2006

Attachment representations in mothers of young children with developmental delay: Relations with concurrent and later maternal depression

Mary Catherine Hutchinson
Wilfrid Laurier University

Your file Votre référence
ISBN: 978-0-494-16741-0
Our file Notre référence
ISBN: 978-0-494-16741-0

Attachment representations in mothers of young children with developmental delay: Relations with concurrent and later maternal depression

by

Mary Catherine Hutchinson

B.A., University of Western Ontario, 1989

THESIS

Submitted to the Faculty of Social Work

in partial fulfillment of the requirements for

MASTER OF SOCIAL WORK

Wilfrid Laurier University

2006

Abstract

Despite the importance of early parent-child attachment and maternal depression to child development and the vulnerability of children with developmental delay, maternal attachment representations and their relation to depression have not been studied in this population. In this study, I examined attachment representations (i.e., internal working models) in 47 mothers of 4- to 8-year-old children with developmental delay and explored the relation between these attachment representations and maternal depression assessed concurrently and again one and two years later. The Working Model of the Child Interview (WMCI) was used to classify representations as balanced (i.e., secure) or non-balanced (i.e., disengaged or distorted) and the Center for Epidemiological Studies Depression (CES-D) Scale was used to assess maternal depression. A significantly large proportion (72%) of the mothers had non-balanced representations, which was significantly greater than a sample of mothers of typically developing children but significantly less than clinical samples. A majority of the mothers (68%) scored above the clinical cutoff score for depression. Mean depression scores were significantly higher than community samples and significantly lower than a sample of psychiatric inpatients, and were not significantly different one or two years later. The relation between maternal attachment representations and concurrent depression was at a trend level of significance. Relations between maternal attachment and later depression were not significant. Results indicated attachment insecurity and depression in most of the mothers in this sample. These findings are consistent with previous studies showing that children with developmental delay are at greater risk of insecure attachment than children who are typically developing, and those indicating risk of maternal depression in this

population. Mothers with non-balanced representations of their child were more likely to report higher levels of concurrent depressive symptoms (d = .66). Additional research is necessary to further investigate these relations and the potential role of contextual factors. Because both insecure attachment and maternal depression are associated with negative outcomes, the findings highlight the need for prevention and intervention strategies aimed at fostering secure attachment and alleviating depression.

Acknowledgments

For almost twenty years, I longed to return to the academic world. The completion of this thesis, as part of my Master of Social Work degree, represents the attainment of a significant milestone in my life. The challenges of the past two years have been exciting and, at times, overwhelming. I could not have accomplished this goal on my own. I would like to express my humble gratitude to those who played important roles in helping me to complete this thesis.

I would like to thank my thesis supervisor, Dr. Alison Niccols (McMaster University, adjunct professor to Wilfrid Laurier University) who graciously offered me this research opportunity and who guided me through the research and writing processes with unrelenting encouragement, optimism, and humour. I greatly appreciated her sharing of her extensive expertise and the time she dedicated to my learning process. She is a wonderful teacher. I feel so fortunate to have received her mentorship.

I would also like to thank Dr. Cheryl-Anne Cait, co-chair of my thesis committee, and Dr. Carol Stalker, committee member. Both provided helpful perspectives and questions that challenged me to be thorough and accurate. Their experience and insights are reflected throughout the thesis. I am grateful for their support and encouragement.

Although not a member of my thesis committee, Dr. Jill Grant played an essential role in the process of completing my thesis by reducing my anxiety regarding quantitative statistical analyses. Her research methods class was, to my surprise, a highlight of my program. Her dedication to reassuring and encouraging each one of her students is remarkable and invaluable. I am also grateful to Michelle Mitchell for her assistance with

data entry and analyses. Her relaxed and cheerful attitude and her readiness to help made the process very enjoyable.

The emotional support I have received along the way from friends, within and outside the program, boosted my spirits when I felt overwhelmed by the size of the project, doubtful about my abilities, or wearied by the many hours of writing. Thanks for cheering me on. In particular, I am grateful for my dear friend, Sandy Jeffels-Saleh, who bravely ventured back into academia ahead of me and who has persistently encouraged and supported me in this endeavour.

I am especially grateful for the enduring love and support from my parents, Don and Ruth Deas. Having, themselves, returned to higher education in later life, their example served as my inspiration. Moreover, I am forever thankful for their unfaltering belief in me and their generous support in making this degree possible.

To my wonderful husband and best friend, Bill, I extend my highest thanks. Understanding my longing to return to school, he willingly made many sacrifices to make it possible. Thank you for your love and support. And to my three precious children, Claire, Eric, and Gillian, thank you for sharing in my enthusiasm for learning and for your patience. The 'essay-that-never-ends' is finally complete. I can emerge from my study and return to participating fully in the life of my family.

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Introduction

Research on attachment theory has shown that the quality of the early relationship between infants and their primary caregiver plays an essential role in child development and has long-term implications for functioning and socio-emotional adjustment (Holmes, 1996; Vaughn, Goldberg, Atkinson, Marcovitch, MacGregor, & Seifer, 1994). Beckwith, Rozga, and Sigman (2002) assert that both parental and child characteristics play a role in shaping the parent-child relationship, including the quality of attachment. Developmental delay in the child (i.e., "a chronological delay in the appearance of normal developmental milestones achieved during infancy and childhood, caused by organic, psychological, or environmental factors", American Heritage Stedman's Medical Dictionary, 2004) places a number of stresses on the parent-child relationship (Baker, McIntyre, & Blacher et al., 2003; Weiss, 2002). Studies examining attachment security in children with developmental delay indicate that they are at greater risk for insecure attachment than typically developing children (Atkinson, Chisholm, Scott, Goldberg, Vaughn, Blackwell, Dickens, & Tam, 1999; Rutgers, Bakermans-Kranenburg, van IJzendoorn & van Berckelaer-Onnes, 2004; Vaughn et al., 1994).

In his theory of attachment, Bowlby (1969; 1988) asserted that individuals create internal working models, or representations, of attachment relationships, which are stable throughout life. This assertion has prompted research into the measurement of attachment in adults, and, specifically, in parents. Research has shown that the quality of attachment in adults, with regard to their relationship with their own parent is related to that of their infants, allowing researchers to make predictions regarding infant attachment security

(Benoit, Parker & Zeanah, 1997; Coolbear & Benoit, 1999; Pederson, Gleason, Moran & Bento, 1998; van IJzendoorn, 1995).

Measurement of attachment in children with developmental delay is hampered by methodological problems (Beckwith et al., 2002; van IJzendoorn, Goldberg, Kroonenberg & Frenkel, 1992; Vaughn et al., 1994). However, not only do children develop representations of their parents and their relationship with their parents, parents develop representations of their children and their relationship with their children (Slade, Belsky, Aber & Phelps, 1999). Measuring parents' representations of their children and their relationships with their children offers an alternate means of understanding parent-child attachment in the developmentally delayed population. To date, maternal attachment representations have not been examined in this population, in spite of the evidence showing difficulties in responding sensitively (Moran, Pederson, Pettit & Krupka, 1992) and in adjusting to raising a child with developmental delay (Weiss, 2002).

Maternal mental health, for example, depression (i.e., feelings of hopelessness, loss of interest in activities, changes in eating and sleeping patterns; Weiss, 2002) is one parental characteristic that has been examined as a correlate of parent-child attachment. Research has shown that maternal depression, whether it is clinically diagnosed or defined by self-reported depressive symptoms, places children who are developing typically at risk for insecure attachment (Campbell, Brownell, Hungerford, Spieker, Mohan & Blessing, 2004; Cicchetti, Rogosch, & Toth, 2004). Mothers of children with developmental delay have been shown to be at greater risk for depression than mothers of children who are typically developing (Weiss, 2002). However, depression in mothers of

children with developmental delay has not been examined in relation to parent-child attachment.

The purpose of this study was to examine attachment representations and depression in mothers of young children with developmental delay and to examine the relation between maternal attachment representations and concurrent and later maternal depression in this population.

Following is a review of the relevant literature. A brief overview of attachment theory is followed by a description of the measurement of attachment, the implications of attachment security, and attachment in children with developmental delay. Maternal attachment representations and two measures of adult attachment are described. Finally, research on the implications of maternal depression on infant development and attachment is reviewed.

Literature Review

Attachment

Attachment theory. Attachment is the enduring emotional bond that develops between an infant and his/her primary caregiver. John Bowlby, a British psychiatrist, began developing his theory of attachment in the 1950s, using his observations of the behaviour of children when separated from their parents during World War II. He noted that infants first exhibited angry protests, then despair and depression, followed by detachment (which he saw as a coping mechanism). Bowlby combined these, and other, clinical observations with his understanding of psychoanalysis, ethology, evolutionary theory and cognitive psychology to develop a theory of attachment, which he published in three volumes, "Attachment", "Separation", and "Loss" (Bowlby, 1969, 1988).

Drawing on evolutionary theory, Bowlby stated that the attachment process is adaptive, intended for protection of the infant, and is evidenced by the proximity-maintaining behaviours of infants seeking safety and a feeling of security (1969). The attachment system is activated when the infant is stressed (e.g., by pain, fatigue, fear) and is observed in the suppression of exploratory behaviours and in the occurrence of attachment behaviours (e.g., crying, clinging). Bowlby believed that, in optimal circumstances, the primary caregiver (or attachment figure) serves as a secure base (e.g., responsive, protective, comforting) that allows the infant to explore his/her environment with confidence, knowing that his attachment figure is available when needed.

Bowlby asserted that attachment persists throughout the individual's life, "from cradle to grave" (1988, p. 82). He postulated that the infant uses early relationship experiences with the attachment figure to create an internal representation, or working

model, of self in relation to the attachment figure and the world. This working model influences expectations of significant others (Bowlby, 1988), by providing "a basic framework for experiencing, interpreting, and anticipating attachment-related events" (Coolbear & Benoit, 1999, p. 89).

Research on attachment: Strange Situation procedure. A great deal of interest in and research on attachment theory has occurred since Bowlby's early works were published, making attachment theory "probably the best supported theory of socio-emotional development" (Bowlby, 1988, p. 28). The work of Mary Ainsworth and colleagues contributed significantly to attachment theory. Building on Bowlby's theory that the infant develops an internal working model of how his primary caregiver is likely to behave, Ainsworth developed a method of classifying attachment behaviours through a procedure called the Strange Situation (Ainsworth, Blehar, Waters & Wall, 1978). This measure was designed to activate the attachment system so that observations can be made of the infant's attachment behaviours, or strategy, based on the infant's working model of the relationship with his/her mother. Infants (i.e., 12-month-olds) underwent a series of brief separations (i.e., 3 min.) from their mothers in a laboratory setting. Observations of the infants' behaviour at separation and, particularly, upon reunion enabled Ainsworth to classify the attachment as secure or insecure. Insecure attachment was further subdivided into three categories: insecure/anxious-avoidant, insecure/anxious-ambivalent/resistant, and insecure-disorganized/disoriented. Those in the secure category settled easily upon reunion and subsequent research revealed a history of consistently responsive caregiving. Those who were insecure/anxious-avoidant ignored or avoided their mothers upon reunion and usually had a history of caregiving that was custodial but emotionally

unresponsive. Those in the insecure/anxious-ambivalent/resistant category were difficult to soothe upon reunion and usually had a history of inconsistent, unpredictable caregiving. Those who were classified as insecure-disorganized/disoriented exhibited odd behaviour upon reunion (e.g., freezing, dropping to the floor) and were significantly likely to have a history of abuse or neglect (Holmes, 1996). Normative samples revealed the following distribution of attachment classifications: 67% secure; 22% insecure/anxious-avoidant; 11% insecure/anxious-ambivalent/resistant (Ainsworth et al., 1978). The insecure-disorganized/disoriented classification is rarely found in normative samples, but more often in atypical samples (van IJzendoorn et al., 1992). In a meta-analysis of clinical samples (i.e., problems in child or mother), van IJzendoorn et al. (1992) found the following distribution: 55% secure; 23% avoidant; 8% ambivalent/resistant; 15% disorganized/disoriented.

Attachment & child outcomes. Longitudinal research has shown that attachment status (i.e., secure or insecure) in infancy is predictive of emotional and social development in childhood, as well as predictive of adult relationship styles and of parenting behaviours (Holmes, 1996). Belsky and Nezworski (1988) reported that children classified as insecurely attached at one year of age, as a group, displayed greater behaviour problems and conflict with parents and peers than those who were classified as securely attached. Some predictions can be made by type of insecurity. For example, children with externalizing problems are more likely to have an insecure-avoidant attachment and/or insecure-disorganized attachment (Goldberg, 2000). Although most insecurely attached children are not psychiatrically disordered, Goldberg reported that

"insecure attachment is a risk factor that operates in concert with other coexisting conditions to increase or decrease vulnerability to disorder" (2000, p. 214).

Attachment in children with developmental delay

Difficulties parenting a child with developmental delay. Much research on children with developmental delay has focused on the impact on the family system and on parental adjustment (Baker et al., 2003; Bouma & Schweitzer, 1990; Trout, 1983; Weiss, 2002). Although recent literature has expressed the need for exploration of the positive impacts of having a child with developmental delay (Blacher, Cameron, Neece, & Paczkowski, 2005; Hastings & Taunt, 2002), these same authors acknowledge that the caregiver role can be very stressful for many reasons, including nature of disability and degree of care required (Eisenhower, Baker, & Blacher, 2005; Weiss, 2002), as well as related behaviour-emotional disorders (Baker et al., 2003; Blacher et al., 2005; Hassall & Rose, 2005). In addition to coping with multiple demands, parents of children with developmental delay and/or disability experience a range of emotions, including negative emotions such as grief, confusion, blame, guilt, and ambivalence (Trout, 1983). Lowered self-esteem, caused by feelings of being a failure or defective, can reduce adaptive capacities at a time when they are needed most (Trout, 1983). Ambivalent feelings about the baby can have an effect on the interactions between parent and child resulting in a "circularity of rejection" (Trout, 1983, p.341).

At risk for insecure attachment. Research indicates that children with developmental delay may be at risk for insecure attachment (Atkinson et al., 1999; Rutgers et al., 2004; Vaughn et al., 1994). As with studies of typically developing children, studies of children with developmental delay have shown a significant correlation between maternal

sensitivity (i.e., attending and responding to infant's needs) and attachment security, suggesting maternal behaviour is an important factor in shaping attachment security in this population also (Moran et al., 1992; van IJzendoorn et al., 1992). Atkinson and colleagues (1999) found that children with Down syndrome who were securely attached had mothers who were more sensitive than the mothers of children with Down syndrome who were insecurely attached. Similarly, Moran and colleagues (1992) found that mothers of children with developmental delay scored lower than the norm for sensitivity. However, they argued that child factors interfere with maternal sensitivity and responsivity; specifically, that deficits in infant behaviours believed to elicit maternal interaction (e.g., facial expression, posture, vocalizations) make it difficult for these mothers to read and respond appropriately to their infants' cues.

Measurement of attachment in children with developmental delay

Attempts to characterize attachment within developmentally delayed populations have been hampered by methodological problems. There are various reasons why attachment security is difficult to measure in atypical populations (van IJzendoorn et al., 1992; Vaughn et al., 1994). One reason pertains to the children's limited ability to reveal their attachment strategy through their behaviours. As with their parents, deficits in the affective signaling of children with developmental delay make it difficult for researchers to interpret their behaviours (Vaughn et al., 1994).

In their attempt to measure attachment in children with Down syndrome, Vaughn and colleagues (1994) reported difficulties for coders to assign classifications because of ambiguous infant behaviours, resulting in relatively reduced inter-rater agreement. They also questioned whether the Strange Situation was having a different impact on the

children with Down syndrome (i.e., less stress), eliciting different behavioural responses, and, therefore, different classifications. Given these difficulties, Vaughn and colleagues questioned whether the Strange Situation is an appropriate measure for atypical populations. van IJzendoorn et al. (1992) suggested that behavioural and cognitive limitations in children with Down syndrome may make the Strange Situation invalid.

Some researchers have modified Ainsworth's Strange Situation procedure. Blacher (1984) assessed attachment in children who were "severely to profoundly retarded" (p. 178) using an adaptation of the Strange Situation. She found that these children exhibited a range of proximity seeking and maintaining behaviours, albeit "less complex, provocative, and differentiated" (p. 178) than those of typically developing children. Similarly, in order to use the Strange Situation to measure attachment in children with autism, adaptations to the classification criteria (i.e., excluding stereotypic behaviours) were necessary (Beckwith et al., 2002; Dissanayake & Crossley, 1992; Rutgers et al., 2004).

Maternal attachment representations

Attachment theory asserts that the internal working models, or attachment representations, created in infancy persist into adulthood and are "largely unconscious" (Bowlby, 1988, p. 130). Research has shown that differences in attachment classification are revealed within the narrative styles of "free communication" (Bowlby, 1988, p. 133), that is, *how* an individual describes their significant relationship rather than *what* they say about it.

Adult Attachment Interview. Mary Main and her colleagues developed the Adult Attachment Interview (AAI) in the 1980s in order to measure mothers' internal working

models of attachment with their own parents. The semi-structured interview focuses on the earliest memories of childhood experiences with the attachment figure. The participant is asked to describe their relationship in general, with examples, as well as to describe how their parent behaved when they were hurt, ill, or upset, and offer an explanation for their parent's response. If applicable, significant losses and traumas are also described (Goldberg, 2000). The interview is transcribed verbatim and coded based on the "narrative coherence" (Goldberg, 2000, p. 43) versus the content. Bakermans-Kranenburg and van IJzendoorn (1993) noted that, methodologically, instruments such as the AAI are unique in quantitative research:

> On the one hand, the AAI has been designed to preserve the depth and nuances of natural discourse on autobiographical experiences and to yield insight into the formal and substantial aspects of subjects' thought processes related to attachment; on the other hand, the coding system of the AAI results in rigorous classifications that can be used in quantitative analyses. (p. 871)

The narrative styles of the interviewees' responses are used to divide them into four classifications. These classifications correspond to those of the Strange Situation and have a concordant distribution pattern (i.e., autonomous – 62%, dismissive – 22%, preoccupied – 16%; Bakermans-Kranenburg & van IJzendoorn, 1993). Adults who are classified as autonomous are able to take their attachment figures' point of view and their narrative is coherent, logical, and concise. Dismissive adults (linked to avoidant infant attachment) either downplay the significance of negative childhood experiences or speak in glowing terms about their parents with little and/or contradictory evidence. Their narratives are unelaborated and unrevealing. The narratives of preoccupied adults (linked

to ambivalent/resistant infant attachment) are rambling and inconclusive. Some narratives include segments which are broken and disjointed and are given the classification of unresolved (linked to disorganized/disoriented infant attachment) in addition to a primary classification of autonomous, dismissive or preoccupied (Goldberg, 2000; Holmes, 1996). Subsequent research using the AAI revealed that attachment categories are sustained over many years (Waters, Merrick, Treboux, Crowell & Albersheim, 2000) and that adult attachment categories are predictive of the attachment pattern of their offspring, even if they are assessed prenatally (Coolbear & Benoit, 1999; Pederson et al., 1998). These results confirmed that the study of attachment at the representational level is both valid and useful (Slade et al., 1999).

Working Model of the Child Interview (WMCI). Another aspect of adult attachment representations is that which relates to their child, rather than to their parent. Attachment theory suggests that the parental representation of the child is linked to the parental representation of their own early attachment (Slade et al., 1999). Slade and colleagues (p. 612) argued, however, that the child's characteristics present a "powerful effect on parental thoughts and feelings" about the child and, so, the parents' representation of the relationship with the child "emerges as a function of an array of influences and will not necessarily be identical to … representations of prior attachment relationships" (p. 612). Zeanah et al (1994) suggested that the AAI and the WMCI measure "different but related concepts" (p.16). Zeanah and Benoit (1995) reported that parental representations of the child, that is, "how parents perceive, interpret, and experience their infant" (p. 539), greatly influence the child's development and adaptation.

The Working Model of the Child Interview (Zeanah, Benoit, Hirshberg, Barton & Regan, 1994) was designed to assess parents' internal representations of their children through their description of their children's personality and the relationship they share with their children (Zeanah & Benoit, 1995). Specifically,

> ... a parent is asked to describe his or her emotional reactions during the pregnancy, the infant's personality and development, characteristics of the relationship with the infant, perceived and anticipated difficulties with infant characteristics, reactions to infant behaviour and distress in a variety of contexts, and anticipated difficulties in later development. (Benoit, Zeanah, Parker, Nicholson, & Coolbear, 1997, p.110)

Parents' perceptions are scored on eight primary scales, according to their organizational features rather than the content: richness of perceptions, openness to change, intensity of involvement, coherence, acceptance, caregiving sensitivity, fear for safety and, infant difficulty. These scales are used to categorize parents into three classifications: balanced, disengaged, or distorted. As with the AAI, these classifications parallel those of the Strange Situation: secure, insecure/anxious-avoidant, and insecure/anxious-ambivalent/resistant, respectively. Benoit, Parker, et al (1997), looking at a sample of 96 mothers and their infants who were developing typically, found concordance (i.e., 73% versus 55% expected by chance) between the distribution of mothers' WMCI classifications (65% balanced, 3% disengaged, 32% distorted) and their infant's Strange Situation classifications (75% secure, 8% avoidant, 17% resistant).

Prior to this study, research using the WMCI has not focused on mothers of children with developmental delay; however, the WMCI has been used in research with

other clinical populations. Benoit, Zeanah, et al. (1997) found that mothers' WMCI classifications distinguished between infants with clinical problems (i.e., failure to thrive, sleep disorders, referred to outpatient infant psychiatry clinic) and infants with no clinical problems. They found that the representations of mothers with children with clinical problems were significantly more likely to be classified distorted or disengaged (i.e., 91% of clinical sample). Specifically, mothers of infants with clinical problems compared to mothers with infants with no clinical problems "conveyed less information about their infants, were less open to change their perceptions, were less involved, less sensitive, less accepting, and expressed less joy and pride and overall coherence when describing their infant and their relationship with their infant." (p.117). Similarly, Coolbear & Benoit (1999), using the WMCI and the AAI, found that mothers of infants with failure-to-thrive were more likely to have insecure attachments (non-balanced with respect to their infant; nonautonomous with respect to their parent) than mothers of infants without failure-to-thrive. Coolbear and Benoit concluded that the measurement of mothers' internal working models of their relationship with their child (i.e., using the WMCI) is useful in the prediction of clinical disturbance of attachment.

Maternal depression

Maternal depression and outcomes for typically developing children. Parental behaviour plays an important role in shaping the quality of the parent-child relationship. Maternal mental health problems, specifically depression, is associated with deficiencies in parental functioning which can impact negatively on interactions with the infant (e.g., lack of physical and psychological availability, flat affect, disengaged and/or hostile interactions; Cohn & Campbell, 1992 cited in Beckwith, 2002).

Maternal depression is associated with negative child outcomes, including lower cognitive and language skills and more frequent behaviour problems in children (Campbell et al, 2004). Field (1992) reported that infants whose mothers' depression lasted to 6 months postpartum appeared to be depressed as well and scored lower on the Bayley Scales of Infant Development at 12 months of age in comparison to infants of non-depressed mothers. Elgar, McGrath, Waschbusch, Stewart & Curtis (2004), in their review, cited studies that found that children whose mothers were depressed were: more fussy; scored lower on measures of intelligence and motor development; had more difficult temperaments; reacted more negatively to stress; had delayed self-regulatory strategies; had poorer academic performance; were less socially competent; had lower self-esteem; more behaviour problems; and were at greater risk for psychiatric disorders. However, the direction of the effect is unknown. Elgar et al. (2004) described mutual influences between maternal depression and child problems, whereby maternal depression may increase the risk of emotional, behavioural and developmental problems in children and child problems may increase the risk of maternal depression.

Maternal depression & children with developmental delay. Parenting a child with developmental delay appears to be a risk factor in maternal mental health. In spite of a shift in research focus away from pathologizing families with children with developmental delay and toward identifying factors in successful adaptation (Hassall & Rose, 2005; Hastings & Taunt, 2002; Kazak, 1987), research continues to show evidence of stress and depression among these parents (Blacher et al., 2005; Eisenhower et al., 2004; Kazak, 1987; Weiss, 2002).

Moes, Koegel, Schreibman, and Loos (1992) found that mothers of children with autism had scores near the clinical level on the Beck Depression Inventory (M = 8.44, SD = 6.99) indicating that they were at risk for depression. Using the Centre for Epidemiological Studies Depression Scale (CES-D), Abbeduto, Seltzer, Shattuck, Krauss, Orsmond, and Murphy (2004) reported that 16% of the mothers in their sample (who had children with autism, fragile X syndrome, and Down syndrome) had levels of depressive symptoms above the cutoff for clinical depression, concluding, "the mental status of these women remains a concern" (p. 249). Weiss (2002) used the Beck Depression Inventory to examine levels of depression risk among 120 mothers of 2 to 7 year old children (40 with autism, 40 with mental retardation, 40 developing typically). There were no significant differences between the three groups of mothers in terms of demographics, child's age, mother's age, maternal education, family income, and marital status and similar predisposition to depression prior to having children was assumed. The mothers of children with autism had a mean score (M = 19.6, SD = 2.4) in the moderately depressed category, the mothers of children with mental retardation had a mean score (M = 15.5, SD = 2.81) indicating mild depression, and the mothers of children who were developing typically had a mean score (M = 9.2, SD = 2.16) in the non-depressed category. Although Eisenhower et al. (2005) reported mean CES-D scores below the clinical cutoff of 16 for the total sample of mothers of children with developmental delay, the mean score for the subgroup of mothers of children with autism was near the clinical level.

Related theory and research offers several explanations as to why depression may be higher in this population. First, it is believed that parents of children with

developmental delay mourn "the death of the expected normal, healthy child" (Seligman & Darling, 1997, p. 93). Olshansky (1962) asserted that chronic sorrow is typical among parents of children with a developmental disability. Wikler, Wasow, & Hatfield (1981) tested this theory and confirmed that parents of children with developmental delay do not report linear, time-limited stages of grief but rather they report chronic sorrow. Throughout the child's lifespan and the family life cycle parents experienced "periodic crises" (p. 63) (e.g., school entry) during which they noted that there was "no decrease in the intensity of the emotions experienced with the passage of time" (p. 69).

Second, the ongoing demands of caring for a child with developmental delay likely take a toll on parental psychological well-being. Rodrigue, Morgan, and Geffken (1990) found that mothers of children with autism and Down syndrome, compared to mothers of children who are developing typically, reported greater disruption in planning family activities and restrictions on family travel, greater financial difficulties, and greater caretaker burden, as well as perceived lower parenting competence and feelings of self-blame.

Third, the likelihood of emotional and behavioural disorders in these children (Eisenhower et al., 2005; Hassall & Rose, 2005) and the resulting stress in day to day parenting, also may impact negatively on maternal mental health. Abbeduto at al. (2004) found that extent and severity of behavioural symptoms was a predictor of maternal depression. They also noted that "some parents have a genetic vulnerability for less than optimal outcomes and that this vulnerability is magnified by the challenges of raising a son or daughter with special needs" (p. 250). For example, they noted that parents of

children with autism compared to the general population have higher rates of psychiatric disturbances.

Finally, societal attitudes and stigma regarding various forms of developmental delay may serve not only as a lens through which a mother, perhaps unconsciously, perceives her child, but also through which she perceives herself, possibly leading to a lowered sense of self-worth as well as feelings of "despair, shame, and isolation" (Bouma & Schweitzer, 1990, p. 729).

Relation between attachment and maternal depression

There is evidence for an association between maternal depression and insecure attachment in typically developing children. Goldberg (2000) reviewed related research and reported that "there is clear evidence that the presence of maternal depression increases the likelihood that an infant will develop insecure attachment" (p. 123). In another review, Beckwith and colleagues (2002) came to the same conclusion. Both reviews, however, noted inconsistencies in the results and Beckwith et al. stated that "no single predominant pattern exists" (p. 260) in terms of degree of maternal mental illness and the child's development or attachment style. Differences in rates of attachment security may be related to differences in the nature of the samples, timing and duration of the maternal depression, and/or concurrent "adverse factors" (e.g., single parent, marital discord, comorbid diagnoses, low socioeconomic status; Beckwith et al., 2002). In their meta-analysis of maternal mental health correlates of attachment security, Atkinson, Paglia, Coolbear, Niccols, Parker, and Guger (2000) found that maternal depression was significantly related to attachment security. They noted as well that the strength of the

association differed according to how depression was measured (i.e., self-report versus clinical diagnosis) as well as in what context (e.g., stress versus social-marital support).

The likelihood of insecure attachment appears to be connected to the type and severity of the maternal depression. Teti, Gelfand, Messinger & Isabella (1995) found that 80% of infants and 87% of preschoolers whose mothers had unipolar major depression that was severe and chronic were rated insecure. Radke-Yarrow, Cummings, Kuczynski, and Chapman (1985) found a greater proportion of children were classified insecure whose mothers were diagnosed with bipolar depression (79%) in comparison to children whose mothers were diagnosed with unipolar depression (46%). They also found that children whose mothers were diagnosed with minor depression were no more likely to be insecure than children of non-depressed mothers.

Studies examining maternal depression in community samples (i.e., self-report of depressive symptoms) also have shown an association with insecure attachment (Atkinson et al., 2000; Campbell et al. 2004) albeit with smaller effect sizes. In addition, Campbell and colleagues (2004) found that the timing and duration of maternal depression are important factors in the development of attachment. Infants whose mother's depression was limited to the infant's first 15 months were not more likely to have insecure attachment than infants whose mothers were not depressed. However, infants whose mothers were intermittently or chronically depressed (i.e., over a period of 36 months) were more likely to be classified as insecurely attached at preschool age.

In terms of contextual risk factors, Radke-Yarrow et al. (1985) found that children whose mothers were clinically depressed and whose fathers were absent were more likely to be insecure than children with depressed mothers and present fathers.

However, Cicchetti et al. (1997) found that toddlers whose mothers were depressed were more likely to have insecure attachment than toddlers whose mothers were not depressed, regardless of contextual risks (in this case, defined as stress, daily hassles associated with parenting, lower social support, marital dissatisfaction, family conflict).

Research on the relation between maternal depression and attachment often raises questions about the impact of maternal depression on the formation of attachment. However, van IJzendoorn et al. (1992) cautioned against assumptions of the direction of the effect. They suggested an alternative interpretation may be that an insecure attachment relationship may have a negative impact on maternal mental health. This broader perspective may also be helpful when considering attachment and maternal depression in mothers and their children with developmental delay.

Thus far, no research has examined maternal attachment representations in mothers of children with developmental delay, even though there is evidence that these relationships are at risk of insecurity. Mothers of children with developmental delay also may be more likely to have symptoms of depression. Yet, in spite of numerous investigations of depressed mothers of typically developing children, researchers have not examined relations between maternal depression and attachment in mothers of children with developmental delay.

In the present study, I examined 1) mothers' attachment representations of their young children with developmental delay, 2) the degree to which these mothers report depressive symptoms concurrently, one year later, and two years later, and 3) relations between maternal attachment representations and concurrent and later maternal depression.

Research Questions

1a. Are mothers of children with developmental delay more likely to exhibit insecure representations of their attachment relationships with their children than non-clinical samples?

1b. Are mothers of children with developmental delay less likely to exhibit insecure representations of their attachment relationships with their children than other clinical samples?

2a. Do mothers of children with developmental delay exhibit levels of depression that are higher than non-clinical samples and lower than clinical samples?

2b. Do mothers of children with developmental delay exhibit levels of depression that are higher than the clinical level?

2c. Do mothers of children with developmental delay exhibit levels of depression at later points in time that are not significantly different than the initial assessment (i.e., chronic depression)?

3a. Are mothers of children with developmental delay who exhibit insecurity in their representations of attachment to their children concurrently more depressed than mothers in the sample who exhibit security in their attachment relationships?

3b. Are mothers of children with developmental delay who exhibit insecurity in their representations of their attachment relationships more depressed later on than mothers in the sample who exhibit security in their attachment relationships?

Hypotheses

1a. A greater proportion of mothers in the study will be classified as non-balanced (i.e., disengaged and distorted combined; Benoit, Parker, et al., 1997) than non-clinical samples.

1b. The proportion of mothers classified as non-balanced will be significantly lower than other clinical samples.

2a. Mean maternal depression scores at Time 1, Time 2, and Time 3 will be higher than means for non-clinical, community samples and lower than means for a clinical sample.

2b. Mean maternal depression scores at Time 1, Time 2, and Time 3 will be higher than the clinical cutoff score, and the majority of mothers in the study will have scores higher than the clinical cutoff.

2c. Mean maternal depression scores at Time 2 and Time 3 will not be significantly different than mean depression scores at Time 1.

3a. Mean concurrent (Time 1) maternal depression scores will be higher for mothers classified as non-balanced than those classified as balanced.

3b. Mean later (Time 2 & Time 3) maternal depression scores will be higher for mothers classified as non-balanced than those classified as balanced.

Method

Paradigm Analysis

This study involved secondary analysis of data gathered for a previous research project (Hundert, Niccols, Perry, Mahoney, & Chambers, 1997). The aim of that research was to determine if an early intervention program reduced the likelihood of out-of-home placement of children with developmental delay and was based on a positivist paradigm. Positivism assumes that reality is fixed and knowable; that the researcher can verify theory empirically from an objective, unbiased standpoint, and that the results are generalizable to the degree that the sample was representative of the population as a whole (Westhues, Cadell, Karabanow, Maxwell, & Sanchez, 1999). Although my study has many elements of positivism, my own ontological and epistemological perspective fits best with the heuristic paradigm, which holds that reality is fixed but only partially knowable, as our understanding of it is influenced by our "cultural and historical context" (Westhues et al., 1999, p. 136). As such, this study endeavored to describe and add to our understanding of a particular phenomenon using a deductive approach and was based on the assumption that it is possible to predict human behaviour. Generalization of the findings, however, will be cautious and with awareness of the contexts of both the researcher and the participants.

The heuristic paradigm embraces inductive research methods equally with deductive, which is congruent with my view of how knowledge is built. My original intention for this study was to carry out a mixed method design. Time constraints prevented me from including a qualitative analysis of the narrative data generated through the interviews (i.e., Working Model of the Child Interview). A follow-up study,

exploring the themes that emerge from the mothers' descriptions of their relationships with their children, would greatly add to an understanding of this phenomenon, allowing the participants' voices to illuminate both commonalities and variations in their experiences.

Within a heuristic paradigm it is necessary to consider the social location and subjectivity of the researcher(s). The original study took place in Hamilton, Ontario between 1999 and 2002 and was designed by five lead researchers, all of whom were employed by social service agencies mandated to support children with developmental disabilities and their families. Specifically, they were middle-class, well-educated professionals who held leadership positions in their agencies. The current study is part of my graduate degree in social work and my academic need for the success of this research must be acknowledged. Further, having worked for several years with families who have children with developmental delay, I am invested in contributing to research that might add to the clinical sensitivity of those working with similar families and to the effectiveness of prevention and intervention methods.

Research Design

This study was longitudinal and involved quantitative analyses. Mean scores for depression and attachment for this sample were compared to existing non-clinical and clinical samples in the literature. Relations between attachment classifications and maternal depression scores (measured at three yearly intervals) were examined using parametric and nonparametric statistics.

Recruitment of Sample

Convenience non-random sampling was used for this study. Using a two-phase screening process, researchers recruited families in the Hamilton-Wentworth area who had children 4 – 8 years old with developmental delay. This study involved the collaboration of many local agencies serving families with children with developmental disabilities in the Hamilton-Wentworth region: Hamilton Health Sciences Corporation – Chedoke Child & Family Centre, Hamilton Association for Community Living, The Children's Aid Society of Hamilton-Wentworth and, Victorian Order of Nurses – The Hamilton-Wentworth Home Care Program.

In the first phase, service providers from the participating agencies (who held diplomas in Early Childhood Education) selected children identified with developmental delay and approached their parents about the study. The early childhood educators confirmed the existence of developmental delay by completing a screening tool – the System to Plan Early Childhood Services: Developmental Specifications, or Developmental SPECS (Bagnato & Neisworth, 1990; 1991). The SPECS identifies children (ages 4 – 7 years) with developmental delay and takes approximately 10 minutes to complete. The SPECS examines skills in 6 main domains comprising a total of 19 developmental dimensions [Communication (Receptive language, Expressive language); Sensorimotor (Hearing, Vision, Gross Motor, Fine motor); Physical (Health, Growth, Normalcy in appearance & actions); Self-regulation (Temperament, Play, Attention, Self-control); Cognition (Basic concepts, Problem-solving); Self/Social (Self esteem, Motivation, Social competence, Self care)]. Each dimension has a brief description of an area of development or behaviour, followed by 5 statements that describe the different

ways a child might act or appear. Raters (in this case early childhood educators who knew the children) make a judgment of a child's development/functioning in each of the 19 developmental dimensions based on their observation of how the child acts or behaves in relation to what they think is typical of children his/her chronological age, as 5 (typical), 4 (at-risk), 3 (mild), 2 (moderate), or 1 (severe). Test-retest reliability over 2-4 weeks ranges from .62 to .87 for each of the 19 dimensions. Concurrent validity was established by comparing ratings to various norm-based, curriculum-based, and judgment-based measures, and agreement was high (ranged from 63 to 100%) indicating that SPECS can reliably identify children with developmental delay. Discriminant function analyses were used to test classification validity and found 86% overall correct classification of mental retardation.

Using this tool, developmental delay was operationally defined as two or more areas of delay (≤ 3 on at least two of four core developmental domains: communication, sensory-motor, cognition, self/social). The children selected for the study met this criterion and their parents were mailed information about the larger study (see Appendix I) and a consent form (see Appendix II) allowing contact by research staff for the second screening.

In the second phase of screening, those parents who gave consent to be contacted (*N* not available) received a telephone call by a research staff member with a degree in psychology. Due to resource limitations, recruitment phone calls (*N* unknown) ended after 51 parents agreed to participate. Those who agreed to participate in the study signed a second consent form (see Appendix III). Of 305 parents mailed a package in the first

phase of screening, 51 (16.7%) agreed and participated in the first year of the 3-year project (1999-2002).

For this study, data from 47 of those participants was used. The data for the other four were excluded because it was from fathers and/or the data was incomplete or unclassifiable.

Measures and Procedures

Research assistants (who were fourth year honours psychology students) completed all data gathering in participants' homes. Descriptive demographic information (e.g., age, sex, socioeconomic status, education, family constellation, level of disability, diagnosis) regarding the children, parents, and families in the study was collected at Time 1. Mothers were interviewed using the Working Model of the Child Interview (WMCI) (see below) at Time 1. Mothers completed standardized questionnaire measures, including the Centre for Epidemiological Studies Depression Scale (CES-D) (see below), at Times 1, 2, and 3 (i.e., at yearly intervals over two years). Total time to complete the interview and other measures (including measures not used in the present study) was approximately two hours. The interviews were audio taped and coded from verbatim transcripts by an experienced rater.

The Working Model of the Child Interview (Zeanah, Benoit, Hirshberg, Barton, & Regan, 1994) is a standardized, structured interview that is designed to assess parents' internal representations of their infants/children through their descriptions of their child's personality and the relationship they share with their child (Zeanah & Benoit, 1995). The 75-minute interview is audio taped, transcribed, and coded by an experienced rater (in this case a trained and reliable coder). Parents' perceptions are scored on eight primary

scales: "richness of perceptions" (the extent to which the parent "knows" their child), "openness to change" (how flexible the parent is to accommodating new information about their child and their relationship with their child), "intensity of involvement" (how psychologically involved the parent is in their relationship with their child), "coherence" (how well-organized and logical the parents' descriptions are of their child), "acceptance" (the level of the parents' acceptance of their child), "caregiving sensitivity" (the degree to which the parents' read and respond to their child's emotional needs), "fear for safety" (the extent to which the parent's fear of losing the child through death affects the parent's behaviour toward the child), "infant difficulty" (the parent's perception of how difficult their child is to care for and relate to). Eight aspects of affective tone are also coded on secondary scales: joy, anxiety, pride, anger, guilt, indifference, disappointment, other. The patterns of the ratings from the eight primary scales are used to categorize parents into 3 classifications: "balanced", "disengaged", or "distorted". Investigations of validity revealed that these classifications match those of the Strange Situation: "secure", "insecure/anxious-avoidant", and "insecure/anxious-ambivalent/resistant" (Benoit, Zeanah, et al., 1997; van IJzendoorn, 1995). The WMCI was found to be reliable and stable over one year in a sample of low-risk children from middle class families (Benoit, Parker, et al., 1997; Zeanah et al., 1994). The WMCI distinguishes between clinical samples (failure to thrive, sleep disordered, infant psychiatry) and non-clinical groups (Benoit, Zeanah, et al., 1997). In the present study, inter-rater reliability was calculated based on a subsample of 11 (23% of the total sample) of the interviews. The proportion of agreement, following discussions between the coders, was .87.

The Centre for Epidemiological Studies Depression Scale **(CES-D)** (Devins & Orme, 1985) is a 20-item self-report measure of adult depressive symptoms developed for use with non-psychiatric research populations. It provides a current description of a person's levels of cognitive, affective, and behavioural depressive features as well as offering an indication of the frequency and duration of those symptoms. While it is not a clinical diagnostic tool on its own, it is viewed as a useful screening tool that can indicate the need for further assessment (Barnes & Prosen, 1984; Devins & Orme, 1985; Roberts & Vernon, 1983). Adults respond to each item on a 4-point scale from 0 ("rarely or none of the time") to 3 ("most or all of the time"). Higher scores (with a maximum of 60) indicate greater sadness/depression (Devins & Orme, 1985). Mean CES-D scores in large community samples ranged from 7.5 to 12.5 (with modal values around 8.5) and standard deviations ranging from 7.5 to 9.8 (Lewinson & Teri, 1982; Radloff & Locke, 1986). A total score of 16 is recommended as a clinical cutoff, distinguishing non-depressed from depressed (Radloff & Locke, 1986; Roberts & Vernon, 1983). Barnes and Prosen (1984) suggested that scores of 16 – 20.5 be interpreted as mildly depressed, 21 – 30.5 as moderately depressed, and 31 and higher as severely depressed.

Test-retest reliability was reported as acceptable, given that it is a measure of *state* depression (i.e., depression symptoms in the preceding week only) (Devins and Orme,1985; Radloff, 1977). Internal consistency levels are high (Devins and Orme,1985; Radloff, 1977). Radloff (1977) reported that CES-D scores were higher for a psychiatric inpatient group ($M = 24.4$, $SD = 13.5$) compared to a community sample ($M = 8.2$, $SD = 8.2$; $p < .05$). Also, Roberts and Vernon (1983), who found that depressed and non-

depressed individuals differed significantly in their scores on the CES-D, reported that it is a valid measure of depressive symptoms.

Ethical Considerations

The methods used in the gathering of data in the original research project were approved by the Hamilton Health Sciences Hospital Research Board. The recruitment process was collaborative in that agencies identified potential participants among their own clients, mailed them information about the study, and clients could consent at that time to have their name forwarded to the researchers. At that stage, qualifying candidates chose whether or not to consent to participate in the study.

Every necessary measure was taken to ensure that recruitment and data gathering was conducted in an ethical manner. No deception took place and parents were informed in writing that their participation or non-participation had no bearing on the services they were already receiving and that they could withdraw from the study at any time (See Consent Forms in Appendices). Participants were not compensated.

Results

Participants

The participants in this study were 47 mothers and their children who were between 4 and 8 years of age (48-105 months; $M = 72.57$, $SD = 14.61$) at Time 1. According to parental report, diagnoses were as follows: 8 (17%) had no diagnosis other than developmental delay; 17 (36%) had a genetic disorder (e.g., Down syndrome, Fragile X, Fraser syndrome); 16 (34%) had Pervasive Developmental Disorder; and 6 (13%) had other diagnoses (e.g., attention deficit disorder, cerebral palsy). Three quarters of parents were members of two-parent families (25% single/other) and households had between 2 and 9 members ($M = 4.26$, $SD = 1.36$). At Time 1, mothers' age ranged from 23 to 48 years ($M = 36.34$, $SD = 5.67$). Education level was varied: 57% - college or university; 20% - high school; 13% - less than high school; 10% - information not available. Sixty-three percent of these households were rated as having high socioeconomic status (i.e., scores above the mean of 42.74 on the index; Blishen, Carroll, & Moore, 1987). Of the 47 mothers who completed measures at Time 1, 42 remained in the study at Time 2 (89% retention rate) and 38 remained in the study at Time 3 (81% retention rate).

Maternal attachment representations

Of the 47 mothers in this study, 72% ($n = 34$) were classified as non-balanced (21% disengaged and 51% distorted). Following are excerpts from two interviews, one classified as balanced and the other as non-balanced (i.e., distorted), respectively. They are both in response to the same question.

Question: Lots of kids get hurt at this age. Can you give me an example of a time when XX was physically hurt just a little bit, like a bump on the head, or a scraped knee, in terms of what happened, what you did, and what you felt like doing?

Answer: Um, I think the last time he scraped his leg on something, I don't know what he did, but he ended up scraping his leg. He just went "aaaaaah", he just made a noise and looked at it. Whenever he hurts himself or falls or whatever I am right there for him. I don't think he has to be a big boy or whatever about any of these things. Right away I went up to him and I rubbed his leg and he laughed and walked away. He doesn't often cry when he falls. He falls quite a bit because he is a bit unsteady on his feet. He doesn't often cry. He may make a little noise after he falls but we usually help him get up and then he is fine and he is off. He does have a lot of bruises from falling and stuff. He wouldn't know when he did them because he doesn't necessarily react to them. He has a high pain tolerance level.

As the preceding example demonstrates, this mother's answers were clear and coherent. In contrast the mother's narrative style in the following excerpt lacks coherence and sensitivity, reveals struggle in the relationship and an angry affective tone.

Question: Lots of kids get hurt at this age. Can you give me an example of a time when XX was physically hurt just a little bit, like a bump on the head or a scraped knee, again in terms of what happened, what you did, and what you felt like doing?

Answer: He has a very high pain threshold. The last time I can remember was when he was stung by a bee. He goes out and he traps bees. We are at the point that I tell him "if you get stung it is your fault because you shouldn't be doing this". He is not in great pain, he never does seem to be in great pain. It is just getting him to clean it and

hopefully he learns from it. I will tell him not to touch bees because you are going to get stung.

Question: How did you feel when you saw that he had gotten hurt like that?

Answer: I was angry at him. I was angry because why does he have to run out and kill bees. I get frustrated with him.

Question: What did you feel like doing?

Answer: Hmm, um, telling him he deserved it I guess. Like "it serves you right" kind of thing. He doesn't learn with being told once or twice, it is like a million times, so it is a real ordeal.

The proportions of balanced and non-balanced (i.e., disengaged and distorted combined; Benoit, Parker, et al., 1997) relationships in this sample were compared to proportions obtained in a study involving mothers of typically developing children. Benoit, Parker, et al. (1997), using the WMCI, interviewed 81 middle-class mothers of children who were developing typically and classified 35% as non-balanced. Yates' chi-square analyses indicated that a significantly higher proportion of relationships in this sample were classified as non-balanced in comparison to the non-clinical sample (χ^2 = 26.50, $p < .01$, Benoit, Parker, et al, 1997).

When the proportion of non-balanced relationships in the study sample were compared to proportions of non-balanced relationships in other clinical samples (i.e., failure to thrive, sleep disorders, clinic referred), Yates' chi-square analyses revealed that the proportions of the non-balanced relationships in the other clinical samples (i.e., 91% non-balanced: failure to thrive, sleep disorder, clinic referred, Benoit, Zeanah, et al, 1997; 86% non-balanced: failure to thrive, Coolbear & Benoit, 1999) were significantly greater

than the study sample ($\chi^2 = 10.74$, $p < .01$, comparing to Benoit, Zeanah, et al, 1997; $\chi^2 = 5.09$, $p < .05$, comparing to Coolbear and Benoit, 1999).

Maternal depression

The mean scores for depression at Time 1, Time 2, and Time 3 were compared to means from three large community samples (see Tables 1 & 2). The Community Mental Health Assessment (CMHA) program tested the CES-D on samples in Missouri (N = 1,173) and Maryland (N = 1,673) and retested over the next two to three years (Ns = 1,089; 1,209; 343). The mean scores for the two sites ranged from 7.8 to 9.92 (SD = 7.5 to 9.31) (Radloff & Locke, 1986). A national sample by the National Center for Health Statistics, Health and Nutrition Examination Survey (NCHS-HANES) found an average CES-D score of 8.7 (*SD* = 8.4) (Radloff & Locke, 1986). As seen in Table 2, *t*-test analyses revealed the depression scores in the study were significantly higher than each of the three community samples.

When the mean scores for depression Times 1, 2, and 3 were compared to a clinical sample (i.e., psychiatric inpatients with depression; Radloff, 1977), *t*-test analyses revealed that the mean CES-D score for the clinical sample (i.e., *M* = 24.4, *SD* = 13.51) was significantly higher than the mean CES-D scores in the study sample [Time 1: $t\ (47) = 13.11$, $p = .00$; Time 2: $t\ (42) = 9.60$, $p = .00$; Time 3: $t\ (38) = 8.61$, $p = .00$].

Mean CES-D scores at Times 1, 2 and 3 were all above the clinical cutoff score (i.e., 16; Barnes and Prosen, 1984). At Time 1, 68% of the scores were above the clinical cutoff, 45% were above the cutoff at Time 2, and 55% at Time 3. A one-way ANOVA revealed no significant difference between the means at Time 1, Time 2, and Time 3 ($F_{(2,124)} = 1.16$, $p = .32$).

Table 1

Mean Maternal Depression Scores (CES-D)

Time	*N*	*M*	*SD*
Time 1	47	17.91	5.29
Time 2	42	16.07	5.58
Time 3	38	16.82	6.46

Table 2

Comparison of Mean Maternal Depression Scores to Community Samples

	Community Sample CMHA Missouri *M* = **7.8**, *SD* = 7.5			Community Sample NCHS-HANES *M* = **8.7**, *SD* = 8.4			Community Sample CMHA Maryland *M* = **9.92**, *SD* = 9.31		
Time	*t*	*df*	*p*	*t*	*df*	*p*	*t*	*df*	*p*
Time 1	13.11	46	.00	11.94	46	.00	10.36	46	.00
Time 2	9.60	41	.00	8.55	41	.00	7.14	41	.00
Time 3	8.61	37	.00	7.75	37	.00	6.59	37	.00

Relation between attachment and maternal depression

The hypothesis that concurrent and later depression scores were higher for those classified as non-balanced than those classified as balanced was tested by comparing means using t-tests for independent samples (see Table 3). Mothers with balanced internal representations showed a trend toward lower depression scores than mothers with non-balanced internal representations [$t(45) = 1.96$, $p = .06$]. The effect size (i.e., the magnitude of the difference) was medium ($d = .66$; Cohen, 1988). At Time 2 and Time 3, group differences were small and not significant.

Table 3

Comparison of Attachment Classifications and Depression Scores

	Balanced			Non-Balanced			Comparison	
Time	*M*	*SD*	*n*	*M*	*SD*	*n*	*t*	*p*
1	15.54	4.50	13	18.82	5.35	34	1.96	.06
2	17.00	5.82	12	15.70	5.55	30	.68	.50
3	15.45	3.91	11	17.37	7.23	27	.83	.41

Discussion

Maternal attachment representations

As hypothesized, a significantly greater proportion of mothers were classified as non-balanced in their attachment representations of their children in comparison to existing non-clinical samples, confirming the risk of insecurity in attachment relationships between mothers and their children with developmental delay. This is the first study to examine maternal attachment representations with respect to the child in this population, and this finding is consistent with those of studies measuring attachment security in children with developmental delay (Atkinson et al., 1999; Rutgers et al., 2004; Vaughn et al., 1994). In general, these mothers appeared less emotionally involved (i.e., disengaged) or less in tune (i.e., distorted) with their children when describing their perceptions of and relationship with their children with developmental delay compared to non-clinical samples.

Studies of other clinical samples (i.e., failure to thrive, sleep disorders, infant psychiatry clinic-referred; Benoit, Zeanah, et al., 1997; Coolbear & Benoit, 1999) also have shown greater proportions of non-balanced representations than non-clinical samples. However, the proportions of non-balanced representations in the studies of these other clinical samples were significantly greater than the proportion found in this study. Thus, the risk of attachment insecurity may be even greater among infants with failure to thrive, sleep disorders, and mental health issues than children with developmental delay. Non-balanced maternal representations may be, at least in part, in response to the specific experience of caring for a child with a certain clinical problem.

This finding is consistent with attachment theory which emphasizes the reciprocity of the attachment process. Bowlby proposed that infants use specific behaviours to elicit caregiver proximity and protective behaviours; therefore, "developing attachments can be disrupted by conditions that limit, impair, or distort the infant's behaviour as well as conditions that interfere with adult responsiveness" (van IJzendoorn et al., 1992, p. 841). Diagnosis specific deficits (e.g., physical, communicative, affective, cognitive) may hinder the child from engaging in the behaviours that elicit appropriate caregiver responses (Beckwith et al., 2002; Vaughn et al., 1994). Some clinical problems may be more detrimental to the attachment process than others. Given that research has revealed that child diagnosis is differentially related to maternal stress and depression (Abbeduto et al., 2005; Eisenhower et al., 2004; Weiss, 2002), future research may reveal that child diagnosis is differentially predictive of maternal attachment representations of the child.

Given the evidence that insecure attachment is associated with negative outcomes for children, the non-balanced mother-child attachment revealed in this sample may suggest further risk to the development of these children who are already delayed. Research on the implications of insecure attachment in *non-delayed* populations lead researchers to suggest that it may, in fact, be a contributing factor in the development of psychological disturbance, placing children at-risk for clinical problems such as failure to thrive and sleep disorders and to internalizing and externalizing problems (Benoit, Zeanah, et. al., 1997; Goldberg, 2000). Although no studies have examined the association between attachment and psychopathology in children with developmental

delay, insecure attachment in this population may increase their vulnerability to psychological disturbance as well.

Maternal depression

As hypothesized, these mothers of children with developmental delay, as a group, exhibited mean levels of depression that were significantly higher than community samples. This finding is consistent with previous research showing that mothers of children with developmental delay are more likely to have symptoms of depression (Abbeduto et al., 2004; Weiss, 2002). This finding must be interpreted cautiously, however, as maternal mental health histories were not assessed and, therefore, it is not known whether or how many of these mothers had depression prior to having children with developmental delay. Nonetheless, the presence of depressive symptoms suggests that maternal mental health is compromised in this population.

As a group, the level of depression among these mothers was significantly lower than that of a sample of psychiatric inpatients with depression (Radloff, 1977). This is consistent with previous research in which the depressive symptoms of mothers of children with developmental delay were not severe and hovered around the clinical cutoff (Abbeduto et al., 2004; Eisenhower et al., 2005; Moes et al., 1992; Weiss, 2002).

The finding that the depression scores were elevated one and two years later is consistent with the notion that parents of children with developmental delay may experience chronic sorrow (Olshansky, 1962; Wikler et al., 1981).

Relation between attachment and maternal depression

The concurrent relation between attachment representation and depression in mothers of children with developmental delay was medium in effect size but only at a

trend level of significance, likely due to the small and unequal sample size. The findings suggest, however, that there may be a concurrent relation between maternal depression and insecure attachment in mothers who have children with developmental delay. Mothers with non-balanced attachment representations to their children tended to have higher levels of depression than mothers with balanced representations. Correlational data cannot be interpreted as causal; however, a tentative speculation is that there may be a mutual influence between maternal depressive symptoms and quality of attachment. Depressive symptoms may undermine a mother's ability to empathize with and enjoy her child, and a compromised internal working model of attachment to her child may increase sadness, helplessness, and hopelessness and undermine her sense of self-worth and competence (van IJzendoorn et al., 1992).

This finding is consistent with previous research showing that maternal depression is associated with insecure attachment in typically developing children (Campbell et al., 2004; Radke-Yarrow et al., 1985; Teti et al., 1995). Specifically, Campbell and colleagues (2004) reported that chronic or intermittent maternal depression was linked to insecure attachment. Depression levels in this study were above the clinical cutoff at each of three yearly measurements (and were either chronic or intermittent).

It is noteworthy that, although the mothers with a *balanced* attachment representation had lower levels of depression than the mothers with a non-balanced attachment representation, as a group their mean depression score hovered near the clinical cutoff score. This finding suggests that insecurity in the attachment relationship is only part of the story in terms of maternal depression in mothers of children with developmental delay. The level of depression seen in this group as a whole is likely

associated with a number of factors, including those related to parenting a child with developmental delay as well as factors not directly related to that role (e.g., context, genetics).

The hypothesis that mothers of children with developmental delay who exhibit insecurity in their representations of attachment to their children have higher levels of later depression (i.e., one and two years later) than mothers who exhibit security in their attachment relationships was not supported. Mean levels of depression remained at or above the clinical level but WMCIs were not repeated and the attachment classifications may have changed. On the other hand, as their children age, maternal depression may have less to do with quality of attachment with respect to their child and more to do with other factors, such as family stresses, child behaviour problems, the transition to elementary school, or the widening gap between these children and their peers and between families with and without a child with developmental delay.

Limitations and recommendations for further research

Recruitment for this study was by invitation (i.e., not random). Only a small portion of families invited to participate agreed to do so. It is not known if those who volunteered were motivated to do so because they were more (or less) distressed in their parenting role of a child with developmental delay. Therefore, caution must be used in speculating on how the findings in this study might be useful in understanding parents of children with developmental delay in general. The fact that information regarding ethnicity was not gathered also leaves questions about whether the sample was representative of the population. Also, the sample was mainly middle class, further limiting the generalization of results to include lower class, higher-risk populations.

Sample size limited the statistical reliability of the findings. Further research using a larger sample would not only help to confirm or rule out a relation between maternal attachment representations and depression but also allow for investigations of the three-way classifications of the WMCI (i.e., Balanced, Disengaged, Distorted) as well as factors predicting both depression and attachment (e.g., child diagnosis, maternal characteristics).

The age spread of the children at Time 1 (i.e., 4 years) allowed for a cross-sectional view. However, future longitudinal research with children the same age at Time 1 would allow for a clearer picture of how specific developmental stages may be related to changes in attachment security, maternal depression (e.g., do transitions intensify grief/depression?), and relations between attachment and depression. Ideally, such research would follow mothers of children from infancy into adolescence/young adulthood. Repetition of the WMCI would offer more information about relations between attachment and maternal depression. Although Benoit, Zeanah, et al. (1997) found no difference between infant age and WMCI classification in a clinical sample of children ranging from 2 weeks to 6 years, more research on stability and change in maternal representations as children with developmental delay develop would be informative.

While some researchers have used the WMCI with mothers whose children were similar in age to those in this study (e.g., Benoit, Zeanah, et al., 1997), most WMCI studies have involved mothers of infants and toddlers (i.e., under 3 years). Further research using the WMCI with mothers of infants and toddlers with developmental delay, as well as with older children (i.e., over 3 years) who are developing typically and

atypically, would allow for a fuller understanding of maternal attachment representations in both clinical and non-clinical populations.

The limited number of measures used in this study restricted the information it yielded. Including the AAI (as did Coolbear & Benoit, 1999) along with the WMCI would have allowed for an examination of relatedness between the classifications. In this study, 28% of the mothers had balanced representations. Were these mothers more likely to be classified as autonomous using the AAI (i.e., a protective factor)? Furthermore, although difficult to measure in children with developmental delay, the Strange Situation, or an adaptation of it, would have added further information about the relation between the three attachment constructs, as well as the relation between maternal depression, infant attachment, and adult attachment. Research has shown a strong association between the AAI and infant attachment classifications (Pederson et al., 1998). Recent research has also shown concordance between the WMCI and the Strange Situation in non-clinical populations (Zeanah et al., 1994). Theoretically, the WMCI measures a parent's attachment representation of a *particular* child and is, therefore, measuring a different construct than the AAI. In order to clarify the similarities and differences between these constructs, future research should: (1) determine whether or not more mothers of children with developmental delay are classified as non-balanced than non-autonomous (i.e., dismissing or preoccupied), given the evidence of infant insecurity in this population (i.e., Are maternal attachment representations of the child more predictive of infant security than adult attachment representations?); and (2) include measuring the maternal attachment representations of siblings as well as of the children with developmental delay. Researchers have not yet measured maternal attachment

representations among siblings who are typically developing, and doing so in dyads with one sibling with developmental delay would be especially interesting and informative, given the higher risk of insecure attachment in children with developmental delay.

There was no comparison group in the present study. A further exploration of the level of depressive symptoms reported in this study could include a comparison to the level of depression reported by mothers of children who are developing typically. Also, this study revealed a range of depression scores and some parents reported no more symptoms than the general population. Further research into possible protective factors and predictors is needed in order to improve clinical efforts.

Little or no research has focused on the impact of maternal depression on children with developmental delay. Extrapolations can be made only very cautiously from the research on children without developmental delay. Research examining child outcomes related to maternal depression (e.g., behavioural and emotional problems) would inform prevention and intervention efforts.

Attachment theory assumes that attachment is rooted in biology and evolution (i.e., survival) and is, therefore, universal. Cross-national research using the Strange Situation confirmed that, "attachment behaviours between attachment figures and children are apparent cross-culturally" (Bolen, 2000, p. 135). However, differences in the distributions of classifications between countries leaves questions regarding the influence of cultural mores in the attachment process (Bolen, 2000). Given the cultural diversity in Canada's largest cities, research into the cross-cultural applicability of the WMCI would be informative.

Previous studies measuring attachment representations in mothers of children with clinical problems (e.g., sleep disorders, failure to thrive) found higher proportions of non-balanced representations than in this sample, suggesting that the risk of insecurity in maternal attachment representations of the child may be related to the child's diagnosis. Recent research has shown that degree of maternal stress and depression is linked to the child's diagnosis (Abbeduto et al., 2004; Eisenhower et al., 2005; Weiss, 2002). Future research allowing for diagnosis-specific examination of maternal attachment representations may offer more information on the relative risks of insecure attachment in different subpopulations of children with developmental delay.

Future research should include an exploration of fathers' attachment representations of their child (with and without developmental delay) in comparison to those of the mother. Research has shown that fathers are less stressed than mothers with regard to the daily caregiving of a child with developmental delay (Kazak, 1987) and their experiences and perceptions of their child may well be different from those of the mother. It would be informative to investigate, for example, whether having a father with a balanced representation serves as a protective factor when the mother has a non-balanced representation.

Finally, although many children with developmental delay are classified as insecure-disorganized (Goldberg, 2000), this sub-classification was not possible using the WMCI and would be an important focus for future research.

Clinical implications

Research on the stability of attachment status suggests that attachment is dynamic (Bolen, 2000). If family circumstances (either negative or positive) remain stable,

attachment usually remains stable. However, changes in the relationship with the attachment figure or disruptive life experiences can lead to a change in attachment classification (Bolen, 2000). Although more research is needed regarding stability and change in attachment status over the lifespan (Goldberg, 2000), the notion of attachment being dynamic has positive implications for clinical intervention. Given the importance of maternal perceptions and subjective experience of the child in terms of risk for psychopathology in the child (Benoit, Zeanah, et al., 1997), as well as the increased risk for non-balanced attachments in mothers of children with developmental delay, efforts to intervene as early as possible are indicated. Atkinson, Goldberg, Raval, Pederson, Benoit, Moran et al. (2005) determined that maternal sensitivity moderates the influence of adult attachment representations on infant attachment. In other words, infants whose mothers behave sensitively are secure even if those mothers have an insecure adult attachment. Atkinson and his colleagues determined that "intervention aimed at changing maternal behaviour altered the quality of infant attachment more effectively (d = .48) than did intervention aimed at modifying maternal attachment representations (d = .00)" (p. 49). Because infants and children with developmental delay may be limited in their ability to produce clear attachment behaviours, mothers may require support in observing their child, identifying their subtle cues, and responding warmly and consistently.

The likelihood that the clinical level of depressive symptoms found in this group of mothers of children with developmental delay was sustained reinforces the need for clinicians working with these families to be aware of the increased risk for depression. Research shows that mothers of *older* children with developmental delay are at greater risk for depression and psychological distress than mothers of younger children with

developmental delay (Kazak, 1987), indicating the need for prevention and treatment as well as the possibility that supports and resources may need to remain available for many years.

Conclusions

This study is the first to examine attachment representations with respect to the child in mothers of children with developmental delay. Compared with mothers of typically developing children, a significantly greater proportion of the mothers had non-balanced representations, indicating insecurity in the mother-child relationship. This finding was consistent with studies showing that children with developmental delay are at greater risk for insecure attachment than children who are typically developing.

A majority of the mothers in this study reported clinically elevated levels of depressive symptoms, which were significantly higher than existing samples from the general population and which remained at the clinical level one and two years later. The concurrent relation between maternal attachment representations and depression was at a trend level of significance. In other words, mothers with non-balanced representations (i.e., disengaged or distorted) of their child tended to be more likely to report higher levels of depressive symptoms. Further research is necessary to investigate this potential relation. No predictive relation between attachment representations and later depression was found.

The results of this study emphasize the risk of insecure attachment and depression in mothers of children with developmental delay and the possibility that insecure attachment may be related to depression. Both insecure attachment and maternal depression are associated with negative outcomes for children, placing them at increased

risk for psychopathology. The results highlight the need for prevention and intervention strategies aimed at fostering secure attachment and alleviating depression.

Appendix I

Letter to families requesting their participation in the project (sent by the school or preschool)

(on preschool or school letterhead)

Date

Mr. and Mrs.
123 Main St.
Hamilton, Ontario

Dear Mr. and Mrs.

RE: Early intervention project

It is my pleasure to inform you of a research project that might be very helpful in learning how best to support families of children with developmental disabilities. The project was planned by many of the agencies in Hamilton, with parent input. The investigators of the project are: Dr. Joel Hundert of Hamilton Health Sciences Corporation and McMaster University; Dr. Alison Niccols of Hamilton Health Sciences Corporation and McMaster University; Dr. Adrienne Perry of Thistletown Regional Centre & York University, Dr. Bill Mahoney of Hamilton Health Sciences Corporation and McMaster University; and, Gaye Chambers of Rygiel Homes.

The first step in this project is to identify children with developmental disabilities and their families who might wish to participate. Enclosed please find a consent form requesting your participation in this study. If you agree to participate, please complete an enclosed brief questionnaire and mail both the completed consent form and the questionnaire in the enclosed envelope.

If you have any questions about the project, please contact xxxxx, at (905) 525-5555.

Sincerely yours,

Ms. Sheila Smith
Supervisor

Appendix II

Early intervention for children with developmental disabilities

Early Intervention to Maintain Children With Developmental Disabilities With Their Families

I, _____, consent to participate with my child, _____,
(parent or guardian) (child's name)
in a study of the challenges of raising a child with developmental disabilities conducted by a team of researchers. I understand that I will be asked to complete the enclosed very brief questionnaires about my family and my child. Based on the results some families will be invited to participate in the next phase of the study. You may contact Dr. Joel Hundert, Director of Behaviour Therapy Consultation Service, Hamilton Health Sciences Corporation and Associate Professor of Psychiatry, McMaster University at (905) 521-2100 extension 7397 if you have questions or concerns.

I understand that there is no obligation to participate in this study and that I may withdrawal my child from the study at any time, even after signing this form and doing so, in no way will affect the typical care and services that my child and my family will receive.

_____	_____	_____
Name	Signature	Date
_____	_____	_____
Witness	Signature	Date

Appendix III

Early intervention for children with developmental disabilities

Early Intervention to Maintain Children With Developmental Disabilities With Their Families

I, _____, consent to participate with my child, _____,
(parent or guardian) (child's name)
in a study of the challenges of raising a child with developmental disabilities by a team of researchers. I understand that I will be asked to complete questionnaires about myself, my family, my child with developmental disabilities and the supports I receive. I also understand that I might receive a 75 minute interview by trained staff on my relationship with my child. This interview will be audiotaped for later scoring. The audiotape will be destroyed within one month after the content is scored. Altogether, the collection of information will take approximately 2 hours of my time. I also understand that the questionnaires and interview will be repeated each year for three additional years.

I understand that one half of families participating in this study will be invited to receive special supports and that my family may not be offered this assistance. Those families selected at random to receive special support will be asked to complete an additional consent form at that time.

I understand that there is no obligation to participate in this study and that I may withdrawal my child from the study at any time, even after signing this form and doing so, in no way will affect the typical care and services that my child and my family will receive. You may contact Dr. Joel Hundert, Director of Behaviour Therapy Consultation Service, Hamilton Health Sciences Corporation and Associate Professor of Psychiatry, McMaster University at (905) 521-2100 extension 7397 if you have questions or concerns.

_____	_____	_____
Name	Signature	Date
_____	_____	_____
Witness	Signature	Date

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