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**Depressed Mothers and Problem Behaviours in their Adolescent Daughters:
The Mediating Roles of Parenting and Attachment Security**

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Depressed Mothers and Problem Behaviours in their Adolescent Daughters:
The mediating roles of parenting and attachment security

Matthew A. Kerr

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Legend

BDI-II: Beck Depression Inventory – 2

DBDS: Disruptive Behavior Disorder Rating Scale

IPPA: Inventory of Parent and Peer Attachment

KSADS: Kiddie - Schedule of Affective Disorders and Schizophrenia

LEE: Level of Expressed Emotion

PDI: Parenting Dimensions Inventory

Abstract

Symptoms and episodes of depression in mothers consistently predict internalizing and externalizing symptoms in their children. Depression is also associated with attachment anxiety and avoidance, and poor parenting practices, which in turn also predict problem outcomes in youth. As girls enter puberty, rates of depression begin to increase dramatically relative to boys, which makes this developmental period well-suited to studying the mechanisms through which maternal depression may lead to depression and other unwanted symptoms in their adolescent daughters. One hundred and fifty-one mother-daughter pairs from two Canadian cities were interviewed with respect to their current and past mental health status. Mothers completed questionnaires with respect to their own depressive symptoms, romantic attachment, parenting practices, and their daughters' disruptive behaviours. Girls completed measures of their own symptoms of depression, their attachment to their mother, and aspects of their mothers' parenting. Daughter outcomes of depression and disruptive behavior were assessed again one year later. Mothers' parenting practices fully mediated the pathway between maternal depression and daughters' disruptive behavior. In combination with daughters' attachment to their mothers, parenting partially mediated the same relationship one year later. Parenting and attachment also significantly predicted daughters' depressive symptoms at Time 1. After controlling for the influence of mothers' parenting, daughters' attachment, and daughters' outcomes at Time 1, maternal depression at Time 1 continued to significantly and directly predict both daughter outcomes one year later. Combined, these results suggest that maternal depression may in part impact on daughters disruptive behavior through its influence on mothers' parenting, which in turn helps to shape daughters' attachment to their mothers. The fact that mothers' depressive

symptoms also uniquely predict Time 2 outcomes indicates that there may be complex elements of the depression construct, not assessed in the present study, that influence adolescent well-being in a more insidious manner.

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Depressed Mothers and Problem Behaviours in their Adolescent Daughters:

The mediating roles of parenting and attachment security

Depression exists within an interpersonal context such that symptoms associated with depression may have an impact on those closest to the depressed individual. This is evident in the mother-child relationship in which mothers' depression is a significant risk factor for behavioural and mental health problems in later childhood and adolescence. Poor parenting practices are thought to mediate the relationship between mothers' depression and negative outcomes in their children. Mother's attachment security has been consistently associated with depression and has been identified as a correlate of parenting practices as well. Adolescents' attachment to their mothers, by its definition is associated with the quality of that relationship, and is predictive of outcome behaviours. Given the associations between attachment security and every level in the pathway of maternal depression to adolescent problem outcome, integrating attachment into the pathway is prudent and may help to more fully explain the impact of mothers' psychopathology on negative outcomes in their adolescents.

Methodological Considerations

In summarizing and drawing conclusions from the wide range of research spanning the areas of depression, parenting, attachment, and adolescent outcomes, it is important to address the variability in the manner in which that research has been conducted. With respect to depression, understanding that the differences in which it is conceptualized and assessed and how to reconcile these is important. More broadly, a wide range of research and data analytic designs have been used to study the associations between these constructs. Some designs and analyses have advantages over others, so

outlining these advantages and weighting studies that employ them more fully than studies that do not seems prudent.

Clinical versus Analogue Depression. Depression constitutes roughly eleven percent of disability worldwide (Murray & Lopez, 1996). Marked by persistent feelings of sadness and/or anhedonia, major depressive episodes also include disruptions to sleep, body weight, appetite, cognitive functioning, energy levels, and/or feelings of self-worth and self-efficacy (American Psychiatric Association, 2000). These episodes contribute to significant impairment in vocational and/or social functioning. Major depressive disorder (MDD), also known as *clinical depression*, is estimated to affect one in five women in North America (Kessler, McGonagle, Shanyang, Nelson, Hughes et al., 1994).

By contrast, individuals may experience many of the symptoms of a depressive episode along with considerable subjective distress, but either lack the requisite number of symptoms or the impairment necessary for a diagnosis of MDD. Most often assessed using self-report measures, sub-syndromal depressive symptomatology, or analogue depression, shares many of the same correlates and developmental risk factors as clinical depression (Solomon, Haaga, & Arnow, 2001). It has been suggested that significant differences exist between clinical and analogue depression (Coyne, 1994). However, a review of the literature found little empirical evidence to support this claim (Solomon et al., 2001). This allows for a generalization of results between those with analogue and clinical depression. Although a distinction between these two types of depression may be made in descriptions of study designs, for the purpose of understanding the research base and building hypotheses, results from both will be pooled.

Study Design and Assessment Method. Researchers who have investigated the links among maternal depression, attachment, parenting, and adolescent outcomes have used a plethora of study designs, data sources, and data analytic tools. As such, a discussion about the differences in each of these domains is warranted. A primary difference between studies is whether data collection is cross-sectional or longitudinal in nature. Data collected at one time point only allow for statements about the strength of the relationship between two or more variables, but little about the directionality of that relationship. By contrast, longitudinal designs allow for the prediction of change over time, which also implies directionality in the relationship between two variables. Identifying these qualities between two variables not only demonstrates a more robust relationship between them than what could be assumed using cross-sectional data, but is also suggestive of a causal relationship. Identifying potential causal mechanisms guides future research and analyses with those variables. More importantly, learning of potential causal mechanisms between variables in clinically-relevant research may direct the development of new clinical interventions. For these reasons, in the present review, studies that employed longitudinal data will be weighted more heavily with respect to summarizing the research and in generating hypotheses than will those that used cross-sectional data.

Regardless of whether data were collected at one or multiple time points, the origin of that data is also a significant concern when examining methodological factors. When data are collected from only one informant, either the mother *or* the adolescent, questions may arise as to the external validity of the data being provided. Such a situation might arise if a mother is endorsing high number of depressive symptoms and is also

reporting on her adolescent's problem behaviour. In this example, elevations on a scale measuring problem behaviour may be due to real problems being experienced by that adolescent or they might be the product of a perception or judgment bias arising from the mother's level of psychological distress. When only one informant is used in data collection, it is not possible to distinguish between these two possibilities. As the numbers of informants increases, cross-informants are used, and/or observational data are collected, the validity of the data being collected also improves and the potential for confounded data decreases. In addition, Burt, Van Dulmen, Carlivati, Egeland, Sroufe, Forman and colleagues (2005) studied the relationship between maternal depression and negative child and adolescent outcomes and found that as the number of informants and time points from which data were collected increased, observed main and mediating effects decreased in strength. This suggests that with a greater number of informants and time points, significant associations between variables may be more difficult to find. This also suggests that the associations that are significant are more robust than those found in cross-sectional or single informant studies. For these reasons, studies that employ multiple informants and/or observational data will be weighted more heavily than those using only one informant for data collection.

Last, when researchers have used more than two variables in their study, the manner in which the data are analyzed becomes a methodological issue that warrants attention when weighting study conclusions. When more than two variables are associated with one another, the question may arise as to whether the relationship between any two variables is mediated, that is better account for, by a third variable. Barron and Kenny (1986) outlined the steps required to statistically demonstrate a

mediation relationship. These are: a) that variability in the independent variable is significantly associated with variability in the presumed mediator variable; b) that variability in the mediator variable is significantly associated with variability in the dependent variable; and c) that when the two above pathways are controlled, that a previously significant relationship between the independent and dependent variables is no longer significant. Mediation is most often demonstrated using a series of hierarchical multiple regressions, path analysis, or structural equation modeling. Due to the fact that mediation points towards potential causal relationships, those studies that have used formal mediation tests in their statistical analyses will be weighted more heavily than those that did not when forming research conclusions and hypotheses.

Maternal Depression and Child Outcomes

A well documented association exists between depression in mothers and negative outcomes in their offspring. Connell and Goodman (2002) conducted a meta-analysis of the research on the impact of parents' psychopathology on their children's outcome and found that maternal depression was associated with children's externalizing and especially internalizing problems. Externalizing symptoms include behaviours such as restlessness, inattentiveness, aggressiveness, and other disruptive behaviours. Internalizing symptoms refer to feelings of anxiety, depression, withdrawal, and somatic complaints. The effect sizes for the associations between maternal depression and externalizing and internalizing symptoms were .14 and .16 respectively. By contrast, small, medium, and large effect sizes are defined as .20, .50, and .80 respectively (Cohen, 1988). Although effect sizes are small and may vary by assessment strategy (Whiffen, 2005), this association is robust. In recent years, mothers' depression continues to be

consistently associated with anxiety (Halligan, Murray, Martins, & Cooper, 2007), depression (Halligan et al., 2007; Hammen & Brennan, 2003, Hammen, Shih, & Brennan, 2004), physical symptoms (Lewinsohn, Olino, & Klein, 2005), internalizing (Leve, Kim, & Pears, 2004; Whiffen, Kerr, & Kallos-Lilly, 2005), and externalizing problems (Brennan, Hammen, Katz, & LeBrocq, 2002; Whiffen et al., 2005) in their children and adolescents. Gunlicks and Weissman (2008) reviewed the research on the impact of treating depression in parents with outcomes in children. They found that decreases in parental depressive symptomatology were consistently associated with decreases in negative outcomes in their children. Although this does not demonstrate a direct causal relationship between these two constructs it strongly supports their connection. However, a theory and strong evidence are still required to suggest a causal mechanism between maternal depression and negative outcomes in their offspring.

Depression is a multi-faceted construct that exists within an intra- and interpersonal context. As such the effects of maternal depression on the emergence of problem behaviours or difficult emotional experiences in children may result in large part from the stressors, attitudes, and relational styles associated with depression. In addition, the fact that effect sizes linking maternal depression and youth problem outcomes are relatively small suggests that there is room for the inclusion of additional constructs in the explanation of these associations. In a review of the literature, Whiffen (2005) commented on evidence which suggested that contextual adversity and impaired parenting behaviours may mediate the relationship between maternal depression and negative outcomes in youth. She noted that research had demonstrated that maternal depression was associated with a lower socioeconomic status, increased marital conflict,

and higher family stress, all of which went on to predict increases in both internalizing and externalizing problem behaviour in children. She observed that research had also demonstrated that depressed mothers tended to show higher levels of negative affect, such as hostility, lower levels of positive affect, and were more disengaged in their interactions with others. These associations may be related to the observation of parenting styles in mothers with depression. Dysphoric mothers tended to feel less competent and have lower self-efficacy in their parenting, and to demonstrate poorer quality interactions with their children. Those endorsing more depressive symptomatology were also more likely to express more anger and use more harsh discipline. Each of these relationship qualities was associated with increases in internalizing and/or externalizing behaviours in children. Parenting behaviour may be a causal mechanism that explains the relationship between maternal depression and problem outcomes in youth.

Good Parenting and Child Outcomes. In order to understand the impact of maternal depression on parenting behaviour and subsequently child outcomes, it is germane to review the impact of good parenting practices on child/adolescent development. An outcome often cited with respect to good parenting practices is resiliency, defined as the absence of significant emotional, psychological, or behavioural difficulties. Two recent literature reviews (DeVore & Ginsburg, 2005; Smetana, Campione-Barr, & Metzger, 2006) have outlined the parenting practices that seem the most related to resiliency in adolescence. Their findings are summarized below.

Authoritative parenting, a style characterized by warmth, setting reasonable expectations and limits, and being responsive to the child's needs, has been consistently identified as the optimum approach to rearing youth. Appropriate behavioural

monitoring, especially for adolescents, is important for knowing what one's child is doing and so provides opportunities to intervene if necessary. Monitoring must also be balanced with a respect for the autonomy and emerging agency of the adolescent. Parents who are able to maintain good communication with their adolescents are also likely to have resilient youth. This is best maintained in the context of a strong sense of connectedness between the parent and child. Good communication and connectedness do not preclude the possibility of conflict between parent and child. A moderate amount of conflict has actually been found to be a predictor of better adjustment than either high levels of conflict or none at all. Perhaps this is because in order to successfully navigate a moderate amount of conflict, parents must embody many of the characteristics outlined above. If they are unable to maintain these qualities then parents are likely to either withdraw, which would avoid conflict, or to escalate the conflict. Ideally, parents who are engaged, responsive, respectful, appropriate in their monitoring and limit-setting, able to communicate with their child, and to maintain a sense of connectedness, produce adolescents who are resilient.

Poor Parenting and Child Outcomes. Not surprisingly, poor parenting is associated with negative outcomes in older children and adolescents. Milevsky, Schlechter, Netter and Keehn (2007) asked adolescents to report on their non-depressed mothers' parenting style, as well as their own self-esteem, life satisfaction, and symptoms of depression. Three broad parenting styles in mothers were found to relate to distinct differences in the outcomes of their adolescent children. Mothers who used an authoritative parenting style, that is one characterized by warmth, non-punitive discipline, and consistency, were more likely to have children with higher self-esteem, greater life

satisfaction, and lower levels of depression than were those who used either an authoritarian (low warmth, harsh discipline, inconsistency) or permissive (little supervision) style. This finding suggests that as parenting behaviour deviates from the ideal that adolescents may be at increased risk for negative outcomes.

Adolescents' problem behaviour is consistently associated with ratings of their parents' poor parenting. When parents are seen as using harsh punishment or as indifferent, their adolescent and pre-adolescent children endorsed a greater number of externalizing symptoms (Bosmans, Braet, Van Leeuwen, & Beyers, 2006). Pre-adolescent girls were also more likely to endorse internalizing and externalizing symptoms when they rated their parents' behaviour as more rejecting, over-protective, and/or more anxious (Roelofs, Meesters, ter Huurne, Bamelis, & Muris, 2006). The association between adolescent-reported parenting practices and negative child outcomes was found to persist over a one year period. Reitz, Dekovic, and Meijer (2006) found that parents' strictness and their granting of decisional autonomy were associated longitudinally with higher levels of internalizing and externalizing symptoms respectively. Levels of self-reported internalizing and externalizing symptoms were also associated with levels of parental warmth and psychological control as reported by adolescents two years previously (Doyle & Markiewicz, 2005). Although the above findings appear robust, they rely on adolescent self-report only, which is problematic because it is difficult to establish the external validity for these ratings.

Parenting, Maternal Depression, and Negative Child Outcomes. Ample evidence exists to suggest that parenting behaviour plays a significant role in the association between maternal depression and adolescent problem outcomes. Constance Hammen and

colleagues followed a cohort of children and their mothers from birth through to adolescence. When the children turned 15 years old, information was collected with respect to their current symptoms and behaviour, parenting practices, and mothers' past and current experiences with depression. The results of this study were summarized in several publications. For instance, Brennan, LaBrocque, and Hammen (2003) asked adolescents to report on their internalizing and externalizing symptoms and their mothers' parenting behavior and asked their mothers to report on their own current and past experiences with depression. Maternal control, warmth, and emotional over-involvement, as observed by the researchers, interacted with maternal depression status to predict resiliency in youth. When mothers who met criteria for a depressive episode in the past or present were less controlling, displayed more warmth, and were less emotionally over-involved, they had adolescent children who were less likely to display problem outcomes than were the children of those depressed mothers who did not display these qualities. This suggests that the parenting qualities of control and emotional over-involvement are likely associated with negative outcomes in the adolescent children of depressed mothers.

Findings reported by Hammen, Shih and Brennan (2004) support this theory. In this study, the assessment of parenting quality was based on adolescent-report and was comprised of the qualities of warmth, hostility, acceptance, and control. Youth depression was assessed through both adolescent- and mother- report. Using structured equation modeling (SEM), mothers' parenting quality was found to fully mediate the pathway between mothers' current depressive symptomatology and current depression in youth. Also using SEM, maternal criticism that was observed by the research team partially mediated the pathway between maternal depression, a latent variable comprised of past

and present symptoms and diagnoses of depression, and child externalizing symptoms that were reported by both mothers and youth (Nelson, Hammen, Brennan, & Ullman, 2003). Thus, cross-sectional evidence exists from this Australian sample that parenting qualities, especially criticism and psychological control, mediate the association between mothers' depression and negative outcomes in their adolescent children.

Research conducted with other samples has also supported these pathways. In a sample of non-depressed mothers, Robila and Krishnakumar (2006) found that symptoms of depression predicted their pre-adolescents' internalizing and externalizing symptoms. Using SEM, it was observed that these effects were both partially (internalizing) and fully (externalizing) mediated by youth's reports of mothers' use of psychological control in their parenting. Mothers' reported acceptance of their child and the granting of psychological autonomy were found to fully mediate the link between maternal psychological distress (depression, anxiety, hostility) and adjustment problems in pre-adolescent youth (Papp, Cummings, Goeke-Morey, 2005). More generally, mothers' observed positive parenting (smiling, laughing, praising, constructive guidance) during a problem-solving task with their pre-adolescent children partially mediated the relationships between both current and past depression and youth externalizing symptoms (Foster, Garber, & Durlak, 2008). Maternal positivity was inversely related to both maternal depression and child externalizing behaviour, thus potentially serving as protective factor in this pathway. By contrast, lack of maternal positivity may serve as a risk factor for youth of depressed mothers. Overall, mothers' parenting behaviour appears to provide an explanatory mechanism for the maternal depression to youth outcome pathway.

In general, longitudinal research has only produced limited support for the robust findings from cross-sectional research with respect to maternal depression, parenting, and youth outcome. Chang, Lansford, Schwartz, and Farver (2004) found that parents' use of harsh parenting, comprised of both verbal and physical aggression, mediated the association between mothers' depression and pre-adolescents' peer and teacher-reported externalizing symptoms over a six-month period. Some evidence was found that maternal depression and broad parenting indices in middle childhood were associated with youth depression in adolescence (Burt et al., 2005). In this case, there was some evidence that the parenting indices mediated the relationship between the earlier maternal depression and the current adolescent depression. Two difficulties with this study that likely interfered with producing strong mediating results were the time between assessments (eight years) and the broadness of the parenting indices. In contrast, Frye and Garber (2005) failed to replicate findings from cross-sectional research results. They found that over a two year period, observed maternal criticism failed to mediate the relationship between maternal depression and either internalizing or externalizing symptoms in their pre-adolescent and adolescent children despite criticism being directly associated with these symptoms. One possibility for this null finding was again the timeframe between assessments (two years) and the failure to include other explanatory variables. In general there is a lack of longitudinal research in this area. More studies are needed to test hypotheses using a longitudinal design. In addition, it may be necessary to identify an additional construct(s) to help account for the variability seen in both parenting and adolescent outcome longitudinal data. Despite its associations with both depression and

parenting, one construct that has received little attention in the attempt to understand the maternal depression to adolescent outcome pathway is that of attachment.

Attachment Theory

Attachment theory seeks to explain emotionally-based behaviour in close relationships. What follows is a brief overview of attachment theory and its use in conceptualizing mothers' relational patterns. Data linking attachment orientations and depression in adulthood are robust and suggest that attachment may make a valuable contribution in the understanding of interpersonal behaviour, including parenting. In the following sections, links between mothers' romantic attachment and their parenting behaviour will also be highlighted. The role that attachment to mothers plays for adolescents will be discussed, as will attachment's implication for negative symptom outcomes and its ability to mediate the parenting to negative outcomes pathway.

Attachment theory (Bowlby, 1969; 1973; 1980) was originally proposed as a biological-behavioural model to explain the development and maintenance of affectional bonds between infants and their mothers. It describes the ways in which infants approach and attempt to elicit caregiving from their mothers in times of stress or distress. Bowlby explained that infants use their mothers as both a safe haven in times of perceived danger or threat, and would use them as a secure base from which to explore a new environment. Infants develop very different ways of responding to separation from their caregiver and very different strategies for eliciting support from them when they returned. This is also in response to the general availability and responsiveness of their primary caregiver (Ainsworth, Blehar, Waters, & Wall, 1978). These strategies tend to be consistent and are considered adaptive to optimize the support garnered from the relationship with the

caregiver. When a primary caregiver, usually the mother, provides consistent, appropriate, and reliable support to their infant, their child will likely develop a *secure* attachment style. This style has been found to correspond to a generally positive view of the self as well as positive expectations of the responsiveness and availability of others. If the caregiver responds inconsistently or is consistently inappropriate to their infant's bids for connection, their child is likely to develop an *insecure* attachment style. Insecure styles tend to be associated with a negative view of the self and/or negative expectations of others. Since its initial development, attachment theory has moved beyond explaining mother-infant dyads and has been used to conceptualize the development and maintenance of pair relationships across the lifespan including adolescence (for a review see Allen & Land, 1999) and adulthood (Hazan & Shaver, 1987).

Attachment in Adulthood. Although attachment theory (Bowlby, 1969; 1973; 1980) was initially used to explain affectional bonds between infants and their caregivers, Hazan and Shaver (1987) used this theory to conceptualize adult romantic love. They suggested that, like infants and their mothers, in times of stress adults seek out their partner as a secure base or safe haven. Adults develop characteristic ways of relating to romantic partners that are thought to be largely the result of early experiences with caregivers and/or earlier romantic partners. Initially conceptualized in terms of distinct styles, adult attachment behaviours have been better understood as arising from two underlying dimensions, *Anxiety* and *Avoidance* (Brennan, Clark, & Shaver, 1998). The *anxiety* dimension reflects the extent to which one believes the self is unlovable and fears abandonment by one's romantic partner. *Avoidance* measures the extent to which one prefers to maintain emotional autonomy as opposed to closeness. Conceptualizing adult

romantic attachment in terms of underlying continuous dimensions is deemed superior to the categorical typology (Fraley & Waller, 1998). Those low in both attachment anxiety *and* avoidance would correspond to the secure attachment style identified above.

Individuals high in *either* attachment anxiety *or* avoidance would be considered to have an insecure attachment style.

Attachment and Depression. In both men and women, negative affectivity was associated with attachment anxiety and avoidance respectively (Davila, Bradbury, & Fincham, 1998). Both dimensions have also been associated with the experience of less frequent and intense positive emotion and more frequent and intense negative emotion (Feeney, 1999). Attachment anxiety in both sexes, but especially in women is related to reports of greater psychological distress (Simpson, Rholes, & Phillips, 1996).

Attachment insecurity is strongly linked to both symptoms and diagnoses of depression in adults. Research with attachment dimensions has found both anxiety and avoidance to be positively associated with levels of negative affect (Davila, et al., 1998; Feeney, 1999) and symptoms of depression (Roberts, Gotlib, & Kassel, 1996; Simpson, Rholes, Campbell, Tran, & Wilson, 2003). Endorsement of an attachment strategy high in anxiety or one high in anxiety and avoidance is positively associated with depressive symptomatology (Murphy & Bates, 1997; Pearson, Cohn, Cowan, & Cowan, 1994), especially in women (Reis & Grenyer, 2002; 2004). Attachment also predicts increases in symptoms of depression over one year (Bifulco, Moran, Ball, & Bernazzani, 2002).

The endorsement of an attachment strategy high in anxiety and avoidance has been particularly associated with a diagnosis of depression (Whiffen, Kallos-Lily, & MacDonald, 2001). Cyranowski, Bookwala, Feske, Houck, Pilkonis, Kostelnik, and

colleagues (2002) found that in a sample of clinically depressed women presenting for individual interpersonal therapy, 43 percent endorsed such a strategy. Similar levels of endorsement have also been observed in other depressed samples (Murphy & Bates, 1997), and these levels differ markedly from non-depressed controls (Whiffen et al., 2001). Women recovering from depression also endorse this strategy to a greater degree than do never depressed women (Carnelley, Pietromonaco, & Jaffe, 1994), as do those with a lifetime diagnosis of depression (Cozzarelli, Karafa, Collins, & Tagler, 2003; Haaga, Yarmus, Hubbard, Brody, Solomon, Kirk et al., 2002). Together, the research suggests that attachment is highly associated with the experience of depression, and is a construct that remains stable independent of current symptom levels of depression. It also suggests that women reporting elevated levels of depressive symptomatology and/or diagnosed with a depressive episode are more likely to be insecurely attached than are those who endorse psychological well-being. Attachment insecurity, like depression, is associated with particular interpersonal styles and parenting practices.

Attachment and Parenting. Interpersonally, different romantic attachment strategies are characterized by particular patterns of behaviour. Securely attached individuals tend to be emotionally expressive of positive emotions (Simpson, 1990), warm, capable of intimacy, and self-confident (Bartholomew & Horowitz, 1991). Those high in attachment anxiety tend to experience more distress than individuals who use other attachment strategies (Collins, 1996) and are more likely to vent their negative emotions (Simpson, 1990). High levels of avoidance have been associated with a desire to be more self-reliant and less likely to want to be close to others (Brennan & Shaver, 1995). This means that attachment security has implications for both the individual

psychological well-being of mothers and their interactions with their own attachment figures, but also the way in which they interact with and parent their young.

Given the concordance between depression and attachment insecurity, and that negative parenting behaviours are associated with the former; the potential exists for the latter to also be associated with poor parenting practices. This seems more plausible when the interpersonal deficits associated with attachment insecurity are considered (see above). However, the bulk of research to date that has examined the association between mothers' attachment security and parenting behaviours has only done so using infants and young children. Although specific parenting practices are likely to vary with the age of the child, because adult attachment orientations are relatively stable, the style of interaction associated with attachment security highlighted in the research with young children may reflect relatively stable parenting behaviour that persists in interactions with adolescent children.

Mikulincer and Shaver (2007) reviewed the literature in this area and made observations about several common themes. With respect to mothers' romantic attachment style, they noted that insecurely attached parents are more likely to have negative experiences of their children, feel less competent in their parenting, and have more negative expectations and evaluations of their children's behaviour than were those who were securely attached. Mothers' attachment insecurity is associated with high levels of intrusiveness and felt distress when parenting infants. Across several studies, when mothers were observed assisting their children with problem-solving activities, securely attached mothers were seen to be warmer, more helpful and supportive than were those who were insecurely attached. Mothers high in attachment avoidance tended to be 'cool'

and controlling and those high in attachment anxiety gave confusing instructions and continued to be distressed and intrusive in their interaction style. The parenting issues associated with mothers' attachment orientations appear to remain relatively stable into adolescence. Insecurely attached mothers were more likely to negatively evaluate their adolescent daughters' ability to cope and had greater difficulty remaining calm when discussing their daughters' autonomy than did mother who were securely attached (Kobak, Ferenz-Gillies, Everhart, & Seabrook, 1994). Thus, research to date has established a pattern of parenting deficits in those endorsing an insecure attachment orientation, which appears to begin in infancy and persist into adolescence.

Attachment in Adolescence. Adolescence is a period of life during which attachment relationships begin to develop with peers and romantic partners. As these new attachments develop, they are shaped by the beliefs about self and others that emerged as a result of the parent-child attachment relationship (e.g. Kahen, Katz, & Gottman, 1994). The adolescent also uses her or his attachment to parents in the present sense as a "secure base" from which to develop greater autonomy, and from which to forge new meaningful relationships (Collins, 1990). From an attachment perspective, forming attachment relationships outside of the family is a significant event in this developmental period. Despite the beginning of a gradual shift in primary attachment relationships from parents to peers, adolescents are still likely to turn to their parents at times of extreme stress (Steinberg, 1990) and may rely on relationships with parents as they establish new attachments with peers and/or a romantic partner. The relationship with parents remains the primary attachment relationship during adolescence. There is also evidence that this may remain so into early adulthood (Fraley & Davis, 1997). A review of the literature

points toward considerable stability in attachment orientations from infancy through adolescence (Allen & Land, 1999). However, the robustness of the attachment behaviours from early childhood through to adolescence is hypothesized to also be a reflection of the stability in the parenting received throughout these periods rather than stability in the adolescent's own internal attachment models (Thompson, 1999).

Parenting, Attachment, and Negative Outcomes. As with previous research, and in line with predictions arising from attachment theory, more recent investigations have pointed towards a link between parenting behaviour and attachment in adolescence. The ability of the mother to provide a 'secure base' for her child via her parenting has been associated with adolescent attachment (Allen, McElhaney, Land, Kuperminc, Moore, O'Bierne-Kelly et al., 2003). Adolescents who reported their mothers as more supportive and more attuned to their life endorsed a higher attachment security to their mothers than did youth who did not. Karavasilis, Doyle and Markiewicz (2003) asked pre-adolescents and adolescents to report on their mothers' parenting style as well as their own attachment orientation to their mothers. Adolescents who reported that their mother used an authoritative parenting style, that is one high in warm involvement, psychological autonomy granting, and behavioural monitoring and control, also tended to endorse a secure attachment strategy. Insecure adolescent attachment, particularly that high in avoidance, tended to be associated with negligent parenting. These studies support theoretical predictions that adolescent attachment is associated with, and arises from, interactions with parents.

In order to incorporate adolescent attachment into a parenting to adolescent outcome pathway, attachment must also be associated with the negative outcomes

themselves. Roelofs and colleagues (2006) observed that adolescents' endorsement of an insecure attachment orientation towards their parents was associated with higher levels of anxiety and aggression, and other internalizing and externalizing symptoms, than was an endorsement of attachment security. Similarly, increased self-reported delinquent behaviour was predicted by higher endorsement of an insecure, anxious, attachment strategy (McElhaney, Immele, Smith, & Allen, 2006). Youth who reported a secure attachment to their mother were less likely to identify themselves as depressed than were those who reported qualities of an insecure attachment (Essau, 2004). These findings correspond to the relationship between attachment and depression observed in adulthood. Together, these studies suggest that when assessed together, there is a significant relationship between youth's attachment to their mothers and their experience of problem symptoms and behaviours.

When adolescents were asked to report on their attachment security to their parents, as well as their symptoms and behaviours at one year intervals, attachment security was found to predict both internalizing and externalizing symptoms longitudinally (Buist, Dekovic, & van Aken, 2004). Allen, Porter, McFarlane, McElhaney, and Marsh (2007) found that adolescents' self-reported attachment to their father was predictive of both parent-reported externalizing behaviour as well as depressive symptoms longitudinally. This study did not examine the mother-child relationship.

Only two studies examined both the parenting to adolescent attachment and the attachment to negative outcomes relationships within the same sample. Bosmans and colleagues (2006) asked youth in pre-, early to mid-, and late-adolescence to report on

their mothers' parenting behaviour, their own attachment to their mother, and their own externalizing behaviours. When mothers used harsh punishment and were minimally responsive in their parenting, their children across the age groups were more likely to endorse a less secure attachment than when mothers did not use these strategies. For the first two age groups, lower attachment security predicted higher externalizing symptoms. In the pre-adolescent group, attachment partially mediated the association between parenting and externalizing symptoms, whereas in the early to mid-adolescent group the relationship was fully mediated. Thus, cross-sectionally, there appears to be some support for the inclusion of attachment security to the parenting to youth outcome relationship.

The second study used a longitudinal research design. Doyle and Markiewicz (2005) asked adolescents about their own attachment to their parents, symptom levels, and their parents' parenting behaviour when they were 13 years old and then again two years later. Attachment was associated cross-sectionally with parenting as well as internalizing and externalizing symptoms. Over the two-year period, attachment security mediated the association between parenting and externalizing problems only. More specifically, although other parenting behaviour was associated with both adolescent attachment and problematic outcomes, it was parental warmth that predicted better attachment security and in turn fewer externalizing problems. This finding coincides with existing research that has linked parental warmth to youth outcomes (Brennan et al., 2003; Hammen et al., 2004). Doyle and Markiewicz (2005) assessed for parents' use of behavioural and psychological control as well, although the associations with youth outcomes were not mediated by attachment. One possibility for this null finding is the time frame over which the study was conducted. It may be that two years is too long a

period in which to detect the impact of control strategies. This may be in part because although these strategies may shape the parent-youth relationship over time, they also likely result in more immediate restrictions on adolescent behaviour, which would have shorter term effects. By contrast, parental warmth may be more uniquely associated with the longer term parent-child relationship. Assessing the relationships between these variables over a shorter time-frame may be necessary to rule out the possibility of attachment being able to mediate the impact of control-based parenting on youth outcomes.

Depression, Adult Attachment, and Parenting: Predicting Adolescent Outcomes

The body of research linking maternal depression with negative outcomes in their adolescent children is well established. Logically, these outcomes are the result of the negative impact of the mother's *behaviour* on her children, and not her internal emotional experience. Behaviour associated with a depressive episode may include increases in expressed negative thinking and affect, decreases in activity, and a withdrawal from meaningful relationships (APA, 2000). For mothers, these behaviours are likely to be enacted with their children. In addition, increases in severity and number of current depressive symptoms have been associated with increases in poor parenting behaviour. Together, these behaviours are in turn associated with negative child and adolescent outcomes. Research to date supports the mediating role of parenting behaviour in the association between maternal depression and adolescents' internalizing and externalizing problems.

Based on an understanding of attachment theory, parenting behaviours experienced by youth also shape the way in which they develop beliefs about themselves

and others. These beliefs then direct their understanding of and approach to establishing and maintaining interpersonal relationships, especially with their parents. An adolescent's attachment orientation is also associated with the severity of experienced internalizing and externalizing problems. Thus, the attachment system may be able at least in part to explain the pathway from parenting behaviour to problem behaviour outcomes in adolescence. There is some evidence to support this argument (Bosmans et al., 2006; Doyle & Markiewicz, 2005). Negative beliefs about the self and/or others, arising from suboptimal interactions with caregivers, are likely to predispose an adolescent to interacting with peers and their environment in a potentially unhealthy manner, which may result in internalized or externalized problem behaviour. Although adolescents' attachment has been found to mediate the relationship between parenting and negative outcomes, this has not yet been done in the context of a family with a depressed mother.

Attachment orientations are relatively stable constructs; however, Thompson (1999) suggested that from childhood to adolescence, this stability likely arises from continuity in parenting practices. Parenting behaviours that have been associated with attachment in adolescence (e.g. low warmth, over-involvement, and criticism) have also been linked with mothers' depression. Given that depression is often a cyclical disorder marked by often long periods of remission between acute episodes of illness, and given that the stability in adolescent attachment likely arises from stable parenting practices, then logically some of the parenting behaviour associated with depression is likely to be maintained even when the illness is in remission. In support of this argument is evidence which suggests that past episodes of depression in mothers are associated with current parenting practices (Dietz, Birmaher, Williamson, Silk, Dahl, Axelson et al., 2008) and

with current negative outcomes in adolescence (Bohon, Garber, & Horowitz, 2007; Brennan et al., 2002; Hammen & Brennan, 2003; Lewinsohn et al, 2005). One possible explanation for the association between past depressive psychopathology and present parenting practices, which in turn are predictive of current problem behaviours in adolescence, is a third, unobserved construct that is associated with both depression and parenting.

As a construct, adult attachment strategies are associated with and conceptually account for diagnoses and symptoms of depression (Simpson & Rholes, 2004) as well as specific parenting behaviours (for a review see Mikulincer & Shaver, 2007), which are also commonly associated with depression. However, little research has examined the role of the mother's attachment security in the research linking maternal depression, parenting and negative child outcomes. In one sample of clinically depressed mothers, levels of maternal attachment avoidance predicted increases in internalizing symptoms in older children over a six-month period (Whiffen et al., 2005). However, parenting behaviour was not assessed in this study. Bifulco, Moran, Jacobs, and Bunn (2009) examined the effect of mothers' attachment style on adolescents' symptoms of anxiety and depression 12 months later. They found a significant predictive relationship between mothers' insecure attachment and their offspring's internalizing outcomes via mothers' self-estimated incompetence in parenting and mothers' neglect/abuse of their children. Further research is needed to better understand the role that mothers' attachment orientation plays in the pathway linking maternal depression to internalizing and externalizing problems via parenting practices.

The Present Study

At present, research has demonstrated links between maternal depression and negative adolescent outcomes via parenting practices. Parenting practices have also been found to predict negative outcomes in adolescents via their attachment to their mother. Adult attachment has also been consistently associated with mothers' depression and parenting, with some preliminary evidence that it may also be associated with problem behaviours. To date, the role that maternal adult attachment orientation may play with respect to parenting and the role that adolescent attachment security may play with respect to problem behaviour outcomes have not been studied in the context of a depressed mother. The present study seeks to empirically evaluate the potential for associations between these variables in one longitudinal model.

Within the context of a larger study, data were collected from girls and their mothers annually for three years. From mothers, information was gathered with respect to past and current episodes of clinically significant depression and other psychopathology, number of depressive symptoms, parenting behaviours, adult romantic attachment, and their daughters' externalizing problems. Girls reported on their attachment to their mother, their mothers' criticism of them, and their own levels of depression and clinically-relevant psychopathology.

The present study sought to make unique contributions to the research in this area by employing the following methodological approaches:

- Longitudinal data were collected over a one year period
- Cross-informants were used with respect to mothers' parenting and daughters' outcomes

- Both mothers' and daughters' psychopathology was assessed via structured clinical interviews
- Both parenting and adolescent attachment variables were included in the analysis of the maternal depression-daughter outcome pathway to better understand this complex association

Hypotheses.

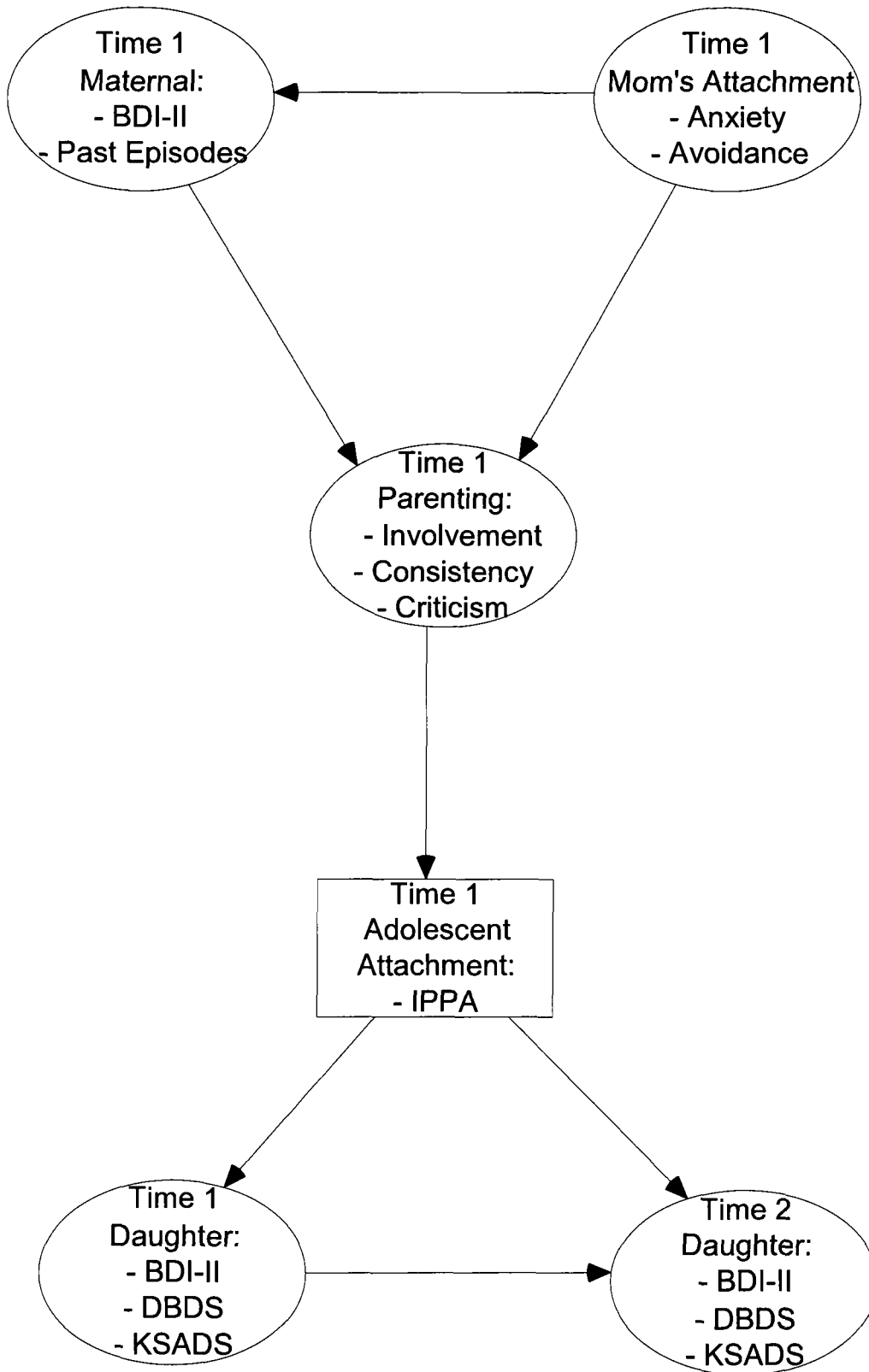
- 1) Mothers' attachment anxiety and avoidance were expected to be significantly associated with maternal depression and to significantly predict a unique amount of variance in parenting behaviour.
- 2) Parenting behaviours at Time 1 were expected to significantly predict internalizing and externalizing outcomes one year later. These predictions will be partially mediated by adolescents' attachment security.
- 3) Direct associations between mothers' depression and attachment security and adolescents' internalizing and externalizing problems were expected to be non-significant once parenting behaviours and adolescent attachment are included as predictors.

A model of the fully-mediated pathways hypothesized above is presented in Figure 1. The latent variable of mother's depression in this figure is comprised of current depressive symptomatology, number of lifetime depressive episodes, and the presence of a current depressive episode. Mother's romantic attachment was conceptualized here as a latent variable that includes both attachment anxiety and avoidance. Parenting behaviour here was comprised of subscales from three parenting measures. Adolescent attachment in this figure is comprised of the items from an adolescent self-report measure. The latent

variable problem behaviour reflects either mother-reported externalizing symptoms or adolescent-reported psychopathology.

Figure Caption

Figure 1. Hypothesized fully mediated model between mothers' depression and daughters' outcome.



Method

Participants and Procedure

The data for the current study were drawn from a larger pool of data that were collected in two sites located in Halifax and Ottawa. Daughter-mother pairs were recruited via mailings that were sent to local schools as well as via advertisements in community newspapers.

Both mothers and daughters were screened for psychopathology using structured diagnostic interviews at an intake appointment. The goal was to recruit a sample of women who either met criteria for a past or present episode of depression (high risk) or who did not meet criteria for any past or present psychopathology (low risk). Mothers in the high risk group were excluded from the study if they had ever experienced a psychotic-spectrum disorder. However, those with other co-morbid disorders were not excluded. Their daughters were eligible for the study if they were between the ages of 10 and 14 at Time 1 and had no history of or current psychopathology meeting diagnostic criteria.

If mother/daughter pairs met inclusion criteria, they were asked to return to the laboratory to complete measures of current symptoms, behaviours, and psychopathology. Participants then returned to complete the same measures and interviews one year later. Measures and data reported on in this report were gathered within the context of a broader study assessing proximal and distal risk factors in the development of depression for adolescent girls. The sample size for the present study is 248 daughter-mother pairs.

Clinical interviews were conducted by research assistants who were graduate students in clinical psychology. Along with general training in clinical interviewing

received in their graduate programs, interviewers also received directed instruction from a clinical psychologist in the use of the structured clinical interviews used in this study. All interviews were audio recorded and reviewed by a clinical psychologist to ensure adherence to the interview protocols. Regular meetings were held in which both research assistants and a clinical psychologist met to review the scoring of the structured interviews.

Measures

Psychopathology

Structured Clinical Interview for Axis I DSM-IV Disorders (SCID-IV; First, Spitzer, Gibbon, & Williams, 1994). The SCID-IV is a diagnostic interview used to systematically assess for the presence of past and current psychopathology. Interviews were conducted with mothers by trained clinical psychology doctoral students and were audio-taped with the participants' consent. Interviews in which diagnostic criteria had been met were discussed at consensus meetings with other interviewers and a supervising clinical psychologist. The same supervisor listened to random interview audio recordings from each interview to ensure adherence to the SCID-IV interview protocols.

Kiddie-SADS (K-SADS-PL; Kaufman, Birmaher, Brent, Rao, & Ryan, 1996).

Girls were administered this diagnostic interview by trained clinical psychology doctoral students to systematically assess for the presence of diagnosable psychopathology. As with the SCID, interviews were audio-recorded and randomly sampled by a supervising clinical psychologist to ensure interview protocol adherence. Consensus meetings were held with interviewers and the supervisor to discuss interviews in which diagnostic criteria had been met.

Depression. Symptoms of depression were assessed using the Beck Depression Inventory – II (BDI-II; Beck, Steer, & Brown, 1996). This measure asks participants to rate their agreement with each of 21 items, which corresponds to a depressive symptom, on a four-point scale (0-3). Total scale scores range from 0 to 63. The BDI-II demonstrates good internal consistency ($\alpha = .91$), adequate validity, and diagnostic discrimination (Beck et al., 1996; Dozois, Dobson, & Ahnberg, 1998). This measure was completed by both mothers and daughters.

Disruptive Behavior Disorder Rating Scale (DBDS; Pelham, Gnagy, Greenslade, & Milich, 1992). Mothers completed this measure with respect to their daughter's externalizing symptoms because mother's reports may more accurately represent externalizing symptoms in their children than the youth's self-reports (Achenbach, McConaughy, & Howell, 1987). This scale consists of 45, five-point Likert-type items and it demonstrates good internal consistency and validity (Pelham et al., 1992). Higher values reflect a greater level of problem behaviour.

Mother-Daughter Relationship

Attachment – daughters. The Inventory of Parent and Peer Attachment-Revised (IPPA-R; Gullone & Robinson, 2005) was used to assess girls' attachment to their mothers. It is comprised of 77 five-point items and is a self-report measure that assesses how well peers and parents serve as a source of emotional security. It contains simplified language for younger participants and demonstrates acceptable validity and reliability (Gullone & Robinson, 2005). The 25 items pertaining to the relationship with the mother were used in the present study. Higher scores reflect a more secure attachment between the adolescent and her mother.

Attachment – mothers. Romantic attachment was assessed via the Experiences in Close Relationships Scale (ECR; Brennan et al., 1998). Mothers completed this 36-item self-report measure, which assessed their degree of attachment anxiety and attachment avoidance. Items are rated on a seven-point scale (1-7). A subscale value for both Anxiety and Avoidance is produced, with high values representing a stronger endorsement of that attachment approach to close relationships. The measure demonstrates good construct and external validity and reliability (Brennan et al., 1998).

Conflict Tactics Scale (CTS; Strauss, 1979). The CTS assesses perceived verbal and physical aggression in a relationship. Daughters completed this 21-item measure with respect to their mothers. Items were rated on a seven-point Likert-type rating scale. The measure demonstrates good validity and internal consistency (Strauss, 1979).

Level of Expressed Emotion (LEE, Cole & Kazarian, 1988). Girls completed the Tolerance/Expectations subscale of the LEE with respect to their mothers. This subscale consists of 15 true-false items and assesses perceived criticism, especially when things go wrong, with higher values reflecting greater perceived criticism. This measure has demonstrated good internal consistency (Cole & Kazarian, 1988), test-re-test reliability, and validity (Kazarian, Cole, Malla, & Baker, 1990).

Parenting Dimensions Inventory (PDI; Power, 1989; Slater & Power, 1987). Twenty-seven items from the 51-item self-report measure were administered to mothers to assess their perception of their parenting style. The items used correspond to subscales that assess the parenting dimensions of Involvement, Consistency, and Rigidity. Higher values on these subscales reflect greater involvement, less consistency, and more rigidity

respectively. Items are descriptive statements that are rated on a six-point scale. No psychometric data are available on this measure.

Statistical Analyses

The data were cleaned for missing and invalid values and checked for normality, with non-normally distributed variables being transformed accordingly. Missing data were handled in various ways, described below. Descriptive statistics, including zero-order correlations, were calculated for the study variables. A structural equation modeling (SEM) analysis of the maternal depression to daughter outcome pathway was conducted using the AMOS [version 17.0] statistical program. SEM was selected as the statistical approach because of its ability to model mediating variables, to simultaneously analyze more than one dependent variable, and its ability to handle missing data. SEM requires that certain assumptions be met in the data used. First, SEM assumes that each variable is normally distributed, and that there is multivariate normality across the data set. SEM also assumes and tests for linear relationships between variables. Last, although somewhat robust to collinearity, SEM assumes the absence of this confound. Standard reporting conventions developed by the American Psychological Association (2002) and by McDonald & Ho (2002) were followed.

Results

Missing Data

A total of 248 mother-daughter pairs participated in the study. However, of these 97 of the mothers provided incomplete data at Time 1. The missing data were not random and often were the result of entire measures or sets of measures for which data did not exist. Although Structural Equation Models can account for missing data, due to the non-random nature of the missing data and the relative size of the sample to the model being tested, deleting cases that included the missing data was deemed appropriate. Those cases that were removed from the study differed from those that remained with respect to the location at which the data were collected, $t(244) = 9.964, p < .05$, and daughter's age, $t(227) = 2.097, p < .05$. Cases with missing data that were excluded from the study tended to be those from the Halifax site. Daughters that remained in the data set were approximately four months older than those that did not. No other significant differences were observed with respect to the demographic or daughters' study variables. Of the 151 mother-daughter dyads that remained, missing data were identified with respect to some of the daughter outcome variables in 67 of the cases. This issue was addressed as described below.

Participant Characteristics

Demographic data for the current sample are summarized in Table 1. Mothers were an average of 41.9 years old ($SD = 4.7$) and had daughters who averaged 11.6 years of age ($SD = 1.1$) at Time 1. Seventy-eight percent of mothers reported that they were currently married and 18% said that they were presently single, but had been married previously. The majority of mothers (74%) reported having two or three children ($M =$

2.2, $SD = 0.8$). Seventy-five percent of mothers had at least two years of post-secondary education and 80% reported that they were currently employed. The average family income was over \$60,000 per year.

Of the 151 mothers in the final sample, 75 met criteria for a past lifetime diagnosis of Major Depressive Disorder and/or Dysthymia. Group comparisons showed that women with a history of depression were less likely to be married, $t(140) = -2.24, p < .05$, and had a lower family income, $t(137) = 2.08, p < .05$, than were those mothers that had never been depressed (see Table 1). They did not differ significantly on other demographic variables. With respect to the study variables (see Table 2), mothers with a history of depression reported more current depressive symptoms, $t(149) = -3.43, p < .001$, endorsed higher levels of attachment anxiety, $t(149) = -5.72, p < .001$, and avoidance, $t(149) = -2.20, p < .05$, were less consistent in their parenting, $t(149) = -2.31, p < .05$, and had daughters who reported a less secure attachment to them, $t(149) = 2.32, p < .05$, than did mothers with no history of depression. These differences are consistent with those reported in the literature. Owing to the size of the sample relative to the statistical procedures being used, the data for both groups of mothers were analyzed together, with the presence or lack of a past depressive episode serving as a predictor variable.

Marital status and family income, the two demographic variables that were significantly associated with depression history, were also significantly associated with mothers' attachment avoidance, $r(142) = .20, p < .05$ and $r(139) = -.30, p < .001$, attachment anxiety, $r(142) = .27, p < .001$ and $r(142) = -.26, p < .01$, and mothers' current symptoms of depression, $r(142) = .24, p < .01$ and $r(139) = -.31, p < .001$,

Table 1.

Participant demographics for mothers with and without a history of depression.

Variable	Depression History (<i>N</i> = 75)		No Depression History (<i>N</i> = 76)	
	Mean	SD	Mean	SD
Mother's Age	41.8	4.8	42.0	4.6
Daughter's Age	11.7	1.1	11.6	1.1
Number of Children	2.1	0.8	2.3	0.8
		%		%
Mother's Marital Status	Married	65.3	Married	80.3
	Separated	9.3	Separated	3.9
	Divorced	10.7	Divorced	9.2
	Never Married	6.7	Never Married	1.3
Mother's Education	Part High School	2.7	Part High School	1.3
	High School	5.3	High School	7.9
	Part College	17.3	Part College	13.2
	College 2 Yr	20.0	College 2 Yr	14.5
	College 4 Yr	24.0	College 4 Yr	30.3
	Part Graduate / Professional	2.7	Part Graduate / Professional	7.9
	Graduate / Professional	20.0	Graduate / Professional	21.1
Household Income	Less than 15K	2.7	Less than 15K	1.3
	15-30K	6.7	15-30K	2.6
	30-45K	13.3	30-45K	9.2
	45-60K	16.0	45-60K	3.9
	60-75K	6.7	60-75K	17.1
	75-90K	9.3	75-90K	22.4
	90K +	34.7	90K +	38.2

Table 2.

Descriptive statistics for study variables for mothers with and without a history of depression.

Variable	History of Depression			No History of Depression			Total Sample					
	Mean	SD	N	Mean	SD	N	Mean	SD	Alpha	N	Skewness	Kurtosis
BDI-2 (Mom)	12.84	11.18	75	7.13	9.17	76	9.97	10.58	.936	151	1.242	.957
ECR – Anxiety	3.56	1.11	75	2.64	0.85	76	3.10	2.94	.904	151	.328	-.678
ECR- Avoidance	2.96	1.22	75	2.53	1.17	76	2.74	1.21	.838	151	.725	.125
CTS	40.71	9.53	75	38.50	9.06	76	39.60	9.33	.702	151	1.259	2.786
LEE – Mother	2.19	1.98	75	1.84	1.97	76	2.01	1.98	modeled	151	1.520	2.494
PDI – Involvement	36.15	5.32	75	36.95	4.52	76	36.55	4.93	modeled	151	-1.126	1.723
PDI – Consistency	20.96	7.56	75	18.26	6.76	76	19.60	7.27	modeled	151	.754	.554
PDI – Rigidity	19.53	4.65	75	20.92	4.67	76	20.23	6.82	.360	151	.533	.335
IPPA	100.24	19.03	75	106.62	14.43	76	84.24	8.96	.923	151	-.903	.623
BDI-2 time 1(child)	8.66	7.33	73	7.37	5.17	76	8.00	6.33	.898	149	1.561	3.366
BDI-2 time 2(child)	10.07	7.81	69	7.98	5.46	66	9.05	6.82	.823	135	1.941	4.483
DBDS time 1 (child)	20.77	15.29	73	14.85	13.16	72	17.62	14.43	.941	145	1.473	2.448
DBDS time 2 (child)	19.12	15.05	42	14.05	12.95	42	16.58	14.19	.942	84	1.246	1.465

BDI-2 = Beck Depression Inventory – 2, ECR = Experiences in Close Relationships Scale, PDI = Parenting Dimensions Inventory, CTS = Conflict Tactics Scale, LEE = Levels of Expressed Emotion Scale, IPPA = Inventory of Parent and Peer Attachment (to mother), DBDS = Disruptive Behavior Disorder Rating Scale, Alpha = Cronbach's Alpha (internal consistency). **Bolded items** reflect statistically significant deviations from normality ($p < .001$).

respectively. Thus, both were considered as potential covariates. However, marital status was not associated with either of the daughter outcome variables, so it was not considered further in the analyses. Household income was significantly associated with daughters' externalizing behaviours at Time 2, $r(81) = -.25, p < .05$. However, when household income and mothers' current depressive symptoms were linearly regressed onto Time 2 externalizing symptoms, the relationship between household income and Time 2 externalizing symptoms was non-significant. Thus, household income was not considered further in the analyses.

The frequencies with which either mothers or daughters met criteria for a psychiatric disorder at either Time 1 or Time 2, as assessed by structured clinical interview, were too low to be included as predictor or outcome variables and so were not included in the present analyses (see Table 3). Of note is the finding that mothers endorsed relatively few symptoms of depression currently, regardless of whether or not they met criteria for a past depressive episode. Daughters also reported relatively few depressive symptoms and mostly secure attachment to their mothers.

Study variables that did not meet the assumptions of a normal distribution were non-linearly transformed using logarithmic or square root functions and in turn these transformed variables were used in subsequent analyses. No significant differences were found in the study variables with respect to the site at which data were collected.

Planned Analyses

Zero-order correlations among the study variables are presented in Table 4. As expected, mothers who endorsed more depressive symptoms and/or those who had experienced a past episode of depression were more likely to endorse items consistent

with attachment anxiety and avoidance. Mothers' current depressive symptom level was significantly associated with three of five parenting indices, their daughters' attachment to them, and to both internalizing (depression) and externalizing (disruptive behaviours) problems in their daughters. As mothers endorsed a greater number of depressive symptoms, they tended to be less consistent and to express more criticism to their daughters. Contrary to previous research, they also tended to be more involved with their daughters. Their daughters tended to report a less secure attachment to them and to endorse a greater number of both depressive and externalizing symptoms. Mother's attachment variables were only minimally associated with the measures of parenting. More anxious and avoidant mothers were less consistent in their parenting and more anxious mothers were more critical of their daughters. Three of five parenting indices were significantly associated with daughter's attachment to their mother. As mothers reported being more involved with their daughter, initiating less conflict, and being less critical, their daughters were more likely to endorse a secure attachment to their mothers. Ratings of more secure attachment were in turn correlated with variables assessing daughters' outcome; less securely-attached daughters reported more depression and externalizing symptoms. Broadly speaking, the observed correlations among the study variables are consistent with previous research and with stated hypotheses, which supported model testing of the relationships among these variables.

Measurement Model. Data used in the following analyses met the assumptions of SEM, particularly multivariate normality and the absence of multicollinearity. Before modeling pathways among the study variables, it was necessary to establish the goodness of fit of all latent structures. The χ^2 value, the root mean square of approximation

Table 3.

Frequency with which current reported symptoms met diagnostic criteria.

	Time 1			Time 2		
	Dep. Hx.	No Dep. Hx.	Total	Dep. Hx.	No Dep. Hx.	Total
Mothers:						
MDD	6	0	6	4	2	6
Dysthymia	1	0	1	0	0	0
Anxiety	12	6	18	7	8	15
			<u>25</u>			<u>21</u>
Daughters:						
MDD	0	0	0	0	0	0
Dysthymia	0	0	0	0	0	0
Dep. NOS	1	0	1	0	0	0
Anxiety	5	3	8	2	1	3
			<u>9</u>			<u>3</u>

Dep. Hx = Depression History; MDD = Major Depressive Disorder; Dep. NOS = Depressive Disorder Not Otherwise Specified; Anxiety = total number of anxiety disorders for which diagnostic criteria were met; ($N = 151$).

Table 4.

Zero-order correlations between relevant study variables at Time 1 and Time 2.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<u>Mother Depression</u>														
1. BDI-2 (mom)	-													
2. Past Depression	.30**	-												
<u>Mother Attachment</u>														
3. ECR-Anxiety	.43**	.18*	-											
4. ECR-Avoidance	.44**	.42**	.34**	-										
<u>Parenting Measures</u>														
5. PDI-Involvement	.21**	.07	.13	.02	-									
6. PDI-Consistency	.35**	.18*	.34**	.24**	.20*	-								
7. PDI-Rigidity	.00	-.15	.11	-.01	.00	.00	-							
8. CTS	.15	.13	.11	.00	.24**	.23**	-.04	-						
9. LEE	.24**	.13	.20*	.02	.30**	.19*	.02	.35**	-					
<u>Daughter Outcome Measures</u>														
10. IPPA	-.18*	-.16*	-.04	-.14	.39**	-.13	.03	-.24**	-.19*	-				
11. BDI-2 time 1 (child)	.14	.04	-.04	.02	.13	.15	.00	.08	.19	-.30**	-			
12. BDI-2 time 2 (child)	.27**	.16	.08	.12	.15	.19*	-.14	.07	.13	.16	.43**	-		
13. DBDS time 1	.35**	.18*	.17*	.22*	.22**	.22*	.04	.42**	.24**	-.24**	.20*	.14	-	
14. DBDS time 2	.39**	.22**	.21	.18	.17	.27*	-.06	.56**	.18	-.35**	.18	.19	.71**	-

* $p < .05$, ** $p < .01$; BDI-2 = Beck Depression Inventory – 2, ECR = Experiences in Close Relationships Scale, PDI = Parenting Dimensions Inventory, CTS = Conflict Tactics Scale, LEE = Levels of Expressed Emotion Scale, IPPA = Inventory of Parent and Peer Attachment (to mother), DBDS = Disruptive Behavior Disorder Rating Scale. **Bolded items** reflect transformed variables.

(RMSEA) and the comparative fit index (CFI) were used as indicators of models' overall level of fit. Due to the sensitivity of chi square to sample size, the relative chi-square, which is χ^2 / df , was also reported. The former represents a good fit if non-significant, while the latter signifies a good fit if less than 2 (Ullman, 2001). Values on the RMSEA index less than .06 have been shown to reflect a good fit (Hu & Bentler, 1999), and those less than .08 an adequate fit (Schumacker & Lomax, 2004). The RMSEA has also generally been shown to be relatively unaffected by sample size (Fan, Thompson, & Wang, 1999). As a fit measure, CFI is also relatively unaffected by sample size, with values greater than .90 reflecting a good fit (Garson, 2009). Despite the chosen fit measures being good choices for smaller samples, the size of the present sample pushes the lower boundary for an acceptable sample size. Due to this, as well as the fact that some values for youth outcome variables were estimated, fit indices were expected at times to fall short of established critical values. Thus, models were retained for further analysis or interpretation if obtained values for fit indices approximated established cut-off values.

Due to the small size of the sample relative to the demands of the analytic approaches, latent structures were used for the parenting indices only. This decision was supported by the relatively robust factor structures that have been established for the non-parenting measures and the lack of available psychometric data for the Parenting Dimensions Inventory (PDI). No attempt was made to fit a latent structure for the Rigidity subscale of the PDI as this variable was not significantly associated with any other study variables. An evaluation of the internal consistency of the Rigidity items confirmed that they yielded an unreliable subscale (Cronbach's $\alpha = .36$).

The first measurement model to be fit was that for the Involvement subscale of the PDI. The latent structure “Involvement” was created and each of the seven items of that subscale was entered, with the error terms, as observed indicators of the latent variable. All seven items were retained as significant indicators ($p < .05$) of the Involvement factor. Four covariance pathways between indicator error terms were added to improve the fit of the model based on four elevated modification index values (M.I. > 10.0). The final measurement model for Involvement was tested using a confirmatory factor analysis and yielded a good fit, $\chi^2(10) = 17.15, p > .05, \chi^2 / df = 1.72, RMSEA = .069, CFI = .984$ (see Figure 2). A similar process was used to fit a latent structure to the items assessing the Consistency subscale and the Level of Expressed Emotion scale (LEE). The model for the Consistency subscale was good, $\chi^2(17) = 21.82, p > .05, \chi^2 / df = 1.28, RMSEA = .043, CFI = .989$ (see Figure 3), while the model for the LEE scale was adequate, $\chi^2(50) = 87.59, p < .001, \chi^2 / df = 1.75, RMSEA = .071, CFI = .857$ (see Figure 4). Fitting the LEE model resulted in the deletion of three indicator items. Due to the lack of available psychometric data for the PDI, in addition to the measurement model, scale reliability was calculated for the two PDI subscales. Analyses revealed that both the Involvement and Consistency subscales are internally consistent, with alphas of .86 and .84, respectively. Data were a poor fit for the model representing the Conflict Tactics Scale (CTS), $\chi^2(76) = 189.86, p < .001, \chi^2 / df = 2.50, RMSEA = .100, CFI = .842$. The poor fit, coupled with the fact that the CTS was not significantly associated with measures of either mother’s depression or mother’s attachment and so could not serve as a mediator in the model, resulted in a decision to exclude this measure from further analyses.

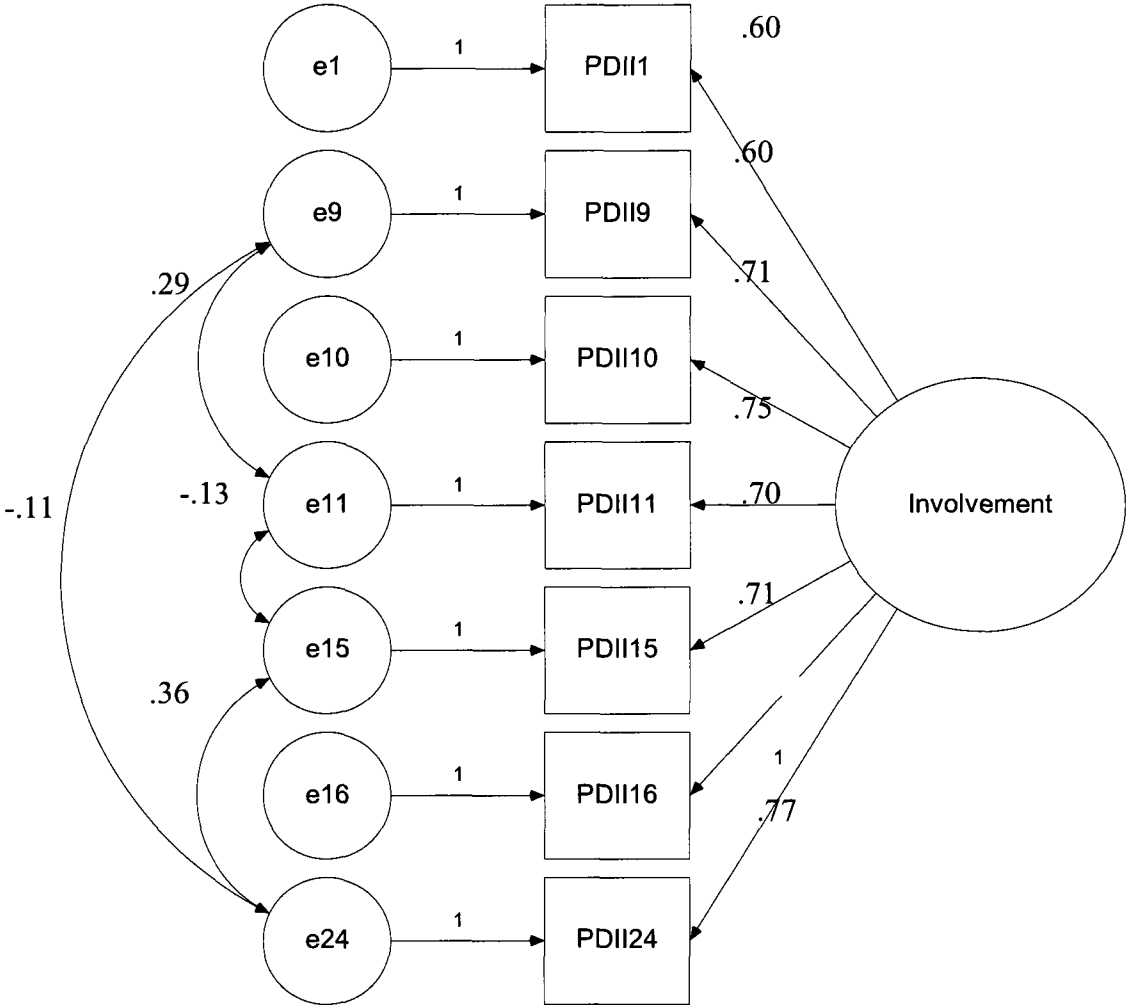


Figure 2. Measurement model for the Involvement subscale of the Parenting Dimensions Inventory

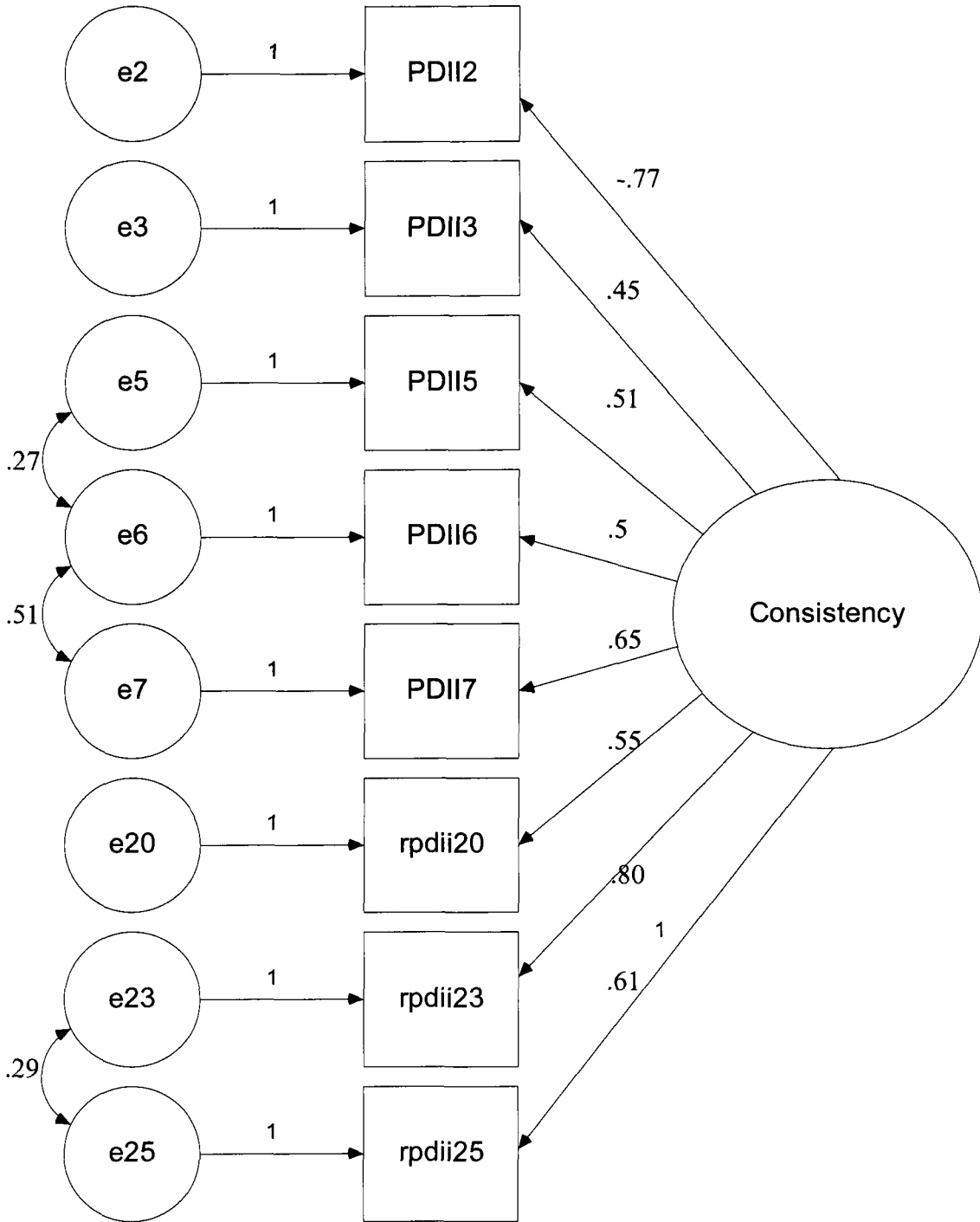


Figure 3. Measurement model for the Consistency Subscale of the Parenting Dimensions Inventory



Figure 4. Measurement model for the Level of Expressed Emotion scale.

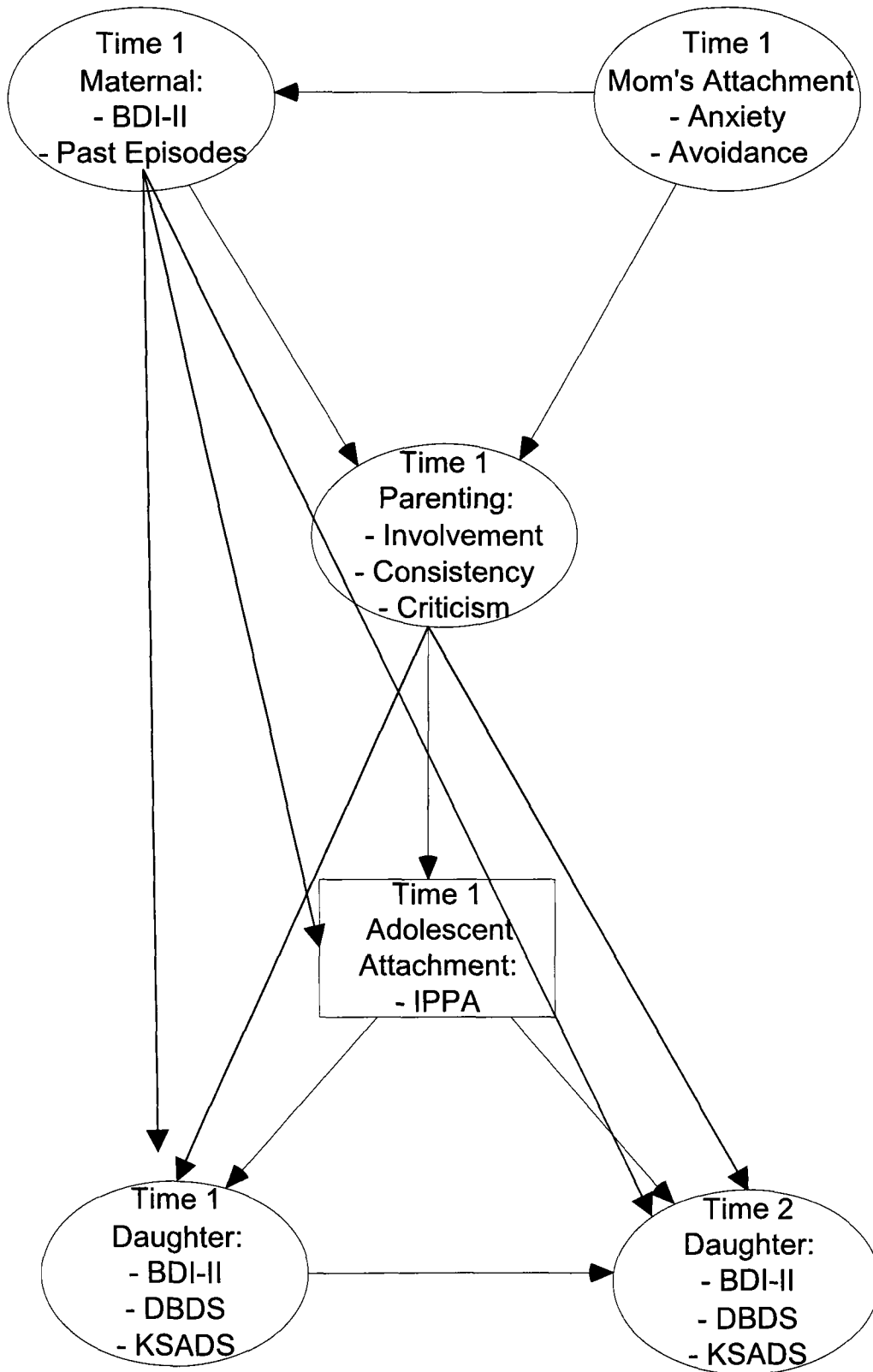
The next step was to determine if each of the remaining three parenting indices (Involvement, Consistency, and Level of Expressed Emotion) could be considered one parenting factor. To test this possibility, each of these latent structures was modeled as an indicator of a fourth latent variable reflecting parenting practices. This new measurement model was an adequate fit to the data, $\chi^2(310) = 521.68, p < .001, \chi^2 / df = 1.68, RMSEA = .067, CFI = .842$, and a slightly better fit than considering each of the parenting indices as separate latent structures, $\chi^2(273) = 487.16, p < .001, \chi^2 / df = 1.76, RMSEA = .072, CFI = .834$. The factor loadings of Involvement (-.65), Consistency (.46), and Level of Expressed Emotion (.71) on the parenting factor were significant ($p < .01$) and suggest that the parenting construct describes less involved, less consistent, and more critical parenting.

Structural Model. A structural model was proposed in which the effects of mothers' depression on their daughters' outcomes was mediated by parenting practices and the daughter's attachment to the mother (see Figure 1). Prior to testing, this model was modified to include direct, non-mediated effects between variables based on significant zero-order correlations (see Figure 5).

In order to test this model it was also necessary to account for missing data in the daughters' outcome variables. Independent sample t-tests were performed to compare those mother-daughter dyads that had complete Disruptive Behavior Disorder Rating Scale data at Time 2 with those that did not. This outcome variable was chosen specifically because only 84 mothers produced this information at Time 2. Mothers who produced these data were more likely than those who did not to be less avoidant in their romantic relationships, $t(149) = 2.177, p < .05$, older, $t(140) = 2.898, p < .01$, and more

Figure Caption

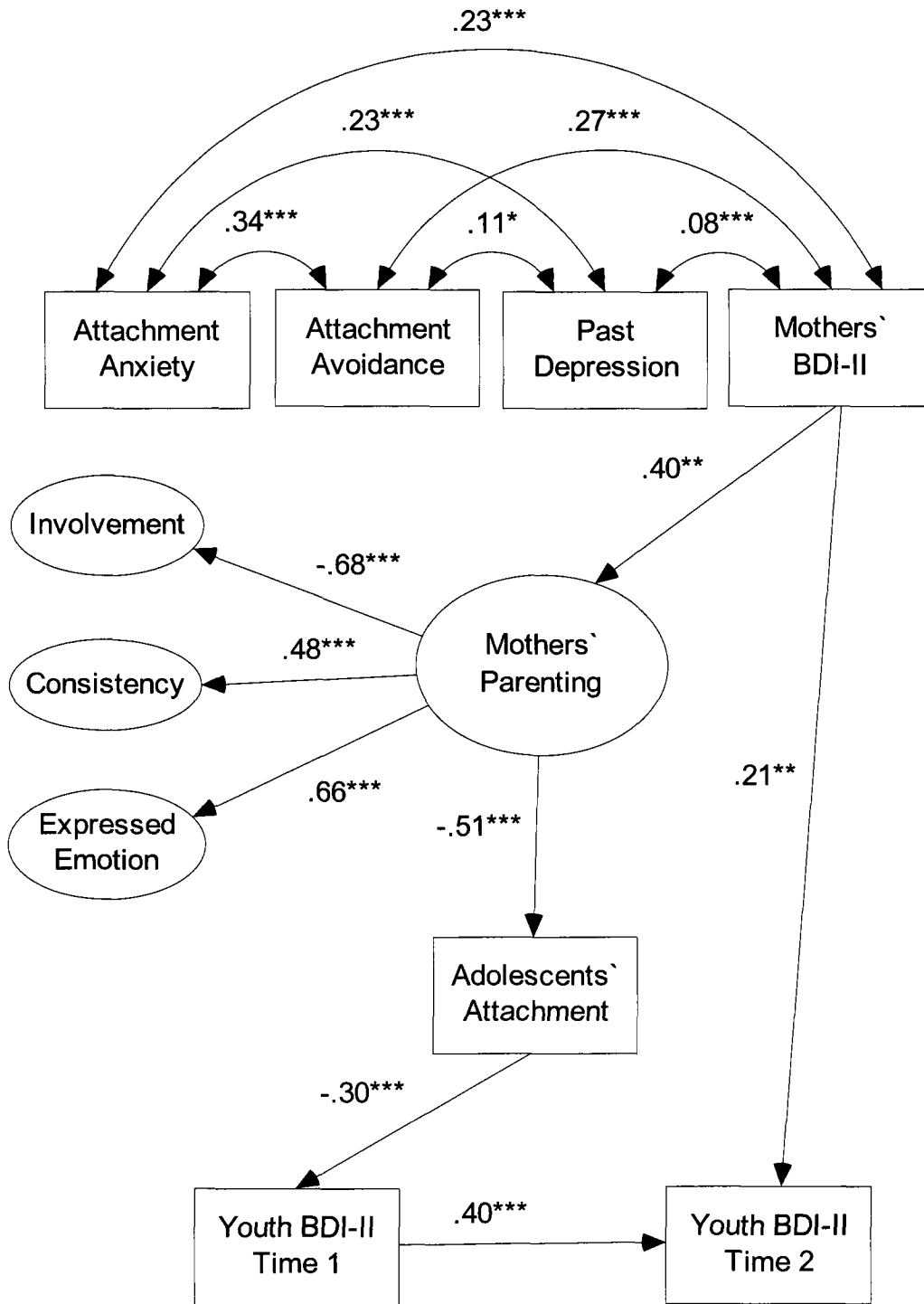
Figure 5. Tested partially-mediated model between mothers` depression and daughters` outcomes



likely to be at the Ottawa rather than the Halifax site, $t(149) = 11.769, p < .001$. There were no other significant differences between the mothers on any other study variables.

Within the SEM framework it is possible to estimate values for missing data rather than to delete cases from the data set. In light of the sample size and the lack of substantial significant differences between the groups with and without complete Time 2 data, estimation was used rather than deletion. AMOS [version 17.0] uses a Maximum Likelihood estimation method for data imputation, which takes random samples from the data set in order to approximate the population covariance matrix. This imputation method has been shown to produce the least amount of bias in its estimation of missing values. Indeed, Byrne (2001) found that, even when estimating 25 percent of her data set, the fit indices were analogous to those of the complete set. See Table 2 for a summary of the missing data.

Daughters' depressive symptoms at Time 1 and Time 2 were predicted from the study variables (see Figure 6). Once non-significant pathways were deleted from the initial model, the model tested was an adequate fit to the data, $\chi^2(509) = 782.92, p < .001, \chi^2 / df = 1.54, RMSEA = .060, CFI = .823$. Consistent with the study hypotheses, mother's depression predicted daughter's depression at Time 1 via her parenting practices and the adolescent's attachment security. More negative parenting, as represented by the parenting latent structure, predicted less secure attachment to mothers as reported by their daughters. In turn, higher levels of secure attachment predicted daughters' report of fewer depressive symptoms at Time 1. However, mothers' Time 1 depressive symptoms also had a direct impact on their daughters' Time 2 depressive symptoms. Thus, the link

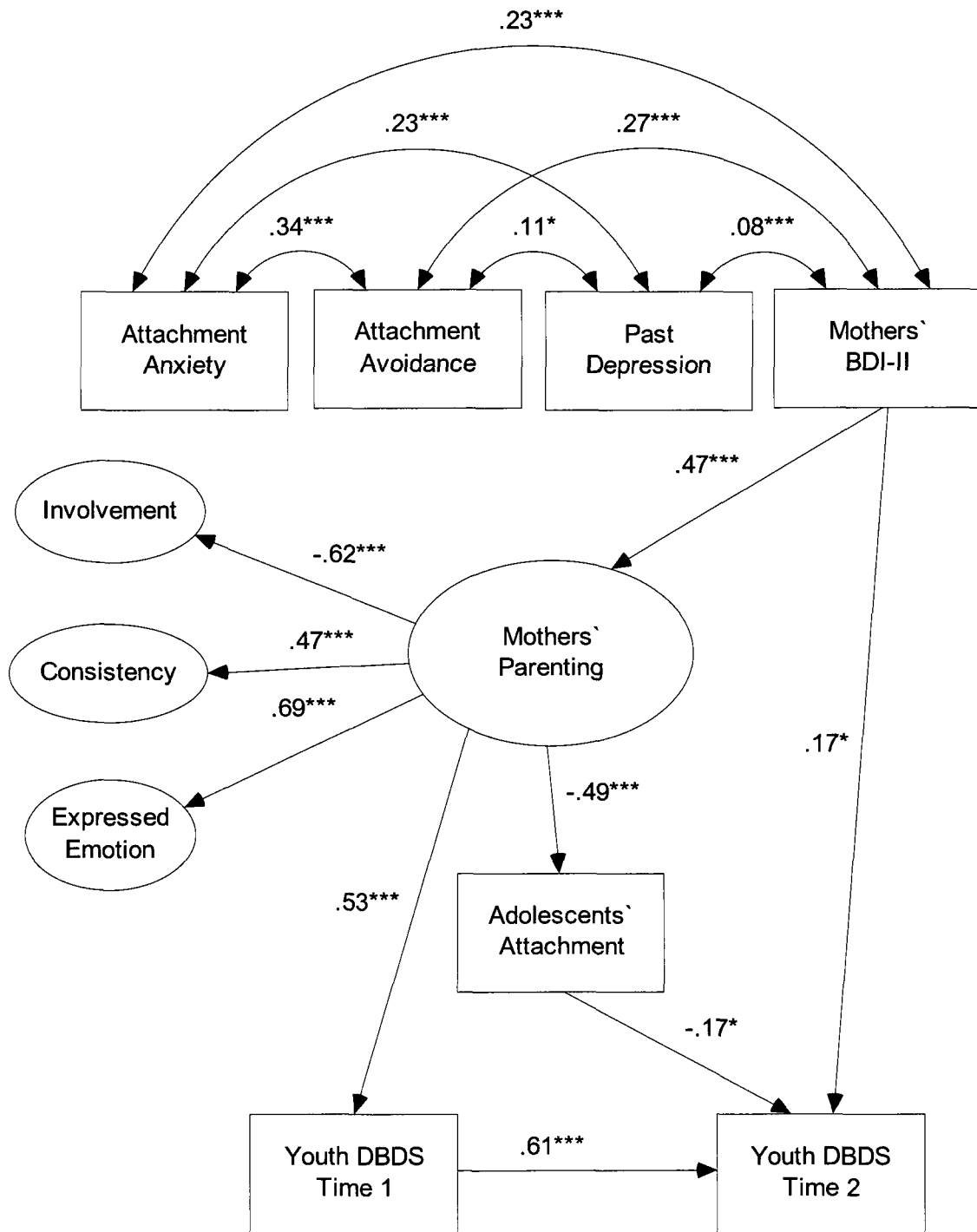


* $p < .05$; ** $p < .01$; *** $p < .001$.

Figure 6. Final model predicting daughters' depressive symptoms.

between maternal depression at Time 1 and daughter's depression at Time 2 was not fully accounted for by the impact of maternal depression on parenting practices and attachment security. Contrary to the study hypothesis, neither the mother's attachment anxiety nor her avoidance in romantic relationships was significantly predictive of her parenting practices, although both co-varied with her depression. Thus, the mother's adult attachment style, as measured in the literature, was not associated with her parenting practices.

The results of the test of the model predicting daughters' externalizing symptoms is shown in Figure 7. Following the deletion of all non-significant pathways, this model was also an adequate fit to the data, $\chi^2(508) = 827.06, p < .001, \chi^2 / df = 1.63, RMSEA = .065, CFI = .805$. The link between mothers' depressive symptoms and daughters' Time 1 disruptive behaviour was fully mediated by mothers' parenting practices, with more negative parenting predicting higher levels of externalizing symptoms. However, mothers' parenting practices at Time 1 had an impact on daughters' attachment security at Time 1, which subsequently predicted higher levels of Time 2 disruptive behaviour. Daughters who were less securely attached at Time 1 engaged in more disruptive behaviour at Time 2. Again, maternal depressive symptoms also had a direct impact on daughters' Time 2 disruptive behaviour, which indicates that not all of the link between maternal depression and daughters' disruptive behaviour can be attributed to the impact of depression on parenting practices and attachment security.



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

Figure 7. Final model predicting daughters' disruptive behaviours

Discussion

The primary hypotheses of the present study were that: 1) mother's attachment anxiety and attachment avoidance would be associated with maternal depression and in combination would uniquely predict parenting behaviour; 2) parenting behaviour would predict daughters' internalizing and externalizing symptoms both cross-sectionally and longitudinally and that this link would be partially mediated by daughters' attachment security; and 3) parenting behaviour and adolescent attachment would mediate the direct relationships between maternal depression or maternal attachment and youth outcomes. The results obtained partially support the latter two of these hypotheses.

Supporting the second hypothesis, mothers' parenting behaviour at Time 1 significantly predicted daughters' depressive and externalizing symptoms at Time 1. More specifically, mothers who were less involved, less consistent, and more critical had daughters who endorsed more depressive and externalizing symptoms. This is consistent with previous findings in this area. For externalizing symptoms, this was a direct relationship, whereas for daughters' depression at Time 1, this relationship was fully mediated by daughters' attachment to their mothers.

Longitudinally, mothers' parenting was hypothesized to uniquely predict daughters' outcomes via daughters' attachment security. This prediction was clearly supported when daughters' disruptive behaviours were used as the outcome variable. Mothers' low involvement, inconsistent, and critical parenting was associated with a less secure attachment between daughters and their mothers at Time 1. Lower attachment significantly predicted higher externalizing behaviour one year later, after controlling for baseline symptoms. This represents a fully mediated predictive pathway between

parenting behaviours at Time 1 and daughters externalizing symptoms one year later. The implication for this is that negative parenting appears to explain increases in youth disruptive behaviour through damage done to the daughter-mother attachment relationship.

The strongest predictors of daughter outcomes at Time 2 were Time 1 symptom levels, which suggest that, once established, problem symptoms are relatively stable in adolescent girls. The second hypothesis then appears to have been largely supported in this sample in relation to both depression and disruptive behaviour at Time 1 and disruptive behaviour at Time 2. This result is not surprising in light of other studies (e.g. Chang et al., 2004; Roblia and Krishnakumar, 2006) that have found that mothers' parenting practices better predict externalizing than internalizing symptoms.

As evidenced by the final models in this sample, mothers' current depressive symptoms and not their endorsement of past episodes of depression were predictive of current parenting behaviour. This finding suggests that although past depressive episodes may be predictive of problem outcomes in youth (e.g. Brennan et al., 2003), the predictive utility of past episodes is eclipsed when current symptoms are included in analyses. Again, it is likely that current psychopathology has a greater impact on current interpersonal behaviour than does past psychopathology or more stable interpersonal styles.

Mothers' depression was expected to predict disruptive behaviours and symptoms of depression in adolescent daughters via negative parenting behaviour and the daughter-mother attachment relationship. For Time 1 variables, this first hypothesis was clearly supported with respect to disruptive behaviours. Despite strong zero-order correlations

between mothers' current depressive symptoms and disruptive behaviour ($p < .001$), when parenting behaviour and daughter attachment were present in the predictive model, mothers' depression failed to uniquely predict youth outcomes at Time 1. Instead, the ability of mothers' depression to predict daughters' externalizing symptoms was mediated by the parenting factor and daughters' attachment. This suggests that at any given point in time, how a mother parents her adolescent daughter and the strength of the relationship with her may be a better determinant of her daughter's externalizing behaviour than are symptoms of the mothers' depression themselves.

Examining daughters' outcome symptoms one year later yielded partial support for the above hypothesis. In the case of disruptive behaviours, the predictive ability of mothers' current depressive symptoms was partially mediated by the parenting to attachment pathway. This means that although there was some direct prediction of externalizing symptoms at Time 2 by mothers' depression at Time 1, that parenting and daughters' attachment at Time 1 were also significant predictors of daughters' outcomes one year later. The impact that depression has on mothers' parenting and the attachment of their daughters and the fact that these variables and the depressive symptoms predict youth externalizing symptoms one year later speaks to the longstanding consequences of maternal depression. This direct predictive ability of mothers' depression on disruptive behaviour one year later may be due to unique qualities of the depression not captured in the present study or potentially in parenting constructs that were not assessed. Given that the vast majority of the mothers in the current sample endorsed sub-clinical depressive symptoms levels at Time 1 suggests that the long-term effect of a major depressive episode, and its correlates, may be greater still.

In contrast, daughters' symptoms of depression at Time 2 were only predicted by mothers' and daughters' depressive symptoms from one year earlier and not by the parenting and attachment variables, as had been the disruptive behaviours. Although daughters' attachment, from parenting and mothers' depression, predicted daughters' symptoms of depression at Time 1, the present results suggest that there may be something unique to mothers' depression, not associated with parenting (and attachment), that is associated with the long-term prediction of depressive symptoms in female youth. It would also appear that this factor is more greatly associated with daughters' depression than with their disruptive behaviour. For both daughters' depression and externalizing behaviours, factors such as maternal warmth (or lack thereof), expressed negative affect, or over-parentifying the child via excessive reassurance seeking, may serve as some of the unique qualities of mothers' depression that continue to predict outcomes in the face of parenting and attachment variables.

This observed difference between how mothers' depression was associated with the two daughter outcomes at Time 2 is to some extent mirrored in the patterns of associations observed at Time 1. Daughters' depressive symptoms at Time 1 were predicted by their attachment to their mothers, which was in turn predicted by mothers' parenting. However, the requirements for mediation (Baron & Kenny, 1986) were not satisfied because based on zero order correlations, neither mothers' depression nor her parenting was significantly associated with adolescent BDI-2 scores at Time 1; there was no association to mediate. Time 1 levels of daughters' depression were only associated with daughters' attachment to their mothers. As such, the second and third hypotheses were not supported with respect to daughters' depressive symptoms.

Another possible explanation for the different results when modeling the daughters' depression and their externalizing symptoms may be the missing data estimation that occurred for the externalizing symptoms. It is possible that the estimation of 44 percent of the Time 2 DBDS data resulted in over-fitting of the model. However, these missing data represent just six percent of the data set. Given that Byrne (2001) estimated 25 percent of a data set and produced similar fit indices to the full set, this possibility may not be likely.

Finally, the observed pathway between mothers' parenting and daughters' externalizing symptoms represents only one possibility with respect to how these variables may be related. Other research suggests that daughters' externalizing symptoms may in fact contribute to the parenting they receive, as well as in part arising from it (e.g. Burt, McGue, Krueger, & Iacono, 2005). The present model did not incorporate Time 2 parenting data or assess for cross-lagged pathways between these two variables.

Despite significant zero order correlations between mothers' attachment anxiety and the two parenting indices, and attachment avoidance with one parenting index, the first hypothesis was not supported. Thus, neither measure of mothers' attachment in romantic relationships was significantly and uniquely predictive of parenting behaviour once the other variables in the model were accounted for. However, and consistent with results cited in the literature, both attachment dimensions were significantly associated with current depressive symptoms and the endorsement of a past episode of depression. Both current symptoms and a past episode were associated with greater anxiety about attachment figures in romantic relationships and greater avoidance of closeness in these relationships. The lack of direct significant relationship between mothers' romantic

attachment and their parenting behaviour stands in contrast to previous research in this area (e.g. Kobak et al., 1994). There are at least three reasons why this result may have been found in the present study.

First, the link between attachment insecurity and psychopathology, especially depression, is well established (e.g. Davila et al., 1998; Simpson et al., 2003; Whiffen et al., 2001). Symptoms of depression, like other psychopathology, represent a significant departure from a “normal” pattern of behaviour and interpersonal interaction. The present results suggest that behaviour arising from current psychopathology may have a greater influence on current parenting practices than do pre-existing interpersonal styles associated with attachment anxiety and avoidance. This may be due to depression posing an immediate pressure on parenting behaviour, unlike attachment orientations which are generally stable and exert their influence on interpersonal behaviour at all times. Unless a mother is experiencing elevated levels of stress or distress the attachment system is unlikely to be activated and as a result be a dominant predictor of current parenting behaviour in the face of current psychopathology. Another potential explanation may lie in the type of attachment that was assessed. Consistent with previous research, maternal attachment was assessed using her attachment to romantic partners. Perhaps assessing mothers’ attachment to their own mothers or their attachment specifically to the daughter in the study may have yielded different results.

Second, attachment theory states that attachment-based behaviours are more likely to be activated in times of stress or distress (Bowlby, 1969; 1973; 1980). As such, it is possible that mothers in the present sample were not experiencing levels of stress/distress sufficient to activate their attachment systems, which might explain the

lack of direct relationship between assessed attachment orientations and parenting behaviour. Thus, this link may be more apparent under conditions of maternal stress and/or distress.

A third possible explanation centres on the parenting behaviours that were assessed. The research to date has found significant associations between maternal attachment security and such parenting qualities as warmth, control, intrusiveness, and supportiveness (Mikulincer & Shaver, 2007). The parenting qualities of involvement and inconsistency, which were included in the present analyses, have not been shown previously to be associated with attachment security, although conceptually there is no reason to assume that they would not be. Maternal avoidance of closeness, in particular, should be associated with the mother's ability to be engaged with her daughter. Maternal criticism, as assessed by the Levels of Expressed Emotion scale, also has not been shown in previous work to be associated with attachment security, although this may be more due to a dearth of research in this area, rather than the lack of overlap between these constructs. Assessing parenting constructs that have established associations with maternal romantic attachment and/or maternal depression would have allowed for a more rigorous test of the hypothesis that maternal attachment security is related to parenting behaviour. At present, it is difficult to ascertain whether lack of support for the hypothesis is a result of a genuine lack of relationship between the parenting and romantic attachment constructs or simply a product of the current sample.

A relatively small proportion of the variance in youth outcomes was predicted by the study variables. For adolescents' depressive symptoms, nine percent of the variance was predicted at Time 1 and 20% at Time 2, with the greatest proportion (16%) being

predicted by Time 1 depressive symptom levels. Externalizing symptoms were predicted to a slightly greater degree: 28% of the variance was explained at Time 1 and 43% explained one year later with 37% predicted by Time 1 levels. Thus, less than half of the variance in depression and externalizing symptom outcomes was explained by the study variables. This result is not entirely unexpected given the small observed effect sizes between depression and child internalizing and externalizing behaviours (Connell & Goodman, 2002). Although one assumes a greater proportion of explained variance with a greater number of relevant predictor variables, there are several reasons why the proportion of explained variance in the youth outcome variables remains relatively low.

First, variability in both the predictor and outcome variables was low, which limits the ability to detect meaningful relationships that may be apparent in the broader population. For example, both mothers' and adolescents' mean level of depressive symptoms was in the mild range. Although some individuals endorsed higher symptom levels, the transformations required to normalize the distribution truncated the range and thus the variability in these variables. Approximately half of the mothers endorsed symptoms consistent with a past episode of major depression. Depression is known to be a recurrent disorder (APA, 2000), so the low levels of self-reported depressive symptoms are surprising. Similarly, approximately 44% of the daughters of mothers with a history of depression are expected to develop a depressive episode during adolescence (Keller, Beardslee, Dorer, Lavori, Samuelson et al., 1986). However, this effect was not observed in either the clinical diagnostic interviews conducted or in the youth's self-report of depressive symptoms.

One possible explanation for the lack of depressive symptoms among the adolescents in this study may be their involvement in the study itself. Twice-annual clinical interviews may have provided the participants with an opportunity to reflect on and discuss their emotional and psychological well-being. Thus, the interviews themselves may be a protective factor against problem outcomes in youth, and heightened psychopathology in the mothers. There also may have been a self-selection bias in the study such that mothers who were involved in the study may be more involved in their daughters' lives relative to mothers who were not involved in the research. In fact, many mothers reported being motivated to participate in the study in part because they knew of their daughter's risk for depression and wanted them to be monitored on a regular basis. Typically, incidents of depression increase dramatically for girls during puberty (e.g. Graber, Brooks-Gunn, Warren, 2006). The fact that daughters were pre-pubertal at the outset of the study (mean age = 11.6 years) and that they were followed for only one year in the present data set suggests the possibility that had the girls been followed for additional time that an increase in symptoms of depression for some girls, and thus an overall greater variability in depression scores, may have been observed.

In addition, the present model does not include some variables that may contribute to the prediction of negative outcomes in youth. The onset of a depressive episode typically follows the experience of a severe acute stressor or a less severe but chronic stressor (Kessler, 1997; Tennant, 2002). Although stress was measured in the broader study, data on these stressors were not included in the present analyses. Similarly, as primary attachment relationships begin to shift from parents to peers during adolescence, the quality of peer relationships and/or relationships with siblings or other significant

attachment figures may contribute to or protect against the development of depression or externalizing behaviour. These variables were not the focus of the present study and in order to preserve statistical power were not included in the present analyses.

Consequently, variability in the outcome measures that may have been explained by these or other similar constructs remains unexplained in the current models.

Methodological Considerations

Perhaps the primary limitation to interpreting the current data set is the small sample size. Garson (2009) reviewed the literature and noted that although sample sizes below 200 can be tenable, those in excess of 200 participants are preferred. Larger sample sizes provide better statistical power and yield a more accurate measure of goodness-of-fit for the model being tested. The relatively small sample size, by structural equation modeling standards, makes the interpretation of non-significant paths between variables problematic. Is the non-significant path due to a genuine lack of a predictive relationship or to a dearth of statistical power? The lack of complete data for a large number of the participants also limited the number of variables as well as the number of latent structures that could be entered into the model. For example, the only data entered at Time 2 were youth outcomes. Including mothers' depression, parenting, and youth attachment at time 2 would have allowed for some cross-lagged structural paths and thus a better understanding of how these constructs interact over time.

Although the current sample began with 248 mother-daughter pairs, the number of participants for which complete data existed fell significantly by the one-year follow-up. The original study from which the current data was drawn attempted to follow the mother-daughter dyads for longer than one year. At one of the study sites, precipitous

drops in rates of participation were experienced with each subsequent follow-up. Possibly in part due to this issue, there was relatively little variability in the measures used with the current sample. Additional reasons for this were presented above and included the possibility that the young age of the participants may have precluded the opportunity to observe more variability in symptom levels that often accompanies the onset of puberty in girls. A potential solution for this problem would have been to collect data from several cohorts that were grouped by age, rather than one large pre-pubertal sample. Although this method would have sacrificed the potential to observe long-term within-subject effects, this solution may have provided a larger sample size with complete data and resulted in increased variability in the data that were collected.

As outlined previously, results obtained with data collected from multiple informants is likely to be robust, whereas data collected from single informants have the potential to over-represent significant effects (Burt et al., 2005). In the present study there was a relative lack of cross-informant data collection. Mothers' parenting behaviour is largely reported on by mothers; mothers completed two and daughters completed one of the three measures that comprised the parenting factor. Given that youth externalizing problems also were assessed via mothers' responses, the possibility of confounded data emerges. Internalizing (depressive) symptoms were reported on by youth only, which introduced the potential for reporter bias. As such, the reported symptoms of depression may not be an accurate reflection of those experienced by the daughters, which if true, may have interfered with being able to properly assess the true relationships between study constructs. The difference in the structural model between depression and externalizing symptoms could then be in part an artefact of who was reporting on the

symptoms. Using a measure that allowed for both youth and mother report on both internalizing and externalizing symptoms would help to alleviate these issues. Obtained results may have been more robust and/or slightly different had mothers and daughters reported together on both parenting behaviours and youth outcomes.

Collecting youth outcome data from both mothers and daughters would have been easily facilitated by using measures such as the Child Behavior Checklist (CBCL; Achenbach & Edlbrock, 1991) and the Youth Self Report (YSR; Achenbach, 1991b). These measures are easily compared and contrasted as they produce analogous subscales (Achenbach, 1991a). The use of these or similar measures also would have afforded the potential to assess for a wider range of daughter outcomes, especially with respect to internalizing symptoms. Internalizing symptoms such as anxiety and withdrawal, both of which are assessed by the CBCL and YSR, may be less tied to specific stressors and so may have shown a greater degree of predictability if included in the current model. Assessing several types of internalizing and externalizing symptoms from both mothers and daughters also may have improved the predictive ability of the model by allowing youth outcomes to be entered as latent factors, which would both explain a greater degree of error variance and potentially better represent the underlying construct of youth problem outcomes.

The absence of fathers' information from the present models undoubtedly yields an incomplete picture of the development of problem outcomes in adolescent girls. Although fathers were included in the broader study from which the current data were drawn, they were recruited in insufficient numbers to include them in the current analyses. Fathers' psychopathology is known to be predictive of negative outcomes in

their daughters (e.g. Brennan et al., 2002; Lewinsohn et al., 2005). Similarly, daughters that are more securely attached to their fathers experience fewer problems in adolescence (Williams & Kelly, 2005). Thus, including fathers' data may have explained a greater proportion of the variance in girls' outcome data.

Similarly, the inability of the current model to account for all potentially confounding variables, including mothers' comorbid psychopathology, also detracts from the ability to appreciate the whole context within which daughters may develop negative outcomes. There is some evidence suggesting that anxiety, for example, may be associated with a different self-other schema (Lumley & Harkness, 2007) than is depression, and so anxiety may have a different impact on adolescents than depression does. Future models may wish to include co-morbidity in their models, or to screen out women with comorbid conditions.

Suggestions for Future Research

The present results suggest that for both mothers and daughters in the sample, the rates of endorsement of clinically significant psychopathology were relatively low. The structured clinical interviews that are used to assess clinical diagnostic criteria are time-intensive and may be a barrier to continued participation in the study. Given that the outcomes of the interviews, clinically-significant episodes, were not frequent enough to be included in the final models, deleting this portion of the study protocol in future research may be appropriate. The time saved by not administering the clinical interviews may increase the long-term retention of participants by making follow-up assessments easier and/or allow for a larger sample to be followed. Future research in this area may choose to omit the use of clinical interviews following the initial assessment.

Previous research has demonstrated that the onset of depression is often precipitated by a severe acute stressor or elevated chronic stress (Kessler, 1997; Tennant, 2002). The important role that stressors play in activating the attachment system also has been clearly delineated (Bowlby, 1969; 1973; 1980). To better understand the links among mothers' depression, romantic attachment, and parenting behaviour, and adolescents' attachment and depression, the inclusion of a measure of stress is prudent. These measures may serve as moderators in the predictive pathways from attachment to parenting or youth outcomes, and/or as direct predictors of internalizing and externalizing symptoms in daughters. Similarly, peer attachment and/or the quality of peer relationships may serve as protective factors or as stressors in the generation of problematic outcomes. An attempt should be made to include these constructs in models linking mother's psychopathology and internalizing/externalizing symptoms in their offspring.

Future research that attempts to incorporate parenting behaviour in the maternal depression to adolescent outcome pathway should assess parenting constructs that have already been shown to be associated with the other variables being assessed. Parenting qualities that fulfill this requirement include: psychological control (e.g. Doyle & Markiewicz, 2005; Robila & Krishnakumar, 2006), warmth (Milevsky et al., 2007, Brennan et al., 2003), and criticism (e.g. Nelson et al., 2003). Of these variables, only criticism was included in the present study. In addition, the results of the present study suggest that inconsistency and lack of involvement are parenting characteristics that are predictive of youth outcomes, particularly disruptive behaviours. Thus, measuring all of

the parenting variables within a multi-level structural model would help to elucidate mechanisms of action that have already been identified.

Clinical Implications

The negative impact of maternal depression on outcomes in youth is well established. Consequently, it stands to reason that treating and reducing depression levels in mothers should result in better psychological and emotional functioning in their daughters. This hypothesis has been supported in clinical outcome research (Gunlicks and Weissman, 2008). The present study suggests that at least some of the impact of maternal depression occurs via the way in which mothers parent their daughters. As a result, targeting parenting skills as a focus of clinical intervention may be prudent. Based on the present results, mothers who can be taught to parent in a less critical, more involved, and more consistent way are likely to have daughters who experience a stronger relationship with them and thus fewer problem outcomes. Choosing to intervene clinically with parenting skills training may be especially important for mothers whose depression is particularly chronic or treatment resistant.

Despite the influence of parenting, attachment, and maternal depression on predicting daughters outcomes over time, the greatest predictor of externalizing symptoms or depression over one year were the symptoms reported at the initial assessment. This finding indicates a relative stability in these symptoms and suggests that once established these problematic behaviours and emotional experiences may require direct clinical intervention in addition to the treatment for depression that mothers may receive. Clinically speaking, preventing these outcomes from arising in daughters via treating mothers' depression and/or parenting skills training may be the most prudent

course of action. Given the relatively low level of clinically-significant psychopathology in a group where half of the participants was at high risk for developing significant symptoms, suggests the prophylactic nature of the twice a year meetings. The long-term value of providing at risk youth with semi-regular opportunities to discuss their emotional and psychological functioning should be studied.

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