 and 6 months, and minutes awake at night tending to the infant at 6 months. They found that the regression was able to explain 40.3% of the variance in maternal affective attachment bonds (total scores on the MPAS; Condon & Corkindale, 1998), ($F = 6.19$, $p < .0005$) 44.5% of the variance in the acceptance/tolerance subscale ($F = 7.34$, $p < .0005$), and 23.7% of the variance in the proximity subscale ($F = 2.84$, $p < .05$), however, depression at 3 and 6 months was not a significant variable in any of these models.

Finally, using multiple regressions to predict maternal affective attachment (measured with FAB; Leifer, 1977) for experienced mothers during the postpartal period, Mercer and Ferketich (1994) found significance for depression ($F = 3.99$, $p = .049$, Unique $R^2 = .023$). Furthermore, a model that included depression together with received support, partner relationship, health status, infant health status, perceived support, anxiety, and fetal attachment explained 43.3% of the variance in maternal affective attachment.

Maternal depression, with older children. Only one study, by Germo and colleagues (2009), did not find a significant correlation between the mother-child relationship (measured with CPRS; Pianta, 1994) and maternal depressive symptoms (measured with CES-D; Radloff, 1977). Interestingly, this was one of only two studies that examined the relationship between depression and mother-child closeness to include children older than a year. The children in this study were an average of 55 months of age. Neither mother-child closeness nor depression scores were of primary interest to the study authors - the study was focused on the impact of sleep training on mothers and children. The other study to include mothers of older children (Nelson & O'Brien, 2012) did find a relationship between depressive symptoms (measured with the CES-D; Radloff, 1977) and mother-child relationship quality (measured with CPRS; Pianta, 1994). In a longitudinal study, Nelson and O'Brien (2012) found that maternal depressive symptoms were significantly negatively correlated with closeness in their relationships with first born (r = - .12, $p < .05$), and second born (r = -.12, $p < .05$) 15-year-old children, and significantly positively correlated with conflict in their relationships with first born (r = .21, $p < .01$), and second born (r = .18, $p < .01$) 15-year-old children (measured with CPRS; Pianta, 1994).

Using a path analysis, Nelson and O'Brien (2012) then controlled for mother's proportion of time partnered, age, and average income-to-needs ratio and found that maternal depressive symptoms (measured with the CES-D; Radloff, 1977) were significantly related to perceptions of conflict in parent–adolescent relationships (β = .16, $t(368) = 3.07$, $p < .01$), but were not significantly related to perceptions of closeness in parent-adolescent relationships (measured with the CPRS; Pianta, 1994). Nagata and colleagues (2003) also conducted a path analysis, with depression (measured with the ZSDS; Zung, 1965) as the predictive variable, and found significant path coefficients for both dimensions of maternal affective attachment bonds

(measured with PMAS; Nagata et al., 2000). They found that for every one point rise in depression score there was an increase of .93 in the anxiety regarding children subscale score ($p < .001$) and a lowering of .33 in the core maternal attachment subscale score ($p < .001$). They also found a significant path between depressive symptoms and core maternal attachment score in the puerperium. A lowering by 1 point in core maternal attachment score was found to be associated with a rise in depression in the mother by .25 points ($p < .001$).

In a study of full term infants, Nagata and colleagues (2000) conducted a path analysis with depression (measured with the ZSDS; Zung, 1965) as the predictive variable and two subscales of maternal affective attachment (measured with PMAS; Nagata et al., 2000) as target variables. They found significant path coefficients for the anxiety regarding children subscale ($b = 0.41$, $p < .001$), and the core maternal attachment subscale ($b = - 0.28$, $p < .001$). For every rise by 1 point in depression there was a rise by .41 points in the anxiety regarding children score and a lowering by .28 points in the core maternal attachment score. In a study of mothers of infants admitted to the NICU, Nagata and colleagues (2004) conducted the same path analysis and found significant path coefficients for the anxiety regarding children ($b = 0.30$, $p < .001$), and the core maternal attachment ($b = - 0.17$, $p < .001$) scores. For every rise by 1 point in depression there was a rise by .30 points in the anxiety regarding children score and a lowering by .17 points in the core maternal attachment score. Mercer and Ferketich (1990) found that at 8 months postpartum, depression (measured with CES-D; Radloff, 1977) explained 12% of the variance in maternal affective attachment bonds (FAB; Leifer, 1977) among high obstetrical risk women ($b = -.35$).

In summary, studies that have examined maternal depression indicate overall that as maternal depression severity increases, affective attachment decreases, and longitudinal studies

show that earlier depression correlates with later affective attachment. Mothers who are depressed feel significantly less affectively attached to their babies than mothers who are not depressed.

Anxiety. Only three studies examined anxiety symptoms of the mother. van Bussel and colleagues (2010) found a correlation between maternal affective attachment (measured using the total score of the MPAS; Condon & Corkindale, 1998) and a measure of anxiety (Hospital Anxiety and Depression Scale; HADS-A; Zigmond & Snaith, 1983) at 8-12 weeks postpartum (r = -.40, p < .0001) and again at 20-25 weeks postpartum (r = -.34, p < .0001) such that as anxiety increased, maternal affective attachment decreased. Anxiety was also significantly negatively correlated with the absence of hostility subscale of the MPAS at both 8-12 weeks (r = -.40, p < .0001) and 20-25 weeks postpartum (r = -.39, p < .0001), and with the attachment quality (confidence and satisfaction) subscale of the MPAS at both 8-12 weeks (r = -.45, p < .0001) and 20-25 weeks postpartum (r = -.35, p < .0001). Mercer and Ferketich (1990) found that among low obstetrical risk women, state anxiety (measured with the State-Trait Anxiety Scale; STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) was able to explain 19% of the variance in maternal affective attachment bonds (measured with the FAB; Leifer, 1977) during the early postpartal period *(b* = -.44).

Mercer and Ferketich (1990) used respecified models to predict mother-infant attachment (measured with FAB; Leifer, 1977) in the early postpartum period. They found that for high obstetrical risk mothers, a model that included parental competence, fetal attachment, socioeconomic status, and antepartal worry (measured with a 9-item measure from Curry and Snell, 1985; a measure of worry occurring before birth, consisting of nine items designed to capture hospitalization concerns for mothers with high risk infants, including worries like

"concern about the baby's wellbeing" and that "something will happen to me") explained a total of 31% of the variance in maternal affective attachment bonds. For low obstetrical risk mothers, they found that a model that included anxiety, parental competence, received support, fetal attachment, marital status, and relationship with own mother as a child explained 41% of the variance in maternal affective attachment bonds. At 8 months, 52% of the variance in low obstetrical risk mothers' attachment was explained by a model that included anxiety, parental competence, family functioning, perceived support, time of first holding infant, relationship with own mother as a child, and negative life events. The strongest predictor of attachment at both time periods for low obstetrical risk mothers was anxiety, which accounted for 23% and 18% of the variance, respectively.

Using multiple regressions to predict maternal affective attachment (measured with FAB; Leifer, 1977) for experienced mothers during the postpartal period, Mercer and Ferketich (1994) found significance for anxiety (measured with the STAI; Spielberger et al., 1983) ($F = 5.45$, $p = .022$, Unique $R^2 = .033$). Furthermore, a model that included anxiety together with received support, partner relationship, health status, infant health status, perceived support, fetal attachment, and depression explained 43.3% of the variance in maternal affective attachment bonds. For inexperienced mothers during the postpartal period, they found significance for anxiety ($F = 23.66$, $p = .0001$, Unique $R^2 = .147$), and 37.6% of the variance in maternal affective attachment bonds was explained by a model that included anxiety along with fetal attachment, postpartum complications, infant birth weight, mastery, and negative life events. For inexperienced mothers at 4 months, they found significance for anxiety ($F = 11.59$, $p = .001$, Unique $R^2 = .092$), and a model that included anxiety and fetal attachment explained 13.2% of the variance in maternal affective attachment bonds.

In summary, it seems that anxiety in the postpartum, for experienced and inexperienced mothers, associates negatively with maternal affective attachment. For mothers with high obstetrical risk, variance in the bond can be explained by models that include worry before birth, while for mothers with low risk, variance in the bond is explained models that include state anxiety.

Post-Traumatic Stress Disorder. One study by Davies and colleagues (2008) found significant correlations between maternal affective attachment (subscales of the MPAS; Condon & Corkindale, 1998) and PTSD symptoms (PTSDQ; Watson, Juba, Manifold, Kucala, & Anderson, 1991). Quality of attachment was found to be correlated with PTSD Re-experiencing ($r = .26$, $p < .01$), PTSD Avoidance ($r = .40$, $p < .01$), PTSD Increased arousal ($r = .36$, $p < .01$), and PTSD Total stress ($r = .41$, $p < .01$). Attachment quality scores in this study had been reflected to correct for negative skew, therefore these relationships indicate that as PTSD symptoms increased, maternal affective attachment bond quality decreased. They also found significant correlations between MPAS Absence of Hostility and PTSD Re-experiencing ($r = .24$, $p < .01$), PTSD Avoidance ($r = .43$, $p < .01$), PTSD Increased arousal ($r = .39$, $p < .01$), and PTSD Total stress ($r = .43$, $p < .01$). This indicates that as PTSD symptoms increased, maternal hostility increased. Finally, they found significant correlations between MPAS Pleasure in interaction and PTSD Avoidance ($r = .20$, $p < .01$), PTSD Increased arousal ($r = .15$, $p < .01$), and PTSD Total stress ($r = .18$, $p < .01$), but not PTSD Re-experiencing ($r = .09$, $p > .05$). Revealing that as most PTSD symptoms increased, maternal pleasure in interaction decreased. Furthermore, when they sorted the mothers into groups of fully, partially, or non-symptomatic for PTSD, they found significant differences between groups on quality of attachment (F (2, 208)

= 14.57, $p < .0001$), absence of hostility (F (2, 208) = 16.55, $p < .0001$), and pleasure in interaction (F (2, 208) = 4.63, $p < .05$).

Other psychological factors. Three studies included mothers' personal history of psychological problems as co-variables. Rholes and colleagues (1995) found significant zero-order correlations between mothers' reports of closeness to child (measured with a subscale of the PSI; Abidin, 1983) and their psychological distress (measured with a combination of scores on the Daily Hassles Scale; Kanner, Coyne, Schaefer, & Lazarus, 1981, and the CES-D; Radloff, 1977) (r = -.39, $p < .01$), such that as maternal distress increased, maternal perceptions of closeness to children decreased. However, Quinlivan and Evans (2005) did not find significance for psychological history of the mother in a MANOVA they conducted.

In the only study to examine mothers' levels of experiential avoidance (measured with the Acceptance and Action Questionnaire; AAQ; Hayes et al., 2004), Evans and colleagues (2012) found that as experiential avoidance increased, maternal affective attachment (measured with the MPAS; Condon & Corkindale, 1998) decreased (r = -.39, $p < .001$). Using a hierarchical multiple regression, they found that the combined effects of experiential avoidance, relationship satisfaction, prenatal expectations compared to postnatal experience, and postpartum support accounted for a significant 21% of variance in maternal affective attachment bonds F (5, 121) = 6.59, $p < .001$.

It seems that as distress and avoidance increase, maternal affective attachment decreases. However, psychological history does not seem to play a significant role.

Maternal physical health. In the only study to include maternal health as a variable, Mercer and Ferketich (1994) conducted multiple regressions predicting maternal affective attachment (measured with the FAB scale; Leifer, 1977) for experienced mothers during the

postpartal period. They found significance for health status ($F = 6.42$, $p = .013$, Unique $R^2 = .045$). A model that included maternal health along with received support, partner relationship, infant health status, perceived support, anxiety, fetal attachment, and depression explained 43.3% of the variance in maternal affective attachment.

Attachment Variables

Mother's childhood attachment. Four studies examined mothers' relationships with their own mothers as co-variables. Yilmaz and colleagues (2011) found that mothers who perceived their relationships with their own mothers as good (measured with a single question: "How would you describe your relationship with your own mother?" Participants were asked to mark 'good', 'mild', or 'poor') had higher scores on the Maternal Attachment Inventory (MAI; Muller, 1994) than those who felt their relationships with their own mothers were poor to mild ($t = 2.623$, $p = .011$, Cohen's $d = 0.60$). Meanwhile, van Bussel and colleagues (2010) found that maternal affective attachment (measured by the MPAS; Condon & Corkindale, 1998) at 8-12 weeks was correlated with their recollections of the level of overprotection of their own mother (measured with the Parental Bonding Inventory; PBI; Parker, Tupling, & Brown, 1979) ($r = .21$, $p < .001$). However, maternal affective attachment was not significantly correlated with their recollections of maternal care (or with paternal overprotection or paternal care). Furthermore, at 20-25 weeks, maternal affective attachment was no longer significantly correlated with any of the above-mentioned factors.

Mercer and Ferketich (1990) used respecified models to predict mother-infant attachment (measured with FAB; Leifer, 1977) for low obstetrical risk mothers in the early postpartum period. They found that a model that included anxiety, parental competence, received support, fetal attachment, marital status, and relationship with own mother as a child explained 41% of

the variance in maternal affective attachment bonds. At 8 months, 52% of the variance in mothers' attachment was explained by a model that included anxiety, parental competence, family functioning, perceived support, time of first holding infant, relationship with own mother as a child, and negative life events. The strongest predictor of attachment at both time periods for low obstetrical risk mothers was anxiety, which accounted for 23% and 18% of the variance, respectively.

Mercer and Ferketich (1994) conducted multiple regressions predicting maternal affective attachment (measured with FAB; Leifer, 1977) for experienced mothers at 4 months. They found significance for the mothers' relationship with her own mother as a child ($F = 6.37$, $p = .014$, $R^2 = .057$), and 6.3% of the variance in maternal affective attachment bonds was explained by a model that included mothers' relationship with her own mother as a child, self-esteem, and pregnancy risk.

In summary, the limited findings in this area suggest that mothers' affective attachment outcomes are associated with positive recalled relationships with their own mothers in childhood. For a period of time early in motherhood, recalled over-protective mothering is also associated with affective attachment.

Fetal attachment. Maternal fetal attachment, also known as prenatal attachment, refers to the unique affectionate relationship that a mother develops with her fetus in the womb during pregnancy (Muller, 1993). Three studies looked at relations between maternal fetal attachment during pregnancy and maternal affective attachment bonds to the infant after birth. van Bussel and colleagues (2010) found that maternal affective attachment scores (measured with the total score of the MPAS; Condon & Corkindale. 1998) at 8-12 weeks postpartum was significantly correlated with earlier scores on the Maternal Antenatal Attachment Scale (MAAS, Condon

1993) measured when mothers were between 8 and 15 weeks pregnant ($r = .39$, $p < .0001$), between 20 and 25 weeks pregnant ($r = .40$, $p < .0001$), and between 30 and 36 weeks pregnant ($r = .38$, $p < .0001$). Maternal affective attachment (MPAS total scores) at 20-25 weeks postpartum was also significantly correlated with fetal attachment (MAAS scores) measured when mothers were between 8 and 15 weeks pregnant ($r = .39$, $p < .0001$), between 20 and 26 weeks pregnant ($r = .49$, $p < .0001$), and between 30 and 36 weeks pregnant ($r = .46$, $p < .0001$). Muller (1996) also found a moderate correlation ($r = .41$, $p < .001$) between prenatal attachment (measured with the PAI; Muller, 1993) and maternal affective attachment (measured with the MAI; Muller, 1994). Furthermore, a regression analysis identified that prenatal attachment explained 17% ($R^2 = .17$) of the variance in maternal affective attachment bonds after birth.

Mercer and Ferketich (1990) used respecified models to predict mother-infant attachment (measured with FAB; Leifer, 1977) for high obstetrical risk mothers in the early postpartum period. They found that a model that included parental competence, fetal attachment (measured with the Fetal Attachment Scale; FAS; Cranley, 1981), socioeconomic status, and antepartal worry explained a total of 31% of the variance in maternal affective attachment bonds. For low obstetrical risk mothers in the early postpartum period, they found that a model that included anxiety, parental competence, received support, fetal attachment, marital status, and relationship with own mother as a child explained 41% of the variance in maternal affective attachment. For low obstetrical risk mothers at 8 months, 52% of the variance in mothers' attachment was explained by a model that included anxiety, parental competence, family functioning, perceived support, time of first holding infant, relationship with own mother as a child, and negative life events.

Mercer and Ferketich (1994) conducted multiple regressions to predict maternal affective attachment (measured with FAB; Leifer, 1977). For experienced mothers during the postpartal period, they found significance for fetal attachment ($F = 5.69$, $p = .019$, Unique $R^2 = .033$), 43.4% of the variance in maternal affective attachment bonds was explained by a model that included fetal attachment along with received support, partner relationship, health status, infant health status, perceived support, and anxiety. For inexperienced mothers during the postpartal period, they found significance for fetal attachment ($F = 19.25$, $p = .0001$, Unique $R^2 = .106$), 37.6% of the variance in maternal affective attachment was explained by a model that included fetal attachment along with anxiety, postpartum complications, infant birth weight, mastery, and negative life events. For inexperienced mothers at 1 month, they found significance for fetal attachment ($F = 10.64$, $p = .001$, Unique $R^2 = .070$), which, together in a model with mastery and infant birth health, explained 23.9% of the variance in maternal affective attachment bonds. For inexperienced mothers at 4 months, they found significance for fetal attachment ($F = 5.34$, $p = .023$, Unique $R^2 = .040$), which together with anxiety explained 13.2% of the variance in maternal affective attachment bonds.

These limited findings suggest that maternal affective attachment in the 3rd and 5th months of motherhood can be predicted by maternal prenatal attachment during pregnancy at three different time periods. Furthermore, prenatal attachment has been included in models that significantly predicted affective attachment after birth.

Earlier measures of maternal affective attachment bonds. Two studies included in this review examined relationships between maternal affective attachment measured early (first few days or weeks of their child's life) and again later. Nagata and colleagues (2003) examined the relationship between two dimensions of maternal affective attachment bonds (measured with

the PMAS; Nagata et al., 2000) in the puerperium and at 1 year of infant age. They found that scores on the core maternal attachment subscale in the puerperium correlated positively with core maternal attachment at 1 year ($r = .55$, $p < .001$), and correlated negatively with the anxiety regarding children subscale at 1 year ($r = -.29$, $p < .001$). They also found that anxiety regarding children scores in the puerperium correlated negatively with core maternal attachment scores at 1 year ($r = -.20$, $p < .01$), and correlated positively with anxiety regarding children scores at 1 year ($r = .36$, $p < .001$). Mothers scored significantly lower on core maternal attachment measured at 1 year postpartum compared to the same measure in the puerperium ($t = 4.03$, $p < .01$). However, there was no significant difference in anxiety regarding children measured at 1 year as compared to the measure in the puerperium. Using a regression analysis to predict core maternal attachment scores in mothers after 1 year, they found significance for core maternal attachment in the puerperium ($t = 8.53$, $p < .001$) and mothers' depression at 1 year ($t = -6.05$, $p < .001$). These two variables together explained 42% of the variance in core maternal attachment scores. Finally, a significant path was found between core maternal attachment scores in the puerperium and at 1 year. For every one-point rise in core maternal attachment scores in the puerperium, there was found to be an associated rise by .46 in core maternal attachment scores at 1 year.

van Bussel and colleagues (2010) found a significant positive correlation between maternal affective attachment (measured by the MPAS; Condon & Corkindale, 1998) measured between 8 and 12 weeks postpartum and measured between 20-25 weeks postpartum ($r = .57$. $p < .0001$). There was no significant difference between the first and second measure of affective attachment ($t = .16$, $p = .87$).

Child attachment to mother. Two studies explored relationships between children's attachment and maternal affective attachment to their children. Holland and McElwain (2013)

found that child-mother attachment security (measured with a modified Strange Situation procedure; Cassidy & Marvin, 1992) was significantly correlated with mother-son relationship quality (measured with CPRS Pianta, 1994) ($r = .26$, $p < .05$), but not with mother-daughter relationship quality ($r = .02$, $p > .05$) with toddlers aged 31-35 months. These limited findings raise interesting questions about whether child's attachment relates differently to mothers' affective attachment based on child gender. More research would be needed to further explore this interesting finding.

In a study of parents of children with autism spectrum disorders, Goodman and Glenwick (2012) found no significant correlation between maternal affective attachment bonds to their children (measured with MPAS; Condon & Corkindale, 1998) and their perceptions of their child's attachment to them (measured with the Maternal Perception of Child Attachment scale; MPCA; Hoppes & Harris 1990).

Adult attachment orientation. A total of five studies examined adult attachment orientation as a variable. In two studies, researchers explored relationships between mothers' adult romantic attachment patterns (measured with the Relationship Questionnaire (Bartholomew and Horowitz, 1991) and their attachment to their children. van Bussel and colleagues (2010) found that maternal affective attachment (measured with total scores on the MPAS, Condon & Corkindale, 1998) between 8 and 12 weeks postpartum was significantly positively correlated with secure adult attachment ($r = .13$, $p < .05$), and significantly negatively correlated with dismissing adult attachment ($r = -.16$, $p < .05$), but not significantly correlated with fearful or preoccupied adult attachment. Maternal affective attachment (measured with total scores on the MPAS; Condon & Corkindale, 1998) at 20 to 25 weeks postpartum was also significantly positively correlated with secure adult attachment ($r = .17$, $p < .05$), and significantly negatively

correlated with dismissing adult attachment (r = -.17, p < .05), but not significantly correlated with fearful or preoccupied adult attachment. Wilkinson and Mulcahy (2010) found that maternal affective attachment bonds (measured with the MAI; Muller, 1994) differed significantly across adult attachment orientations (F (3, 111) = 2.847, p < .05, n^2 = .071). Mothers with fearful and preoccupied attachment styles reported significantly lower levels of mother-infant affective attachment t = 2.624, p < .05, n^2 = .071) compared to mothers with secure and dismissing styles. It appears that while fearful and preoccupied attachment orientation does not correlate with maternal affective attachment for new mothers, the mothers with fearful and preoccupied styles report lower affective attachment than mothers with secure and dismissing styles.

Three studies examined the relationships between dimensions of adult attachment and mothers' affective attachment to children. Sen and Kavlak (2012) found significant negative correlations between maternal affective attachment (measured with the MAI; Muller, 1994) and both the adult attachment dimension of anxiety (r = -.321, p < .05) and avoidance (r = -.281, p < .05) as measured with the Experiences in Close Relationships (ECR; Brennan, Clark, and Shaver, 1998). This suggests that as adult romantic attachment anxiety and avoidance increase, maternal affective attachment to children decreases. Sierau and colleagues (2013) found a significant negative association between romantic attachment avoidance (measured with the Adult Attachment Scale; AAS; Collins & Read, 1990, which combines reverse scored dimensions of comfort with closeness and comfort with dependency to determine a score for avoidance) and postnatal maternal affective attachment (measured with the MPAS; Condon & Corkindale, 1998) (β = -.36, p < .01). They also found that quality of affective attachment (measured with a subscale of the MPAS; Condon & Corkindale, 1998) was significantly positively correlated with the romantic attachment avoidance subdimension of comfort with

closeness ($r = .32$, $p < .01$) but not comfort with depending on others. Neither the closeness nor the dependency dimensions of adult attachment were found to correlate with the pleasure in interaction or absence of hostility subscales of the MPAS. This suggests that the negative association between affective attachment and the avoidance dimension in adult attachment may have to do with the positive relationship between mothers' comfort with closeness and the quality of their affective attachment.

Similarly, Rholes and colleagues (1995) found that mothers' reports of affective attachment closeness to child (measured with a subscale of the PSI; Abidin, 1983) were significantly negatively correlated with their adult attachment avoidance ($r = -.61$, $p < .01$), but not significantly correlated with their romantic attachment anxiety/ambivalence (measured with the Attachment Style Measure; ASM; Simpson, 1990). It seems that as level of attachment avoidance increases, mothers report less closeness with their children. To further examine this relationship they performed a hierarchical regression, entering marital quality first, then mothers' avoidance scores, and finally an interaction of marital quality and avoidance. They found that avoidance scores were strongly associated with maternal affective attachment closeness ratings (F (1, 40) = 22.94, $p < .001$), with more avoidant mothers reporting less maternal affective attachment closeness. Avoidance accounted for 37% of the variance in maternal affective attachment closeness, the other two variables did not account for significant variance. A second hierarchical regression was then conducted, replacing marital quality with the distress index. They found that distress was significantly related to maternal affective attachment closeness (F (1, 41) = 7.18, $p < .05$). Higher distress levels were associated with lower maternal affective attachment closeness to the child, accounting for 15% of the variance in closeness. Avoidance was also found to significantly predict affective attachment closeness (F (1, 40) = 17.14, $p <$

.001) accounting for another 25% of the variance in closeness above that accounted for by distress. It appears romantic attachment avoidance is a key variable, with a more significant relationship to maternal affective attachment closeness than marital quality or maternal distress.

To examine the relationship between maternal affective attachment bonds to children and level of anxious ambivalence in adult attachment, Rholes and colleagues (1995) performed another hierarchical regression, entering marital quality first, then mothers' anxious-ambivalence scores, and finally an interaction of marital quality and anxious-ambivalence. They found significance for an interaction between anxious-ambivalence and marital quality (F (1, 39) = 4.84, $p < .05$), which accounted for 11% of the variance in affective attachment closeness, indicating that when their marriages were more positive, mothers low in ambivalence reported more affective attachment closeness with their children, while more highly ambivalent mothers reported less affective attachment closeness to their children. A final hierarchical regression was then conducted, replacing marital quality with the distress index. They found that distress was significantly related to affective attachment closeness (F (1, 41) = 7.18, $p < .05$), accounting for 15% of the variance in closeness. They also found a significant interaction between distress and ambivalence, (F (1, 39) = 4.24, $p < .05$) accounting for another 8% of the variance in closeness. However, anxious ambivalence did not uniquely explain a significant portion of variance in maternal affective attachment closeness.

In summary, it seems maternal affective attachment has a clear relationship with romantic attachment avoidance and, in particular the dimension of attachment avoidance that has to do with comfort with closeness. Romantic attachment anxiety, on the other hand, seems to have a more complex relationship with maternal affective attachment, with some studies finding a negative correlation, and some finding no correlation. A study that examined interaction effects

provides possible explanation for these mixed findings, showing that anxious ambivalence interacts with marital quality and distress levels.

Maternal affective attachment subscales. Three studies examined inter-relations between two domains of maternal affective attachment. Nelson and O'Brien (2012) found significant negative correlations between mothers' perceptions of closeness and conflict in relationships with their firstborn (r = -.48, p < .01) and second-born (r = -.49, p < .01) children (measured with the CPRS, Pianta, 1994). Thus it appears that from the mother's perspective, as conflict increases, closeness decreases. Similarly, Nagata and colleagues (2003) found a negative correlation between the core maternal attachment subscale at 1 year and the anxiety regarding children subscale at 1 year (r = -.47, p < .001) (measured with the PMAS; Nagata et al., 2000).

Nagata and colleagues (2004) found that, while the core maternal attachment subscale was significantly negatively correlated with the anxiety regarding children subscale for control group mothers (r = -.12, p < .01) (measured with the PMAS; Nagata et al., 2000), no significant relationships were found between the core maternal attachment and anxiety regarding children subscales for mothers with infants admitted to the NICU (r = .09, p > .05). This suggests the possibility that having an infant admitted to intensive care may be associated with changes in the relationship between these two affective attachment subscales.

Pre-Pregnancy Factors

Five studies explored factors that pre-dated the pregnancies of their participants. For example, van Bussel and colleagues (2010) found that women with a previous miscarriage reported significantly lower maternal affective attachment (measured with total scores on the MPAS; Condon & Corkindale, 1998) than those with no history of miscarriage (t = 2.40, p = .02). Chen and colleagues (2011) found that infertility treated pregnant women had higher

maternal affective attachment (measured with MAI; Muller, 1994) than did the naturally pregnant women (t (108) = 2.79, $p < .05$). Furthermore, pregnancy mode (naturally pregnant or infertility treated) was found to be a main effect of maternal affective attachment (F (1, 366.47) = 8.20, $p < .05$), accounting for 10.2% of the variance in maternal affective attachment.

With regards to the relationship between pregnancy planning and maternal affective attachment bonds, the results were mixed. In a study by Nelson and O'Brien, pregnancy planning was found to negatively correlate with conflict (measured with the CPRS; Pianta, 1994) in their relationship with a first-born child (r = -.10, $p < .05$), but not with a second born child. In other words, mothers who had not planned their pregnancy with their first-born child reported higher conflict with that child when they reached adolescence than did mothers who had planned their first pregnancy. There was no correlation between pregnancy planning and perceptions of closeness in their relationships with first or second born children. In a group of first-time mothers, Gharaibeh and Hamlan (2012) found no significant differences in maternal affective attachment (measured with the MAI; Muller, 1994) between the mothers who had planned their pregnancy and those who had not. Perry and colleagues (2011) asked participants to report whether: a) their pregnancy had been planned, b) they intended to get pregnant but not at the present time, or c) they did not intend a pregnancy at any time. They found that affective attachment scores at 2 months (measured with the MPAS; Condon & Corkindale, 1998) did not significantly vary based on pregnancy intendedness. However, there was a linear relationship such that planned pregnancies were associated with highest levels of affective attachment, followed by mistimed pregnancies which were associated with lower levels of affective attachment, and unplanned pregnancies which were associated with the lowest levels of affective attachment. A regression model that included prenatal depression prevention intervention group,

depressive symptoms in early and late pregnancy, pregnancy intention, and feelings about pregnancy accounted for 25% of variance in maternal affective attachment at 2 months ($F = 5.81$, $p < .001$). The only significant predictors of affective attachment were depression symptoms later in pregnancy; however, pregnancy intention was marginally significant in this model ($p = .05$).

In summary, findings are mixed with regards to pregnancy planning, with one study finding no relationship, one finding marginal significance in a prediction model, one showing trends in expected directions, and one finding that unplanned first pregnancies are associated with increased conflict with eldest children in adolescence. This finding did not emerge for second born children however, and there were no significant correlations between pregnancy planning and closeness with first or second born children.

Pregnancy Factors

Feelings about pregnancy. Three studies considered prenatal feelings about the pregnancy as variables of interest. While Nagata and colleagues (2000) found no significant correlations between the core maternal attachment or anxiety regarding children subscales (measured with the PMAS; Nagata et al., 2000) and mothers' feelings on learning of pregnancy in a sample of mothers of full term infants, Nagata and colleagues (2004) found that for mothers with infants in the NICU, but not for mothers in the control group, mothers' positive feelings when learning of their pregnancy were significantly positively correlated with scores on the core maternal attachment subscale ($r = .26$, $p < .001$), and significantly negatively correlated with scores on the anxiety regarding children subscale ($r = -.14$, $p < .01$) in the early postpartum. These findings suggest that positive feelings when learning they were pregnant may be more important to mothers with infants in the NICU than to mothers with infants born full term.

Perry and colleagues (2011) found statistically significant differences in maternal affective attachment bonds (measured with the MPAS; Condon & Corkindale, 1998) based on feelings about the pregnancy reported in the second trimester, with mothers who felt happiest about their pregnancies reporting highest affective attachment to their infant. A regression model that included prenatal depression prevention intervention group, depressive symptoms in early and late pregnancy, pregnancy intention, and feelings about pregnancy accounted for 25% of variance in maternal affective attachment bonds at 2 months ($F = 5.81$, $p < .001$).

Nagata and colleagues (2000) found that fathers' reactions to the pregnancy were correlated with mothers' scores on the core maternal attachment subscale ($r = .15$, $p < .01$) in the postpartum. Path analysis revealed that a lowering by 1 point in fathers' reaction when learning of pregnancy (i.e. a more negative response) resulted in a lowering by .12 points in mothers' core maternal attachment scores. Nagata and colleagues (2004) also found that fathers' reactions to the pregnancy were correlated with core maternal attachment scores for mothers with infants in the NICU ($r = .35$, $p < .001$), and for control group mothers ($r = .15$, $p < .01$). Path analysis revealed that a lowering by 1 point in fathers' reaction when learning of pregnancy resulted in a lowering by .31 points in mothers' core maternal attachment scores.

It seems that both the feelings mothers have about their pregnancy, and the reactions of their partners when learning of their pregnancy, play a role in mothers' affective attachment in the postpartum.

Pregnancy/delivery experience. In six studies, researchers examined mothers' experiences of pregnancy and delivery. Yilmaz and colleagues (2011) found that mothers who had problems during pregnancy reported significantly lower maternal affective attachment (measured with the MAI; Muller, 1994) than those who reported no problems in pregnancy ($t =$

2.286, $p = .028$, Cohen $d = 0.59$). Gharaibeh and Hamlan (2012) also found significant differences in maternal affective attachment bonds (measured with the MAI; Muller, 1994) according to the mothers' perceptions of the pregnancy and childbirth experience ($F = 2.32$, $p < .05$). Post hoc tests found significantly higher mean attachment scores for mothers who reported a very good pregnancy and delivery experience than for mothers who reported a poor pregnancy experience. In a stepwise regression analysis, they found that maternal self-efficacy, mothers' perceptions of their marital relationships after the birth of their infants, and mothers' perceptions of their pregnancy and delivery experience significantly predicted mothers' maternal affective attachment ($F = 34.23$, $p < .0001$) together explaining 33% of variance in maternal affective attachment bonds (adjusted $R^2 = .33$, $p < .001$).

Evans and colleagues (2012) found that maternal affective attachment (measured with the MPAS; Condon & Corkindale, 1998) correlated with a measure of the difference between prenatal expectations and the actual postnatal experience ($r = -.28$, $p < .05$) (higher discrepancies between expectations and experiences were related to lower affective attachment), but not with the level of postpartum support received. Using a hierarchical multiple regression, they found that the combined effects of experiential avoidance, relationship satisfaction, prenatal expectations compared to postnatal experience, and postpartum support accounted for a significant 21% of variance in maternal affective attachment bonds (F (5, 121) = 6.59, $p < .001$).

Yilmaz and colleagues (2011) did not find a significant difference between the maternal affective attachment bonds (measured by the MAI; Muller, 1994) of mothers who held their baby within an hour of delivery and mothers who waited longer than an hour to hold their baby. Nagata and colleagues (2000) did not find significant correlations between the core maternal attachment, or the anxiety regarding children subscale scores (measured with the PMAS; Nagata

et al., 2000) and mode of delivery or problems in gestational period in a sample of mothers of full term healthy infants.

In a longitudinal study of new mothers, Mercer and Ferketich (1990) found that in the early postpartum period, mothers who were considered high obstetrical risk scored significantly higher on affective attachment (measured with FAB, Leifer, 1977) than mothers who were considered low obstetrical risk (t (299) = 2.28, p = .02). However, by 8 months postpartum, high obstetrical risk mothers scored only somewhat higher than low obstetrical risk mothers on maternal affective attachment, and the difference was no longer significant, indicating that differences between mothers based on risk decreased over time.

Mercer and Ferketich (1994) conducted multiple regressions predicting maternal affective attachment (measured with FAB, Leifer, 1977). For experienced mothers at 1 month, they found significance for labour and delivery experience (F = 4.34, p = .040, Unique R^2 = .035), which, in a model together with partner relationship, infant birth weight, and received support, explained 23.2% of the variance in maternal affective attachment bonds. For experienced mothers at 4 months, they found significance for pregnancy risk (F = 4.36, p = .040, Unique R^2 = .042), and 26.3% of the variance in maternal affective attachment was explained by a model that included pregnancy risk along with self esteem and the mothers relationship with her own mother as a child. For experienced mothers at 8 months, they found significance for postpartum complications (F = 6.52, p = .013, Unique R^2 = .053), which, together in a model with self-esteem, infant birth weight, and negative life events, explained 43.1% of the variance in maternal affective attachment bonds. For inexperienced mothers during the postpartal period, they found significance for postpartum complications (F = 6.95, p = .009, Unique R^2 = .037). A model that included postpartum complications along with anxiety, fetal attachment, infant birth

weight, mastery, and negative life events explained a total of 37.6% of the variance in maternal affective attachment bonds. For inexperienced mothers at 8 months, they found significance for postpartum complications ($F = 17.03$, $p = .0001$, Unique $R^2 = .143$) and intrapartal complications ($F = 9.35$, $p = .003$, Unique $R^2 = .073$), which, together in a model with mastery and education level, explained 29.5% of the variance in maternal affective attachment bonds.

Mercer and Ferketich (1990) then used respecified models to predict mother-infant attachment (measured with the FAB; Leifer, 1977) for high obstetrical risk mothers at 8 months. They found that 29% of the variance in mothers' affective attachment was explained by a model that included parental competence and pregnancy risk. The strongest predictor of affective attachment at both time periods was parental competence, which accounted for 16% and 20% of the variance, respectively. For mother-infant affective attachment for low obstetrical risk mothers at 8 months, they found that 52% of the variance in mothers' attachment was explained by a model that included anxiety, parental competence, family functioning, perceived support, time of first holding infant, relationship with own mother as a child, and negative life events.

It would seem that lower affective attachment is associated with problems during pregnancy, perceptions of the pregnancy and delivery experience, as well as discrepancies between expectations before birth and actual experiences postpartum. For first time mothers, postpartum complications significantly predict affective attachment in the postpartum and at 8 months, while for experienced mothers different aspects of the pregnancy, labour, and delivery experience predict affective attachment at different time periods. Finally, mothers with high obstetrical risk report higher affective attachment initially, though this difference reduced over time and is no longer significant by 8 months.

Characteristics of the Infant/Child

Birth order. Three studies included variables related to the birth order of the focal child and findings were mixed. Nagata and colleagues (2004) found that birth order was significantly negatively correlated with anxiety regarding children subscale scores (measured with the PMAS; Nagata et al., 2000), for mothers with infants in the NICU ($r = -.35$, $p < .001$) and for control group mothers ($r = -.40$, $p < .001$). In other words, mothers of first-born children reported higher levels of anxiety in relationships with those children than did mothers of second or third born children. Path analysis also revealed that a lowering by 1 point in birth order resulted in a rise in the anxiety regarding children score by .31 points. Birth order was not, however, found to correlate significantly with the core maternal attachment subscale of the measure. Similarly, Mercer and Ferketich (1994) did not find any significant differences between the maternal affective attachment bonds (measured with the FAB, Leifer, 1977) of experienced and inexperienced mothers during the postpartum hospitalization, at 1 month, 4 months, or 8 months. However, van Bussel and colleagues (2010) found higher maternal affective attachment (measured with total scores on MPAS; Condon & Corkindale, 1998) for primiparous than for multiparous mothers, ($t = 3.83$, $p < .0001$) indicating that mothers of first-born children were reporting more affective attachment than mothers of second- or third-born children.

Gender. Three studies examined child gender as a variable, all finding no differences by child gender. Sierau and colleagues (2013) found no significant relationship between child gender and mothers' pleasure in interaction, absence of hostility, or quality of attachment (measured with the MPAS; Condon & Corkindale, 1998). Gharaibeh and Hamlan (2012) found that mothers did not differ significantly in their maternal affective attachment bonds (measured with MAI, Muller 1994) based on the gender of their infant. Finally, in a MANOVA conducted

by Quinlivan and Evans (2005), infant sex was not found to be a significant factor associated with mothers' affective attachment scores (measured with the MPAS; Condon & Corkindale, 1998).

Age. In the only study to examine child age as a variable, Gharaibeh and Hamlan (2012) found no significant differences in maternal affective attachment bonds (measured with the MAI, Muller, 1994) between mothers of infants younger than 4 months compared to mothers of infants older than 4 months of age.

Infant/child socio-emotional characteristics. Four of the studies examined issues related to infant temperament, emotions, and other characteristics. Germo and colleagues (2009) found that mother-child affective attachment closeness (measured with the CPRS; Pianta, 1994) was significantly negatively correlated with recalled infant temperament ($r = -0.25$, $p < .05$) and significantly positively correlated with child independence ($r = .26$, $p < .01$). Mothers' recall of her infant's temperament at 12 months of age was measured with the Pictorial Assessment of Temperament (PAT): Toddler version (Clarke-Stewart, Fitzpatrick, Allhusen, & Goldberg, 2000). Mason and colleagues (2011) found a significant negative correlation between maternal affective attachment bonds (measured with the MPAS; Condon & Corkindale, 1998) and mothers' reports of concerns with their children's social emotional development ($r = -.24$, $p < .001$), such that higher concern about children's development was associated with lower maternal affective attachment.

Mason and colleagues (2011) found a significant negative correlation ($r = -.385$, $p < .001$) between dissatisfaction with interactions with their child (measured with the Parent-child Dysfunctional Interaction subscale of the Parenting Stress Index-Short Form; PSI-SF; Abidin,

1995) and maternal affective attachment (measured with the MPAS; Condon & Corkindale, 1998).

Finally, (Tikotzky and colleagues (2012) found significant correlations between infant negative affectivity and maternal affective attachment bonds (measured with the MPAS; Condon & Corkindale, 1998). Higher scores on infant negativity were found to be associated with lower maternal affective attachment scores on the total scale (r = -.45, p < .0005), on the acceptance/tolerance subscale (r = -.44, p < .0005), on the proximity subscale (r = -.34, p < .01) and on the competence subscale (r = -.41, p < .001). They conducted multiple regression analyses with the following predictors: infant negative affectivity, depression at 3 and 6 months, total sleep time at 3 and 6 months, and minutes awake at night tending to the infant at 6 months. They found that this regression was able to explain 40.3% of the variance in maternal affective attachment bonds (total scores on the MPAS; Condon & Corkindale, 1998), (F = 6.19, p < .0005) with three significant variables: infant negative affectivity (β = -.29, p < .05), total sleep time at 3 months (β = .28, p < .05), and time awake attending to the infant at night at 6 months (β = -.27, p < .05). The same model accounted for a total of 44.5% of the variance in the acceptance/tolerance subscale (F = 7.34, p < .0005) with the same three significant variables: negative affectivity score at 6 months (β = -.33, p < .01), total sleep time at 3 months (β = .30, p < .05), and time awake attending to the infant at night at 6 months (β = -.31, p < .05). Finally, the same model was able to explain 23.7% of the variance in the proximity subscale (F = 2.84, p < .05), however none of the variables on their own were significant.

In summary, it seems maternal affective attachment is lower when mothers perceive their infants to have difficult temperament or negative affectivity, or when mothers have concerns about their infant's social-emotional development. Of course, the association could operate in

either direction; it could be that mothers feel less attached when their child has more difficult characteristics, or that a mother who is less attached will be more critical in her report of the child's characteristics.

Infant/child health. Infant health variables were considered across four of the included studies. Evans and colleagues (2012) found no significant correlation between maternal affective attachment bonds (measured with the MPAS; Condon & Corkindale, 1998) and infant birth weight. Yilmaz and colleagues (2011) found that maternal affective attachment (measured with the MAI; Muller, 1994) was lower for mothers of infants with anomalies that could not be cured with surgical operation compared to mothers of infants with anomalies that could be cured with surgical operation ($F = 4.541$, $p = .014$, Cohen $d = 0.34$).

Mercer and Ferketich (1994) conducted multiple regressions predicting maternal affective attachment (measured with the FAB, Leifer, 1977) for experienced mothers during the postpartal period. They found significance for infant health status ($F = 7.22$, $p = .008$, Unique $R^2 = .048$). A model that included infant health status along with received support, partner relationship, health status, perceived support, anxiety, fetal attachment, and depression explained a total of 43.3% of the variance in maternal affective attachment bonds. For experienced mothers at 1 month, they found significance for infant birth weight ($F = 4.16$, $p = .044$, Unique $R^2 = .032$). Together with partner relationship, received support, and labour and delivery experience, the model explained 23.2% of the variance in maternal affective attachment bonds. For experienced mothers at 8 months, they found significance for infant birth weight ($F = 6.92$, $p = .010$, Unique $R^2 = .061$). Together with self-esteem, postpartum complications, and negative life events, the model explained 43.1% of the variance in maternal affective attachment bonds.

Mercer and Ferketich (1994) also conducted multiple regressions predicting maternal affective attachment bonds (measured with the FAB, Leifer, 1977) for inexperienced mothers during the postpartal period. They found significance for infant birth weight ($F = 7.85$, $p = .006$, Unique $R^2 = .039$) a total of 37.6% of the variance in maternal affective attachment bonds was explained by a model that included infant birth weight along with anxiety, fetal attachment, postpartum complications, mastery, and negative life events. For inexperienced mothers at 1 month, they found significance for infant birth health ($F = 4.38$, $p = .039$, Unique $R^2 = .028$), which, together in a model with mastery and fetal attachment, explained 23.9% of the variance in maternal affective attachment bonds.

Parenting

Parenting stress. Two studies explored the variable of parenting stress. Nelson and O'Brien (2012) found significant negative correlations between maternal parenting stress and perceptions of affective attachment closeness with a first born child ($r = -.25$, $p < .01$) and a second born child ($r = -.10$, $p < .05$) (measured with the CPRS; Pianta, 1994). They also found significant positive correlations between maternal parenting stress and perceptions of conflict with a first born child ($r = .13$, $p < .05$) and a second born child ($r = .11$, $p < .05$). In a study of parents of children with autism spectrum disorders, Goodman and Glenwick (2012) found a significant negative correlation between mothers' level of parenting stress and their affective attachment toward their children (measured with the MPAS; Condon & Corkindale, 1998) ($r = -.70$, $p < .001$), and these correlations remained significant when controlling for social desirability.

Sense of parental competence. Parental sense of competence consists of both efficacy and satisfaction dimensions. Efficacy refers to competence, level of capability, and problem-

solving in the parental role, while satisfaction refers to anxiety, motivation, and frustration in the parental role (Gilmore & Cuskelly, 2009). Sense of parenting competence or parental self-efficacy was examined in four studies.

Mothers' sense of their own efficacy or competence in the parental role was considered in four different studies. Gharaibeh and Hamlan (2012) found a significant positive pearson moment correlation between maternal self-efficacy (measured with the Perceived Maternal/Parental Self-efficacy (PMP S-E) scale; Barnes & Adamson-Macedo, 2007) and maternal affective attachment (measured with the MAI, Muller, 1994) ($r = .54$, $p < .0001$). In a stepwise regression analysis, they found that maternal self-efficacy, mothers' perceptions of their marital relationships after the birth of their infants, and mothers' perceptions of their pregnancy and delivery experience significantly predicted mothers' maternal affective attachment ($F = 34.23$, $p < .0001$) together explaining 33% of variance in maternal affective attachment bonds (adjusted $R^2 = .33$, $p < .001$).

Mercer and Ferketitch (1994) reported that maternal sense of competence (measured with the Parenting Sense of Competence Scale; Gibaud-Wallston and Wandersman, 1978) was significantly positively correlated with maternal affective attachment (measured with the FAB, Leifer, 1977) for experienced mothers at all four different time periods tested; during hospitalization postpartum ($r = .34$), at 1 month ($r = .38$), at 4 months ($r = .45$), at 8 months ($r = .56$). Maternal competence and maternal affective attachment were also significantly positively correlated for inexperienced mothers at all four time periods; during hospitalization postpartum ($r = .55$), at 1 month ($r = .62$), at 4 months ($r = .46$), at 8 months ($r = .39$).

Mercer and Ferketich (1990) used respecified models to predict mother-infant attachment (measured with the FAB, Leifer, 1977) for low obstetrical risk mothers in the early postpartum

period. They found that a model that included anxiety, parental competence (measured with the Parenting Sense of Competence Scale; Gibaud-Wallston and Wandersman, 1978), received support, fetal attachment, marital status, and relationship with own mother as a child explained 41% of the variance in maternal affective attachment bonds. At 8 months, 52% of the variance in mothers' affective attachment was explained by a model that included anxiety, parental competence, family functioning, perceived support, time of first holding infant, relationship with own mother as a child, and negative life events. Mercer and Ferketich (1990) also used respecified models to predict affective attachment (measured with the FAB, Leifer, 1977) for high obstetrical risk mothers in the early postpartum period. They found that a model that included parental competence, fetal attachment, socioeconomic status, and antepartal worry explained a total of 31% of the variance in maternal affective attachment bonds. At 8 months, a model that included parental competence and pregnancy risk explained 29% of the variance in affective attachment. The strongest predictor of affective attachment at both time periods for high obstetrical risk mothers was parental competence, which accounted for 16% and 20% of the variance, respectively.

In a study of parents of children with autism spectrum disorders, Goodman and Glenwick (2012) found a significant positive correlation between mothers' parenting sense of competence (measured with the Parenting Sense of Competence Scale; Johnston & Mash, 1989) and their affective attachment bond with their child (measured with the MPAS, Condon & Corkindale, 1998) ($r = .66$, $p < .001$), and these correlations remained significant when controlling for social desirability.

In summary, parental sense of competence relates positively to maternal affective attachment outcomes. It seems that feeling capable in the maternal role is related to feeling

affectively attached to children. This finding has also been identified in a population of mothers of children with autism spectrum disorders. For mothers with both high and low obstetrical risk, early in the postpartum and again at 8 months, parental sense of competence predicts affective attachment, and is the strongest predictor at both times for high risk mothers. In models to predict affective attachment, for first time mothers in the postpartum and at 1 and 8 months, mastery is a significant predictor, while for experienced mothers at 4 and 8 months, self-esteem is a significant predictor.

Maternal perceptions/beliefs. In one of only two studies to examine maternal perceptions or beliefs, Gillum and O'Brien (2011) found that mothers' perceptions of parent-child relationship quality (measured with the CPRS, Pianta, 1994) in adoptive mothers were correlated with beliefs about adopted children. Mothers who believed that adopted children were similar to non-adopted children were more likely to have positive perceptions of their own adopted child ($r = .48$, $p < .01$). They also found that relationship quality was related to attributions for child behaviour. Mothers with high conflict-promoting attributions reported lower levels of relationship quality with their adopted child ($r = -.50$, $p < .01$). However, parent-child relationship quality did not significantly correlate with perceptions of parent control. Using regressions, they found that perceptions of parent control, beliefs about adopted children, and attributions for child behaviour together accounted for 35.5% of variance in parent-child relationship quality (F (3, 56) = 11.84, $p < .01$).

In a study of parents of children with autism spectrum disorders, Goodman and Glenwick (2012) found a significant negative correlation between mothers' perceptions of their child's level of functional impairment and their affective attachment bond with their child (measured

with the MPAS, Condon & Corkindale, 1998) (r = -.39, p < .001), and these correlations remained significant when controlling for social desirability.

Maternal parenting orientations and behaviours. Various parenting orientations and behaviours were examined as variables in three studies. van Bussel and colleagues (2010) found that maternal affective attachment (measured with MPAS between 8-12 weeks postpartum) was positively correlated with a facilitator maternal antenatal orientation to the maternal role (r = .28, p < .0001). The facilitator orientation is characterised by feelings of closeness, selfless nurturance, and adaptation to the infant's world (Raphael-Leff, 1983). At the same time, maternal affective attachment was negatively correlated with a regulator maternal antenatal orientation (r = -0.24, p < .0001). The regulator orientation is characterised by dissociation, rigidity, and avoidance of fantasy about the infant or the maternal role (Raphael-Leff, 1983) Measured again at 20-25 weeks postpartum maternal affective attachment was significantly correlated with facilitator (r = .29, p < .0001), and regulator (r = -0.31, p < .0001) orientations. Rholes and colleagues (1995) found significant zero-order correlations between mothers' reports of affective attachment closeness (measured with a subscale of the PSI; Abidin, 1983) and mother's supportive presence with their child in a laboratory observation (r = .26, p < .05); mothers who felt closer to their child showed more supportive behaviours with the child. Germo and colleagues (2009) found no significant correlations between affective attachment closeness (measured with the CPRS, Pianta, 1994) and parenting commitment or maternal support of child's autonomy.

Feeding methods. In the three studies that examined feeding methods, there were no statistically significant findings. Wilkinson and Scherl (2006) found no difference in maternal affective attachment (measured with the MAI; Muller, 1994) between breastfeeding and bottle-

feeding mothers. Germo and colleagues (2009) found no significant correlations between affective attachment closeness (measured with the CPRS, Pianta, 1994) and the age at which the child was weaned from breastfeeding. However, Quinlivan and Evans (2005) found a trend toward higher affective attachment (measured with the MPAS, Condon & Corkindale, 1998) for adolescent mothers who were still breastfeeding their babies at 6 months (+3.29, 95% CI [-0.34, 6.92], $p = .078$).

Sleep. Maternal sleep was examined in two different studies included in this review. Tikotzky and colleagues (2012) found that total sleep time at 3 months correlated significantly with maternal affective attachment (total scores on the MPAS; Condon & Corkindale, 1998) ($r = .35$, $p < .01$), as well as with mothers' perceived pleasure in proximity ($r = .31$, $p < .05$), and acceptance/tolerance ($r = .35$, $p < .005$), but not with their sense of competence. Total sleep time at 6 months correlated with maternal affective attachment ($r = .27$, $p < .05$), and with pleasure in proximity ($r = .36$, $p < .01$) but not with acceptance/tolerance or competence. Minutes awake tending to the infant at night at 6 months correlated negatively with MPAS total score ($r = -.33$, $p < .05$), proximity ($r = -.32$, $p < .05$), and acceptance/tolerance ($r = -.31$, $p < .05$), but not with competence. When they controlled for depression (measured with HRSD) at 3 and 6 months postpartum, they found significant prospective partial correlations between total maternal sleep time at 3 months and maternal affective attachment ($r = .28$, $p < .05$), as well as with acceptance/tolerance ($r = .30$, $p < .05$), and pleasure in proximity ($r = .26$, $p < .05$) at 6 months. Total sleep time at 6 months was also associated with pleasure in proximity ($r = .34$, $p < .05$), such that less sleep time was associated with lower scores. Furthermore, when they controlled for depression at 6 months, they found significant negative concomitant partial correlations between the amount of time mothers were awake attending to their infants in the night and their maternal

affective attachment (r = -.33, p < .05), acceptance/tolerance (r = -.31, p < .05), and pleasure in proximity (r = -.31, p < .05), illustrating that more time awake at night was related to lower affective attachment, even after controlling for the effect of mothers' depression severity. They finally conducted a multiple regression analysis with the following predictors: infant negative affectivity, depression at 3 and 6 months, total sleep time at 3 and 6 months, and minutes awake at night tending to the infant at 6 months. They found that this regression was able to explain 40.3% of the variance in maternal affective attachment (total scores on the MPAS; Condon & Corkindale, 1998), (F = 6.19, p < .0005) with three significant variables: infant negative affectivity (β = -.29, p < .05), total sleep time at 3 months (β = .28, p < .05), and time awake attending to the infant at night at 6 months (β = -.27, p < .05). The same model accounted for a total of 44.5% of the variance in the acceptance/tolerance subscale (F = 7.34, p < .0005) with the same three significant variables: negative affectivity score at 6 months (β = -.33, p < .01), total sleep time at 3 months (β = .30, p < .05), and time awake attending to the infant at night at 6 months (β = -.31, p < .05). Finally, the same model was able to explain 23.7% of the variance in the proximity subscale (F = 2.84, p < .05), however none of the variables on their own were significant.

Similarly, Germo and colleagues (2009) found that maternal affective attachment closeness (measured with the CPRS, Pianta, 1994) was significantly negatively correlated with mother's difficulty with child sleeping through the night (r = -0.26, p < .01). However, closeness was not found to correlate with child's difficulty with sleeping through the night, age at which child slept through the night, importance of sleeping through the night by 12 months, solitary sleep attitudes, or bed-sharing sleep attitudes of the mother.

Partner Variables

Relationship satisfaction. Seven research teams examined satisfaction in the partner relationship as a variable, most finding associations with maternal affective attachment. For example, Evans and colleagues (2012) found a significant positive correlation between maternal affective attachment (measured with the MPAS, Condon & Corkindale, 1998) and relationship satisfaction with a partner ($r = .18$, $p < .05$). Sierau and colleagues (2013) found that relationship satisfaction with a partner was significantly positively correlated with absence of hostility (a subscale of the MPAS; Condon & Corkindale, 1998) toward their child ($r = .29$, $p < .01$). However, relationship satisfaction was not significantly correlated with pleasure in interaction with, or quality of attachment (MPAS subscales) to, their child. Holland and McElwain (2013) found that marital quality was significantly positively correlated to both mother-son ($r = .37$, $p < .01$) and mother-daughter ($r = .37$, $p < .01$) affective attachment quality (measured with the CPRS, Pianta, 1994). Furthermore, Gharaibeh and Hamlan (2012) found significant differences in maternal affective attachment (measured with the MAI; Muller, 1994) based on perceived status of the marital relationship ($F = 2.78$, $p = .023$). Scheffe's post hoc tests revealed that mothers who reported very good relationships with their husbands had higher scores on affective attachment to their infants, and the difference in affective attachment was significant between mothers with very good marital relationships as compared to mothers with poor marital relationships (mean difference = 0.286, $p < .05$). Rholes and colleagues (1995) found that affective attachment closeness (measured with a subscale of the PSI; Abidin, 1983) was not significantly correlated with marital relationship quality, and Perry and colleagues (2011) found that dyadic adjustment with partner in early and late pregnancy did not correlate with affective attachment to a child at 2 months (measured with the MPAS, Condon & Corkindale, 1998).

In a path analysis that tested three models, Holland and McElwain (2013) found that the best fit was one that included the indirect effects of marital quality, via co-parenting perceptions, on parent-child relationship quality, (x^2 = .54, p = .76) with a root mean square error of approximation of 0.00 and comparative fit index of 1.

Sierau and colleagues (2013) used an actor-partner mediation model to test for whether partner relationship satisfaction would have a mediating effect between parents' romantic attachment avoidance and their postnatal affective attachment. And actor-partner mediation model (Ledermann & Bodenmann, 2006) is an extension of an actor-partner interdependence model (Kashy & Kenny, 2000), which allows for the effects of both the individual and their partner. They found a significant indirect partner effect from fathers' avoidance to mother's postnatal affective attachment (-.15, SE = .12, $p < .05$), and the direct partner effect from father's avoidance to mother's postnatal affective attachment was not significant, indicating that mothers' relationship satisfaction with partner fully mediated the association between fathers' avoidance and mothers' postnatal affective attachment to the infant.

In multiple regressions predicting maternal affective attachment (measured with FAB, Leifer, 1977) for experienced mothers during the postpartal period, Mercer and Ferketich (1994) found significance for partner relationship (F = 11.58, p = .001, Unique R^2 = .085). A model that included partner relationship along with received support, health status, infant health status, perceived support, anxiety, fetal attachment, and depression explained a total of 43.3% of the variance in maternal affective attachment. For experienced mothers at 1 month they again found significance for partner relationship (F = 13.34, p = .0001, Unique R^2 = .116). Together in a model with received support, labour and delivery experience, and infant birth weight, these variables explained 23.2% of the variance in maternal affective attachment bonds.

Using a hierarchical multiple regression, Evans and colleagues (2012) found that the combined effects of experiential avoidance, relationship satisfaction, prenatal expectations compared to postnatal experience, and postpartum support accounted for a significant 21% of variance in maternal affective attachment bonds (measured with the MPAS; Condon & Corkindale, 1998) F (5, 121) = 6.59, $p < .001$.

Gharaibeh and Hamlan, (2012) conducted a stepwise regression analysis and found that maternal self-efficacy, mothers' perceptions of their marital relationships after the birth of their infants, and mothers' perceptions of their pregnancy and delivery experience significantly predicted mothers' maternal affective attachment (measured with the MAI; Muller, 1994) (F = 34.23, $p < .0001$) together explaining 33% of variance in maternal affective attachment bonds (adjusted $R^2 = .33$, $p < .001$).

To examine the relationship between affective attachment to children (measured with a subscale of the PSI; Abidin, 1983) and level of avoidance in adult attachment (measured with the Attachment Style Measure; ASM; Simpson, 1990), Rholes and colleagues (1995) performed a hierarchical regression, entering marital quality first, then mothers' avoidance scores, and finally an interaction of marital quality and avoidance. They found that avoidance scores were strongly associated with affective attachment closeness ratings (F (1, 40) = 22.94, $p < .001$), with more avoidant mothers reporting less closeness. Avoidance accounted for 37% of the variance in closeness, marital quality and the interaction of the two variables did not account for significant variance. To examine the relationship between affective attachment closeness ratings and level of anxious ambivalence in adult attachment, Rholes and colleagues (1995) performed another hierarchical regression, entering marital quality first, then mothers' anxious-ambivalence scores, and finally an interaction of marital quality and anxious-ambivalence. They found significance

for an interaction between anxious-ambivalence and marital quality (F (1, 39) = 4.84, $p < .05$), which accounted for 11% of the variance in closeness, indicating that mothers low in ambivalence reported more closeness with their children when their marriages were more positive, while mothers high in ambivalence reported less closeness to their children when their marriages were more positive.

In summary, marital/partner relationship quality generally seems to correlate with maternal affective attachment to both daughters and sons. Mothers with very good marital relationships have significantly higher affective attachment to children compared to mothers with poor marital relationships. Quality of the partner relationship significantly predicts affective attachment in the postpartum and at 1 month for experienced mothers. Finally, there appears to be an interaction between marital quality and anxious ambivalence in adult attachment, such that positive marital relationships associate with more maternal affective attachment closeness for mothers low in anxious ambivalence, and with less maternal affective attachment closeness for mothers high in anxious ambivalence.

Support. Support was examined in six studies. Holland and McElwain (2013) found that maternal perceptions of co-parenting (measured with the Parenting Alliance Inventory, Abidin & Brunner, 1995) were significantly positively correlated with maternal perceptions of affective attachment (measured with the CPRS; Pianta, 1994) with their sons ($r = .30$, $p < .05$) and their daughters ($r = .50$, $p < .001$).

Nagata and colleagues (2000) found a significant negative correlation between support in child rearing and scores on the anxiety regarding children subscale ($r = -.15$, $p < .01$), but not the core maternal attachment subscale of the PMAS (Nagata et al., 2000) in the first week after giving birth. On the other hand in a follow up study conducted at 1 year postpartum, Nagata and

colleagues (2003) found a significant positive correlation between support in childrearing and the anxiety regarding children subscale ($r = .20$, $p < .01$), but not the core maternal attachment subscale of the PMAS (Nagata et at, 2000). It is possible that in the initial postpartum period, anxiety would be higher in mothers who feel unsupported. By one year after birth, perhaps the mothers most anxious about their child would have had time to express their needs for support, or to find someone to help them with childcare or advice.

Using multiple regressions to predict maternal affective attachment (measured with the FAB; Leifer, 1977) for experienced mothers during the postpartal period, Mercer and Ferketich (1994) found significance for received support ($F = 16.32$, $p = .0001$, Unique $R^2 = .131$) and perceived support ($F = 5.46$, $p = .021$, Unique $R^2 = .035$). Together in a model with partner relationship, maternal health status, infant health status, anxiety, fetal attachment, and depression, the variables explained 43.3% of the variance in maternal affective attachment. For experienced mothers at 1 month, they found significance for received support ($F = 5.89$, $p = .017$, Unique $R^2 = .049$). A total of 23.2% of the variance in maternal affective attachment bonds were explained by a model that included received support and perceived support along with partner relationship, labour and delivery experience, and infant birth weight.

Mercer and Ferketich (1990) used respecified models to predict maternal affective attachment (measured with the FAB; Leifer, 1977) for low obstetrical risk mothers in the early postpartum period. They found that a model that included anxiety, parental competence, received support, fetal attachment, marital status, and relationship with own mother as a child explained 41% of the variance in maternal affective attachment bonds. At 8 months, 52% of the variance in mothers' affective attachment was explained by a model that included anxiety, parental

competence, family functioning, perceived support, time of first holding infant, relationship with own mother as a child, and negative life events.

Using a hierarchical multiple regression, Evans and colleagues (2012) found that the combined effects of experiential avoidance, relationship satisfaction, prenatal expectations compared to postnatal experience, and postpartum support accounted for a significant 21% of variance in maternal affective attachment (measured with the MPAS; Condon & Corkindale, 1998) (F (5, 121) = 6.59, $p < .001$).

In summary, it seems mothers who feel supported have better maternal affective attachment outcomes. In two studies that examined the dimension of anxiety regarding children a year apart, an interesting difference emerged. It appears that in the early postpartum, higher anxiety is associated with lower support in parenting, while for mothers of 1 year olds; higher anxiety is associated with higher support in parenting. This may suggest that mothers who feel unsupported in the transition to parenthood experience more anxiety about their newborns, while mothers experiencing higher anxiety may have found ways to increase the level of support they have received over time. For experienced mothers, both received support and perceived support predicted maternal affective attachment. For low obstetrical risk mothers in the postpartum period, a model that includes received support predicts maternal affective attachment, while at 8 months a model that includes perceived support predicts maternal affective attachment.

Partner's relationship with child. The father-child relationship was examined in three different studies. Holland and McElwain (2013) found that father-child affective attachment relationship quality was significantly positively correlated with mother-son affective attachment relationship quality ($r = .55$, $p < .001$) and mother-daughter affective attachment relationship quality ($r = .32$, $p < .05$) (measured with the CPRS; Pianta, 1994). In a path analysis that tested

three models, the best fit was one that included the indirect effects of marital quality, via co-parenting perceptions, on parent-child relationship quality, (x^2 = .54, p = .76) with a root mean square error of approximation of 0.00 and comparative fit index of 1. When they separated by child gender and tested indirect effects, they found for mother-son relationships there were two significant paths from marital quality to mother-son affective attachment relationship quality; via maternal co-parenting perceptions (estimate: 0.09; 99% CI_{bc} [0.001, 0.198]; and via paternal co-parenting perceptions (estimate: 0.10, 99% CI_{bc} [0.003, 0.227]. Neither of the path models tested from marital quality to mother-daughter affective attachment relationship quality was significant.

Sierau and colleagues (2013) found that fathers' scores on pleasure in interaction with their infant were significantly positively correlated with mothers' scores on pleasure in interaction (r = .23, p < .05) (measured with the MPAS; Condon & Corkindale, 1998). However, fathers' and mothers' scores did not correlate on absence of hostility toward the infant or on quality of attachment to the infant.

Mercer and Ferketich (1990) found that mothers with high obstetrical risk scored significantly higher on attachment to their infants (measured with FAB, Leifer, 1977) than did their partners in the early postpartum (t (60) = 2.51, p = .02) and at 8 months postpartum (t (43) = 2.08, p = .04). However, for low obstetrical risk mothers there were no significant differences between their own and their partners' reports of their attachment to their infants in either time period.

In summary, mothers and fathers generally report similar affective attachment experiences, particularly when it comes to pleasure in interaction with their child. It seems the relationship between partners' affective attachment manifests differently in the context of high

obstetrical risk, where mothers have been found to report higher affective attachment than their partners in the early postpartum and at 8 months.

Other Variables

Negative life events. Three studies explored negative life experiences of the mother. Quinlivan and Evans (2005) found significantly higher scores on maternal affective attachment (measured with the total score of the MPAS; Condon & Corkindale, 1998) (t (114) = 2.83, p < .01), tolerance (t (114) = 3.40, p < .001), and pleasure in proximity (t (114) = 2.37, p < .05) for mothers who had not been exposed to domestic violence than for those who had. The two groups did not differ significantly in their acceptance (t (114) = 1.87, p = .064) or competence (t (114) = 1.86, p = .065). Using a MANOVA, they found that domestic violence had significant effect on maternal affective attachment (-4.04, 95% CI [-7.57, -.51], p = .027) independent of other factors. Drug use at 6 months postpartum also had a significant effect on affective attachment scores (-10.24, 95% CI [-14.96, -5.52], p = .0001). They found no significant effects for smoking, alcohol or drug use, social isolation and homelessness, postnatal smoking, or alcohol at 6 months postpartum.

Mercer and Ferketich (1990) used respecified models to predict maternal affective attachment (measured with the FAB, Leifer, 1977) for low obstetrical risk mothers. At 8 months, 52% of the variance in mothers' affective attachment bonds was explained by a model that included anxiety, parental competence, family functioning, perceived support, time of first holding infant, relationship with own mother as a child, and negative life events. The strongest predictor of affective attachment in both time periods for low obstetrical risk mothers was anxiety, which accounted for 23% and 18% of the variance, respectively.

Using multiple regressions to predict maternal affective attachment (measured with the FAB, Leifer, 1977) for inexperienced mothers during the postpartal period, Mercer and Ferketich (1994) found significance for negative life events ($F = 4.38$, $p = .038$, Unique $R^2 = .021$). A model that included negative life events along with anxiety, fetal attachment, postpartum complications, infant birth weight, and mastery explained 37.6% of the variance in maternal affective attachment. For experienced mothers at 8 months, they found significance for negative life events ($F = 6.94$, $p = .010$, Unique $R^2 = .053$), which together in a model with self-esteem, infant birth weight, and postpartum complications, explained 43.1% of the variance in maternal affective attachment.

In summary, in the studies that have examined negative life events, research has identified significant negative relationships between maternal affective attachment and both domestic violence and drugs use. Negative life events were also found to be significant predictors of maternal affective attachment for inexperienced mothers in the postpartum, and for experienced mothers at 8 months. For mothers with low obstetrical risk, negative life events were one variable in a model that explained more than half of the variance in maternal affective attachment.

Parent interventions. In two of the studies included in this review, interventions for mothers were examined for their effects on maternal affective attachment. In a study of low-income Latina women, Perry and colleagues (2011) found a marginal significant difference in maternal affective attachment bonds (measured with the MPAS; Condon & Corkindale, 1998 at post intervention) (t (166) = -1.87, $p = .06$) between women who took part in a perinatal depression prevention intervention ($M = 67.7$, $SD = 5.9$) and women who had received usual care ($M = 65.9$, $SD = 6.6$). Furthermore, a regression model that included an intervention group,

depressive symptoms in early and late pregnancy, pregnancy intention, and feelings about pregnancy accounted for 25% of variance in maternal affective attachment bonds at 2 months ($F = 5.81$, $p < .001$). Chen and colleagues (2011) found that mothers' participation in prenatal education was a main effect of maternal affective attachment (MAI; Muller, 1994) (F (1, 1484.97) = 36.20, $p < .01$), accounting for 33.5% of the variance in affective attachment.

Separation anxiety. One study by Muller (1996) found a significant positive correlation ($r = 0.46$, $p < 0.001$) between maternal affective attachment (measured with the MAI; Muller, 1994) and maternal separation anxiety level (measured with the Maternal Separation Anxiety Scale; MSAS; Hock, Gnezda, & McBride, 1984).

Social desirability. Finally, in the only study that examined social desirability, van Bussel and colleagues (2010) found significant positive correlations between social desirability and maternal affective attachment (measured with total scores on the MPAS; Condon & Corkindale, 1998) between 8-12 weeks postpartum ($r = .17$, $p < .05$), and between 20-25 weeks postpartum ($r = .22$, $p < .05$).

Chapter III

Summary of Review Findings & Thesis Research Questions

In the literature focused on facilitators of maternal affective attachment bonds to date, researchers have given most attention to the variable of maternal depression and have found support for a negative relationship between depression and affective attachment. Results from studies exploring maternal anxiety symptoms, adult attachment orientation, and parental sense of competence also reveal significant relationships that merit further exploration.

Depression

The relationship between maternal depression and maternal affective attachment has been well established in the research to date. Half of the studies in our systematized review included maternal depression as a co-variable, and these studies provide near-unanimous support for the existence of a significant negative relationship between maternal depression and affective attachment. Findings overall indicate that as maternal depression severity increases, affective attachment decreases. Researchers have found negative correlations between maternal depression and affective attachment (measured with a variety of instruments) at a range of time periods within the first year of a baby's life: within the first month (Nagata et al., 2004), at 8-12 weeks (van Bussel et al., 2010), at 12 weeks (Tikotzky et al., 2012), at 20-25 weeks (van Bussel et al., 2010), at 6 months (Tikotzky et al., 2012), and at 1 year (Nagata et al., 2003). Furthermore, longitudinal studies show that earlier maternal depression correlates with later maternal affective attachment – with depression in pregnancy related to attachment at 2 months (Perry et al., 2011) and depression at 3 months related to affective attachment at 6 months (Tikotzky et al., 2012). Finally, Mothers who are depressed report significantly less affective attachment to their babies than do mothers who are not depressed (Mason et al., 2011; Wilkinson & Mulcahy, 2010).

Anxiety

Fewer researchers have examined the variable of maternal anxiety, however findings from three studies suggest that it does relate to maternal affective attachment. For example, a negative correlation between anxiety and maternal affective attachment (as well as subscales of affective attachment: absence of hostility, and quality of attachment) was found at 8-12 weeks and 20-25 weeks postpartum (van Bussel et al., 2010). State anxiety was found to predict maternal affective attachment for both experienced and inexperienced mothers in the postpartal period (Mercer & Ferketich, 1994). Significant variance in maternal affective attachment bonds in the early postpartum period was explained by maternal state anxiety for mothers with low obstetrical risk. Meanwhile, for mothers with high obstetrical risk, significant variance in maternal affective attachment bonds in the early postpartum was explained by worry occurring before birth (Mercer & Ferketich, 1990).

Adult Attachment Orientation

Researchers have identified relationships between aspects of mothers' adult attachment orientations and their affective attachment to their children. Van Bussel and colleagues (2010) found that mothers' correspondence with secure adult attachment was positively correlated with their maternal affective attachment to infants. Meanwhile, mothers' level of correspondence with dismissing attachment was negatively correlated with maternal affective attachment to infants. However, no relationships were found between mothers' levels of correspondence with fearful or preoccupied adult attachment and their affective attachment to their infants (van Bussel et al., 2010).

When mothers with fearful or preoccupied adult attachment orientations were compared with mothers with secure or dismissing adult attachment orientations, the former (the two

orientations characterized by higher levels of attachment anxiety) were found to have lower affective attachment to their infants (Wilkinson & Mulcahy, 2010). Consistent with this finding, research that examined adult attachment orientation dimensionally found negative correlations between the adult attachment dimension of anxiety and maternal affective attachment bonds with infants. In other words, when mothers' adult attachment was characterized by higher levels of anxiety, maternal affective attachment to infants was found to be lower (Sen & Kavlak, 2012). Interestingly, Rholes and colleagues (1995) identified an interaction effect with anxious-ambivalence and marital quality, such that when mothers were lower on anxious ambivalence, more positive marriages were associated with more closeness with their children, but when they were higher on anxious ambivalence, more positive marriages were associated with less closeness to their children (Rholes et al., 1995).

Similarly, researchers found negative relationships between the adult attachment dimension of avoidance and maternal affective attachment bonds to their infants (Sen & Kavlak, 2012). In a hierarchical regression, avoidance was found to strongly associate with affective attachment bonds to children, and accounted for 37% of the variance. The full scale of avoidance was found to correlate negatively with affective attachment in a study conducted by Sierau and colleagues (2013). However, when avoidance was subdivided it into dimensions of closeness and dependency, it was revealed that only the subscale of closeness, and not dependency, correlated with mothers' affective attachment bonds (Sierau et al., 2013).

Parental Sense of Competence

Mothers' sense of efficacy was found to correlate with their affective attachment (Gharaibeh & Hamlan, 2012). Maternal competence was correlated significantly with affective attachment in the postpartum, and at 1, 4, and 8 months, for both experienced and inexperienced

mothers (Mercer & Ferketitch, 1994). The relationship between sense of parental competence and affective attachment was also found in mothers of children with autism spectrum disorders (Goodman & Glenwick, 2012). Mercer and Ferketitch (1990) found that the strongest predictor of affective attachment for high obstetrical risk mothers in the puerperium and at 8 months was parental competence, which accounted for 16% and 20% of the variance, respectively.

The Current Study

Based on the findings of our in-depth review of the literature, our own original research sought to explore patterns in the expression of previously identified facilitators of maternal affective attachment bonds using a person-centered (rather than a variable-centered) model. Our objective was to learn how previously identified facilitators of maternal affective attachment co-exist within individual mothers, and to allow family process (rather than family structure) to define the groups for our analysis. We collected data from a non-clinical population sample of Canadian mothers, assembling information about the following variables of interest: symptom distress (related to depression and anxiety symptoms), adult romantic attachment dimensions of avoidance and anxiety, and parental sense of efficacy and satisfaction. We then used these variables to create profiles of maternal experiences, and then tested whether the profiles significantly differed from one another. Finally, we tested whether the profiles that emerged differed in their maternal affective attachment and maternal perceptions of closeness and conflict in the mother-child relationship. In other words, we wanted to know if there would be distinct patterns of maternal experience that significantly differed from one another, and whether those distinct groups differed in their level of maternal affective attachment to their children?

Rationale for Selection of Independent Variables

We selected our independent variables based on the existing evidence found in our

systematized review, which identified them as promising facilitators of maternal affective attachment bonds. The variables chosen stood out among the many different ones that emerged from the review when we considered the purpose and approach of our study. We began by ruling out the categories of variables that we would not include. We were interested in taking a normative adaptive approach and we wanted to focus on the mothers' experience. Therefore, we did not want to use demographic variables that would lead us to compare mothers based on their socio-economic status or family configurations, and we were less interested in the characteristics of the children given that our study was exclusively focused on mothers' experience. We knew we would be using a cross-sectional design, and only including women who were already mothers, so we did not want to include pregnancy or pre-pregnancy variables. We wanted to include a variable focused on partner relationship, however we did not want to exclude mothers who did not have partners and we knew that within our latent profile analysis the inclusion of a partner relationship variable as an indicator would have resulted in a profile in which mothers who did not have partners would cluster based on their same non-response to that variable. The categories that remained were maternal mental health, attachment, and parenting, from which we selected the most widely studied variables to guide our decision on the measures to use.

We also considered theoretical rationale for the inclusion each of the variables within our person-centered approach. Initially proposed by Bowlby (1982), attachment is a relatively consistent orientation toward relationships that is initially formed in infancy with a primary caregiver, which then becomes generalized to other important relationships over the lifespan. It has been more recently theorized as a working model that contains both generalized and relationship-specific components (Collins & Read, 1994). When attachment has been studied in adults, the relationships of focus have more often been romantic relationships, friendships, or

continuing attachments to mother and father (Brennan et al., 1998; Fraley, 2002; Hazan & Shaver, 1987). Adult attachment researchers have found that adult romantic relationships function in similar ways to the infant-caregiver attachment. For example, researchers have found that secure adults are more likely to rely on their romantic partner as a secure base, from which to comfortably explore (Fraley & Davis, 1997) and that during and after conflict, insecure adults tend to make attributions about their partner's behaviour that exacerbate their insecurities (Simpson, Rholes, & Phillips, 1996). Researchers have also identified ways in which adult attachment relationships evolve to become more reciprocal; for example, secure adults have been found to not only be more likely to seek support from their partners when they are distressed, but also to be more likely to provide support when their partners are distressed (Simpson, Rholes, & Nelligan, 1992). This suggests that the attachment orientation of adults when applied to different types of relationships evidence different behaviours than those seen in infants.

Bowlby (1982) clarified that the relationship between parent and child is complementary, and therefore maternal behaviour is usually quite different than child behaviour. He acknowledged that in his introduction of the nature of attachment, he had been "examining one half of what is normally a shared dyadic programme" (p.376). He suggested use of different terms (attachment-caregiving) to refer to the mother's side of this relationship, reserving the term attachment for "the behaviour typical of child to parent and the behavioural system responsible for it, and to avoid using it to describe the complementary behaviour and behavioural system of the parent" (p. 376). While a great deal of early work on attachment was necessarily concerned with behaviour and relied on infant behaviour to indicate the attachment of pre-verbal infants, Ainsworth (1969) clarified an important distinction: "attachment relates to something within the organism which may be distinguished from the behaviours which mediate it" (p. 1014). A focus

on the affective component of attachment allows us to explore the mutuality of the mother-child attachment bond in a different way than is possible with behavioural indicators of attachment. Bowlby (1982) briefly addressed affect as it relates to attachment, saying, "no form of behaviour is accompanied by stronger feelings than is attachment behaviour. The figures towards whom it is directed are loved and their advent is greeted with joy" (p. 208). These strong feelings, that would accompany maternal attachment-caregiving behaviours, are the focus of this thesis.

Attachment theory provides an over-arching rationale for the inclusion of each of our variables. According to this theory, our earliest attachments help to shape our lifetime experiences of relationships. The experiences we have with our primary caregiver contribute to the development of our internal representations of ourselves and of close others. A securely attached infant will use their primary attachment figure as a secure base from which to explore, and a safe haven to return to, when faced with threat or distress, to receive emotional support. In the context of a secure attachment, a growing child would develop a sense of competence in themselves while they explore, and would learn to regulate their emotions when they receive emotional support after encountering challenges. As they reach adolescence and young adulthood, they would be likely to have lower levels of avoidance and anxiety in their romantic attachment relationships. It would follow that as these secure individuals become mothers themselves, they would report good mental health, with low levels of romantic attachment avoidance and anxiety, and a stronger sense of competence in their parental role. On the other hand, a child growing up with an insecure attachment may be more wary of exploring too far away from their mother and therefore not develop a strong sense of competence, or may be reluctant to return to their mother for help in regulating their emotions when they are distressed. As they reached adolescence and young adulthood, they would be more likely to report higher

levels of avoidance and/or anxiety in their romantic attachments. It would make sense that when these insecure individuals become mothers themselves, they would experience more symptom distress, with higher levels of romantic attachment avoidance and anxiety, and a lower sense of competence in their parental role.

In other words, we theorize that the culmination of mothers' own attachment experiences across the lifespan would underlie all of our selected variables. Therefore, mothers with the overall most positive lifetime of attachment experiences would be experiencing the lowest levels of symptom distress, the lowest levels of romantic attachment avoidance and anxiety, and the highest sense of parenting competence, and would be in the best position to form a strong maternal affective attachment bond with their children. On the other hand, mothers with the overall least positive lifetime of attachment experiences would be experiencing the highest levels of symptom distress, highest levels of romantic attachment avoidance and anxiety, and the highest sense of parenting competence, and would not be in the best position to form a strong maternal affective attachment bond with their children.

We also conceptualize the relationships among our system of variables using the interacting systems principle underlying the cognitive behavioural model (Westbrook, Kennerly, & Kirk, 2011). The interacting systems principle refers to an understanding of problems as interactions between systems within the person and their environment. These systems include cognitions, affect, physiology, and behaviour. In line with this principle, distressing symptoms experienced by mothers in any of these areas would interact with her affective experience of attachment to her children. This supports the inclusion of symptom distress (related to both depression and anxiety) in our study. A related principle, the continuum principle refers to an understanding of psychological problems as being on a continuum with healthy processes, rather

than as a qualitatively different pathological state on a separate dimension. In line with this principle, we selected a measure of symptom distress that would capture both non-clinical and clinical levels of distress on a continuum, and we expected that lower levels of distress would facilitate stronger maternal affective attachment bonds.

Attachment theory provides theoretical rationale for the inclusion of romantic attachment anxiety and avoidance in our research. While Bowlby (1982) asserted that attachment is a generalized orientation to relationships that is relatively consistent across important relationships, contemporary researchers conceptualize working models of attachment as containing both generalized and relationship-specific components (Collins & Read, 1994). Therefore, levels of attachment anxiety and avoidance in the domain of adult romantic relationships should theoretically relate to mothers' experience of their maternal affective attachment bond to children because both romantic and maternal relationship-specific attachment experiences should be related to their more generalized working model of attachment. Lower levels of romantic attachment anxiety and avoidance would therefore facilitate stronger maternal affective attachment bonds. Finally, self-efficacy theory provides theoretical rationale for the inclusion of parenting sense of competence. Bandura (1977) proposed that self-efficacy influences thoughts, motivations, behaviours, and emotional reactions to situations. Those with lower self-efficacy tend to imagine that difficulties will be greater than they really are, feel stressed, and focus on concerns about failing. Meanwhile, those with higher self-efficacy tend to focus attention on the task at hand, and to feel energized and motivated when they encounter obstacles. Applying this theory to parenting, mothers who report higher self-efficacy in their parenting will have different experiences with their children than those who report lower self-efficacy, which would therefore relate to the quality of the relationship between mother and

child. Furthermore, Bandura (1982) proposes that depression is related to perceptions of inefficacy with regards to valued outcomes, while anxiety is related to perceptions of inefficacy in handling threatening situations, which lends theoretical support for empirically identified relations between parenting self efficacy and symptoms of depression and anxiety.

The Study of the Relationship Between Adult Attachment, Parental Sense of Competence, and Symptoms of Depression and Anxiety: Previous Empirical Evidence

The variables of interest in the present thesis have never, as yet, been examined together in one study predicting maternal affective attachment. However, in three previous studies, two of the variables have been included together as predictors. Mercer and Ferketich (1990) included both anxiety and parental competence, and found that the variables explained a different portion of variance depending on the level of obstetrical risk of the mothers, and on whether the variables were measured in the early postpartum or at 8 months. For low risk mothers, anxiety explained the most unique variance at both early postpartum (*Unique* R^2 = .2311) and at 8 months (*Unique* R^2 = .1818*)* followed by competence in the early postpartum (*Unique* R^2 = .0869) and at 8 months (*Unique* R^2 = .1045*)*. Anxiety explained slightly less variance after 8 months, while competence explained slightly more. For high-risk mothers, competence explained the most unique variance in the early postpartum (*Unique* R^2 = .1557) and at 8 months (*Unique* R^2 = .1983). Worry before birth accounted only for a small amount of variance in the early postpartum (*Unique* R^2 = .0271*)* and did not significantly explain unique variance at 8 months.

van Bussel and colleagues (2010) reported that maternal affective attachment was significantly negatively correlated with depression (r = -0.30, p <.0001) and anxiety (r = -0.40, p <.0001), and with dismissing adult attachment (r = -0.16, p <.05), and was significantly

positively correlated with secure adult attachment ($r = 0.13$, $p < .05$) measured between 8-12 weeks. Between 20-25 weeks postpartum maternal affective attachment was again significantly negatively correlated with depression ($r = -0.32$, $p < .0001$) and anxiety ($r = -0.34$, $p < .0001$), and with dismissing adult attachment ($r = -0.16$, $p < .05$), and was significantly positively correlated with secure adult attachment ($r = 0.17$, $p < .05$). However, the authors did not examine the variables together in a model predicting maternal affective attachment. Wilkinson and Mulcahy (2010) included a clinical group with diagnosed postnatal depression and a comparison group in their study. They found a significant difference in adult attachment orientation between the clinical and comparison groups such that mothers in the clinical group were significantly more likely to report preoccupied ($t = 4.57$, $p < .001$) and fearful ($t = 3.55$, $p < .001$) attachment orientation, and significantly less likely to report secure attachment orientation ($t = -6.10$, $p < .001$). The groups did not differ in their likelihood of reporting dismissing attachment orientation. The clinical group also reported significantly lower attachment with their infant ($t = -5.55$, $p < .001$).

In summary, the very limited available research that has examined more than one of these variables together with maternal affective attachment reveals that between one third and one half of the variance in maternal affective attachment has been accounted for in models that include anxiety and parental competence together. Findings from two studies seem to suggest that maternal affective attachment is lower for mothers who are depressed or anxious, or who have insecure adult attachment.

While only three studies have examined the variables of interest to our research together as correlates or predictors of maternal affective attachment, a number of other researchers have examined the relationships between depression and anxiety, romantic attachment avoidance and

anxiety, and parental sense of competence. We will briefly review the literature on the relationships between these variables of interest here.

Adult attachment and symptoms of depression and anxiety. Researchers have found significant relationships between adult attachment dimensions and depression in the transition to parenthood and over the course of the first year. Feeney, Alexander, Noller, and Hohaus, (2003) found that prenatal measures of women's romantic attachment anxiety predicted increases in depressive symptoms in the transition to parenthood. In a prospective study, McMahon, Barnett, Kowalenko, and Tennant (2005) found that attachment factors of discomfort with closeness and anxiety in relationships measured between 2-4 months of infant age significantly predicted maternal depression at 4 and 12 months.

The relationship between romantic attachment anxiety and depression symptoms has been identified in both directions in longitudinal research by Gauthier, Guay, Senecal, and Pierce (2010), who found that romantic attachment anxiety at 2 months positively predicted postpartum depression symptoms at 5 months ($\beta = .16$) and postpartum depression symptoms at 2 months positively predicted romantic attachment anxiety at 5 months ($\beta = .12$).

Simpson, Rholes, Campbell, Tran, and Wilson (2003) found that mothers who reported high levels of anxious attachment, and who perceived insufficient support from their partners before and after birth, showed increased depressive symptoms after the transition to motherhood. They found the relationship between romantic attachment anxiety and depressive symptoms was mediated by perceived support from a partner. The same relationship was not found for women reporting high levels of romantic attachment avoidance, perhaps due to their placing less value on support from their partners.

Symptoms of anxiety show similar relationships to adult attachment in previous research.

Gratz and colleagues (2015) identified significant relationships between insecure romantic attachment (measured with the ECR; Brennan, Clark, & Shaver, 1998) and maternal symptoms of depression ($r = .58$, $p < .001$) and anxiety ($r = .48$, $p < .001$). Costa and Weems (2005) found that maternal anxiety was significantly correlated with romantic attachment anxiety ($r = .60$, $p = .001$), but not romantic attachment avoidance (measured with the ECR; Brennan, Clark, & Shaver, 1998).

In summary, depression and anxiety symptoms have been found to relate to romantic attachment anxiety far more than they have been found to relate to romantic attachment avoidance. Findings show the relationship between depression and romantic attachment anxiety is mediated by partner support, such that mothers with high levels of romantic attachment anxiety who feel unsupported after birth show more depressive symptoms in the transition to motherhood.

Parental sense of competence and symptoms of depression and anxiety. Researchers have also identified relationships between maternal sense of competence and symptoms of depression. For example, Knoche, Givens, and Sheridan (2007) found that maternal depression was significantly negatively correlated ($r = -.58$, $p < .01$) with parental sense of competence in a sample of adolescent mothers. Teti and Gelfand (1991) also found significant zero-order negative correlations between maternal depression and maternal self-efficacy beliefs ($r = -.54$ $p < .001$).

Using structural equation modeling on two cohorts of mothers in three time periods during toddlerhood of their children, Gross, Conrad, Fogg, and Wothke, (1994) found support for a model in which maternal depression influenced perceptions of toddler temperament (the more depressed mothers were, the more likely they were to rate infant temperament as difficult), which

influenced maternal self-efficacy ratings (the more difficult infant temperaments were perceived, the lower mothers estimated their efficacy), which influenced depression (the lower mothers rated their efficacy, the greater their depression).

In one study that included maternal anxiety symptoms, the relationships were slightly stronger between maternal efficacy and anxiety than with depression. Porter and Hsu (2003) found that maternal efficacy at one month postpartum was significantly negatively correlated with anxiety symptoms measured prenatally (r = -.48, p < . 01) and at one month (r = -.42, p < . 01), and with depression symptoms measured prenatally (r = -.30, p < . 05).

In summary, it seems that there is a negative relationship between maternal depressive and anxiety symptoms and parenting sense of competence.

Adult attachment and parental sense of competence. Regarding a link between adult attachment and parental sense of competence, the findings are mixed; some found negative relationships between the dimensions of anxiety and the subscales of parental sense of competence, while others found no significant relationships between them.

Calvo and Bianco (2015) found that romantic attachment anxiety was significantly negatively correlated with both parenting satisfaction (r = -.43, p < .01) and parenting efficacy (r = -.27, p < .01). Romantic attachment avoidance was also found to significantly negatively correlate with parenting satisfaction (r = -.27, p < .01) and parenting efficacy (r = -.23, p < .05). They also found that higher attachment anxiety was associated with lower parenting satisfaction (β = -0.46, p < 0.001). Rholes, Simpson, and Friedman, (2006) found a significant negative correlation between attachment avoidance and parenting satisfaction (r = -.17, p < .01) assessed

postnatally. However, they found that attachment anxiety was not significantly related to parenting satisfaction.

Schoppe-Sullivan, Settle, Lee, and Kamp Dush (2016) found no significant correlations between mothers' reported parenting self-efficacy or satisfaction and their levels of adult attachment anxiety or avoidance at three months postpartum.

Vieira, Avila, and Matos (2012) found significant negative correlations between parenting satisfaction and adult attachment avoidance, and significant positive correlations between parenting satisfaction and attachment anxiety. However, these relationships were mediated by work-family conflict. Finally, Lau and Peterson (2011) found no significant associations between attachment style and parenting satisfaction in a sample of parents diagnosed with Asperger's syndrome.

Adult attachment, parental sense of competence, and symptoms of depression and anxiety. In a study examining the impact of childhood maltreatment on mothers in an at-risk population, Caldwell, Shaver, Li, and Minzenberg (2011) found significant negative correlations between parental efficacy and attachment anxiety (r = -.37 p < .01) and attachment avoidance (r = -.20, p < .05) and with symptoms of depression (r = -.53, p < .01). Maternal depression was found to significantly positively correlate with attachment anxiety (r = .50, p < .01), and attachment avoidance (r = .39, p < .01). Attachment anxiety and avoidance were also significantly positively correlated (r = .40, p < .01).

Lee and Koo (2015) found that depression was significantly positively correlated with preoccupied attachment (r = 0.32, p < 0.001) and fearful attachment (r = 0.35, p < 0.001), but not secure or dismissive attachment. Depression was negatively correlated with maternal efficacy (r = - 0.37, p < 0.001). In a mediation analysis, they found that the relationship between

preoccupied attachment and maternal depression was fully mediated by self-esteem, and the relationship between fearful attachment and maternal depression was partially mediated by self-esteem. Maternal efficacy moderated the mediating effects of self-esteem, such that mothers with high maternal efficacy, compared to mothers with low maternal efficacy, were protected from the negative impact of attachment anxiety and low self esteem on levels of maternal depression.

Kohlhoff and Barnett (2013) found that parenting efficacy correlated negatively with symptoms of anxiety (r = -.40, p < .01), and depression (r = -.45, p < .01), and with romantic attachment avoidance (r = - .25, p < .05), and romantic attachment anxiety (r = - .33, p < .05). Attachment anxiety also correlated with symptoms of anxiety (r = .36, p < .05) and depression (r = .27, p < .05), and with attachment avoidance (r = .56, p < .01). Symptoms of depression and anxiety were also significantly correlated (r = .68, p < .01). In separate regressions they also found that both attachment anxiety and attachment avoidance predicted major depression, and parental self-efficacy. Tests for significance confirmed that major depression mediated the relationship between both of the attachment variables and parental self-efficacy.

In summary, when all the independent variables included in our study have been examined together, there appear to be positive relationships between romantic attachment anxiety and avoidance and symptoms of depression and anxiety, and those variables seem to be negatively related to parenting sense of efficacy and satisfaction. To date, however, these predictors have never been tested together as part of a model to predict maternal affective attachment.

Our Study

Although previous research has identified relationships between symptoms of depression and anxiety; adult romantic attachment anxiety and avoidance; parenting efficacy and

satisfaction, and other research has found links between each of these variables and maternal affective attachment outcomes, this will be the first study to examine all of these variables together. Furthermore, the existing literature has tended to take a variable-centered approach (i.e. examining one or two variables in isolation while holding others constant). Currently, there is no known study of maternal affective attachment that has used a person-centered approach (such as cluster analysis or latent profile analysis) to identify how groups of variables work together within individuals to explain the variance in mothers' feelings of attachment toward their children. The present study fills this gap in the literature in order to extend our understanding of the maternal experience of affective attachment bonds to children in a holistic, person-centered way.

Research Questions and Hypotheses

We were motivated to answer two main questions in our examination of the data. 1) What are the different profiles of motherhood experiences in our sample of Canadian mothers?

We wanted to learn how predictor variables (symptom distress, romantic attachment avoidance and anxiety, and parental sense of efficacy and satisfaction) would co-exist in individual mothers' experiences. Would there be some profiles of mothers who are having very positive experiences and other profiles of mothers who are having very negative experiences, or would there be profiles characterized by a mixture of positive and negative experiences? We also wanted to know whether the profiles identified in the latent profile analysis would significantly differ from one another in terms of their symptom distress, romantic attachment avoidance and anxiety, and parental sense of efficacy and satisfaction.

Given the established relationships between each of our indicator variables, and between the variables and maternal affective attachment, we hypothesized that the variables would also vary together to a certain degree within mothers. In other words, we theorized that the profiles that emerged would consist of some clusters of mothers with more positive experiences on most of the indicator variables (i.e. lower levels of symptom distress, lower levels of romantic attachment avoidance and anxiety, and higher sense of parental efficacy and satisfaction) and some clusters of mothers with more negative experiences (i.e. higher levels of symptom distress, higher levels of romantic attachment avoidance and anxiety, and lower sense of parental efficacy and satisfaction) on most of the indicator variables. We also hypothesized that the profiles would differ significantly from one another.

2) Does profile membership account for a significant portion of variance in the quality of maternal affective attachment bonds?

We wanted to know whether maternal affective attachment bonds would differ significantly between the profiles, or whether the variance in maternal affective attachment bonds could be accounted for by profile membership of the mothers. We hypothesized that maternal affective attachment would differ significantly between the profiles. Furthermore, based on previous findings, we hypothesized that maternal affective attachment would be strongest for mothers in profiles characterized by lower symptom distress, lower romantic attachment avoidance and anxiety, and higher sense of efficacy and satisfaction in the maternal role. We hypothesized that maternal affective attachment would be lowest for mothers in profiles characterized by greater symptom distress, higher romantic attachment avoidance and anxiety, and lower sense of efficacy and satisfaction in the maternal role.

Chapter IV

Methods

Methods

Participants

Participants were 300 Canadian mothers who completed an online survey on their maternal experiences. Any woman involved in raising at least one child under the age of 19 (including stepchildren or adoptive children) was allowed to participate. Our rationale for this age limit was that we were predominantly interested in learning about women with children who were still dependent on them to some degree. Every effort was made to reach and gather a large and diverse sample of mothers from across Canada. Recruitment of participants began in the fall of 2013 and was completed in the spring of 2015. Ethics approval was obtained within the context of another project and a copy of the approval is available by request.

Our objective was to recruit a sample that is representative of the diversity of motherhood experiences in Canada according to the latest statistics from the Canadian census, (Statistics Canada, 2011). The sample we obtained came close to meeting this objective, however we were not able to achieve the level of representation we had hoped for. Our sample had a similar proportion of stepmothers; 10.6% (n = 32) in our sample, compared to the 9.5% of Canadian mothers who are in stepfamilies according to the latest census information. Lesbian mothers were under-represented in our sample; 0.01% of our mothers reported having a female partner (n = 3), compared to 0.1% of mothers who are in relationships with women in the population. Adoptive mothers were also under-represented in our sample; 0.04% (n = 12) compared to estimates of 1.7% of the population. Mothers in intact partnerships (married or cohabiting) were over-represented in our sample; 85.4% (n = 246) compared to 61.78% in the population. Finally, single mothers were under-represented in our current sample; 14.6% (n = 44) compared to 24.6% of mothers who are single in the population.

Power considerations. Statistical power in latent profile analysis (LPA) is defined as the ability to detect the model with the correct number of classes. Power is influenced by a number of variables, including sample size, level of separation between classes, and number of indicators (Tein, Coxe, & Cham, 2013).

Researchers have found that in latent class analysis and latent profile analysis, the amount of separation between classes has far more influence on power than does sample size. For example, Tein and colleagues (2013) conducted simulations and manipulated sample size (N = 250; 500; 1000), separation between classes (Cohen's d = 0.2; 0.5; 0.8; and 1.5), and number of indicators (6, 10, and 15 items). They found that power to detect the correct number of classes is low when there is small or medium separation between classes, regardless of the sample size used (Tein et al., 2013). Tekle, Gudicha, and Vermunt (2016) found that when class separation is moderate, adequate power of .80 could be achieved with a sample size as small as 150. However with low class separation, high power would only be possible with a sample of more than 300 participants.

Using simulation studies, researchers have found adequate power (BLRT of 0.80) with samples of 200 (Nylund, Asparouhov, & Muthen, 2007). The BIC was able to accurately select the model with the correct number of classes at a rate of 91% in samples of 200 participants in equal classes (Yang, 2006). Finally, the adjusted BIC was able to accurately select the model with the correct number of classes at the acceptable rate of 80% in samples of 300 participants in both equal and unequal classes (Swanson, Lindenberg, Bauer, & Crosby, 2012).

Statistical power for conducting a MANOVA was calculated *a priori* with the use of a statistical software called G*Power. To conduct a MANOVA with a medium effect size of 0.25,

alpha error probability of 0.05, power (1-beta error probability) of 0.95, with 10 groups (allowing for the possibility of up to 10 profiles in the LPA) required a sample size of 200.

For the purposes of this research, with our 300 participants and moderate separation between classes, we were able to achieve adequate power of .80 for both sets of analyses.

Sample descriptives. Mothers in the full sample (N = 300) ranged in age from 18 to 57 (M = 35.57, SD = 7.70). The majority of participants reported their ethnicity as Caucasian (n = 265, 88.3%), the remaining participants were split between African origin (n = 4, 1.3%), Asian origin (n = 5, 1.7%), Arabic origin (n = 2, 0.7%), Latino (n = 3, 1%), Native North American (n = 3, 1%), or Other (n =18, 6%). Of the participants who reported 'Other', eight reported a combination of ethnicities (2.7%), two reported Turkish (0.7%), other ethnicities were reported once (0.3% each (South Asian, Metis, Lebanese, Haitian, European, Celtic). Two participants reported their ethnicity as "Canadian".

The vast majority of participants reported on their citizenship as 'Canadian born in Canada' (n = 267, 89%). Others reported 'Canadian born outside of Canada' (n = 25, 8.3%), 'Permanent Resident' (n = 5, 1.7%), 'Canadian currently living out of the country' (n = 2, 0.7%), and 'Other' (n = 1, 0.3%). The one participant who reported 'Other' citizenship did not indicate any further about her citizenship, but did indicate that she has been living in Canada for between 36 and 40 years. Participants also reported which province they lived in: Alberta (n = 13, 4.4%), British Columbia (n = 12, 4.0%), Manitoba (n = 3, 1.0%), New Brunswick (n = 40, 13.3%), Newfoundland (n = 3, 1.0%), Northwest Territories (n = 4, 1.3%), Nova Scotia (n = 14, 4.7%), Ontario (n = 187, 62.3%), Prince Edward Island (n = 1, 0.3%), Quebec (n = 14, 4.7%), Saskatchewan (n = 7, 2.3%).

Participants reported on their annual household incomes and levels of difficulty paying for necessities. Nearly half of participants (*n* = 138, 46%), reported incomes of $90,000 or more, another 46% of the sample reported income in the next four brackets: $75,000 - 89,999 (*n* = 33, 11%), $60,000-74,999 (*n* = 33, 11%), $45,000-59,999 (*n* = 46, 15.3%), $30,000 – $44,999 (*n* = 27, 9%). Only 7.7% of the sample reported incomes lower than $30,000: $15,000 - $29,999 (*n* = 13, 4.3%), 0-$14,999 (*n* = 10, 3.3%). Similarly, the majority of participants reported 'never' having difficulty paying for substantial needs (food, clothing, housing, etc.) (*n* = 175, 58.3%), another 91 (30.3%) participants reported 'sometimes' having difficulty, while only 31 (10.3%) reported "often" having difficulty. Three participants reported that they did not know if they had difficulties in this area.

Participants reported a range of educational experience attainment: 'some high school' (*n* = 4, 1.3%), 'high school diploma' (*n* = 10, 3.3%), 'some college studies' (*n* = 24, 8.0%), 'college diploma' (*n* = 69, 23.0%), 'some undergraduate studies' (*n* = 14, 4.7%), 'undergraduate university degree' (*n* = 107, 35.7%), 'some masters studies' (*n* = 15, 5.0%), 'masters degree' (*n* = 30, 10.0%), 'some doctoral studies' (*n* = 5, 1.7%), 'doctoral degree' (*n* = 15, 5.0%), 'some postdoctoral studies (*n* = 4, 1.3%), and 'postdoctoral degree (*n* = 3, 1.0%).

The majority of our participants were currently employed (*n* = 205, 68.3%), and reported their occupation: 'professional (doctor, lawyer, engineer, scientist, teacher, nurse, etc.)' (*n* = 86, 41.9%), 'office employee (manager, director, salesperson)' (*n* = 58, 28.3%), 'tradesperson (construction, factor, manual work)' (*n* = 3, 1.5%), 'self employed (' (*n* = 22, 10.7%), 'student' (*n* = 4, 2.0%), 'stay-at-home parent' (*n* = 5, 2.4%), or 'other' (*n* = 27, 13.2%). Participants who were not currently employed (*n* = 95, 13.7%) reported their most recent occupation:

'professional' (*n* = 13, 13.7%), 'office employee' (*n* = 9, 9.5%), 'student' (*n* = 18, 18.9%), 'stay-at-home parent' (*n* = 47, 49.5%), or 'other' (*n* = 8, 8.4%).

The majority of mothers were currently in partnered relationships (*n* = 256, 85.3%): married (*n* = 198, 66.0%), cohabiting (*n* = 35, 11.7%), remarried after divorce (*n* = 18, 6.0%), or cohabiting after divorce/separation (*n* = 5, 1.7%). They reported being in their current relationships for between 6 months and 30 years (*M* = 11.5 years, *SD* = 6.4). Their current partners were married for the first time (*n* = 191, 74.6%), cohabiting/never married (*n* = 32, 12.5%), remarried after divorce (*n* = 22, 8.6%), cohabiting after divorce/separation (*n* = 8, 3.1%), or remarried after being widowed (*n* = 3, 1.2%). Mothers who were not currently in partnered relationships (*n* = 44, 14.7%), were single/never married (*n* = 22, 7.3%), or separated/divorced (*n* = 22, 7.3%).

The vast majority of our participants reported their sexual orientation as 'heterosexual' (*n* = 288, 96.0%). Two participants reported 'homosexual' (0.7%), and ten reported 'bisexual' (3.3%). The genders of their current or most recent partners were reported as 'male' (*n* = 297, 99.0%), 'female' (*n* = 3, 1.0%).

Participants reported on the number of children they had in total. The majority were in small families, with one (*n* = 102, 34.0%) or two (*n* = 126, 42.0%) children. Fewer mothers reported having three (*n* = 51, 17.0%), four (*n* = 15, 5.0%), five (*n* = 5, 1.7%), or six (*n* = 1, 0.3%) children. Focal children were selected randomly for each participant included in the MANOVA analysis (n = 269). Focal children ranged in age between 0-6 months and 19 years. A total of 32.3% of the focal children were under 1 year of age, 34.2% were between 1 and 5, and 33.5% were between 6 and 19 years of age. A full breakdown of focal child age frequencies and percentages can be found in Table 5.

The focal child's gender was reported as 'male' (*n* = 151, 50.3%), 'female' (*n* = 148, 49.3%), and other (*n* = 1, 0.3%). Mothers reported on their relation to the child: 'biological child conceived in context of current relationship' (*n* = 218, 72.7%), 'biological child conceived in context of a former relationship' (*n* = 45, 15.0%), 'adopted in the context of current relationship' (*n* = 5, 1.7%), 'adopted while single' (*n* = 4, 1.3%), 'current partner's biological or adopted child with a former partner' (*n* = 21, 7.0%), 'conceived or adopted with current lesbian partner' (*n* = 1, 0.3%), or 'conceived or adopted with a former lesbian partner' (*n* = 1, 0.3%). Of the participants who reported on a custody arrangement for their focal child (*n* = 72, 24%), mothers reported custody arrangements of 'I have sole custody' (*n* = 23, 31.9%), 'child lives primarily with me' (*n* = 13, 18.1%), 'we have joint custody' (*n* = 25, 34.7%), 'child lives primarily with other parent' (*n* = 4, 9.7%), and 'other parent has sole custody' (*n* = 4, 5.6%).

Materials

Our online survey, "Canadian Survey on Parenthood", was available on Fluid Survey, a secure online software at this link: http://fluidsurveys.com/surveys/stepfamilyresearchlab/copy-test-data-base/?ef . The survey was carefully designed so that questions customized to the needs of each participant. Based on responses to socio-demographic questions, participants were administered the correct number of questionnaires for the number of children they had (i.e. if they had three children, they were provided with three parent-child relationship scales). A focal child was then selected randomly for each participant by the first author, using a coin toss for mothers with 2 children or a dice roll for mothers of three or more children. The survey included a section of demographic questions followed by a set of questionnaires. The independent variables in our study were symptom distress (measured with the symptom distress subscale of the Outcome Questionnaire; Lambert, Burlingame, Umphress, Clouse, & Yanchar (1996),

romantic attachment dimensions of avoidance and anxiety (measured with the ECR-SF; Wei, Russel, Mallinckrodt, & Vogel, 2007), and parental sense of efficacy and satisfaction (measured with the Parenting Sense of Competence Scale; Gibaud-Wallston & Wandersman, 1978). The dependent variables in our study were maternal affective attachment (measured with the MPAS; Condon & Corkindale, 1998), and perceptions of closeness and conflict with the child (measured with the CPRS; Pianta, 1994. A copy of each of the questionnaires included in the survey is included in Appendix F.

Demographic variables. The survey consisted of a detailed demographics section which asked mothers about their age, ethnic background, citizenship, length of time living in Canada, province of residence, approximate annual income and financial situation, level of educational attainment, employment status, amount of hours of work per week, occupation or most recent occupation, marital status, length of current relationship, relationship status of current partner, sexual orientation, and number of children. Mothers were asked to report the age, gender, and relationship (e.g. biological child, adopted child, stepchild) to each of her children. If applicable, additional questions appeared to inquire about the custody arrangement of the child, as well as the level of involvement in the child's life of the biological father, partner of the biological father, or in the case of stepmothers, the biological mother.

Maternal Postnatal Attachment Scale. To measure the mother's affective attachment bonds to each of her children, the Maternal Postnatal Attachment Scale (MPAS; Condon & Corkindale, 1998) was administered to all participants (mothers were provided with a separate questionnaire for each child). The scale is designed to assess the mother's subjective experience of her bond to her infant with 19 items. The scale produces a total attachment score ranging from 19 to 95, where higher scores indicate higher attachment, as well as three subscales: 1) quality of

attachment with nine items (e.g. "*Over the last two weeks I would describe my feelings for the baby as: 1 = dislike* to *5 = intense affection"*), 2) pleasure in interaction with five items (e.g. "*when I have to leave the baby: 1 = I usually feel rather relieved* to *5 = I usually feel rather sad*"), and 3) absence of hostility with five items (e.g. "*When I am caring for the baby I get feelings of annoyance or irritation: 1 = very frequently* to *5 = never*"). The scores for each of the subscales are determined using the average of each of the items from that subscale, providing a range of scores for each subscale between 1 and 5.

Condon and Corkindale (1998) reported acceptable internal consistency for the full scale at four weeks (α = .78), four months (α = .79), and eight months (α = .78). Test-retest reliability was acceptably high according to an interclass correlation coefficient of $r = .70$, and a significant Pearson correlation coefficient between the assessments of $r = .86$, ($p < .001$). The scale demonstrated high face validity by reflecting various facets of emotions mothers experience toward their child (Condon & Corkindale, 1998). The MPAS is also significantly related to the Attachment Q-Set, an observational measure of parent and infant attachment behaviours (Feldstein et al., 2004). Following the method used by Goodman and Glenwick (2012), we modified the measure so that the word "baby" was replaced with "child", to allow for its administration to mothers of children of any age. In their study, they reported acceptable internal consistency of the measure for mothers ($\alpha = .77$), equivalent to the internal consistency of the measure when used with mothers of infants, ranging from .77 to .79 (Condon & Corkindale, 1998; Feldstein et al., 2004; Scopesi, Viterbori, Sponza, & Zucchinetti, 2004). Internal consistency in our study was higher than that reported in previous studies ($\alpha = .85$).

In the present study, only 18 of the 19 items were administered to participants due to an error in transcription during the creation of the online survey. The missing item (#10) is indicated

with an asterisk in the questionnaire found in Appendix F. The missing item was from the quality of attachment subscale; one that originally consists of 9 items, therefore this scale now consists of 8 items. van Bussel and colleagues (2010) reported lower internal consistency for the subscales: the quality of attachment subscale (α = .69), the absence of hostility scale (α = .50), and the pleasure in interaction (α = .50). In our study, we found higher internal consistency than has previously been reported for all subscales: the eight-item quality of attachment scale (α = .76), the five-item absence of hostility scale (α = .70) both had acceptable internal consistency, however, the five-item pleasure in interaction scale (α = .68) had lower internal consistency.

The Child-Parent Relationship Scale: Short Form. To measure the mother's perspective of the mother-child relationship with each of her children, the short form of the Child-Parent Relationship Scale (CPRS; Pianta, 1994) was administered to all participants (mothers were provided with a separate questionnaire for each child). The scale is a measure of parent-child relationship quality, with 15 items comprising two subscales: closeness with 7 items (e.g. "*I share an affectionate, warm relationship with this child*"), and conflict with 8 items (e.g. "*This child and I always seem to be struggling with each other*"). Participants respond using a 5-point Likert scale where *1 = definitely does not apply* and *5 = definitely applies*. There is a low correlation between each subscale, indicating that they represent two distinct domains of the parent-child relationship.

Pianta (1998) reported good internal consistency for the conflict subscale when the child was 54-months-old (α = .84), and when the child was in first grade (α = .84). He reported lower internal consistency for the closeness subscale when the child was 54 months old (α = .69), and when the child was in first grade (α = .64). Driscoll and Pianta (2011) assessed the validity of the scale through associations with coded videotaped interactions between parents and children.

They reported correlations between CPRS closeness and observer ratings of supportive presence, sensitivity, and positive caregiving, and between CPRS conflict and observer ratings of hostility. In our study, internal consistency was again higher than in previous research, with good internal consistency for both the conflict subscale (α = .87), and the closeness scale (α = .84). For the present study, the scores for the subscales were determined using the average of all the items from that subscale. This allowed all the DVs in our study to have a consistent standard range from 1-5, improving clarity and ease of understanding.

Experiences in Close Relationships Scale: Short Form. To measure mothers' romantic attachment orientations, the short form of the Experiences in Close Relationships Scale (Wei et al., 2007) was administered to all participants. The scale is designed to assess a general pattern of attachment in relationships with 12 items comprising two subscales: Anxiety with six items (e.g. *"I need a lot of reassurance that I am loved by my partner"*), and Avoidance, with six items (e.g. *"I am nervous when my partners get too close to me"*). Participants respond using a 7-point Likert scale, where *1 = Strongly Disagree* and *7 = Strongly Agree.*

The short form was developed from the widely used, highly reliable and valid 36 item Experiences in Close Relationships Scale that was developed by Brennan and colleagues (1998). Wei and colleagues (2007) concluded that the short scale retained similar psychometric properties to the original scale with a stable factor structure, acceptable to good internal consistency, (with coefficient alphas of .77 to .86 for Anxiety and .78 to .88 for Avoidance across studies). It had test-retest reliability for both subscales over a 1-month interval (r = .80 and .82 for anxiety and r = .83 and .86 for avoidance). It also demonstrated construct validity across samples with a positive association between attachment anxiety and excessive reassurance seeking, as well as positive associations between depression and attachment anxiety and

avoidance. In our study, the Cronbach alphas were somewhat lower than those reported in previous studies (α = .68) for romantic attachment anxiety, and within the previously reported range (α = .81) for romantic attachment avoidance. This indicates that the responses of our sample were less internally consistent than those found in previous studies. This may mean that our participants did not interpret the items in the same way as previous participants have. This difference may be due to the very different sample used to validate the scale, which was a sample of undergraduate students who were mostly single, mostly in very early adulthood, and were evenly split between men and women (Wei et al., 2007). Thus, caution should be exercised in the interpretation of findings.

Parenting Sense of Competence Scale. To measure mothers' sense of efficacy and satisfaction in the parental role the Parenting Sense of Competence Scale (Gibaud-Wallston & Wandersman, 1978) was administered to all participants. The scale is designed to assess parenting self-esteem with 17 items. Factor analysis on this instrument has been conducted by four sets of researchers (Gilmore & Cuskelly, 2009; Johnston & Mash, 1989; Ohan, Leung, & Johnston, 2000; Rogers and Matthews, 2004). For our purposes we used all the items that consistently loaded into the two factors of interest to us: efficacy, with five items (e.g. *"If anyone can find the answer to what is troubling my child, I am the one"*) and satisfaction, with six items (e.g. *"being a parent makes me tense and anxious"*). Participants respond using a 6-point Likert scale where *1 = strongly disagree* and *6 = strongly agree*.

The scale has demonstrated internally consistent with Cronbach alpha of .79 for the full scale. Factor analysis of the scale revealed a satisfaction subscale with a Cronbach alpha of .75 and an efficacy subscale with a Cronbach alpha of .76 (Johnston & Mash, 1989). The scale demonstrated test-retest reliability ranging from .46 to .82 (Gibaud-Wallston & Wandersman,

1978). It was initially developed for parents of infants, but the wording was changed in a later study to replace "infant" with "child" to extend the scale's use for children of different ages and they found that there were no significant effects of the age of the child (Johnston & Mash, 1989). The scale is the most commonly used of any parental belief measures according to a review by Pritchett and colleagues (2011). In our study, the Cronbach alpha was higher than previously reported; with .86 for the full scale, .77 for satisfaction subscale, and .78 for efficacy subscale.

Outcome Questionnaire: Symptom Distress Subscale. As a measure of symptoms of common mental health problems including anxiety and depression, the Outcome Questionnaire symptom distress subscale was administered to all participants. This scale was selected for our purposes because we were recruiting our sample from a non-clinical population, and this measure reflects symptoms of the most common disorders (anxiety, affective, adjustment, and stress-related illness) and a range of scores in both clinical and non-clinical levels. The subscale is designed to measure core aspects of anxiety and depression with 25 items (e.g. *"I feel blue", "I feel nervous", "I tire quickly")*. Participants respond using a 5-point Likert scale where *0 = never* and *4 = almost always*. High scores indicate that the participant is bothered by these symptoms, and a cut-off score of 36 indicates clinically significant distress related to the most common disorders (anxiety disorders, affective disorders, adjustment disorders, and stress-related illness) and found to reflect the symptoms of these disorders.

Symptom scores have been found to correlate highly with various measures of depression, such as the BDI, and anxiety, such as the State-Trait Anxiety Inventory (Umphress, Lambert, Smart, & Barlow, 1997). The scale has excellent internal consistency reliability coefficients (α = .93; Lambert et al.,1996) and good 3-week test-retest reliability (.84). It has great concurrent validity coefficients with the Beck Depression Inventory (Beck et al., 1996),

and the State Trait Anxiety Inventory (Umphress et al., 1997). In our study, we found excellent internal consistency for the symptom distress subscale (α = .93).

Procedure

Participants were recruited nationally through convenience and snowball sampling across Canada. The Stepfamily Research Lab's website announced the launch of the survey in October 2013, and social media (e.g. Facebook, Twitter, blogs) was used to share the survey with extended networks of potential participants. We contacted a number of Canadian agencies that work with families asking them to share the survey links with their contacts across most provinces. Data collection began in October of 2013 and continued until March of 2015. Every attempt was made to recruit as many mothers as possible for the survey.

Participants were provided with an informed consent form on the first page of the online survey. The form provided information about the purpose of the research, what their participation would involve, the risks (possible discomfort when sharing information about their personal experience) and benefits (opportunity to share own experience and enable researchers to better understand motherhood). Confidentiality and anonymity were assured and participants were informed that their name would not appear on any document related to their participation. Details about conservation of data for a period of 5 years after the completion of the study were provided, and the lack of compensation for participation and the voluntary nature of participation and were clearly stated. Participants were informed that if they withdrew from the study their data would be destroyed. Contact information for the researchers was also provided for any participants who had questions or comments about the study. Participants gave their consent to participate in the study by clicking 'next' on the survey page to be taken into the survey. The informed consent form can be found in Appendix G.

The online software is secure and password protected. After the data was imported it was stored on a password-protected computer in a locked office. Only the primary researchers involved in the project have had access to the surveys and data.

Chapter V

Research Question 1:

What are the different profiles of motherhood experiences in our sample of Canadian mothers?

Analysis and Results

The first research question was concerned with identifying profiles of mothers who share similar patterns of maternal experiences. In other words we wanted to group our participants into clusters who resembled one another and could be differentiated from mothers in other profiles based on our defined set of indicator variables. The indicator variables of interest to us in this project were maternal experience variables that have been identified in past research as being associated with maternal affective attachment outcomes, that haven't all been tested together: symptom distress related to the most common mental health difficulties (measured with the Outcome Questionnaire; OQ; Lambert et al., 1996), romantic attachment avoidance and anxiety (measured with the two subscales of the Experiences in Close Relationships - Short form; ECR-SF; Wei et al., 2007), and parental sense of efficacy and satisfaction, (measured with the two subscales of the Parental Sense of Competence Scale; PSOC; Gibaud-Wallston & Wandersman, 1978). Descriptive statistics for the full sample on each of these indicator variables can be found in Table 6.

A latent profile analysis (LPA) is a person-centered method that does not require prior knowledge of the groups being studied (Muthen & Muthen, 2002; Tabachnick & Fidell, 2007). There are several advantages to using LPA instead of other non-hierarchical clustering methods such as k-means cluster analysis. First, the expectation maximization algorithms in LPA provide information about the probability of a particular mother belonging to a specific profile, while traditional algorithms only calculate distances between individuals' scores and cluster means to determine membership in a cluster. Furthermore, LPA provides information about which of the models best fits the data, allowing the researcher to determine statistically the model with the best number of profiles. Finally, LPA is able to accommodate missing data, data with non-normal distributions, and modest inter-correlations between indicator variables (Muthen, 2004).

Indicator variables were screened for univariate outliers and multivariate normality prior to conducting the LPA. There was no missing data because the online survey did not allow participants to not respond to questions, and participants were informed that incomplete surveys would be considered as a withdrawal from the study and removed from the data set. Univariate outliers were identified and replaced with scores within 3 standard deviations from the mean (Tabachnick & Fidell, 2007). Multivariate normality was assumed when it was determined that all maternal experience questionnaires demonstrated univariate and bivariate normality, as well as linearity and homoscedasticity (Tabachnick & Fidell, 2007).

The amount of clusters in LPA is not something that is pre-determined; the analysis results in several models, each with a different number of clusters. We conducted analyses for seven different models, ranging from two to eight classes in size. In order to determine which one was the best fitting model, we used information criteria provided in the MPlus LPA output; the Akaike Information Criterion (AIC; Akaike, 1987), the Bayesian Information Criterion (BIC; Schwarz, 1978), and sample size adjusted BIC (Sclove, 1987). Lower AIC, BIC, and adjusted BIC values indicate the better fit to the data (Vermunt & Magidson, 2005). Simulation studies have identified the adjusted BIC as the best information criterion statistic (Yang, 2006). We also considered entropy values, which represent the percentage of correctly classified cases in the model. Entropy values closer to 1 demonstrate better model fit (Ramaswamy, Desarbo, Reibstein, & Robinson, 1993).

Given the established relationships between each of our indicator variables and maternal affective attachment, we hypothesized that the variables would also vary together to a certain degree. In other words, we theorized that the profiles that emerged would consist of some

clusters of mothers with more positive experiences on most of the indicator variables, and some clusters of mothers with more negative experiences on most of the indicator variables.

We used MPlus software to conduct a latent profile analysis to identify profiles. of mothers by assigning each mother to the cluster that best represents her particular profile of scores on the measures of these maternal experiences. We ran models for two to eight profiles. We then used information criteria and entropy values to determine the model with the optimal number of profiles. We also decided that profiles would not be further examined if they contained less than 5% of the respondents, as we wanted our profiles to be meaningful and useful (Stanley, Kellermanns, & Zellweger, 2017).

After motherhood profiles were identified we examined the item response means of each profile to gain information about the characteristics of the different profiles and to assign them with descriptive labels. To test whether the profiles differed significantly on the indicator variables, we conducted a MANOVA using SPSS software. The independent variable was profile membership. The dependent variables were symptom distress; romantic attachment dimensions of avoidance and anxiety; and parental sense of efficacy and satisfaction. The null hypothesis of this analysis was that there would be no significant differences between the different profiles.

Results

In latent profile analysis, information criteria provides information about which model, with which number of classes, is the best fit for the data. The information criteria and entropy values for each of the seven models of the LPA can be found in Table 7. To help select the best fitting model, we examined the values provided for each of the seven models, and used our stated decision criteria: lower AIC, BIC, and adjusted BIC values (Vermunt & Magidson, 2005), with

particular emphasis on the adjusted BIC (Yang, 2006), and entropy values closer to 1 (Ramaswamy et al., 1993).

In our study, the lowest of the AIC values was found in the 8 class solution, the lowest of the BIC values was found in the 4 class solution, and the lowest of the adjusted BIC values was found the 7 class solution. The 2 and 7 class solutions both had entropy values of .85, the closest to a value of 1 among the 7 models. Upon closer inspection we determined that the 7 class solution, in addition to having the lowest score on the adjusted BIC (known to be the best information criterion statistic according to Yang, 2006) and entropy value closest to 1, also had the second lowest value for the AIC. We felt confident, based on this information, that the 7-class solution was the best fit for the data. However, three of the profiles in this best-fitting model were small, with only 3, 6, and 15 members. We decided to describe these profiles, but not include them in further analyses, based on the criteria that profiles would not be further examined if they contained less than 5% of the respondents (Stanley et al., 2017).

To determine whether there are significant differences between the profiles on the indicator variables, we ran a one-way MANOVA. Our independent variable was profile membership, using the four large groups identified in our latent profile analysis. Our dependent variables were the indicator variables entered into the LPA: symptom distress, romantic attachment dimensions of avoidance and anxiety, and parental sense of efficacy and satisfaction.

Because we had uneven group sizes, for Post Hoc tests we selected Tukey-Kramer HSD, which has been demonstrated to be conservative in all cases, and appropriate for use with unequal sample sizes (Hayter, 1984). We found that Pillai's Trace test was significant F (15, 810) = 55.00 ($p < .001$), indicating significant differences between profiles on a linear combination of the dependent variables. Therefore, we reject the null hypothesis and conclude

that there were statistically significant differences between profiles. Effect size was determined using partial eta squared ($\eta_p^2 = 0.505$, demonstrating that 50.5% of the multivariate variance of the dependent variables is associated with profile membership of the mothers.

To protect against Type I error, we used a traditional Bonferroni procedure of dividing our alpha of .05 by the number of dependent variables (5) to get our new value of 0.01 to test for significance. Tests of between-subjects effects showed that all dependent variables were significantly different between profiles: symptom distress (F (3, 272) = 133.33, $p < .001$), romantic attachment avoidance (F (3, 272) = 225.75, $p < .001$), romantic attachment anxiety (F (3, 272) = 62.25, $p < .001$), parental efficacy (F (3, 272) = 28.66, $p < .001$), and parental satisfaction (F (3, 272) = 231.39, $p < .001$). Finally, we examined multiple comparisons to identify where the significant differences occurred (See Table 10). Here we present the four large profiles and a brief description of the three small profiles retained in the 7-class solution. Means and standard deviations of the indicators for each of the seven profiles can be found in Table 8.

The Four Larger Profiles:

Class A: Lucky Lindas. This profile stood out with the most favourable results on each of the measures. These 85 mothers reported significantly lower levels of symptom distress (M = 14.41, SD = 6.88) than all other profiles. They also reported significantly lower romantic attachment anxiety (M = 14.02, SD = 4.32) than all of the other profiles, as well as romantic attachment avoidance (M = 8.94, SD = 2.68) significantly lower than the Hannas and the Annies. They also reported the highest levels of perceived efficacy (M = 25.75, SD = 2.95) and satisfaction (M = 30.45, SD = 2.70) in their parental role, significantly higher than the other three profiles.

Class B: Feeling Fine Fionas. With a total of 109 mothers, the second profile was the largest one. The mothers in this profile reported the second lowest levels of symptom distress (*M* = 24.40, *SD* = 8.72), significantly less distress than the Hannas, while still significantly more distress than the Lindas. They reported significantly less romantic attachment avoidance than the Annies of the Hannas (*M* = 9.98, *SD* = 2.90). They also reported the second lowest levels of romantic attachment anxiety (*M* = 18.78, *SD* = 4.61), significantly less than the Hannas, and significantly more than the Lindas. However, these mothers reported a more moderate sense of efficacy (*M* = 21.48, *SD* = 3.99) and satisfaction (*M* = 23.06, *SD* = 3.02) in their parental role, with significantly less efficacy or satisfaction than the Lindas, but significantly more satisfaction than the Hannas.

Class C: Alright Annies. A total of 41 mothers fit into the third profile. The mothers in this profile reported symptom distress (*M* = 25.90, *SD* = 9.50) that was significantly lower than that reported by the Hannas and significantly higher than that reported by the Lindas. They had the highest reported levels of romantic attachment avoidance (*M* = 21.00, *SD* = 3.19), significantly higher than the Lindas and Fionas, and the second highest reported levels of romantic attachment anxiety (*M* = 20.78, *SD* = 5.18), which was still significantly lower than the Hannas and significantly higher than the Lindas. They also reported significantly lower parental efficacy (*M* = 22.27, *SD* = 3.29), and satisfaction (*M* = 23.59, *SD* = 2.46) than the Lindas, and significantly higher satisfaction than the Hannas.

Class D: Hard Time Hannas. There were 41 mothers classified into this fourth profile. Within this profile, mothers reported the highest levels of symptom distress (*M* = 48.29, *SD* = 12.09) among the four large groups, with significantly higher distress than all three other profiles. They were the only large group with distress scores higher than the cut-off of 36,

indicating clinically significant distress. They also had the highest reported levels of romantic attachment anxiety (*M* = 25.76, *SD* = 4.99), significantly higher than all other profiles, and the second highest levels of romantic attachment avoidance (*M* = 19.41, *SD* = 4.37), significantly higher avoidance than the Lindas or Fionas. They also reported the lowest levels of parental satisfaction (*M* = 16.32, *SD* = 3.59), significantly lower than all other profiles, as well as the lowest levels of parental efficacy (*M* = 20.63, *SD* = 4.19), significantly lower than the Lindas.

The Three Smaller Profiles:

Three of the seven classes were quite small, with only 3, 6, and 15 members. The experiences of these mothers are unique and important, and their experiences are distinct enough to warrant membership in a separate profile according to the information criteria provided with the analysis however the small size of these groups necessarily limits our ability to draw strong conclusions about them. These profiles were not included in the further analysis; however, their experiences are described below.

Class E: Blending in Betties. This small group included 15 mothers. Their reported symptom distress levels were similar to the levels found in Annies and Fionas (*M* = 25.53, *SD* = 11.17). Their romantic attachment scores resembled the Hannas, with similarly high anxiety (*M* = 25.40, *SD* = 4.44), but lower avoidance (*M* = 15.93, *SD* = 3.28). Their sense of competence was similar to the Lindas with high reported efficacy (*M* = 26.00, *SD* = 2.56) and satisfaction (*M* = 30.13, *SD* = 1.84).

Class F: Struggling Sallies. This small group included only 6 mothers, however their reports indicate they are experiencing higher levels of difficulty than the Hannas in every respect. They indicate the highest overall reported levels of symptom distress (*M* = 50.00, *SD* = 11.58), scoring above the cut-off of 36 for clinically significant distress. Their romantic

attachment scores also indicate the highest overall reported levels of anxiety (M = 34.33, SD = 4.72), but very low levels of avoidance (M = 8.5, SD = 2.26). Finally, they report the lowest overall reported levels of efficacy (M = 18.16, SD = 4.92) and satisfaction (M = 13.83, SD = 3.54) in their maternal role.

Class G: Avoidant Andreas. The smallest group consisted of only 3 mothers. They reported levels of symptom distress that were the second lowest (M = 18.33, SD = 4.93) after the Lindas. These mothers presented with the highest reported levels of romantic attachment avoidance (M = 32.33, SD = 8.33) and lowest reported levels of romantic attachment anxiety (M = 11.00, SD = 4.00). In terms of parental sense of competence, these mothers reported perceived efficacy (M = 25.00, SD = 2.65) similar to the Lindas, meanwhile they reported satisfaction levels (M = 15.67, SD = 6.66) comparable to Hannas.

Chapter VI

Research Question 2:

Does profile membership account for a significant portion of variance in maternal affective attachment bonds?

Analysis and Results

To determine whether profile membership would account for a significant portion of the variance in maternal affective attachment bonds, we conducted a MANOVA using SPSS software. The independent variable was maternal profile, and for this step of the analysis we included only the four larger profiles. The dependent variables were five subscales from two measures of maternal affective attachment; quality of attachment, absence of hostility, and pleasure in interaction (measured with the Maternal Postnatal Attachment Scale; MPAS; Condon & Corkindale, 1998); perceptions of conflict, and perceptions of closeness, in the mother-child relationship (measured with the Child Parent Relationship Scale; CPRS; Pianta, 1994). The null hypothesis was that there would be no significant differences between the different profiles. We hypothesized that profiles characterized by lower symptoms of distress, lower romantic attachment avoidance and anxiety, and higher efficacy and satisfaction in the parental role would be in the best position to feel strongly affectively attached and perceive more closeness and less conflict in their relationship with children.

The assumptions of MANOVA. In the design of our study we ensured that we met the assumptions of continuous dependent variables and a categorical independent variable. We ensured independence of observations by asking each individual to complete only one survey, Furthermore, the data was not manually entered, it was directly downloaded from the fluidsurveys website into SPSS, so there was no chance of accidentally entering participant data more than once. We ensured that there were different participants in each group with the LPA, with no participants in more than one group. We also verified that we would have an adequate sample size for MANOVA. Our original sample consisted of 300 mothers who were all entered into the latent profile analysis, which found that a 7-class solution provided the best fit. Three of those classes contained 15 individuals or less, and those were therefore described, but not

included in further analyses. After excluding the three smaller classes, the full sample consists of 276 mothers, and the smallest profiles contain 41 members.

Even though most of the distributions of scores within each group were significantly skewed, central limit theorem suggests that the sampling distribution of sample means will be normal even if the underlying raw data are skewed (Tabachnick & Fidell, 2007). However, extreme scores can still have an important influence on the means. To determine the influence of these scores, we tested for univariate outliers by calculating z-scores and examining the data for all cases with z-scores greater than 1.96 to determine if the values were also disconnected from the distribution. There were 52 cases with scores that fell below our cut-off for at least one of the dependent variables. To address the univariate outliers, we used the winsorizing method of adjusting the values beyond a 1.96 cut-off that were also disconnected from the distribution, to move them closer to the rest of the distribution (the value of the nearest value in that distribution +/- .01).

We saved a winsorized dataset and a nonwisorized dataset, and then tested each separately for multivariate outliers by calculating Mahalanobis's distance. In the original, non-winsorized dataset, there were 7 cases considered to be multivariate outliers, and in the winsorized dataset there were only 4 cases considered to be multivariate outliers. Cases that were considered multivariate outliers were eliminated in both data sets.

We tested the assumption of linear relationships between pairs of dependent variables and independent variable by examining scatterplot matrices to determine whether the relationships between each of the dependent variables appear to be linear. This assumption was met in both datasets.

We tested the assumption of no multicollinearity by examining the correlations between the dependent variables. Correlations were all significant at the 0.01 level, and none of the pearson's r values were above a cut-off of 0.8. Therefore, this assumption was met. Furthermore, none of the pearson's r values were below a cut-off of 0.2, indicating that there is enough of a relationship between the variables that it makes sense to run a MANOVA rather than separate one-way ANOVAs.

Box's test of equality of covariance matrices was significant in both the non-winsorized dataset, ($F = 2.27$, $p < .001$), and in the winsorized dataset ($F = 2.99$, $p < .001$) indicating that the assumption of homogeneity of variance-covariance was not met. Therefore, when making the decision of whether to reject the null hypothesis in our MANOVA, Pillai's Trace test, which is more robust to the assumption violations, was used instead of the Wilk's Lambda (Olson, 1976).

Analyses were performed using both the winsorized and the non-winsorized data sets. Since the results were the same irrespective of the data set used, only the results for the non-winsorized data set are presented- that is, the data set with the least amount of modifications. Means and standard deviations of the indicator variables for each of the four large profiles after testing assumptions of MANOVA and removing cases that violated assumptions can be found in Table 9.

Results

To test the null hypothesis that there are no significant differences between profiles on any of our maternal affective attachment variables, we ran a one-way MANOVA. Our independent variable was profile membership, using the four large groups identified in our latent profile analysis and described above: Lucky Lindas, Feeling Fine Fionas, Alright Annies, and Hard Time Hannas. Our dependent variables were five maternal affective attachment variables:

quality of attachment, absence of hostility, and pleasure in interaction (subscales of the MPAS; Condon & Corkindale, 1998), and perceived conflict and perceived closeness (subscales of the CPRS; Pianta, 1994). For Post Hoc tests, because we had uneven group sizes, we selected Tukey-Kramer HSD, which has been demonstrated to be conservative in all cases, and appropriate for use with unequal sample sizes (Hayter, 1984). Because some of our assumptions were not met, when making our decision of whether to reject the null hypothesis we examined the Pillai's Trace test that is known to be more robust to violations of the assumptions, rather than the Wilk's Lambda (Olson, 1976). We found that Pillai's Trace test was significant F (15, 789) = 7.418 ($p < .001$), indicating significant differences between profiles on a linear combination of the dependent variables. Therefore, we reject the null hypothesis and conclude that there are statistically significant differences in maternal affective attachment between profiles. Effect size was determined using partial eta squared ($\eta_p^2 = 0.124$, demonstrating that 12.4% of the multivariate variance of the dependent variables is associated with profile membership of the mothers. Observed power for this analysis was 1.00.

To protect against Type I error, we used a traditional Bonferroni procedure of dividing our alpha of .05 by the number of dependent variables (5) to get our new value of 0.01 to test for significance. Tests of between-subjects effects showed that all dependent variables were significantly different between profiles: quality of attachment (F (3, 265) = 36.33, $p < .001$), absence of hostility (F (3, 265) = 20.08, $p < .001$), pleasure in interaction (F (3, 265) = 7.03, $p < .001$), perceived conflict (F (3, 265) = 25.66, $p < .001$), and perceived closeness (F (3, 265) = 5.97, $p = .001$). Means and standard deviations of each of the outcome variables can be found in Table 11.

Finally, we examined multiple comparisons to identify where the significant differences occurred (See Tables 12 - 16).

For quality of attachment, the Lucky Lindas ($M = 4.75$) had significantly higher mean scores than all other profiles: Feeling Fine Fionas ($M = 4.40$) ($d = .35$, $p < .001$), Alright Annies ($M = 4.35$) ($d = .40$, $p < .001$), Hard Time Hannas ($M = 4.01$) ($d = .74$, $p < .001$), while the Hard Time Hannas also had significantly lower mean scores than Feeling Fine Fionas ($M = 4.40$) ($d = -.38$, $p < .001$), and Alright Annies ($M = 4.35$) ($d = -.33$, $p = .002$).

For absence of hostility, Lucky Lindas ($M = 4.24$) had significantly higher scores than Feeling Fine Fionas ($M = 3.78$) (.46, p < .001), and Hard Time Hannas ($M = 3.29$) (.95, $p < .001$), but were not significantly different from Alright Annies ($M = 3.94$). Hard Time Hannas ($M = 3.29$) again had significantly lower mean scores than Alright Annies ($M = 3.94$) (-.64, $p < .001$) and Feeling Fine Fionas ($M = 3.78$) (-.49, $p = .001$).

For pleasure in interaction, Lucky Lindas ($M = 4.40$) had significantly higher mean scores than Hard Time Hannas ($M = 3.84$) (.55, $p = .001$). No other significant differences between any other profiles were found for Pleasure in Interaction.

For perceived conflict, Lucky Lindas ($M = 1.55$) had significantly lower mean scores (representing less conflict perceived) than all other profiles: Feeling Fine Fionas (M = 2.14) (-.58, $p < .001$), Alright Annies ($M = 2.29$) (-.74, $p < .001$), and Hard Time Hannas ($M = 2.76$) (-1.21, $p < .001$). Hard Time Hannas ($M = 2.76$) also had significantly higher mean scores (representing more perceived conflict) than Feeling Fine Fionas ($M = 2.14$) (.62, $p < .001$).

For perceived closeness, Lucky Lindas ($M = 4.65$) had significantly higher mean scores than Hard Time Hannas ($M = 4.27$) (.38, $p = .002$). No other significant differences between any other profiles were found.

Chapter VII

Discussion

Attachment is a complementary and dynamic process, but research to date has focused predominantly on the infant or child's attachment to the mother, leaving the mother's experience of this connection understudied. Maternal affective attachment, the emotional tie of affection felt by a mother toward her child, is a topic that remains mostly neglected by family researchers. This thesis was conducted to advance our understanding of facilitators of maternal affective attachment bonds to children. Our findings organize and contribute to the small body of work that has begun to shed light on the affective component of attachment felt by a mother toward her child.

Our first goal in conducting this thesis was to identify all factors that have been previously found to facilitate the maternal affective attachment bond. We began by exploring the literature systematically, and found this is a research area in its infancy. In the 25 years between 1990 and 2015, only 26 articles have been published that pertain to facilitators of maternal affective attachment measured with a validated instrument. While this is a relatively novel area of study, and it is difficult to draw strong conclusions due to the lack of replication of most findings to date, researchers have already identified a number of variables that may predict, facilitate, or correlate with maternal affective attachment bonds.

Limitations of the Literature

A significant obstacle to conducting our systematized review was a lack of consistent terminology in the literature to date regarding the subject of mothers' feelings of attachment to their children. Researchers referred to "maternal feelings of attachment", "mother-to-infant bonding" "attachment to children" "maternal perceptions of their attachment relationship", "feelings of closeness", and more. This made it necessary to cast a very wide net and to closely examine each of the articles to establish that no relevant studies were lost to our review. We

ensured that the measures used in our retained studies were designed with items that were consistent with our defined construct of maternal affective attachment. In this thesis, we propose the term "maternal affective attachment" to capture the essence of what this research examines. In order to facilitate the reading of this review, we have used this term consistently throughout, regardless of the terms used by the authors.

A related difficulty with this review is the fact that mothers' affective attachment has been examined using a variety of different measures. There were six different measures used across the 26 included studies, and a number of other measures had been developed for use in only a single study, and had not been validated, so were therefore excluded in accordance with our criteria. While there were, of course, commonalities among the items included in the measures in our review, and each was designed to capture mothers' feelings toward their children, the measures have not been studied together to determine whether they validly measure the same construct.

Lacking diversity of maternal experiences. When researchers included information about the mothers' marital status, the majority of mothers (89%) who participated in the research included in our systematized review were married or partnered. The vast majority of researchers did not ask mothers about their sexual orientation (they seemed to assume they were heterosexual), and to our knowledge no studies included lesbian mothers. Furthermore, with regards to the mothers' relationship to their child, nearly all of the available research on maternal affective attachment has focused on biological motherhood. Only one study focused exclusively on adoptive mothers. This indicates that research to date has not conceptualized maternal affective attachment outside of biological bonds.

Most of the research to date has focused on mothers' affective attachment to very young children; over two thirds of the included studies looked at mothers of children under 1 year of age. Only six studies include mothers of children between 1 and 5 years of age, and only two examine mothers of a child over 6 years of age.

The research to date does represent a diversity of ethnicities and a range of economic situations for mothers, though some have only small samples. Across all of the studies, participants represented a variety of ethnicities, with participants of European and Asian origins predominating, followed by smaller samples of Middle Eastern, Hispanic, and African origins, as well as a very small sample of individuals identified as being indigenous to Australia or America. Interestingly, four of the studies did not report on the ethnicity of their participants at all, and in another eleven articles, the ethnicities of some participants were either specified as "other" or not reported.

Future research would benefit from the inclusion of more diversity of family forms, including mothers in different family configurations, with children of different ages, which would represent the range of different families that exist in our society. It would be interesting to learn if the variables found to relate to maternal affective attachment in biological, heterosexual, mostly partnered mothers of very young children would extend to adoptive or stepmothers, lesbian mothers, single mothers, and mothers of older children.

Lacking replication of findings. Given the wide range of variables already examined, future research should focus on replication and extension of the most well-supported findings, as well as further examination of the variables that have received less attention despite promising early findings. For example, while maternal depression has been examined quite extensively, maternal symptoms of anxiety have received significantly less attention despite early results

suggesting that as maternal anxiety increases, maternal affective attachment, quality of attachment, and absence of hostility towards the child all decrease.

Another limitation of the systematized review was the use of only one database, PsycInfo, in our search of the literature. We made the choice to rely on PsycInfo because we were interested in the psychological theory of attachment, and therefore expected that an extensive database of psychological references would be the one most relevant to our research question. Furthermore, in previous iterations of this review, in which PsychArticles, Women's Studies International, Family Studies Abstracts, and GLBT databases were used, they did not return any articles relevant to our research question that were not also found in PsycInfo. However, we could have taken a more inter-disciplinary approach to this review and included other databases. For example, we could have sought out a medical or nursing perspective of maternal affective attachment by also searching in Medline, EMBASE, or CINAHL.

In summary, the existing literature has shown that a number of maternal, child and family factors have been linked to maternal affective attachment, some more consistently than others, such as depression and adult attachment orientation. However, the literature is plagued by a number of issues including a relative lack of attention within the larger attachment field, overall lack of diversity in sampling to better represent the diversity of maternal experiences, lack of replication, the proliferation of measures (including some with limited psychometric validity and reliability) that limits our ability to compare findings, as well as a lack of person-centered models that would help to better account for the complex reality of what contributes to a positive maternal affective attachment experience.

The primary objective of the main study in the thesis was to build upon findings from previous research by conducting a more in-depth and intra-individual level analysis of the

maternal experiences that have been found to relate to mothers' affective attachment bonds. We relied on the normative adaptive approach to guide us in the design of our research; we took care in designing our research questions to ensure that we were not comparing mothers based on their family structure or other demographic information, and made efforts to recruit mothers from diverse family contexts. From the findings of our review we identified variables with good theoretical rationale for inclusion in our study: symptom distress, romantic attachment avoidance and anxiety, and parenting sense of efficacy and satisfaction. We decided to use a latent profile analysis to learn about patterns in the expression of our variables that would allow us to identify profiles of maternal experiences within our sample. We were pleased that this provided us with an option for a grouping variable that was not based on family configuration or other demographic variables, which has often been used in the literature to categorize motherhood experience based on what is favoured by the dominant social discourse (i.e. married intact middle-class heterosexual families vs. other families). Finally, we tested whether the profiles differed significantly in their maternal affective attachment bonds. This approach contributes a new perspective to the literature on maternal affective attachment, with the use of a statistical method that had not yet been applied to this research area. This was also the first study of maternal affective attachment conducted in Canada.

Our first research question was concerned with identifying profiles of maternal experiences with our indicator variables. We hypothesized that the indicators, which had been previously found to relate to maternal affective attachment in our systematized review, would also relate to one another to some degree, which would therefore reveal patterns in the expression of the variables in which some groups of mothers would be reporting mostly positive experiences, while others reported mostly negative experiences.

Information criteria provided by our latent profile analysis suggested the existence of seven maternal profiles and four of them were large enough to include in further analyses. We found support for our first hypothesis through examination of the mean scores in each of the four large profiles. One group of mothers, who we named the Lucky Lindas, reported all of the most positive experiences: lowest levels of symptom distress, lowest levels of romantic attachment avoidance and anxiety, and highest levels of efficacy and satisfaction in the parental role. Another group, who we named the Hardtime Hannas, reported all of the least positive experiences: highest levels of symptom distress, second highest levels of romantic attachment avoidance, highest levels of romantic attachment anxiety, and lowest levels of efficacy and satisfaction in the parental role. A MANOVA revealed that the profiles differed significantly from one another, and multiple comparisons showed that the differences between the Lindas and Hannas were significant on every variable. The other two groups, the Annies and Fionas, reported very similar experiences, mostly falling in between the Lindas and Hannas with significant difference only in their levels of romantic attachment avoidance, where the Annies reported the highest levels and Fionas reported the second lowest levels.

The pattern of expression of the variables in the profiles of the Lindas and Hannas are not surprising, and fit with previous research that found positive relationships between depression and romantic attachment anxiety (Feeney et al., 2003; Gauthier et al., 2010; McMahon et al., 2005), positive relationships between anxiety and romantic attachment anxiety (Costa & Weems, 2005), negative relationships between depression and parenting sense of competence (Knoche, Givens, & Sheridan, 2007; Teti & Gelfland, 1991), negative relationships between anxiety and parenting sense of competence (Porter & Hsu, 2003), and negative relationships between parenting sense of competence with attachment anxiety and attachment avoidance (Calvo &

Bianco, 2015). The profiles show a pattern that was expected based on the directions of relationships between each of the variables individually.

The intention of our second research question was to discover whether the identified profiles would help to explain variance in maternal affective attachment bond outcomes. In other words, would maternal affective attachment differ significantly between the profiles? We hypothesized that the profiles characterized by lower symptoms of distress, lower levels of romantic attachment avoidance and anxiety, and higher sense of efficacy and satisfaction in the maternal role (i.e. the Lucky Lindas) would report significantly higher maternal affective attachment, while those characterized by higher symptoms of distress, higher levels of romantic attachment avoidance and anxiety, and lower sense of efficacy and satisfaction in the maternal role (i.e. the Hardtime Hannas) would report significantly lower maternal affective attachment.

We found support for our hypotheses; the MANOVA found that maternal affective attachment differed significantly between the profiles. Furthermore, multiple comparisons revealed that the profile characterized by all of the most positive experiences, Lucky Lindas, reported the best maternal affective attachment outcomes on all variables measured in our study, and all outcomes were significantly more positive than the profile characterized by the most negative experiences, Hardtime Hannas. Furthermore, Lucky Lindas reported a significantly higher quality of attachment and a significantly lower perceived conflict than all three of the other large profiles, as well as significantly more absence of hostility than two of the other profiles (Feeling Fine Fionas and Hardtime Hannas). Meanwhile, Hardtime Hannas reported all of the least positive affective attachment outcomes across all of the measures in our study, all significantly less positive than those of the Lucky Lindas. Furthermore, their outcomes were significantly less positive than all three of the other profiles when it came to their quality of

attachment, and absence of hostility (i.e. they felt more hostility). They also reported significantly more perceived conflict than two of the other profiles (Feeling Fine Fionas and Lucky Lindas). The affective attachment outcomes of the Fionas and Annies were very similar, and none were statistically significantly different from one another.

These findings fit with those of previous researchers who have identified that maternal affective attachment is facilitated by low levels of maternal depression and anxiety (Mason et al., 2011; Mercer & Ferketich, 1990; 1994; Nagata et al., 2004; Perry et al., 2011; Tikotzky et al., 2012; van Bussel et al., 2010), low levels of romantic attachment avoidance and anxiety (Rholes et al., 1995; Sen & Kavlak, 2012; Sierau et al., 2013; van Bussel et al., 2010; Wilkinson & Mulcahy, 2010), and higher parenting sense of competence (Gharaibeh & Hamlan, 2012; Goodman & Glenwick, 2012; Mercer & Ferketich, 1990; 1994). It is therefore not surprising that the Lindas reported all of the most positive affective attachment outcomes, and significantly more positive affective attachment on all variables than did the Hannas, who reported all of the least positive outcomes.

The Annies and Fionas are interesting in that they differed only in their level of romantic attachment avoidance, but not on any other independent or dependent variable. Given the negative relationships identified in previous research between romantic attachment avoidance and maternal affective attachment (Rholes et al., 1995; Sen & Kavlak, 2012; Sierau et al., 2013), we would have expected the Annies to report lower maternal affective attachment than the Fionas. The finding that they did not differ on any affective attachment outcomes suggests that the role of romantic attachment avoidance was not as strong an influence on maternal attachment as that of the combination of the other variables. This fits with previous research by van Bussel and colleagues (2010), who found stronger and more significant relationships between maternal

affective attachment and depression (r = -0.30, p <.0001) and anxiety (r = -0.40, p <.0001), as compared to relationships between maternal affective attachment and dismissing adult attachment (r = -0.16, p <.05). Furthermore, Wilkinson and Mulcahy (2010) found no significant differences between a postnatal depressed clinical group and a non-depressed comparison group in their likelihood of reporting dismissing attachment orientation, though the clinical group reported significantly lower attachment with their infants than the comparison group did.

The results are also consistent with our expectations given our theoretical rationale for including these variables. Our measure of symptom distress was a continuous (rather than categorical) measure, allowing us to capture non-clinical and clinical levels of distress from symptoms of both depression and anxiety. Based on the interacting systems principle from the cognitive behavioural model, we theorised that symptom distress would relate to mothers' affective attachment experience through interacting systems of cognition, affect, physiology, and behaviour. Therefore, as distress decreased, maternal affective attachment would increase, and as distress increased, maternal affective attachment would decrease. Our findings supported this, with the profile reporting the lowest levels of symptom distress (Lindas) showing the best affective attachment outcomes and the profile reporting the highest levels of symptom distress (Hannas) showing the worst affective attachment outcomes.

Our measure of romantic attachment was dimensional, identifying levels of attachment anxiety and avoidance in adult romantic relationships. Drawing on attachment theory, we anticipated that these dimensions of adult romantic attachment would relate to maternal affective attachment bonds, as they would both be related to their generalized working model of attachment. Our findings partially supported this, with the profile marked by the lowest levels of romantic attachment anxiety and avoidance (Lindas) showing the best affective attachment

outcomes, and the profile marked by the highest level of romantic attachment anxiety (Hannas) showing the worst affective attachment outcomes, across the board. On the other hand, the Annies and Fionas, who did not differ on any of the variables except their level of romantic attachment avoidance (Annies with the highest reported levels and Fionas with the second lowest levels) surprisingly did not differ in their maternal affective attachment bonds. We would have expected based on their different levels of avoidance that the Fionas would have had more positive affective attachment outcomes than the Annies. Our findings suggest that the role of romantic attachment avoidance was not as strong as that of the combination of the other variables.

Our measure of parenting sense of competence examined dimensions of efficacy and satisfaction. Drawing from Bandura's self-efficacy theory, we expected that parenting sense of competence would relate to maternal affective attachment through its' influences on thoughts, motivations, behaviours, and emotional reactions to situations, resulting in different experiences with children. We found some support for this; though efficacy showed little variation across most profiles; the only significant differences revealed that the Lindas reported significantly higher efficacy than all of the other profiles. With regard to the satisfaction dimension there was more variation, with Lindas reporting significantly more satisfaction than all three other profiles, and Hannas reporting significantly less satisfaction than all three others. In other words, the profile with significantly higher efficacy and satisfaction showed the most positive maternal affective attachment outcomes, and the profile with significantly lower satisfaction in parenting showed the least positive maternal affective attachment outcomes.

Attachment theory provided our over-arching rationale for the inclusion of all variables. We theorized that the culmination of mothers' own attachment experiences across their lives

would be an underlying influence, such that mothers with overall positive attachment experiences would be the most likely to be in good mental health (low symptom distress), be secure in their romantic attachment (low romantic attachment avoidance and anxiety), and feel competent in their maternal role (high parental efficacy and satisfaction), while mothers with overall less positive attachment experiences would be the most likely to be in poorer mental health (high symptom distress), be less secure in their romantic attachment (high romantic attachment avoidance and anxiety), and feel less competent in their maternal role (lower parental efficacy and satisfaction). We did find generally good support for this hypothesis in its application to the study of maternal affective attachment. Future research in this area would benefit from the inclusion of a direct measure of mothers' attachment representations or state of mind with respect to attachment (e.g. the AAI; George, Kaplan, & Main, 1985) in order to clarify the attachment classifications of each of the profiles and further test this hypothesis in how it relates to other aspects of maternal attachment, such as behavioural and cognitive aspects.

Advantages of Latent Profile Analysis in Family Research.

The findings from our main study contribute to the literature with the first use of a person-centered approach in this research area. The use of a latent profile analysis allows dimensional/continuous process variables to reveal groups of mothers who are having similar experiences. This allows us to learn more about the experiences of individual mothers, showing us a snapshot of the patterns in the expression of each of these variables within mothers. We are then able to see these mothers, to describe their experiences, to name them, and to imagine how their set of experiences might feel in a more holistic manner. Similar to how researchers have observed patterns in behaviours displayed by infants to learn more about their attachment

experience, latent profile analysis allows us to examine patterns in the self-reported internal processes of mothers.

With a latent profile analysis, the focus is on the person and her experience, rather than on relationships between variables. This difference is subtle, but we hope to highlight the distinction. With the same set of data, we could have explored relationships between variables directly, and concluded something about the variables, such as: symptom distress is negatively correlated with maternal affective attachment, or parenting efficacy is positively correlated with affective attachment. Instead, our results emphasize that a set of experiences are able to sort our sample into groups of mothers who are having similar experiences to one another that are different from the experiences of other groups. Furthermore, these groups are not pre-determined or arbitrarily assigned based on external factors such as their socioeconomic status, family configuration, or age, but rather it is their own reports of internal experiences that group them with others who are feeling the same way. Finally, we find that this set of experiences is also associated with differences between profiles in their maternal affective attachment bonds. From the researcher perspective, we recognize the advantage of using this method; we continue to feel as though we can see the mothers and their set of experiences throughout our analysis, without losing them in variables. We can also imagine that this makes our findings more relatable to the mother who wants to learn about maternal bonds from research. Mothers who read this research may find themselves able to relate to a particular profile, and perhaps feel less alone in their particular experience, knowing there are others having similar nuanced experiences.

Our normative adaptive perspective highlights additional advantages of latent profile analysis. Instead of arbitrarily creating groups to compare according to demographic characteristics (e.g. age, family configuration, income, or education) it is the self-reported

experiences of the mothers in our sample that serve as the basis for identifying these groups, revealing mothers' experiences as they exist in the population. This differs from other research methods that classify mothers into groups based on their demographic information, which may leave the false impression that it is the demographic differences themselves that lead to the differences in maternal experiences. Clinically, this is not only unhelpful (e.g. what use is it to a clinician working with a young single mother to learn that she is at a disadvantage compared to an older married mother?); it also possibly contributes to stigma for certain mothers, or leads to potential clinical bias in providers who work with them. Viewing mothers through the lens of their psychological experiences of distress, attachment orientation, and sense of efficacy and satisfaction in their role allows for a more nuanced understanding of the facilitators of maternal affective attachment and equips maternal health providers with information that empowers them to identify targets for treatment. We hope to highlight the need for maternal research that departs from a deficit model aimed at comparing categories of mothers on the basis of their family configuration or demographics to more dimensionally-based paradigms that transcend simple categorizations and focus more on central aspects of parenthood and the maternal experience.

Limitations of the Present Study & Future Directions

Because we were interested in learning about the facilitators of strong affective attachment bonds, and existing research has found evidence that postpartum depression is associated with bonding difficulties, we drew from a non-clinical sample in our study, using an online survey to collect our data, and promoting it through social media. We did not exclude mothers from clinical populations from completing our survey, but we also did not actively seek them out. This is somewhat of a break from tradition in maternal research where the tendency has been to study mothers who are struggling; who are disadvantaged or at risk (Quinlivan &

Evans, 2005; Sierau et al., 2013); who are depressed or experiencing other mental illness (Davies et al., 2008; Mason et al., 2011; Nagata et al., 2000; Nagata et al., 2003; Nagata et al., 2004; Perry et al., 2011; Wilkinson & Mulcahy, 2010); or who have children who are preterm, ill, or may be challenging to parent (Evans et al., 2012; Goodman & Glenwick, 2012; Yilamz et al., 2011). While it makes sense for research to focus on the experiences of mothers who are struggling, this can lead to distortions in our understanding of the more general maternal experience. It is also important to study the experiences in non-clinical samples, in order to learn about mothers who are having positive experiences. Research on these mothers benefits the literature by allowing for a more balanced view of maternal experiences in the general population and by identifying variables linked to those positive resilient family experiences. This study finds that far more of the mothers in our non-clinical population sample report maternal experiences that classify them into the profiles with the best outcomes. Furthermore, even the mothers whose profiles reveal less positive maternal experiences still generally report strong affective attachment outcomes.

Still, it would be interesting to use the methods of latent profile analysis to learn more about the profiles of mothers in clinical samples of mothers. In our study, one of the large profiles (Hardtime Hannas) and one of the small ones (Struggling Sallies) were reporting distress above the cut-off for clinical significance. It is our hope that other researchers will attempt to replicate these findings, and will make efforts to recruit mothers with a wider range of experiences. It would be worthwhile for future research to include mothers from both clinical and nonclinical populations together in a profile analysis, to determine whether there would be new profiles that emerge, or whether the profiles would resemble the ones already identified in

our study, with perhaps more participants filling in the more distressed profiles that emerged in our data.

While we made efforts to reach mothers from a variety of family configurations, and promoted our survey with specific calls for single, step, and adoptive mothers, as well as mothers who were in lesbian partnerships, we were unfortunately unable to reach a sample of mothers that represented the demographics of the population of Canada. As a result, our final sample under-represented single mothers, mothers in lesbian partnerships, and adoptive mothers, and over-represented married biological mothers. Furthermore, our sampling technique did not allow us to know how many mothers saw our survey and decided not to participate in it, mothers self-selected to complete our survey. It is possible that mothers having more positive experiences were more willing to complete our survey, leaving us with a bias in our sample. Indeed, previous family research by Heiervang and Goodman (2011) found that the rate of logging on to an online survey was comparable to the rate of response to in-person interviews, however the rate of completion for web surveys was much lower. Furthermore, they found that full completion of their survey was less frequent for non-traditional families, immigrant parents, and less educated parents. They observed that this selective participation affects point estimates, while patterns of association are more robust. It is important to note that our non-representative sample limits the generalizability of our findings. We would encourage future researchers to make strong efforts to recruit mothers who were under-represented in our sample, including single mothers and adoptive mothers, and mothers in same-sex partnerships, in order to represent the full range of family experiences in the Canadian population.

Our study did not find the same level of bonding difficulty as was found in a recent survey conducted in the UK (National Childbirth Trust, 2016). In fact, our findings revealed that

most of our sample reported strong bonds to their children, high closeness and low conflict. This may have been due to the fact that their survey was focused on new mothers, when bonding difficulties may be more prevalent during the adjustment to parenthood, while ours included mothers of older children as well. This may also have been due to our sample being not fully representative of the range of maternal experiences in the population, tending to represent a more privileged group overall. On the other hand, mothers in Canada may have different maternal experiences than do mothers in the UK, perhaps reflecting cultural differences between the countries. Future studies to explore this discrepancy would benefit from a data collection from mothers with both young and older children in Canada and the UK.

Our research was aimed at understanding mothers' own experiences of their affective attachment bonds to their children and other maternal experiences, and for this reason we used self-report measures. We understand that this was a necessary limitation in our study, as self-report measures are subject to bias and to shared variance. We also knew that we were asking about a sensitive topic, and that social desirability may possibly lead mothers who are not feeling as attached to their children, or who are not having a positive experience of motherhood, to hesitate about revealing the full truth of their experiences to researchers. Indeed, past research has identified a negative correlation between impaired affective attachment bonds and social desirability (van Bussel et al., 2010). In an attempt to overcome this limitation, we chose to use an online survey that mothers could complete in the privacy of their own homes. Previous studies have found that there is a lower effect of social desirability when using computer based surveys, with increased reporting of even highly sensitive information (Turner et al, 1998). We did not meet our participants, and we did not collect their names in our survey. We assured them in our online consent form that their information would remain confidential and anonymous. They did

not need to sign any forms or reveal their identities to us in order to participate, as they consented to participate by clicking on the "next" button after reading the consent form, in order to bring them to the online survey. It is our hope that the mothers who participated in our research were able to feel more comfortable reporting their experiences honestly in this context. Future research might benefit from inclusion of a measure of social desirability in order to control for it in statistical analyses.

The internal consistency reported in our study often differed from that reported in their validation studies. In the majority of cases, our internal consistency was higher than that previously reported, which means that our sample was responding in a more internally consistent way than has been found previously. In only one subscale, the romantic attachment anxiety scale of the ECR-SF (Wei et al., 2007), we had lower internal consistency (α =.68) than has previously been reported (α =.77), meaning that our sample was responding in a less internally consistent manner than has been previously found with this measure. The ECR-SF (Wei et al., 2007) was validated on a sample of undergraduates (n = 851), mostly single (94%), relatively evenly split by gender (48% male and 52% female), mostly in very early adulthood (*M* = 20.36 years, *SD* = 2.04). This differs in many ways from the sample included in our study. The differences in internal consistency may reflect the many differences between our sample and the one used to validate the scale. Therefore, we should be somewhat cautious in the interpretation of our results.

The present study used a cross-sectional design and methods that do not allow us to imply causation, therefore we are not able to infer that the variables we positioned as facilitators exert influence on maternal affective attachment outcomes. It is just as possible that the joy of bonding to a child, or the frustrations of having difficulty bonding with them, might exert an influence on symptoms of distress, or parental sense of competence. It would be interesting to

use a longitudinal or quasi-experimental design to learn whether changes in the maternal variables we explored would result in changes in maternal affective attachment bonds, or whether changes in bonds would lead to changes in the other maternal variables. For example, maternal therapy could be designed to address and reduce mothers' symptom distress, and improve their sense of efficacy and satisfaction in the parental role, measuring changes to those variables and to affective attachment over time to determine whether improvements in those variables are associated with improvements in affective attachment bonds. Other therapy could focus on enhancing the mother-child affective attachment bond, measuring changes to those variables and to symptom distress, efficacy and satisfaction in the parental role over time to determine whether improvements in bond are associated with reduction of distress symptoms and increases in parental sense of competence.

Only two previous studies of maternal affective attachment have explored whether prenatal interventions influence maternal affective attachment to an infant. One study (Chen et al., 2001) did not provide any information about the details of the intervention, describing it only as "prenatal education", however they found that participation in this prenatal education was able to account for 33.5% of the variance in maternal affective attachment. The other study (Perry et al., 2011) found a marginally significant difference in maternal affective attachment between mothers who had taken part in an 8-week group CBT depression prevention program during pregnancy with 3 booster session follow-ups over the course of the first year, and those in the usual care group. Those who had participated in the intervention reported slightly higher maternal affective attachment to their infants. This suggests a possibility that preventatively addressing maternal depressive symptoms may have a positive impact on the maternal bond.

Our systematized review uncovered many variables that have been found to facilitate maternal affective attachment. For our main study, we had to make decisions about what variables to include and which ones to leave out. We hope future research will include some of the variables that we were unable to use. For example, we did not include a partner relationship quality variable in our study because we were concerned that in the identification of latent profiles, the mothers without partners would have likely clustered together based on their responses to that variable, which would have interfered with our main goal of identifying groups in a way that was not based on family configuration differences. However, some previous research has found evidence for associations between maternal affective attachment and relationship satisfaction with a partner (Evans et al., 2012; Sierau et al., 2013), or marital quality (Holland & McElwain, 2013; Gharaibeh & Hamlan, 2012), while other researchers found no significant relationships between maternal affective attachment and partner relationship quality (Rholes et al., 1995) or dyadic adjustment (Perry et al., 2011). One study by Rholes and colleagues (1995) found an interaction effect between marital quality and mothers' romantic anxious ambivalence, showing that mothers with lower anxious ambivalence reported more closeness with their children when their marriages were more positive, while mothers high in anxious ambivalence reported more closeness with their children when their marriages were more negative. Future research using predictive models should include partner relationship quality as a variable to better understand how this variable contributes to maternal affective attachment outcomes.

Furthermore, the use of our online survey did not permit us to include any observational or interview measures, however it would be fascinating for future research to include other components of the maternal attachment experience along with maternal affective attachment,

such as observed maternal sensitivity and responsiveness, maternal mind-mindedness or insightfulness, maternal state of mind with respect to attachment in adulthood (measured with the AAI; George, Kaplan, & Main, 1985), or child attachment security (measured with the Strange Situation). Latent profile analysis could be used to learn whether there are profiles of multiple components of maternal attachment. It would be quite interesting to learn whether the profiles differ in terms of child's attachment to mother.

Another important future direction for this research would be the incorporation of a qualitative examination of mothers from each of these profiles, to learn about their lived experiences. Through in depth interviews or narrative accounts of maternal experiences, we could learn about mothers' perceptions of the source of their positive or negative outcomes. It would be interesting to learn whether narrative accounts from mothers would show patterns or themes that would allow blind coders to distinguish them into the profile that emerged from their qualitative reports. It might also be interesting to ask specific questions to mothers from each of the profiles, tailored to their experiences, so that we could learn specific things from them. Lucky Lindas might be asked about what they have found to be the most helpful to them in their maternal experience, to what do they credit their positive outcomes. It would be valuable to ask Hardtime Hannas about what they have found contributes most strongly to their difficulties and distress, as well as what kinds of support they are most in need of.

In our study, we focused entirely on mothers and the maternal experience of affective attachment to children. While some psychometric properties of measures of affective attachment to children have been validated for use with fathers (e.g. Condon, 1993; Condon & Corkindale, 1998; Condon, Corkindale, & Boyce, 2008), and some researchers have begun to turn their attention to the affective attachment of expectant fathers (Colpin, De Munter, Nys, &

Vandemeulebroecke, 1998; Habib & Lancaster, 2010; Kunkle & McKinnon-Doan, 2003; Righetti, Dell'avanzo, Grigio, & Nicolini, 2005; Seimyr, Sjogren, Wells-Nystrom, & Nissen, 2009), the experience of paternal affective attachment to infant and children remains understudied (Condon, Corkindale, Boyce & Gamble, 2013; Feldstein, Hane, Morrison, & Huang, 2004). An important future direction would be to examine the experiences of fathers and their paternal attachment to children through a similar systematized review conducted to learn about paternal experiences found to associate with fathers' affective attachment to children. This would allow for profiles of those paternal experiences to be identified. It would also be interesting to investigate interrelations between the mother's and father's profiles within a family context.

Our findings illustrate that motherhood is not a homogeneous experience, revealing the existence of patterns of maternal experiences that can differentiate profiles in a non-clinical sample of Canadian mothers. It appears that the saying "when it rains, it pours" can be applied to motherhood; when mothers are experiencing difficulty in one area, they tend to be facing challenges in other areas as well. When mothers are doing well in any area, they are likely to be experiencing positive outcomes in other areas. Finding that these profiles of motherhood exist opens the door for researchers to learn from the mothers who are having the best experiences of motherhood, and to learn what is needed from the mothers who are struggling.

The profile of the Hardtime Hannas presented with somewhat surprising results. They reported clinically significant levels of symptom distress, the highest levels of romantic attachment anxiety and second highest levels of avoidance, and the lowest levels of satisfaction and efficacy, which would lead us to expect that they would not be in the best position to develop a strong maternal affective attachment bond with their children. Indeed, in terms of their

absence of hostility and their perceptions of conflict, their scores neared the midpoint of the scales, suggesting the presence of some challenging areas. However, we found that their quality of attachment and perceptions of closeness both fell within the top quartile of scores, and their level of pleasure in interaction fell just outside of this range. These results go against expectations when we imagine the experiences of these mothers. It seems that despite the challenges these mothers face in other areas, and the relatively higher conflict and hostility that is present within their relationships with their child, they still report good quality in their attachment, high levels of closeness and pleasure in interacting with their child. This suggests that the bond a mother feels to her child is robust even in the face of intrapersonal and interpersonal stressors, perhaps serving as a protective factor guarding against abandonment or neglect.

Furthermore, the vast majority of the mothers in our sample, despite having both qualitatively and statistically significantly different affective attachment experiences, reported strong maternal affective attachments to their children. For instance, means for quality of attachment and perceptions of closeness for all four profiles, as well as pleasure in interaction for three of the profiles (Lindas, Fionas, Annies), ranged in the top quartile of possible scores, and absence of hostility and perceptions of conflict for Fionas and Annies fell just outside of this range. These results reveal that most of the differences in maternal experience appear at each end of the spectrum (Lindas and Hannas), with a great deal of mothers (Fionas and Annies, a total of 55% of our sample) reporting experiences somewhere in between, and relatively more positive experiences of maternal affective attachment.

Our findings show that overall, even when mothers are having very different experiences and coping with different personal situations, in the absence of consistently poorer maternal

experiences, mothers are not reporting adverse maternal affective attachment outcomes. The vast majority of mothers feel very little hostility toward their children, and do not perceive their relationships to be high in conflict. Furthermore, mothers across all profiles perceive their relationships with their children to be very close, take great pleasure in interacting with their children, and feel that their affective attachment is of high quality. This suggests that maternal affective attachment bonds appear to be relatively robust, withstanding the stressors, disappointments and hardships that are part of the mother-child relationship as well as the additional burdens that may come from mothers' own life circumstances.

It is our hope that these findings can take some pressure off of mothers who may fear that their personal difficulties might have a negative impact on their relationships with their children. Even in the face of challenges and difficulties, the maternal affective attachment bond remains robust. In an age where we are often flooded with various levels of parenting advice for mothers to be 'the best mom they can be', it is refreshing to report on research findings that normalize the experience of mothers in the general population as nuanced and at times challenging, but ultimately positive and generally rewarding.

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Tables

Table 1

Rate of Agreement between Volunteers and First Author For Coding Articles

	Volunteer 1		Volunteer 2		Volunteer 3		Volunteer 4	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
Week 1	11	3	13	1	13	1	13	1
Week 2	13	1	13	1	11	3	12	2
Week 3	14	0	13	1	13	1	13	1
Week 4	14	0	12	2	14	0	14	0
Week 5	13	1	14	0	14	0	13	1
Week 6	14	0	14	0	11	1	12	1
Week 7	14	0	11	3	11	0	14	0
Week 8	12	2	14	0	13	0	13	1
Week 9	13	1	14	0	13	0	13	1
Week 10	12	1	14	0	13	2	12	1
Week 11	12	2	13	1	13	1		
Week 12	13	1	13	1				
Week 13			12	2				
Week 14			14	0				
Week 15			13	1				
Week 16			14	0				
Week 17			12	2				
Total N	155	12	223	15	139	9	129	9
% Agreement	92.8%		93.7%		93.9%		93.5%	

Table 2

Demographics of Included Articles: Participant and Family Information

Author(s) (year)	Participants	Age Mothers M (SD)	Age Children M (SD)	Relation to Child	Sexual Orientation	Marital Status	
						Partnered	Single
Chen, Chen, Sung, Kuo, & Wang (2011)	N = 110		3rd trimester to 1-2 months	Biological	Not reported	110	0
	Infertility treated group:						
	n = 51	88.31% < 36 years					
	Naturally pregnant group:						
	n = 59	92.30% < 36 years					
Davies, Slade, Wright, & Stewart (2008)	N = 211		6 weeks	Biological	Not reported	198	12
	PTSD Fully symptomatic:						
	n = 8	26.13 (6.47)					
	PTSD Partially symptomatic:						
	n = 45	30.40 (6.16)					
	PTSD Non-symptomatic:						
	n =158	30.21 (5.64)					
Evans, Whittingham, & Boyd (2012)	N = 127	32.47 (7.63)	< 24 months	Biological	Not reported	127	0

Germo, Goldberg, & Keller (2009)	N = 102	36.7 (5.4)	54.9 months (8.3)	Biological	Not reported	85	17
Gharaibeh & Hamlan (2012)	N = 220	24.3 (4.7)	1-6 months	Biological	Not reported	Not reported	
Gillum & O'Brien (2011)	N = 71	47.9 (9.3)	9.5 years	Adoptive	Not reported	35	36
Goodman & Glenwick (2012)	N = 72 (+30 fathers)	Mothers and Fathers: 35+: n = 85 25-34: n = 18 <24: n = 3	Range 2-10 years 5.51 years (2.47)	Not reported	Not reported	Not reported	
Holland & McElwain (2013)	N = 122	32.75 (5.62)	32.6 months (0.73)	Biological	Heterosexual	122	0
Mason, Briggs, & Silver (2011)	N = 127	23.5	2.7 months to 6.8 months (longitud)	Biological	Not reported	28	99

Mercer & Ferketich (1990)	N = 302		early postpartum, 1 month, 4 months, 8 months (longitud)	Biological	Not reported	263	39
	Experienced mothers:						
	n = 136	29 (4.84)					
	Inexperienced mothers:						
	n = 166	28 (5.00)					
Mercer & Ferketich (1994)	N = 303		0-8 months	Biological	Heterosexual	303	0
	High risk:						
	n = 121	28.2 (5.28)					
	Low risk:						
	n = 182	28.6 (4.69)					
Muller (1996)	N = 228	28	M = 29 days	Biological	Not reported	208	20
Nagata, Nagai, Sobajima, Ando, Nishide, & Honjo (2000)	N = 417	29.9 (4.02)	M = 5.2 days	Biological	Not reported	416	1

Nagata, Nagai, Sobajima, Ando, & Honjo (2004)	N = 267	29.9 (4.75)	6.1 days (4.31)	Biological	Not reported	568	2
Nagata, Nagai, Sobajima, Ando, & Honjo (2003)	N = 247	31.0 (3.99)	puerperium - 1year, 1month (longitud)	Biological	Not reported	247	0
Nelson & O'Brien (2012)	N = 845		15 years	Biological	Not reported	Reported instead about proportion of time partnered	
	Mothers of first born children:						
	n = 373	27.55 (5.47)					
	Mothers of later born children:						
	n = 472	30.00 (5.18)					
Perry, Ettinger, Mendelson, & Le (2011)	N = 217	25.4 (4.6)	2nd Trimester, 3rd Trimester, 6-8wks (longitud)	Biological	Heterosexual	139	78

Quinlivan & Evans (2005)	N = 136		first antenatal visit - 6 months (longitud)	Biological	Not reported	45	91
	Exposed to domestic violence:						
	n = 40	16.3 (0.9)					
	Not exposed to domestic violence:						
	n = 96	16.6 (0.9)					
Rholes, Simpson, & Blakely (1995)	N = 44	not reported	M = 36 months	Not reported	Heterosexual	44	0
Sen & Kavlak (2012)	N = 140	26.94 (5.18)	1 - 4 months	Biological	Not reported	140	0
Sierau, Jungmann, & Herzberg (2013)	N = 104	22.0 (5.5)	6 months	Biological	Not reported	88	12
Tikotzky, Chambers, Kent, Gaylor, & Manber (2012)	N = 62	33.3 (4.5)	3 - 6 months (longitud)	Biological	Not reported	Not reported	

van Bussel, Spitz, & Demyttenaere (2010)	N = 263	30.41 (4.14)	8 - 12weeks, 20-25 weeks (longitud)	Biological	Not reported	243	20
Wilkinson & Scherl (2006)	N = 60			Biological	Not reported	Not reported	
	Breast-feeding mothers:						
	n = 36	30.78 (4.18)	19.42 weeks (3.43)				
	Formula-feeding mothers:						
	n = 24	29.25 (4.51)	19.29 weeks (3.43)				
Wilkinson & Mulcah (2010)	N = 115	31.58 (3.98)	< 12 months 7.19 months (3.67)	Biological	Not reported	107	8
Yilmaz, Kavlak, Isler, Liman, & Van Sell (2011)	N = 70	27.42	1-8 months	Biological	Not reported	64	6

Table 3

Demographics of Included Articles: Ethnicity of Participants

Author(s) (year)	Total Sample (N)	Country	Ethnicity							
			Not Reported	White/ European origin	Black/ African origin	Asian origin	Hispanic /Latino	Indigenous	Middle Eastern	Other/ Not Specified
Chen, Chen, Sung, Kuo, & Wang (2011)	110	Taiwan				110				
Davies, Slade, Wright, & Stewart (2008)	211	UK	211							
Evans, Whittingham, & Boyd (2012)	127	Australia		126		1				
Germo, Goldberg, & Keller (2009)	102	USA		58		18				26
Gharaibeh & Hamlan (2012)	220	Jordan							220	
Gillum & O'Brien (2011)	71	USA			71					

Goodman & Glenwick (2012)	72 (+30 fathers)	USA	72						
Holland & McElwain (2013)	122	USA		100	4	7	1	3	7
Mason, Briggs, & Silver (2011)	127	USA	2	2	44	1	70		8
Mercer & Ferketich (1990)	302	USA		215					87
Mercer & Ferketich (1994)	303	USA		216					87
Muller (1996)	228	USA		208					20
Nagata et al. (2000)	417	Japan				417			
Nagata, Nagai, Sobajima, Ando, & Honjo (2004)	267	Japan				267			

Nagata, Nagai, Sobajima, Ando, & Honjo (2003)	247	Japan				247				
Nelson & O'Brien (2012)	845	USA	845							
Perry, Ettinger, Mendelson, & Le (2011)	217	USA					217			
Quinlivan & Evans (2005)	136	Australia						30		106
Rholes, Simpson, & Blakely (1995)	44	USA		43		1				
Sen & Kavlak (2012)	140	Turkey							140	
Sierau, Jungmann, & Herzberg (2013)	104	Germany		100						4
Tikotzky, Chambers, Kent, Gaylor, & Manber (2012)	62	USA		44	1	6				11

van Bussel, Spitz, & Demyttenaere (2010)	263	Belgium		246		17
Wilkinson & Scherl (2006)	60	Australia		52		8
Wilkinson & Mulcahy (2010)	115	Australia	115			
Yilmaz, Kavlak, Isler, Liman, & Van Sell (2011)	70	Turkey			70	

Table 4

Study Methods of Included Articles: Measures, Research Design and Analyses, Predictors/Correlates Tested

Author(s) (year)	**Measure of Maternal Affective Attachment**	**Research Design**	**Type of Analysis Conducted**	**Predictors/Correlates of Attachment**
Chen, Chen, Sung, Kuo, & Wang (2011)	Maternal Attachment Inventory	Cross sequential	MANOVA, t-tests	Pre-pregnancy (natural/infertility treated), intervention (prenatal education)
Davies, Slade, Wright, & Stewart (2008)	Maternal Postnatal Attachment Scale	Cross sectional	Correlations, ANOVA	PTSD
Evans, Whittingham, & Boyd (2012)	Maternal Postnatal Attachment Scale	Cross sectional	Correlations, regressions (hierarchical multiple)	Other mental health (experiential avoidance), pregnancy experience, infant health, relationship satisfaction, support
Germo, Goldberg, & Keller (2009)	Child Parent Relationship Scale	Cross sectional (retrospective and current)	Correlations	Maternal age, depression, infant temperament, feeding, sleep
Gharaibeh & Hamlan (2012)	Maternal Attachment Inventory	Cross sectional	Correlation ANOVA, t-tests, regression (stepwise)	Martial status, Pre-pregnancy (pregnancy planning), pregnancy experience, child gender, child age, maternal self efficacy, partner relationship satisfaction

Gillum & O'Brien (2011)	Child Parent Relationship Scale	Cross sectional	Correlations, regressions	Perceptions/beliefs (beliefs about adopted children, attributions for child behavior, perceptions of parent control)
Goodman & Glenwick (2012)	Maternal Postnatal Attachment Scale	Cross sectional	Correlations	Child attachment, pre-pregnancy (pregnancy planning), feelings about pregnancy, child gender, parenting stress, maternal self efficacy, perceptions/beliefs
Holland & McElwain (2013)	Child Parent Relationship Scale	Cross sectional	Correlations, path analyses	Child attachment, partner relationship satisfaction, support, father-child relationship quality
Mason, Briggs, & Silver (2011)	Maternal Postnatal Attachment Scale	Longitudinal	Correlations, ANOVA	Depression, infant temperament, parenting satisfaction
Mercer & Ferketich (1990)	How I Feel About My Baby Now	Cross sequential	Correlations, t-tests, regressions (multiple),	Education, depression, anxiety, maternal health, mother's own childhood attachment, fetal attachment, pregnancy experience, birth order, infant health, maternal efficacy, partner relationship satisfaction, support, negative life events
Mercer & Ferketich (1994)	How I Feel About My Baby Now	Longitudinal	t-tests, structural equation models (theoretical, respecified)	Income, marital/partner status, depression, anxiety, mother's own childhood attachment, fetal attachment, pregnancy experience (obstetrical risk), maternal efficacy, support, father's attachment, negative life events

Muller (1996)	Maternal Attachment Inventory	Longitudinal	Correlations, ANOVA, regressions	Income, education, employment, marital/partner status, fetal attachment, separation anxiety
Nagata, Nagai, Sobajima, Ando, Nishide, & Honjo (2000)	Postpartum Maternal Attachment Scale	Cross sectional	Correlations, path analysis	Maternal age, education, employment, depression, pregnancy planning, feelings about pregnancy, pregnancy experience, birth order, child gender, infant health (birth weight), support in parenting
Nagata, Nagai, Sobajima, Ando, & Honjo (2004)	Postpartum Maternal Attachment Scale	Cross sectional	Correlations, path analysis	Depression, adult attachment, feelings about pregnancy (mother and fathers'), birth order
Nagata, Nagai, Sobajima, Ando, & Honjo (2003)	Postpartum Maternal Attachment Scale	Longitudinal	Correlations, t-tests, regressions, path analysis,	Depression, earlier bonding, adult attachment, support
Nelson & O'Brien (2012)	Child Parent Relationship Scale	Longitudinal	Correlations, path analysis	Maternal age, income, marital/partner status, depression, adult attachment, pre-pregnancy (planning), parenting stress
Perry, Ettinger, Mendelson, & Le (2011)	Maternal Postnatal Attachment Scale	Longitudinal	Correlations, ANOVA, t-tests, regressions	Depression, pre-pregnancy (pregnancy planning), feelings about pregnancy, partner relationship satisfaction, intervention (perinatal depression prevention)
Quinlivan & Evans (2005)	Maternal Postnatal Attachment Scale	Prospective cohort	MANOVA, t-tests	Income, employed, marital status, depression, other mental health, child gender, feeding, negative life events (domestic violence, drug use)

Rholes, Simpson, & Blakely (1995)	Parenting Stress Index	Cross sectional	Correlations, regressions	Other mental health, adult attachment, maternal behaviours, partner relationship satisfaction
Sen & Kavlak (2012)	Maternal Attachment Inventory	Cross sectional	Correlations	Adult Attachment (Anxiety/Avoidance)
Sierau, Jungmann, & Herzberg (2013)	Maternal Postnatal Attachment Scale	Cross sectional	Correlations, Actor-Partner mediator model	Maternal age, adult attachment (anxiety/avoidance), child gender, partner relationship satisfaction, father's attachment
Tikotzky, Chambers, Kent, Gaylor, & Manber (2012)	Maternal Postnatal Attachment Scale	Naturalistic follow up after a randomized controlled study	Correlations (partial), regressions (standard multiple)	Depression, infant temperament (negative affectivity), maternal sleep
van Bussel, Spitz, & Demyttenaere (2010)	Maternal Postnatal Attachment Scale	Longitudinal	Correlations (Pearson, Spearman) t-tests	Education, depression, anxiety, mother's own childhood attachment, earlier bonding, adult attachment, pre-pregnancy (previous miscarriage), birth order, maternal orientation (facilitator/regulator), social desirability
Wilkinson & Scherl (2006)	Maternal Attachment Inventory	Cross sectional	f-tests (univariate)	Feeding
Wilkinson & Mulcah (2010)	Maternal Attachment Inventory	Cross sectional	ANOVA, t-tests, planned comparisons	Depression, adult attachment

Yilmaz, Kavlak, Isler, Liman, & Van Sell (2011)	Maternal Attachment Inventory	Cross sectional	f-tests, t-test (student)	Income, mother's own childhood attachment, pregnancy experience, infant health (congenital anomalies)

Table 5

Age of Focal Children in Full Sample

Child Age	Frequency	Percent	Cumulative %
0-6 mo	44	14.7	14.7
6-12 mo	51	17.0	31.7
1	21	7.0	38.7
2	21	7.0	45.7
3	25	8.3	54.0
4	15	5.0	59.0
5	19	6.3	65.3
6	12	4.0	69.3
7	7	2.3	71.7
8	11	3.7	75.3
9	9	3.0	78.3
10	5	1.7	80.0
11	11	3.7	83.7
12	9	3.0	86.7
13	6	2.0	88.7
14	8	2.7	91.3
15	5	1.7	93.0
16	3	1.0	94.0
17	5	1.7	95.7
18	8	2.7	98.3
19	5	1.7	100.0

Table 6

Descriptive Statistics of Indicator Variables for All Participants

	M	*SD*	Min	Max
OQ Symptom Distress	25.55	14.14	.00	89.00
ECR Avoidance	12.97	6.09	6.00	39.00
ECR Anxiety	19.22	6.51	6.00	41.00
PSOC Efficacy	22.88	4.19	7.00	30.00
PSOC Satisfaction	24.40	5.77	9.00	36.00

Table 7

Information Criteria and Entropy Values for Seven models of the Latent Profile Analysis

	AIC	BIC	aBIC	Entropy
2 Class	9700.11	9759.37	9708.63	0.85
3 Class	9613.66	9695.14	9625.37	0.78
4 Class	9583.57	9687.28	9598.48	0.77
5 Class	9561.63	9687.56	9579.74	0.80
6 Class	9541.31	9689.46	9562.61	0.83
7 Class	9528.52	9698.89	9553.01	0.85
8 Class	9527.53	9720.13	9555.22	0.84

Table 8

Means and Standard Deviations of Indicator Variables for Seven Profiles

		Symptom Distress	Attach Avoidance	Attach Anxiety	Parental Efficacy	Parental Satisfaction
		M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Lucky Lindas	85	14.4 (6.88)	8.94 (2.68)	14.0 (4.32)	25.8 (2.95)	30.4 (2.70)
Feeling Fine Fionas	109	24.4 (8.71)	9.98 (2.90)	18.8 (4.61)	21.5 (3.99)	23.1 (3.02)
Alright Annies	41	25.9 (9.50)	21.0 (3.19)	20.8 (5.18)	22.3 (3.29)	23.6 (2.46)
Hardtime Hannas	41	48.3 (12.1)	19.4 (4.37)	25.8 (4.99)	20.6 (4.19)	16.3 (3.59)
Blending in Betties	15	25.5 (11.2)	15.9 (3.28)	25.4 (4.44)	26.0 (2.56)	30.1 (1.85)
Struggling Sallies	6	50.0 (11.6)	8.50 (2.26)	34.3 (4.72)	18.2 (4.92)	13.8 (3.54)
Avoidant Andreas	3	18.3 (4.93)	32.3 (8.33)	11.0 (4.00)	25.0 (2.65)	15.7 (6.66)

Table 9

Means and Standard Deviations of Indicator Variables for Final Samples in Four Large Profiles Entered into MANOVA

		Symptom Distress	Attach Avoidance	Attach Anxiety	Parental Efficacy	Parental Satisfaction
		M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Lucky Lindas	84	14.4 (6.92)	8.87 (2.61)	14.0 (4.35)	25.7 (2.96)	30.5 (2.70)
Feeling Fine Fionas	108	24.6 (8.63)	9.97 (2.91)	18.7 (4.61)	21.6 (3.91)	23.0 (3.01)
Alright Annies	40	25.5 (9.27)	20.9 (3.17)	20.8 (5.25)	22.5 (3.12)	23.6 (2.49)
Hardtime Hannas	37	47.9 (12.6)	19.1 (4.45)	25.5 (5.12)	20.7 (4.26)	16.2 (3.58)

Table 10

Mean Differences Between Profiles on Indicator Variables for Four Large Profiles

		Lindas	Fionas	Annies	Hannas
Symptom Distress	Lindas		-9.99**	-11.49**	-33.88**
	Fionas			-1.50	-23.89**
	Annies				-22.39**
	Hanans				
Attachment Avoidance	Lindas		-1.04	-12.06**	-10.47**
	Fionas			-11.02**	-9.43**
	Annies				1.59
	Hanans				
Attachment Anxiety	Lindas		-4.76**	-6.76**	-11.73**
	Fionas			-2.00	-6.98**
	Annies				-4.98**
	Hanans				
Parental Efficacy	Lindas		4.28**	3.48**	5.12**
	Fionas			-0.79	0.84
	Annies				1.63
	Hanans				
Parental Satisfaction	Lindas		7.38**	6.86**	14.13**
	Fionas			-0.52	6.75**
	Annies				7.27**
	Hanans				

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

Table 11

Means and Standard Errors of Outcome Variables for the Four Large Profiles

	Quality of Attachment	Absence of Hostility	Pleasure in Interaction	Perceived Conflict	Perceived Closeness
	M (*SE*)	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)
Lucky Lindas	4.75 (.041)	4.24 (.070)	4.40 (.073)	1.55 (.081)	4.65 (.054)
Feel Fine Fionas	4.40 (.036)	3.78 (.062)	4.09 (.064)	2.14 (.072)	4.59 (.048)
Alright Annies	4.35 (.059)	3.94 (.102)	4.06 (.106)	2.29 (.118)	4.42 (.078)
Hardtime Hannas	4.01 (.062)	3.29 (.106)	3.84 (.110)	2.76 (.122)	4.27 (.082)

Table 12

Significant Differences Between Maternal Profiles in Quality of Attachment

Profile (I)	Profile (J)	Difference (I-J)	Std. Error
Lucky Lindas	Feeling Fine Fionas	.3486**	.05449
	Alright Annies	.4047**	.07196
	Hardtime Hannas	.7361**	.07391
Feeling Fine Fionas	Lucky Lindas	-.3486**	.05449
	Alright Annies	.0561	.06933
	Hardtime Hannas	.3875**	.07135
Alright Annies	Feeling Fine Fionas	-.0561	.06933
	Lucky Lindas	-.4047**	.07196
	Hardtime Hannas	.3314*	.08544
Hardtime Hannas	Feeling Fine Fionas	-.3875**	.07135
	Lucky Lindas	-.7361**	.07391
	Alright Annies	-.3314*	.08544

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

Table 13

Significant Differences Between Maternal Profiles in Absence of Hostility

Profile (I)	Profile (J)	Difference (I-J)	Std. Error
Lucky Lindas	Feeling Fine Fionas	.4593**	.09344
	Alright Annies	.3074	.12338
	Hardtime Hannas	.9479**	.12673
Feeling Fine Fionas	Lucky Lindas	-.4593**	.09344
	Alright Annies	-.1519	.11888
	Hardtime Hannas	.4885**	.12235
Alright Annies	Feeling Fine Fionas	.1519	.11888
	Lucky Lindas	-.3074	.12338
	Hardtime Hannas	.6404**	.14650
Hardtime Hannas	Feeling Fine Fionas	-.4885**	.12235
	Lucky Lindas	-.9479**	.12673
	Alright Annies	-.6404**	.14650

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

Table 14

Significant Differences Between Maternal Profiles in Pleasure in Interaction

Profile (I)	Profile (J)	Difference (I-J)	Std. Error
Lucky Lindas	Feeling Fine Fionas	.3124*	.09737
	Alright Annies	.3426*	.12857
	Hardtime Hannas	.5544**	.13206
Feeling Fine Fionas	Lucky Lindas	-.3124*	.09737
	Alright Annies	.0302	.12388
	Hardtime Hannas	.2419	.12749
Alright Annies	Feeling Fine Fionas	-.0302	.12388
	Lucky Lindas	-.3426*	.12857
	Hardtime Hannas	.2118	.15266
Hardtime Hannas	Feeling Fine Fionas	-.2419	.12749
	Lucky Lindas	-.5544**	.13206
	Alright Annies	-.2118	.15266

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

Table 15

Significant Differences Between Maternal Profiles in Perceived Conflict

Profile (I)	Profile (J)	Difference (I-J)	Std. Error
Lucky Lindas	Feeling Fine Fionas	-.5848**	.10833
	Alright Annies	-.7400**	.14305
	Hardtime Hannas	-1.2095**	.14693
Feeling Fine Fionas	Lucky Lindas	.5848**	.10833
	Alright Annies	-.1552	.13783
	Hardtime Hannas	-.6247**	.14185
Alright Annies	Feeling Fine Fionas	.1552	.13783
	Lucky Lindas	.7400**	.14305
	Hardtime Hannas	-.4695*	.16985
Hardtime Hannas	Feeling Fine Fionas	.6247**	.14185
	Lucky Lindas	1.2095**	.14693
	Alright Annies	.4695*	.16985

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

Table 16

Significant Differences Between Maternal Profiles in Perceived Closeness

Profile (I)	Profile (J)	Difference (I-J)	Std. Error
Lucky Lindas	Feeling Fine Fionas	.0637	.07221
	Alright Annies	.2282	.09536
	Hardtime Hannas	.3755*	.09794
Feeling Fine Fionas	Lucky Lindas	-.0637	.07221
	Alright Annies	.1646	.09188
	Hardtime Hannas	.3118*	.09455
Alright Annies	Feeling Fine Fionas	-.1646	.09188
	Lucky Lindas	-.2282	.09536
	Hardtime Hannas	.1473	.11322
Hardtime Hannas	Feeling Fine Fionas	- .3118*	.09455
	Lucky Lindas	-.3755*	.09794
	Alright Annies	-.1473	.11322

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

Appendix A: Search Terms

1. Mother Child Relations/

2. bonding.mp.

3. maternal bond.mp.

4. maternal bonding.mp.

5. maternal attachment.mp.

6. maternal feelings of attachment.mp.

7. maternal feelings.mp.

8. maternal love.mp.

9. maternal postnatal attachment.mp.

10. mother-child relationship.mp.

11. mothers.mp. or Mothers/

12. single mothers.mp. or Single Mothers/

13. stepmothers.mp.

14. Stepparents/

15. adoptive mothers.mp.

16. Adoptive Parents/

17. lesbian mothers.mp.

18. Homosexual Parents/

19. 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18

20. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10

21. 19 and 20

Appendix B: Codebook for Article Classification

Coding Instructions for Volunteers:

At the top right corner of the desktop, click endnote to open.

In the left pane, find your folder in the "volunteers" tab, click it to open the folder to your own assigned references.

1) **Exclusion Criteria: "Article"** – We want to keep all original research and reviews of research, and eliminate all other types of articles.

In the center pane, click on the column called "Type of Work" to re-organize the articles by article type.

Retain the article if:	**Exclude if:**
Brain Imaging	Column/Opinion
Empirical Study	Comment/Reply
Interview	Editorial
Quantitative Study	Erratum/Correction
Qualitative Study	Letter
Clinical Case Study	Obituary
Interview	Poetry
Literature Review	Review-Book
Meta-Analysis	Review-Media
Systematic Review	
Nonclinical case study	
Reprint	

If this space is blank, explore the abstract to determine whether the article is an original research article (collects participants, uses measures, reports results) or a review of literature (i.e. systematic review, literature review, meta-analysis)

To RETAIN the article, leave the information that is in that column exactly as it is. (If blank, enter 0 to indicate you have coded it)

To EXCLUDE the article, go to the right pane, mark a "1" under "type of article" (without erasing what is there, just enter it at the end of what is there). In the center pane, right click on the reference that you have just marked with the 1, select "mark as read" to conclude your work with this article, move on to the next reference.
It will be best to do all of this at once at the start of your process, so that you will have completed the first exclusion step entirely before moving on to the next step.

2) **Exclusion Criteria: "Participants"** – Does this article include mothers as participants?

Scan the abstract to find information about participants. If there is no information, you may need to access the full article. Consult the document "To Access the Full Document PDF".

Are there mothers included as participants? (tricky! Sometimes it will look like moms are included as participants but it was in fact their infants who were the participants!)

YES (KEEP): enter a "0" in the right pane under "short title", stay with this article and continue to step 3.

NO (EXCLUDE): exclude the article from further analysis by placing a "1" in the right pane under "short title", right click on the reference and select "mark as read", move on to the next reference and start at step 2 again.

3) **Exclusion Criteria: "Bond" –** Does this article measure the maternal bond to her child? (we are looking for any research that tries to learn more about how bonded/connected/attached mothers feel to their kids)

In the abstract and keywords, look for terms like "maternal bond", "maternal postnatal attachment", "bonding", "attachment to child", "feelings of connection to child", "feelings of attachment", or an interview that asks about any of these topics.

YES (KEEP): The bond/attachment/love/connection is mentioned, enter a "1" in the right pane under "reviewed item"

MAYBE: If you are unsure, place a "1" in the right pane under "reprint edition" and I will take a closer look at it.

NO (EXCLUDE): If the bond/attachment/love/connection is not measured, exclude this article by placing a "1" in the right pane under "alternate journal", close the article, right click on the reference and select "mark as read", move on to the next reference and start at step 2.

To Access the Full Document PDF:

If there is a paperclip icon before the reference in the main list, there is a PDF attached.

Scroll down the right pane all the way until you see a pdf icon under “file attachments”, double click to open it.

If there is no paperclip icon before the reference, right click on the reference, select “URL” and “open URL”

- In new window click on “afficher/get it!”
- Click “click this link to open the document
- Click “full text available via” links in order until you find a PDF link, open it

If the links don’t lead you to a PDF – Go back into endnote, copy the title of the article, do a google search for the article, and try to access the PDF in this way.

If you retain the article, follow the remaining steps to save the PDF in Endnote:

Right click on the page and click “save page as” save to the desktop file called “Natasha PDF Temp”

Back in endnote, at the top of the right pane, click on the paperclip icon

In the pop-up, select desktop, Natasha PDF Temp, select the file, open

Now in endnote at the top of the right pane click “reference”, there should be a PDF under “file attachments”, double click to open it.

Go back to the desktop, open the “Natasha PDF Temp file”, and delete the file

End of Day procedures: BUDGET at least 10 MINUTES for these steps!

Connect Orange USB to Computer

Creating a Compressed Library File

1. From the Endnote File menu, select Compressed Library (.enlx) to display a Compressed Library dialog.
2. Use the radio buttons to select these options:
   - Create
   - With file attachments
   - All references in library

Click Next to display a file dialog.

1. Save the compressed library to Lexar (F:) – Endnote Compressed Save Spot
2. Rename the file: MM/DD/NG (month, day, YOUR initials)
3. Click Save – THEN WAIT 6-7 mins and *DON'T CLICK ANYTHING!*
4. Once the new compressed file appears in the Lexar Folder, delete your own last saved compressed copy (before this one) *DO NOT REPLACE* the previous (If you do two sessions on same day, add a 2 to the newest one)

Shut down the computer

Check to see if you are the last one using the computer today, and if so, please shut down the computer before you go (the old girl needs her sleep!)

Restoring a Compressed Library File

Hopefully we will never need to use this step, as it means our computer has totally crashed, but if so, this is how we will restore from the latest backup if we need to.

1. Use EndNote (version X or later) to open the filename.enlx file, which will extract the .ENL file and the .DATA folder to the same folder where the. enlx file is located.
2. Use EndNote to open the filename.enl file as you normally would to use the library.

Natasha's Re-Coding Process:

1) Randomly marked 14 articles in each folder for re-coding

2) Closely examined each article to determine how I would code it

3) Checked whether your code matched with mine:

a. If we agreed, I turned your "1" into a "111" code, then I marked it as read.

b. If we disagreed, I changed your code from a "1" to a "000", then put my new code in as "111" in the new category, then I left the article marked as unread

4) I checked all the "reprint edition" codes (aka maybe retained) for all volunteers:

a. I recoded the reprint category from "1" to "2" and then entered the new code as "111" into the category that I feel it should go (I did not mark these as unread, because I did not count them as a disagreement)

5) I checked all the "reviewed item" (aka retained) for all volunteers:

i. If we agreed, I turned your "1" into a "111" in the reviewed item category, or

ii. marked my disagreement by changing the "1" to "2" in the reviewed item category, then indicated my code as "111" in the new category

Information For Volunteers about Re-coding:

1) MAYBE: With your folder selected, go to the search bar at the top of the center pane, select "reprint edition" "contains" "2". These are all the articles that you initially marked as Maybe Retained, and I have re-coded them where I feel they belong. Please carefully review these articles one by one to see how they have been re-coded, and check that you understand why they were coded in this way. If you try to understand but are still confused, please copy the abstract and the URL link and send them to me in an email, I will reply as soon as I can to all with more info about why this article was coded this way. (If it is alright, I will send my response to all of you, so that we can all benefit from one anothers questions)

a. IF you have more time, look in the left pane at the new smart folder called "Re-Coded Maybes" to view all articles of the other volunteers. This will allow you to see articles that others have been uncertain about and see how they were eventually coded.

2) RETAINED: With your folder selected, go to the search bar at the top of the center pane, select "reviewed item" "contains" "2". These are all the articles that you initially marked as Retained that I have re-coded to where I feel they belong. Please carefully review these articles one by one to see how they have been re-coded, and check that you understand why they were coded in this way. Again, if you look for a bit and are still confused, please copy the abstract and link and send them to me in an email, I will reply as soon as I can with more info about why this was coded this way. (If it is alright, I will send my response to all of you, so that we can all benefit from one another's questions)

a. Again, IF you have more time, look in the new smart folder called "Re-Coded Retained" to view all articles of the other volunteers, this will allow you to see articles that others have been uncertain about and see how they were eventually coded.

3) WEEKLY FOLDER: Within your week 1 folder, look for articles marked as unread (and please leave them marked as unread even after you review them), these are articles that I coded differently than you did. Your original code has been changed from “1” to “000” (so you can know how you originally coded it), and my new code has been marked as “111”. Please review each one of these carefully, check that you understand why they were recoded in this way. Again, if you look for a bit and are still confused, please copy the abstract and URL link and send them to me in an email, I will reply as soon as I can with more info about why this was coded this way. (If it is alright, I will send my response to all of you, so that we can all benefit from one another’s questions).

4) Also within your folder, you will see some marked as read articles with “111”, these are articles I reviewed and agreed with, so I turned your “1” into a “111” and then marked as read. You can congratulate yourself on a job well done with these articles!

Additional Clarifications Provided to Volunteers

Please clarify your understanding of these distinctions, if you are confused by any of these, please email me!

! Participant Exclusion – Tricky Issues !

If mom fills out questionnaires that are all about the child only (reporting on school performance, health, symptoms, etc), she is not considered a participant, so excluding at step 2 is appropriate. *Why?* Because in this case, the researchers are simply getting a third party to report on the one they are really interested in, the child.

If a child fills out a questionnaire about their perception of their mom (e.g. perceptions of parental conflict) and there is nothing else reported about the mom by anyone else, or by the mom, the child is the participant. *Why?* Because the researchers are interested in the child`s outcomes. (A child would not be considered a credible source for a third party report on their own parent, so we can assume they ask the child for their perceptions in order to see how this perception would affect the child in some way.)

If a researcher fills out a questionnaire about the mother's behaviour, mom is a participant because something is being recorded about her from an objective source. Also, of course, if mom fills out a questionnaire about herself, she is a participant.

Sounds Right BUT Not Quite!

Measures that seem promising but are measuring the wrong thing:

Adult Attachment Interview – Measures mom's attachment history with her mom

Emotional Availability Scales (EA) – measures maternal behavior

Parental Bonding Instrument (PBI) – from the child/adolescent perspective

Maternal Competence – Confidence in own skills as a mother

Maternal Role – about the role of mother – not her feelings

Attachment Q-Set – behavior observed, not feelings reported

Strange Situation – measures infant attachment by observation

Interaction Behavior Questionnaire (IBQ) – communication & conflict behaviors

Experiences in Close Relationships Scale (ECR) – adult attachment to other adults

Maternal Behavior Q-Sort (MBQS) – behaviors observed

Mind-Mindedness – representations of the infant

Adult Attachment Relationship Questionnaire (Hazan & Shaver 1987) – romantic

Neonatal Perception Inventory – rating of own and average baby on behaviors

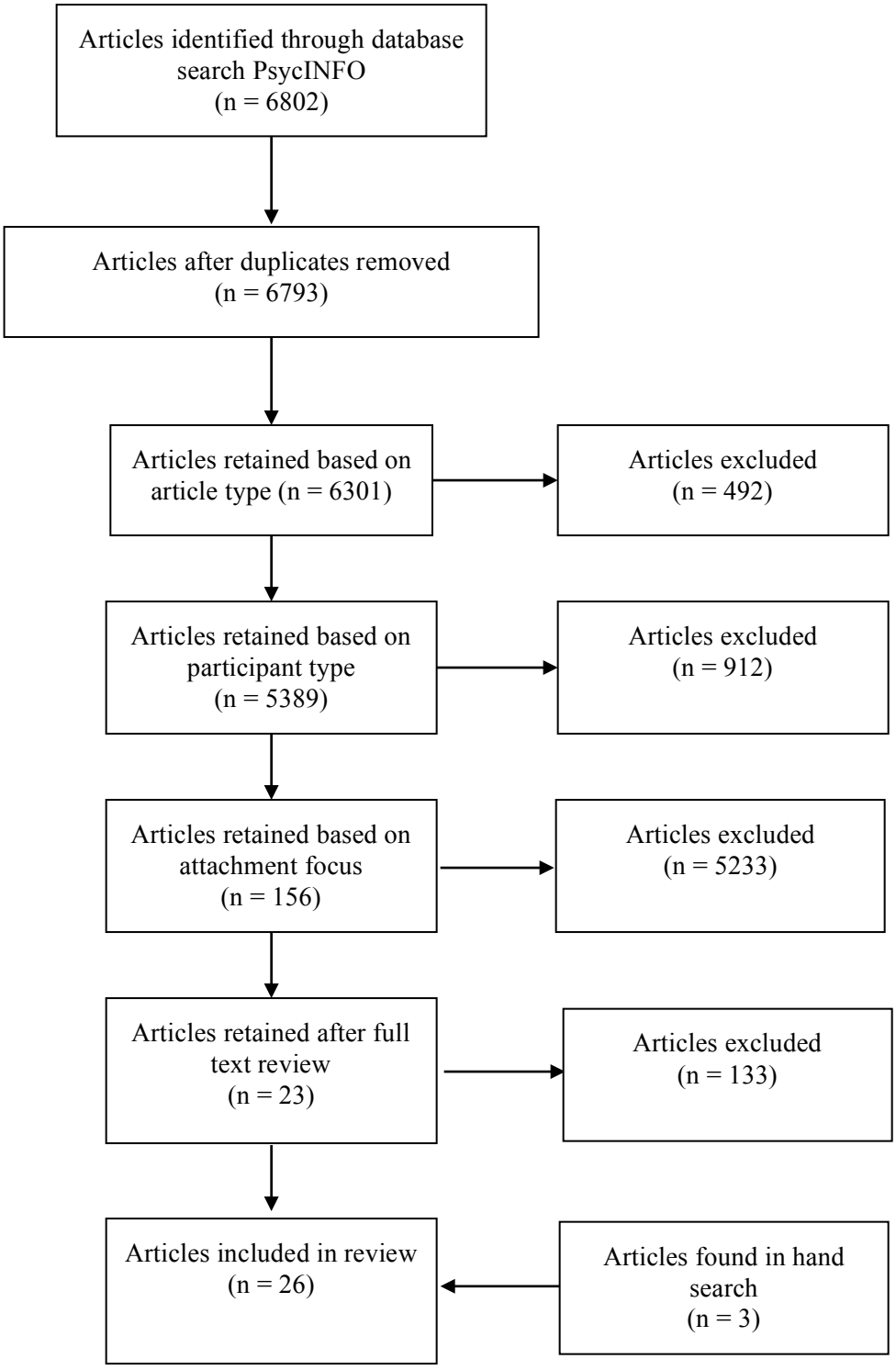
Response to Motherhood – feelings about role of motherhood

Early Adaptation Score – confidence, anxiety, insecurity and mood with baby

Maternal-Fetal Attachment scale – measures sense of attachment to unborn child

Attachment Style Questionnaire – general style of attaching to others

Appendix C: Flow Diagram of Article Exclusion and Inclusion



Appendix D: Glossary of Measure Acronyms

Maternal Affective Attachment Measures

CPRS: Child Parent Relationship Scale (Pianta, 1994)

FAB: How I Feel About My Baby Now (Leifer, 1977)

MAI: Maternal Attachment Inventory (Muller, 1994)

MPAS: Maternal Postnatal Attachment Scale (Condon & Corkindale, 1998)

PMAS: Postpartum Maternal Attachment Scale (Nagata et al, 2000)

PSI: Parenting Stress Inventory (Abidin, 1983)

Depression Measures

BDI-II: Beck Depression Inventory (Beck, Steer, & Brown, 1996)

CES-D: Center for Epidemiologic Studies Depression Scale (Radloff, 1977)

EPDS: Edinburgh Postnatal Depression Scale (Cox, Holden, & Sagovsky, 1987)

ZSDS: Zung Self-rating Depression Scale (Zung, 1965)

Anxiety Measures

HADS-A: Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983)

STAI: State Trait Anxiety Scale (Speilberger, Gorsuch, Lushene, Vagg, and Jacobs, 1983)

PTSD Measures

PTSDQ: Post-Traumatic Stress Disorder Questionnaire (Watson, Juba, Manifold, Kucala, & Anderson, 1991).

Other Mental Health Measures

AAQ: Acceptance and Action Questionnaire (Hayes et al., 2004)

DHS: Daily Hassles Scale (Kanner, Coyne, Schaefer, & Lazarus, 1981)

Mother's Childhood Attachment Measures

PBI: Parental Bonding Inventory (Parker, Tupling, & Brown, 1979)

Fetal Attachment Measures

FAS: Fetal Attachment Scale (Cranley, 1981)

MAAS: Maternal Antenatal Attachment Scale (Condon 1993).

PAI: Prenatal Attachment Inventory (Muller, 1993)

Other Attachment Measures

AAI: Adult Attachment Interview (George, Kaplan, & Main, 1985)

AAS: Adult Attachment Scale (Collins & Read, 1990)

ASM: Attachment Style Measure (Simpson,1990)

ECR: Experiences in Close Relationships (Brennan, Clark, & Shaver, 1998)

MPCA: Maternal Perception of Child Attachment scale (Hoppes & Harris, 1990).

Appendix E: Measures

Maternal Postnatal Attachment Scale

1) When I am caring for the child, I get feelings of annoyance or irritation:
   - Very frequently
   - Frequently
   - Occasionally
   - Very rarely
   - Never

2) When I am caring for the child I get feelings that the child is deliberately being difficult or trying to upset me:
   - Very frequently
   - Frequently
   - Occasionally
   - Very rarely
   - Never

3) Over the last two weeks I would describe my feelings for the child as:
   - Dislike
   - No strong feelings towards the child
   - Slight affection
   - Moderate affection
   - Intense affection

4) Regarding my overall level of interaction with the child I:
   - Feel very guilty that I am not more involved
   - Feel moderately guilty that I am not more involved
   - Feel slightly guilty that I am not more involved
   - I don't have any guilty feelings regarding this

5) When I interact with the child I feel:
   - Very incompetent and lacking in confidence
   - Moderately incompetent and lacking in confidence
   - Moderately competent and confident
   - Very competent and confident

6) When I am with the child I feel tense and anxious:
   - Very frequently
   - Frequently
   - Occasionally
   - Almost never

7) When I am with the child and other people are present, I feel proud of the child:
   - Very frequently

Frequently
Occasionally
Almost never

8) I try to involve myself as much as I possibly can playing or interacting with the child:
This is true
This is untrue

9) When I have to leave the child:
I usually feel rather sad (or it's difficult to leave)
I often feel rather sad (or it's difficult to leave)
I have mixed feelings of both sadness and relief
I often feel rather relieved (and it's easy to leave)
I usually feel rather relieved (and it's easy to leave)

* 10) When I am with the child:
I always get a lot of enjoyment/satisfaction
I frequently get a lot of enjoyment/satisfaction
I occasionally get a lot of enjoyment/satisfaction
I very rarely get a lot of enjoyment/satisfaction

11) When I am not with the child, I find myself thinking about the child:
Almost all the time
Very frequently
Frequently
Occasionally
Not at all

12) When I am with the child:
I usually try to prolong the time I spend with him/her
I usually try to shorten the time I spend with him/her

13) When I have been away from the child for a while and I am about to be with him/her again, I usually feel:
Intense pleasure at the idea
Moderate pleasure at the idea
Mild pleasure at the idea
No feelings at all about the idea
Negative feelings about the idea

14) I now think of the child as:
Very much my own child
A bit like my own child
Not yet really my own child

15) Regarding the things that we have had to give up because of the child:

I find that I resent it quite a lot
I find that I resent it a moderate amount
I find that I resent it a bit
I don't resent it at all

16) Over the past three months, I have felt that I do not have enough time for myself or to pursue my own interests:
Almost all the time
Very frequently
Occasionally
Not at all

17) Taking care of this child is a heavy burden of responsibility. I believe this is:
Very much so
Somewhat so
Slightly so
Not at all

18) I trust my own judgement in deciding what the child needs:
Almost never
Occasionally
Most of the time
Almost all the time

19) Usually when I am with the child:
I am very impatient
I am a bit impatient
I am moderately patient
I am extremely patient

Scoring
Items in brackets( ) are reverse scored
Quality of attachment: 3 4 5 6 (7) (10) (14) 18 19
Absence of hostility: 1 2 15 16 17
Pleasure in interaction: all reversed (8 9 11 12 13)
To ensure equal weighting of all questions it is recommended that response options be recoded to represent a score of 1 (low attachment) to 5 (high attachment) for every question. For example:
Question 4 would be scored as: 1; 2.3; 3.6; 5
Question 8 would be (reverse) scored as: 5; 1

* In our study, item 10 was not included in the online survey due to an error in transcription. The score for each factor is the average of the scores for all of the items in that factor.

The Child-Parent Relationship Scale: Short Form

Please reflect on the degree to which each of the following statements currently applies to your relationship with your child. Using the scale below, circle the appropriate number for each item. Definitely Does Not Apply = 1, Not Really = 2, Neutral, Not Sure = 3, Applies Sometimes = 4, Definitely Applies = 5

1. I share an affectionate, warm relationship with this child.

2. This child and I always seem to be struggling with each other.

3. If upset, this child will seek comfort from me.

4. This child is uncomfortable with physical affection or touch from me.

5. This child values his/her relationship with me.

6. When I praise this child, he/she beams with pride.

7. This child spontaneously shares information about himself/herself.

8. This child easily becomes angry at me.

9. It is easy to be in tune with what this child is feeling.

10. This child remains angry or is resistant after being disciplined.

11. Dealing with this child drains my energy.

12. When this child wakes up in a bad mood, I know we're in for a long and difficult day.

13. This child's feelings toward me can be unpredictable or can change suddenly.

14. This child is sneaky or manipulative with me.

15. This child openly shares his/her feelings and experiences with me.

Short-Form Scoring Guide

Conflicts: 2, 4, 8, 10, 11, 12, 13, 14, Closeness: 1, 3, 5, 6, 7, 9, 15

Experiences in Close Relationships Scale: Short Form (ECR-S)

Instruction: The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Mark your answer using the following rating scale:
1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Neutral, 5 = Slightly Agree, 6 = Agree, 7 = Strongly Agree

1. It helps to turn to my romantic partner in times of need.

2. I need a lot of reassurance that I am loved by my partner.

3. I want to get close to my partner, but I keep pulling back.

4. I find that my partner(s) don't want to get as close as I would like.

5. I turn to my partner for many things, including comfort and reassurance.

6. My desire to be very close sometimes scares people away.

7. I try to avoid getting too close to my partner.

8. I do not often worry about being abandoned.

9. I usually discuss my problems and concerns with my partner.

10. I get frustrated if romantic partners are not available when I need them.

11. I am nervous when partners get too close to me.

12. I worry that romantic partners won't care about me as much as I care about them.

Scoring Information:

Anxiety = 2, 4, 6, 8 (reverse), 10, 12

Avoidance = 1 (reverse), 3, 5 (reverse), 7, 9 (reverse), 11

Parenting Sense of Competence Scale

Please rate the extent to which you agree or disagree with each of the following statements. Strongly Disagree = 1, Somewhat Disagree = 2, Disagree = 3, Agree = 4, Somewhat Agree = 5, Strongly Agree = 6

1. The problems of taking care of a child are easy to solve once you know how your actions affect your child, an understanding I have acquired.

2. Even though being a parent could be rewarding, I am frustrated now while my child is at his / her present age.

3. I go to bed the same way I wake up in the morning, feeling I have not accomplished a whole lot.

4. I do not know why it is, but sometimes when I'm supposed to be in control, I feel more like the one being manipulated.

5. My mother was better prepared to be a good mother than I am.

6. I would make a fine model for a new mother to follow in order to learn what she would need to know in order to be a good parent.

7. Being a parent is manageable, and any problems are easily solved.

8. A difficult problem in being a parent is not knowing whether you're doing a good job or a bad one.

9. Sometimes I feel like I'm not getting anything done.

10. I meet by own personal expectations for expertise in caring for my child.

11. If anyone can find the answer to what is troubling my child, I am the one.

12. My talents and interests are in other areas, not being a parent.

13. Considering how long I've been a mother, I feel thoroughly familiar with this role.

14. If being a mother of a child were only more interesting, I would be motivated to do a better job as a parent.

15. I honestly believe I have all the skills necessary to be a good mother to my child.

16. Being a parent makes me tense and anxious.

17. Being a good mother is a reward in itself.

Scoring Information:

Scoring for Items 2, 3, 4, 5, 8, 9,12, 14, 16 is reversed so that, for all items, higher scores indicate greater self- esteem. The PSOC was originally used with parents of infants, and so, to increase its applicability to parents of older children, "child" was substituted for "infant" in the wording of items. Parents were asked to complete the PSOC thinking only about the target child in the family (i.e., the child who had been selected for the survey).

Factor analysis on this instrument has been conducted by four sets of researchers (Johnston & Mash, 1989, Ohan et al., 2000, Rogers and Matthews, 2004, and Gilmore & Cuskelly, 2009). For our purposes we used all of the items that consistently loaded into the two factors of interest to us: satisfaction and efficacy. The items found by all four studies to load onto satisfaction were item 2r, 3r, 4r, 8r, 9r, 16r. The items for efficacy were 6, 10, 11, 13, 15 (Gilmore & Cuskelly, 2009).

Outcome Questionnaire: Symptom Distress Subscale

Looking back over the last week, including today, help us to understand how you have been feeling. Please read each item carefully and select the circle under the category which best describes your current situation.

0 = never, 1 = rarely, 2 = sometimes, 3 = frequently, 4 = almost always

2. I tire quickly.

3. I feel no interest in things.

5. I blame myself for things.

6. I feel irritated.

8. I have thoughts of ending my life.

9. I feel weak.

10. I feel fearful.

11. After heavy drinking, I need a drink the next morning to get going. (If you do not drink mark "never").

13. I am a happy person. *

15. I feel worthless.

22. I have difficulty concentrating.

23. I feel hopeless about the future.

24. I like myself. *

25. Disturbing thoughts come into my mind that I can't get rid of.

27. I have an upset stomach.

29. My heart pounds too much.

31. I am satisfied with my life. *

33. I feel that something bad is going to happen.

34. I have sore muscles.

35. I feel afraid of open spaces, or of driving, or being on buses, subways, etc.

36. I feel nervous.

40. I feel something is wrong with my mind.

41. I have trouble falling asleep or staying asleep.

42. I feel blue.

45. I have headaches.

Scoring Information:

Symptom Distress (SD) Score: Range: 0-100

Values for items 13, 24, 31, are reverse scored.

Sum the total score for the symptom distress subscale by adding all item scores.

Clinical cut-off score: 36 or more – indicates symptoms of clinical significance

The subscale is composed of items that have been found to reflect the symptoms of the most common disorders (anxiety disorders, affective disorders, adjustment disorders and stress related illness). A high score indicates the client is bothered by these symptoms, while low scores indicate either absence or a denial of the symptoms.

Appendix F: Consent Form

Canadian Survey on Parenthood in Modern Families

Julie Gosselin, Ph.D.	Sophie-Claire V.-Tessier	Natasha Gosselin
School of psychology	School of psychology	School of psychology
Faculty of Social Sciences	Faculty of Social Sciences	Faculty of Social Sciences
University of Ottawa	University of Ottawa	University of Ottawa
613-562-5800 #ext	613-562-5800 #ext	613-562-5800 #ext
emails	email	email

Invitation to Participate: I am invited to participate in the abovementioned research study conducted by Dr. Julie Gosselin and coordinated by Sophie-Claire Valiquette-Tessier and Natasha Gosselin.

Purpose of the Study: The purpose of the study is to examine motherhood in different modern contexts, more precisely biological, adoptive and step-parent relationships including hetero and homosexual married, single, divorced, widowed, cohabiting and remarried mothers.

Participation: My participation will consist essentially of completing an online survey and providing sociodemographic information as well as answering questionnaires.

Risks: I understand that my participation in this study implies that I will answer questions concerning my personal experience. While it is possible that this may lead to some emotional discomfort, I have been informed by the researchers that everything is done in attempt to diminish those risks.

Benefits: My participation in this study will provide me with an opportunity to participate in a research process and to ask questions to researchers regarding this study and research in general. My participation will also provide me with the opportunity to share my experience, which will enable researchers to better their understanding of motherhood.

Confidentiality and anonymity: I have received assurance from the researcher that the information (sociodemographic information) I will share will remain strictly confidential. I understand that the contents will be used only for this study and that my confidentiality will be protected. Anonymity will be protected in the following manner: my name will not appear on any document related to my participation.

Conservation of data: The data collected (the questionnaire I will have filled out) will be kept in a secure manner. Data will be kept, under key, in Dr. Gosselin's research laboratory for a period of five years following the end of the data collection. Only Dr. Gosselin and the project coordinator Sophie-Claire Valiquette-Tessier and Natasha Gosselin will have access to the data.

Compensation: My participation in this study does not entitle me to receive a compensation.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw from the study, the data will be destroyed.

Acceptance: I agree to participate in this research study conducted by Dr. Julie Gosselin and coordinated by Sophie-Claire Valiquette-Tessier and Natasha Gosselin of the School of Psychology at the University of Ottawa

If I have any questions about the study, I may contact the researcher.

If I have any questions regarding the ethical conduct of this study, I may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5
Tel.: (613) 562-5387
Email: ethics@uottawa.ca

By clicking NEXT, I hereby agree with the information provided here and give my consent to participate in this study.