The Role of Paternal Support in the Behavioural Development of Children Exposed to Postpartum Depression

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Abstract

Fathers' ability and availability to provide social support to their depressed partners and thus promote their children's development and success may be influenced by their workforce participation, health, and years of education. This study of 626 children and their families examined the influence of fathers' characteristics on their children's behavioural development, when exposed to maternal postpartum depression, taking into account known covariates, including sex of the child, family structure, number of children in the household, annual income, and family functioning. For the behavioural outcomes of anxiety, hyperactivity, and aggression, fathers' workforce participation during the children's first 2 years of life significantly predicted their development over the next 10 years. Most notably, weekend work by fathers was a risk factor, particularly for boys. Thus fathers' characteristics related to their ability and availability to provide social support for their depressed partner appear to predict children's developmental success.

Keywords

child health; development; family; mental health/pyschosocial; post-partum care; social support

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Postpartum depression (PPD), sometimes referred to as childbearing depression, affects 13% of mothers and constitutes a major health problem for families (Whiffen, 2004). Characterized by the disabling symptoms of dysphoria, emotional lability, insomnia, confusion, acute anxiety, guilt, and suicidal ideation, PPD is a strong predictor of both depression in fathers and behavioural problems in children (Goodman, 2004). Frequently exacerbating these symptoms, many women are reluctant to seek help for their PPD symptoms, even from their partner, who is most often the child's father (Letourneau et al., 2007). While it is apparent that children exposed to both PPD and paternal depression are at dual risk for developmental problems (Elgar, Mills, McGrath, Waschbusch, & Brownridge,

2007), little is known about how the availability of social support from fathers may protect children from the deleterious effects of exposure to PPD.

Postpartum Depression and Children's Development

The impact of maternal PPD on child development is well documented. Postpartum depression affects maternal-infant interaction and attachment and predicts poor social and cognitive developmental outcomes (Beck, 1998; Bialy, 2006; Campbell et al., 2004; Grace, Evindar, & Stewart, 2003; Kurstjens & Wolke, 2001; Murray & Cooper, 1996, 1997a, 1997b, 1997c, 1999; Murray, Cooper, Wilson, & Romaniuk, 2003; Murray, Fiori-Cowley, Hooper, & Cooper, 1996; Murray, Sinclair, Cooper, Ducournau, & Turner, 1999). Longitudinal research by the first author has shown that boys are particularly vulnerable to the effects of PPD, predicting increased incidence of hyperactivity and aggression between 2 and 8 years of age (Letourneau et al., 2006). Children's development is also influenced by the presence of two parents in the home, family income, and number of children in the household (Letourneau et al., 2006; Willms, 2002). Children's relationship with their father also predicts long-term behavioural outcomes (Ramchandani, Stein, Evans, & O'Connor, 2005). Fathers may promote their children's development by being sensitive and responsive to their changing needs (Goodman, 2004), protecting their partner against a depressive relapse (Misri, Kostaras, Fox, & Kostaras, 2000), or buffering their children from the negative effects of PPD (Tannenbaum & Forehand, 1994;Thomas, Forehand, & Neighbors, 1995). However, when fathers with depressed partners become depressed as well, the comorbidity can have an additive effect on child development; children residing with two depressed parents are at significantly greater risk for poor social, emotional, and developmental outcomes (Brennan, Hammen, Katz, & LeBrocque, 2002; Dierker, Merikangas, & Szatmari, 1999; Meadows, McLanahan, & Brooks-Gunn, 2007).

PPD and Parenting in the Postpartum Period

Fathers whose partner suffers from PPD report increased dissatisfaction with the relationship, including sexual problems and lack of intimacy (Meignan, Davis, Thomas, & Droppleman, 1999). Men's assessment of fatherhood as either beneficial or burdensome may be directly linked to their perception of stressors and the availability of support from their partner in the postpartum period (Garfield, Clark-Kauffman, & Davis, 2006). A mother with PPD is less capable of being supportive of her partner, which in turn may reduce the father's supportiveness of his young family. Further, the emphasis on the man's role as breadwinner may be increased due to the added financial burden after the birth, which in turn may prevent the father from becoming more involved in parenting and more supportive of his partner. A sense of failure in performance at work, within the family, and sexually, as part of the emphasized male gender role, is clearly related to psychological distress and mental health problems among fathers, which can further reduce their availability to the partner (Morse, Buist, & Durkin, 2001). Postpartum depression thus creates multiplicative risks to children's development associated with marital distress and the ability of both mothers and fathers to be adequately involved and invested in family activities that support children's development.

Maternal PPD and Fathers' Health in the Postpartum Period

While maternal PPD has been much researched in the past decade, little is known about the impact of PPD on fathers and the consequences for child development. For fathers, increased societal expectations, demands, and responsibilities during the postpartum period create stressors that can lead to depression (Kim & Swain, 2007). A systematic review of 20 studies revealed that when mothers experience depression, 24% to 50% of their partners will also experience depression (Goodman, 2004). In a Canadian national sample, 10% of fathers exhibited symptoms of depression in the postpartum period (Paulson, Dauber, & Leiferman, 2006). Paternal depression tends to develop more gradually than maternal PPD (Kim & Swain, 2007), typically appearing with the onset of the PPD and increasing during the first postpartum year (Matthey, Barnett, Ungerer, & Waters, 2000). It is often the consequence of more severe maternal symptoms that reduce a woman's ability to look after herself and her child, thus increasing the burden on the father (Pinheiro et al., 2006). Fathers are known to underreport symptoms of depression in the post-partum period (Skrenden et al., 2008).

Fathers' Employment, Socio-economic Status, and Child Development

Families affected by PPD may be particularly vulnerable to the stress associated with non-standard work schedules. Increased hours of paid employment outside the home, combined with a non-standard work schedule, may negatively affect the amount of social support fathers can provide to their partner and the amount of time they have available for family activities (Turcotte, 2005). Unlike new mothers, new fathers tend to increase their hours of work outside the home, leaving them less time to participate in leisure activities with their children (Paull, 2008). On the other hand, new fathers have been found to become more engaged in intergenerational and extended family interactions (Knoester & Eggebeen, 2006). Fathers' involvement in child care has been negatively associated with lower family income and lower paternal education (Fagan & Iglesias, 1999).

Fathers' level of satisfaction with long hours of work is an important factor in the relationship between work hours and health and well-being (Gray, Qu, Stanton, & Weston, 2004). While the standard work week has traditionally been defined as 8 hours a day, 5 days a week, the evolution of a 24-hour economy has led to a redefinition of the typical work week, to include evenings and weekends (Costa, 2000). Maternal employment, particularly during the first year of a child's life and when it entails a non-standard schedule (Han, 2005), negatively affects children's cognitive development (Ruhm, 2004). Joshi and Bogen (2007) studied the impact of non-standard schedules (nights, weekends, or rotating shifts) of low-income mothers on the behaviour of preschool children. They found an association between non-standard schedules and a higher incidence of externalizing behaviours such as aggression and hyperactivity. Strazdins, Clements, Korda, Broom, and D'Souza (2006) found that preschool children were more likely to have emotional or behavioural difficulties if one or both of their parents worked non-standard shifts (i.e., evenings, nights, weekends), mediated by reduced family functioning. How fathers' work schedules and education level affect children's development, particularly when their partner has PPD, is unknown. We found no studies that used longitudinal population-based data to examine the effects of

fathers' employment characteristics on the development of children prone to poor developmental outcomes associated with maternal depression.

Theoretical Model

The Clinical Model of Parent-Child Interaction, adapted from Letourneau (1997), formed the theoretical foundation for this study. Based on concepts of risk and resiliency (Garmezy, 1985; Rutter, 1987), the model identifies: (1) Risk Factors (under Assessment) to children's development, including parental health problems such as PPD; (2) Protective Factors (under Intervention) regarding social support and quality of the parent-child relationship; and (3) Resiliency (under Outcomes), characterized by cognitive and behavioural development. In this study of families affected by PPD, fathers' characteristics (including health and workforce participation) are theorized to relate to their ability/availability to provide social support to mothers and children in the home, which in turn relates to children's behavioural development.

The purpose of this descriptive study of families affected by PPD was to determine the impact of fathers' characteristics (relative to the availability of social support) on children's behavioural development. The research question was as follows: In the face of maternal PPD, what is the impact of fathers' health and workforce participation on their children's behavioural development, taking into account family structure, the sex of the child, number of children in the household, socio-economic status, and family functioning?

Method

Because earlier analyses revealed differences in the development of children born to mothers with and without PPD (Letourneau et al., 2006), this study was focused explicitly on families affected by PPD. Thus factors that promote children's development in families affected by PPD could be explicitly examined. Data from 626 of the families included in the National Longitudinal Survey of Children and Youth (NLSCY) were used to address the research question using logistic Hierarchical General Linear Modelling (HGLM). The NLSCY, launched by Statistics Canada in 1994, tracks the development, health, and well-being of a nationally representative sample of children. The original cohort of children were interviewed every 2 years. Six cycles of NLSCY data were available at the time of the present study: Cycle 1 (1994–95), Cycle 2 (1996–97), Cycle 3 (1998–99), Cycle 4 (2000–01), Cycle 5 (2002–03), and Cycle 6 (2004–05). In the present study, children (0 to 24 months inclusive) identified in Cycle 1 were followed through at least two subsequent cycles, up to age 149 months (12.5 years), to create growth trajectories for behavioural outcomes. Many of the predictor variables used in this study were designed to evaluate only children under 24 months, while the outcome measures were designed to evaluate children 24 months and older. Therefore, information for the predictor variables was extracted from Cycle 1 data whereas information for the outcome measures was extracted from subsequent cycles. All data were obtained via maternal report.

Participants

The population of interest was children whose mothers reported being depressed within 2 years of their birth. Children were eligible based on three criteria: their mothers scored high (9 or higher) on the depression measure (CES-D) or had been diagnosed as depressed in Cycle 1; their parents were partnered at the time of the birth and the children lived with at least one biological parent; and their father cohabitated with their mother at the time of the birth and during at least two subsequent cycles. Partners were eligible if they were a biological, foster, or step parent. When there was more than one child in the family, the oldest child was selected; in the event of multiple births, one child was randomly selected. The eligibility criteria also required that the person who provided survey responses, known as the person most knowledgeable (PMK), be the biological mother of the child. The sample size was maximized through the inclusion of children surveyed in Cycle 1 (for predictor variable information) and at least two subsequent cycles (2, 3, 4, 5, or 6). A total of 626 children (615 with completed data) were included in the sample. Table 1 details the cycle participation of these 626 children.

Measures

Postpartum Depression

Maternal depression was measured using the NLSCY Depression Scale, based on the National Institute of Mental Health's Center for Epidemiological Studies Depression (CES-D) scale (Radloff, 1977). The full CES-D (20 items; scores range from 0 to 60 and a score of 16 represents a classification of depression) was rescaled to produce a shortened version (12 items with scores ranging from 0 to 36) with a cut-off proportional to that of the full CES-D. Thus the cut-off for depression on the 12-item NLSCY Depression Scale was set at 9. Cronbach's alpha for the 12-item scale was 0.82, slightly lower than the reliability of the full 20-item scale (0.85) (Somers & Willms, 2002). In this study, the PMK (which is the biological mother for the selected subsample) was considered to be depressed if she had a score of 9 or higher on the NLSCY Depression Scale or if she reported a diagnosis of PPD.

Behavioural Outcomes

The measures of anxiety, hyperactivity, and aggression were designed to assess aspects of behaviour in children 2 years and older. The *anxiety* measure included items such as "How often would you say that your child is too fearful or anxious?" and "How often would you say that your child is worried?" Examples for *hyperactivity* include "How often would you say that your child is distractible or has trouble sticking to any activity?" and "How often would you say that your child can't sit still or is restless or hyperactive?" The *aggression* measure included the following: "How often would you say that your child gets into fights?" and "How often would you say that your child kicks, bites or hits other children?" (Statistics Canada, 1998). Possible PMK responses to these items were 1 = *never or not true,* 2 = *somewhat or sometimes true,* and 3 = *often or very true,* with higher scores indicating increased presence of the behaviour. For ease of interpretation, dichotomous variables were created for each measure. A score of 0 was assigned if the score was less than or equal to 2 and 1 if the score was greater than 2. Cronbach's alpha reliabilities for the behavioural

measures in Cycle 1 are as follows: anxiety, 0.59; hyper-activity, 0.80; aggression, 0.75 (Statistics Canada, 1998).

Predictors Related to Fathers' Support Availability[1]

Workforce participation was measured using several variables, including employment status (i.e., employed or unemployed), work schedule (e.g., Monday to Friday and standard business hours [9 a.m. to 5 p.m.]), full-time or part-time status, and weekend work. *Employment status* was measured using a dichotomous variable: 1 (employed); 0 (unemployed). Full-time status (30 hours or more per week) and part-time status (less than 30 hours per week) were measured using a dichotomous variable where full-time was coded 1 and part-time was coded 0. Standard schedule was measured using a dichotomous variable where 1 corresponds to standard days and standard hours and 0 corresponds to one of the following: standard days/non-standard hours, non-standard days/standard hours, non-standard days/non-standard hours. Standard days refers to Mondays through Fridays and standard hours refers to a regular daytime schedule. A dichotomous variable was also created for fathers' weekend work, coded 1 if the father worked weekends and 0 if otherwise.

Mothers were asked to report on the state of their partner's *general health,* both physical and mental. No other measure in the NLSCY provides insight into fathers' mental health; thus this variable served as a general proxy. It was measured as a dichotomous variable with excellent (1), very good (2), and good (3) coded as 1 and fair (4) and poor (5) coded as 0.

Covariates

Sex of the child. This dichotomous variable was coded 1 for female and 0 for male. *Family structure.* A dichotomous variable was created and coded 1 if the child lived with both biological parents in all cycles and 0 if the child lived with only one biological parent in at least one cycle. *Number of siblings.* The child's siblings range in number from 0 to 9. This variable was included to account for the declining developmental achievement of children in larger families, related to the diminished time available for parents to be supportive and involved with each child (Iacovou, 2007; Nuttall, Nuttall, Polit, & Hunter, 1976; Polit & Falbo, 1988). *Household income.* Annual income was recorded in thousands of dollars and measured as a continuous variable ranging from 0 to 90 ($0–$90,000). *Fathers' years of education.* Fathers' education was measured as the total number of years of formal education, ranging from 0 to 20. This variable was centred on its Cycle 1 mean of 12 years. *Family functioning.* The NLSCY's questions related to family functioning were developed by researchers at the Chedoke-McMaster Hospital of McMaster University. This scale is used to measure various aspects of family functioning — for example, problem-solving, communication, roles, affective involvement, affective responsiveness, and behaviour control. The total score may vary between 0 and 36, with higher scores indicating family dysfunction. Cronbach's alpha coefficient for the 12 items is .87.

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[1]The NLSCY contains no data that directly measure the availability of social support from fathers. Its only measure of social support is perceived availability of support from professionals and the community, not from partners.

Analysis

Descriptive statistics were calculated to examine sample characteristics over time during the study period (birth to 12.5 years). Logistic HGLM was used to model the data longitudinally, specifically to examine children's behavioural growth trajectories. Hierarchical General Linear Modelling takes into account the clustering of observations by estimating a single model that describes data at two levels: within-child and between-child (Raudenbush & Bryk, 2002). Within-child differences summarize an observed pattern of an outcome variable across measurement occasions into a trajectory or functional relationship with time. Between-child differences are specified using coefficients denoting the effects of selected predictor variables. Logistic HGLM was used to explore the relationships among predictors, covariates, and children's initial level (centred at age 6; beta 0), rate of change (beta 1), and curvilinearity (beta 2) of each behavioural outcome. Quadratic terms were added to examine curvilinearity of the children's behavioural growth trajectories.

Beta 0 (fixed effects) coefficients are interpreted as the probability (log odds) of a child having a high score on a given outcome (i.e., anxiety, hyperactivity, aggression) at 6 years of age, based on predictor scores (e.g., father's weekend employment, family functioning). Beta 1 (slope) coefficients are interpreted as the rate of change over time in the relationship between the predictor and the outcome. Beta 2 (acceleration) coefficients are interpreted as the probability that the relationship between the predictor and the outcome is curved (not linear). Perhaps most important for our understanding of statistical relationships is the need to consider the fixed effects coefficients, as these are the starting point (i.e., initial level) for the slope and curvilinearity interpretation. To interpret the direction of the relationship between each predictor and outcome, the intercept for each significant coefficient is examined to determine the starting point. Alpha was set at .05, so that significant coefficients indicated that the relationship between the predictor and the outcome was significantly greater than that observed by chance. Sampling weights were not used, as the goal of the study was to examine relationships, not to generalize to the Canadian population.

Results

Table 2 contains descriptive data for demographic and predictor variables from Cycle 1. Table 3 provides the percentages of children who scored high (greater than 2) on the outcome measures in each cycle, with descriptive comparisons to national data. As is evident from Table 3, high *anxiety* scores increase up to Cycle 6, while high *hyperactivity* and *aggression* scores decrease over time. Table 4 reports significant logistic HGLM results for behavioural outcomes. Figure 2 shows graphed trajectories that take significant sex differences into account. In general, children whose fathers work on weekends have higher scores on the behavioural outcomes; this result is most notable for boys.

Anxiety

The HGLM results reveal that children whose fathers work on weekends during their first 2 years of life have higher anxiety scores than children whose fathers do not work on weekends, for the fixed effect and slope coefficients. Moreover, the slope coefficient reveals that the rate of change for children whose fathers work on weekends is significant and

negative; thus the slope is decelerating over time. Curvilinearity was present, but not significant, in this relationship. These data are graphed with comparisons between males and females in Figure 2. Fixed effects results also reveal that living in an intact family where the father works full-time and has more years of education lowers the probability of anxiety at 6 years of age, while living in a household with a high family functioning score (indicating more dysfunction) increases the probability of high anxiety scores for children at 6 years of age.

Hyperactivity

Fixed effects coefficients reveal that the percentage of hyperactive children is lower for girls than for boys. For all children, however, the initial probability of having high hyperactivity scores increases as family dysfunction increases. Slope coefficients suggest that being in an intact family with two parents significantly reduces the rate of change in the percentage of hyperactive children, as does fathers' years of education. Therefore, while intact family status is not significantly related to the percentage of hyperactive children at 6 years of age, the slope comparing the two levels of the variable (intact vs. single-parent family) is significantly different and favours children's development in intact families over time. The slope coefficient for fathers' years of education suggests that the slope decelerates with increasing education, thus favouring children of fathers with more education over time.

Aggression

Fixed effects results reveal that children whose fathers work on weekends have higher aggression scores than children whose fathers do not work on weekends. Girls tend to have lower aggression percentages overall. Figure 2 reveals that boys whose fathers work on weekends have higher aggression percentages from 2 to 10 years of age. Living in a household with a higher family income and an employed father lowers the probability of aggression, while a higher degree family dysfunction and having more siblings raises the probability of aggression. Slope coefficients suggest that family dysfunction significantly increases the trajectory of the relationship between family dysfunction and aggression in children. Lower health status among fathers reduces the rate of change of the slope; however, the fixed effect coefficient is not significant, which indicates that essentially there is no difference between fathers with high and low health status in terms of children's aggression scores.

Discussion

In the face of maternal PPD, what is the impact of fathers' health and workforce participation on their children's behavioural development, taking into account the sex of the child, family structure, number of children in the household, socio-economic status, and family functioning? The findings show that fathers' workforce participation in the first 2 years of a child's life has a long-term impact on the behavioural outcomes of children in families affected by PPD. We found that children's anxiety and aggression scores over time were affected by fathers' full-time work, weekend work, and employment status, taking covariates into account. Weekend work was a consistent predictor of a higher degree of behavioural problems in each outcome variable, while other non-standard work hours failed

to predict behavioural outcomes. Partial support for these findings is found in previous research on the influence of non-standard work schedules on children's behavioural outcomes (Joshi & Bogen, 2007; Strazdins & Loughrey, 2007). In keeping with the theoretical framework, the availability of support from fathers during children's first 2 years of life appears to have a protective effect on their behavioural development over the next 10 years. Paternal availability thus appears to be a protective factor in children's development. This finding is balanced by the observation that full-time work also had a protective effect. Fathers need to work, but perhaps they should avoid weekend work.

Weekend work may interfere with normal family routines and the availability of support from fathers. Weekends are traditionally reserved for leisure activities, which are important to the development of strong and supportive family relationships. An ever-increasing number of new parents are working rotating shifts, perhaps in part to avoid the high costs of child care; however, the savings may not be worth the costs to the well-being of parents and their children. Perry-Jenkins and colleagues (2007) found that non-daytime shift work predicted high levels of depressive symptoms in both mothers and fathers during the first year of parenthood. In addition, the greater the reported family dysfunction, the more significant the symptoms of depression (Perry-Jenkins, Goldberg, Pierce, & Sayer, 2007). Poorly educated and low-income families tend to work more non-standard and weekend hours (Heymann, 2000). While the present study did not examine this interaction, it did find that income played a role in children's behavioural outcomes.

Limitations and Strengths

This study was limited by the lack of a measure of fathers' social support for their partner. However, the large size of the data set permitted the examination of long-term effects of fathers' characteristics associated with support availability on children's development over time. Due to the fact that only the PMK (mother) is assessed for depression, the role of possible concurrent paternal depression is unknown. In addition, maternal depressive symptoms are a factor only in Cycle 1, which does not consider the possible recurrence of maternal depression and potential compounding impacts on developmental outcomes. As well, this sample of children and partners of depressed mothers were not compared with children and partners of non-depressed mothers to assess whether the impacts of fathers' characteristics are a function of maternal depression. At the same time, the relationship between maternal depression and developmental impairments in children is well established (Beck, 1998; Letourneau et al., 2006). While only 5% of fathers were reported to be in fair to poor health, the size of the database was sufficient for robust comparison between healthy and unhealthy fathers. However, mothers may not have been aware of fathers' health problems, as fathers are known to underreport symptoms (Skrenden et al., 2008). Future work could consider improved measures of fathers' health status. While continuous (rather than binary) outcomes may have yielded more complex findings, the use of logistic HGLM nonetheless allowed for the graphing of children's behavioural growth trajectories to 12 years of age. Also, the addition of quadratic terms enabled the examination of nonlinear trends.

In spite of the above limitations, this study is the first to point to the effect of fathers' characteristics, associated with their support availability in families affected by PPD, on children's long-term behavioural outcomes.

Conclusion

The results of this longitudinal study demonstrate that the negative impact of maternal depression on children's social development may be mediated by fathers' characteristics related to their availability to provide family support. Moreover, these results and the findings of other research suggest that early environmental exposure to maternal depression is associated with negative behaviours in children, extending into adolescence, that may be mediated by father involvement (Halligan, Murray, Martins, & Cooper, 2007). Further research is needed to explore the duration of PPD effects on child/youth development and how fathers' characteristics contribute to these developmental outcomes.

Much of the research exploring the effects of work schedules on children's development has looked at the impact of maternal employment on young children. Little research has been concentrated on the effects of dual-earning parents on family relationships, especially with respect to non-standard work hours and adolescent development (Davis, Crouter, & McHale, 2006). Descriptive and longitudinal research is warranted, to more fully explore how non-standard work schedules impact on father involvement and both early child development and development over time. Workplace policies should recognize the importance of flexibility and paid personal time in order for parents to maintain strong and supportive family relationships throughout childhood (Thornthwaite, 2004). Fathers tend to be more reluctant than mothers to seek out support services (Summers, Boller, & Raikes, 2004). The evidence, while limited, suggests that interventions to promote father involvement, such as those offered through Head Start programs (Fagan & Iglesias, 1999), may be an important means of reducing the deleterious impacts of PPD on children's social and emotional development.

Almost 60% of Canadians who are employed outside the home are unable to balance their work and family demands (Statistics Canada, 2001). High levels of work-life conflict are more prevalent among those who have children, and a disproportionate number of low-income families experience difficulty striking a balance between work and home life (Heymann, 2000). Women are more likely than men to report high levels of role overload and caregiver strain; however, there is increasing evidence that fathers are having a difficult time balancing work and home life, particularly during the transition to parenthood (Knoester & Eggebeen, 2006). As expectations for fathers change and as fathers become more equal partners in child care and domestic responsibilities, they may experience higher levels of role strain that influence their ability to support both their partner and their children's healthy development.

Acknowledgments

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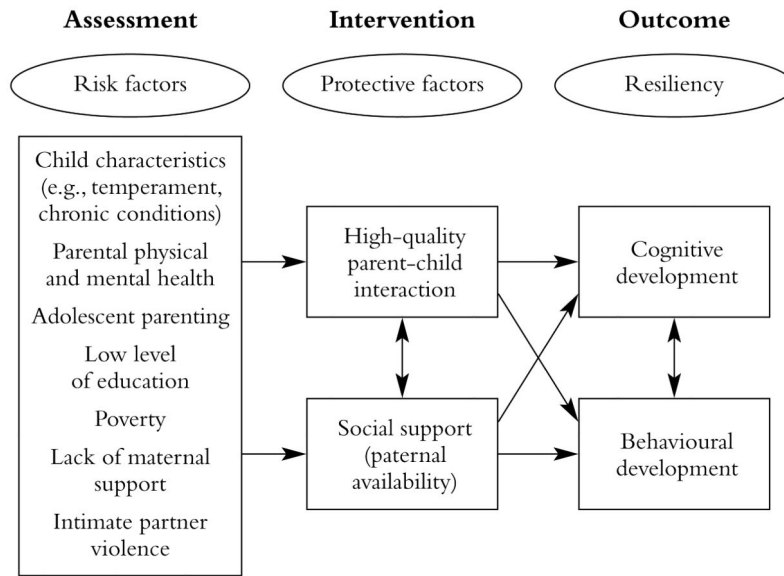
Figure 1.
Clinical Model of Parent-Child Interaction
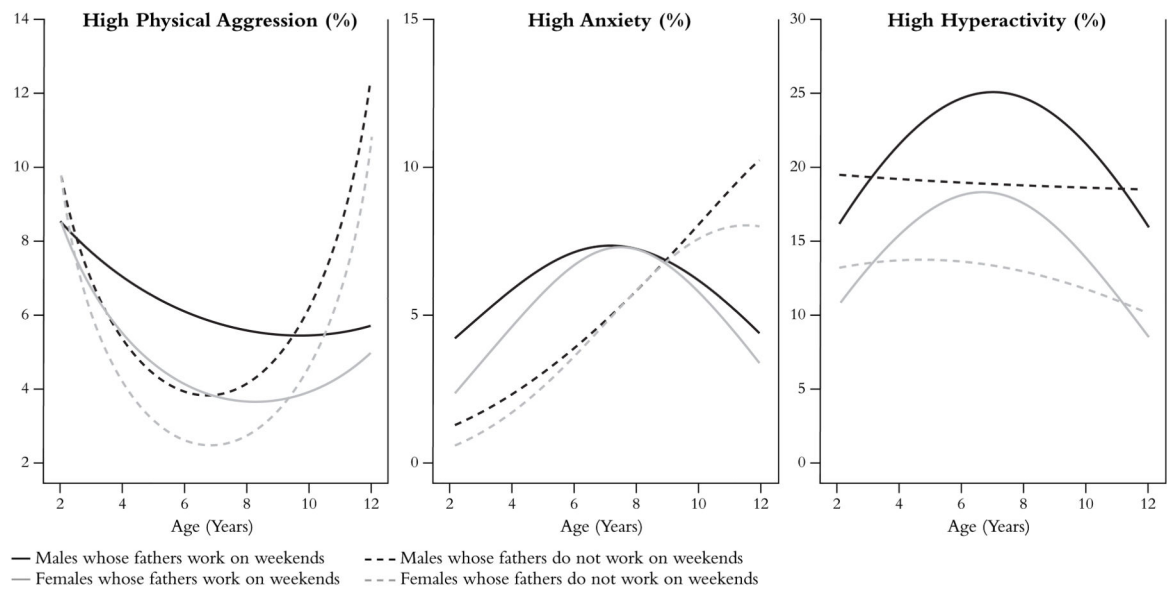*Source:* Adapted from Letourneau (1997).

Figure 2.
High Behavioural Outcome Scores (%) Comparing Children Whose Fathers Do and Do Not Work on Weekends
Note: The percentages are associated with: children who live in intact families with: one sibling, average household income, average family functioning, 12 years of paternal education, and paternal full-time work.

Table 1

Number of Children 24 Months or Younger in Cycle 1 Participating in Two, Three, Four, or Five Other Cycles of the NLSCY

	Number of Children (Cases)
Cycle 1 and two other cycles (total of three)	47
Cycle 1 and three other cycles (total of four)	40
Cycle 1 and four other cycles (total of five)	92
Cycles 1, 2, 3, 4, 5, and 6 (total of six cycles)	447

Table 2

Predictor and Covariate Statistics for Children of Depressed Mothers

Covariate/Predictor	Statistic
N	626
Intact family	68%
Family functioning	*Mean* = 9.98; *SD* = 5.37
Household income	*Mean* = $44,533; *SD* = $22,020
Father's years of education	*Mean* = 12 years; *SD* = 2 years
Number of siblings	*Mean* = 0.41; *SD* = 0.05; *median* = 1 (40%); *range* = 0–9
Female	49%
Father's standard work schedule	39%
Father's health = excellent, very good, or good	95%
Full-time employment	87%
Weekend work	44%
Employed	90%

Table 3

Percentage of Children Scoring High (Greater Than 2) on Behavioural Outcomes

Outcome Variable	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6
Anxiety	.80 (2.2)	1.5 (1.7)	**4.5 (1.7)**	**5.2 (2)**	**5.6 (1.8)**
Hyperactivity	**19 (13.2)**	**17 (12.2)**	**18 (11.5)**	**18 (11.1)**	**15 (11.6)**
Aggression	**8.0 (3.3)**	**3.6 (3)**	2.3 (3.6)	2.0 (3.3)	2.0 (3.5)

Note: Parentheses denote normative comparisons with NLSCY data for the entire sample using all age groups (birth to 18 years). **Bold type** indicates significantly higher (i.e., worse) behavioural outcomes for children of depressed mothers than for all children.

Table 4

Final Estimation of Fixed Effects: Significant HGLM Output for the Trajectory of Anxiety, Hyperactivity, and Aggression

Fixed Effect	Anxiety	Hyperactivity	Aggression
Intercept (log odds of having high score outcome at age 6), β_0			
Intrcpt2	**−2.72** (0.269)	−0.476 (0.335)	**−3.23** (0.261)
Female	−0.065 (0.106)	**−0.371** (0.122)	**−0.373** (0.095)
Intact	**−0.394** (0.124)	−0.212 (0.139)	−0.047 (0.110)
Family functioning score	**0.036** (0.011)	**0.031** (0.012)	**0.084** (0.010)
Household income	−0.000 (0.002)	−0.005 (0.003)	**−0.006** (0.002)
Number of siblings	0.095 (0.055)	−0.006 (0.064)	**0.411** (0.051)
Father's years of education	**−0.076** (0.028)	−0.046 (0.028)	−0.019 (0.017)
Full-time employment	**−0.889** (0.344)	−0.691 (0.394)	0.551 (0.289)
Father works on weekends	**0.624** (0.162)	0.313 (0.198)	**0.426** (0.161)
Father's employment status	0.568 (0.417)	0.241 (0.462)	**−1.078** (0.331)
Slope, β_1			
Intrcpt2	**0.316** (0.058)	0.045 (0.088)	**−0.092** (0.044)
Female	**0.062** (0.024)	−0.007 (0.029)	−0.043 (0.027)
Intact	**−0.064** (0.030)	**−0.077** (0.034)	−0.049 (0.033)
Family functioning score	−0.003 (0.002)	0.003 (0.003)	**0.006** (0.003)
Household income	**0.005** (0.001)	0.001 (0.001)	−0.001 (0.001)
Father's years of education	**−0.031** (0.007)	**−0.018** (0.007)	−0.008 (0.008)
Father's health	−0.032 (0.048)	−0.017 (0.071)	**0.219** (0.126)
Full-time employment	**−0.311** (0.104)	0.084 (0.114)	−0.022 (0.110)
Father works on weekends	**−0.157** (0.041)	0.054 (0.044)	0.016 (0.042)
Father's employment status	**0.424** (0.122)	−0.115 (0.126)	0.219 (0.126)
Acceleration, β_2			
Intrcpt2	**−0.064** (0.022)	**−0.052** (0.024)	−0.008 (0.013)
Family functioning score	0.000 (0.001)	**−0.002** (0.001)	**−0.004** (0.001)
Household income	**−0.001** (0.000)	−0.000 (0.000)	0.000 (0.000)
Number of siblings	0.004 (0.006)	0.005 (0.004)	**−0.009** (0.004)
Father's years of education	**−0.006** (0.002)	**0.005** (0.002)	0.001 (0.002)
Father's standard work schedule	−0.001 (0.012)	−0.021 (0.011)	**−0.026** (0.010)
Full-time employment	**0.065** (0.015)	0.007 (0.027)	−0.040 (0.030)
Father works on weekends	−0.011 (0.012)	−0.020 (0.012)	**−0.032** (0.010)

Note: Standard errors are enclosed in parentheses. Coefficients shown in **bold** are significant at an alpha level of 0.05.