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ORIGINAL ARTICLE

Mothering and Domestic Violence: A Longitudinal Analysis

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Abstract The quality of the relationships that parents, particularly mothers, have with their children is a potent predictor of children's future development. Recent research suggests that mothers of preschool-age children exposed to domestic violence may be more sensitive and responsive to their children than other parents. This heightened sensitivity and responsiveness in relationships may be key to the successful development of some children exposed to domestic violence; however this theory remains unexplored. The Canadian National Longitudinal Survey of Children and Youth provided a large sample size suitable for longitudinal analysis of the relationship between exposure to family violence and parenting behaviors. Analysis revealed that mothers of children exposed to domestic violence may indeed compensate for exposure to violence in their parenting interactions with their 2- to 12-year-old children.

Keywords Domestic violence · Parenting behaviors · Longitudinal study · Canadian children

Domestic violence is widely recognized to have profound effects on child development (Geffner et al. 2003b). However, some children from families with domestic violence develop well or are "resilient" in spite of this risk (Humphreys 1993; Rudo et al. 1998). The quality of relationships that parents, particularly mothers, have with their children is a potent predictor of children's future development (Bornstein 2002; McCain and Mustard 1999; Shore 1997; Sumner and Spietz 1994). Recent research suggests that some mothers of preschool-age children exposed to domestic violence may be more sensitive and responsive to their children than other parents (Levendosky et al. 2003). Such heightened sensitivity and responsiveness in relationships may be key to the successful development of some children exposed to domestic violence; however, this theory remains unexplored. By better understanding the reported parenting behaviors of mothers in families exposed to domestic violence, this study aims to uncover a potential strength in these families and help explain the resiliency of children exposed to domestic violence.

Estimates of women's lifetime exposure to domestic violence by husbands, partners or boyfriends range between 8% and 66% dependent upon the study sample (e.g., shelter versus non-shelter population) and definition of abuse (Browne 1993; Johnson and Sacco 1995; Jones et al. 1999; Morse 1995; Statistics Canada 2003; Straus and Gelles 1986; Sugarman and Hotaling 1989). Abuse may begin or intensify for women during pregnancy or pregnancy may be a reprieve from abuse (Campbell et al. 2004; Campbell and Parker 1999; Martin et al. 2001; McFarlane et al. 2002). Women who experience abuse during pregnancy tend to experience higher levels of violence and are at greater risk of having an attempt made on their life than non-childbearing women (McFarlane et al. 2002, p. 27). Experiencing violence before pregnancy tends to be predictive of later violence although violence begins in the postpartum period for some women (Campbell et al. 2004; Campbell and Parker 1999). Most significantly, preschool children under 5 years of age are disproportion-

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ately over-represented in households where women experience domestic violence (Fantuzzo 2002; Fantuzzo et al. 1991; Fantuzzo and Lindquist 1989).

Children exposed to domestic violence often suffer severe psychological and behavioral after-effects (Fantuzzo et al. 1991; Fantuzzo and Lindquist 1989; Hazen et al. 2006; Hughes 1988; Hughes and Barad 1983). A meta-analysis of 41 studies, occurring over 25 years, indicates that children's exposure to domestic violence predicts significant social and emotional problems (Wolfe et al. 2003). Furthermore, male children tend to display more externalizing behaviors including aggression and hyperactivity characterized by antisocial, active, and distractible behaviors than female children who tend to display more internalizing behaviors such as anxiety and withdrawal (Leinonen et al. 2003). Although exposure to domestic violence is considered a risk factor for children's development, some children do well in spite of being exposed to violence between their parental figures (Geffner et al. 2003a; Humphreys 1993; Kerig 2003). Reasons for variability in this outcome are unclear and little studied.

Most research to date examining the impact of domestic violence on relationships between parents and children focuses on older children, and frequently on the maternal behavior of child-directed aggression (Holden et al. 2000). Tolan et al. (2002) examined the relationship between maternal partner violence and parenting of adolescents and noted that violence exposure was negatively related to harsh parenting and unrelated to discipline practices. Hazen et al. 2006 conducted a longitudinal study examining the relationship between women's experiences with intimate partner violence and child behavior problems in 4- to 14-year-old children. They reported that intimate partner violence was associated with both externalizing and internalizing behavior problems in children and that parenting behaviors including corporal punishment and psychological aggression were significant moderators.

Children's mental health and developmental difficulties may be influenced by the quality of early relationships they have with their primary caregivers, usually mothers (Doyle and Moretti 2000; Garcia Coll and Meyer 1993; Letourneau, 2001; McCain and Mustard 1999; Sternberg and Williams 1995). Perry (1995) theorized that the developmental after-effects of violence for children may stem from parents' inability to establish an emotionally safe and secure environment characterized by a sensitive and responsive parent–child relationship. Behaviors characteristic of an optimal parenting relationship generally include sensitivity, responsiveness, warmth and nurturance, and consistency (Barnard, 1997; Bornstein, 2002). These features of parenting behaviors have seldom been considered in the family violence literature examining relationships between mothers and very young children.

With the exception of Levendosky's cross-sectional study of 3- to 5-year-old children, previous research has not explored the mother–child relationship as potentially mediating the effects of exposure to violence on children's development. Levendosky et al. (2003) found that domestic violence negatively influenced the quality of mothers' interactions with their preschoolers, but not consistently. In some cases, mothers exposed to domestic violence appeared to compensate in interactions by being very attentive and sensitive to their preschool children. There is a lack of longitudinal investigation of the impact of domestic violence on mothers' parenting behaviors.

Other variables are known to impact parenting behaviors, including social support, family functioning, maternal education, socioeconomic status, child gender and maternal depression (Willms 2002). Social support for parenting, characteristics of parents' support networks, and family functioning have been linked to the quality of parent–child relationships (Barnard 1997; Barnard et al. 1993; Letourneau et al. 2001). The quality of parent–child relationships is affected by the support parents receive from their adult relationships (Letourneau et al. 2001). Mothers in abusive, dysfunctional relationships are not likely to receive adequate support from partners for their parenting efforts and external sources of support are often necessary (Jouriles et al. 2000). Providing abused mothers with instrumental (e.g. transportation, clothing) and emotional (e.g. listening, encouragement) social support from a trusted adult combined with parent–child relationship training promoted more maternal warmth and involvement in interactions with their 4- to 9-year-old children (Jouriles et al. 2000). Parental nurturing behaviors were associated with cohesive, organized, low-conflict family environment in a longitudinal study (Bystritsky 2000). Maternal education, socioeconomic status (Sumner and Spietz 1994) and maternal depression (Beck 1995) are other well-known predictors of the quality of parent–child relationships and should be included in any analysis examining parenting as an outcome. Because child gender appears to predict behavior patterns that may differentially impact parenting behavior, child gender should be considered a potential confound in analyses of parenting behavior. Mothers of sons report more parenting stress than mothers of daughters (Scher and Sharabany 2005) while intimate partner violence predicts child abuse risk, but only in female children (Merrill et al. 1996).

As Levendosky et al. (2003) note, "none of the current published studies of young children examined mediating variables to understand the variance in children's behavioral and emotional adjustment in domestic violence families" (p. 275). This study begins to address this gap in the literature by examining differences in parenting between mothers in families who have and have not been exposed to domestic violence. The purpose of this study is to examine

changes over time in the parenting behaviors of mothers whose children were exposed to domestic violence in early life (between the ages of 24 and 47 months of age, inclusive), taking into account known covariates. It is hypothesized that reported parenting behaviors (*Positive Discipline*, *Warm and Nurturing Parenting* and *Consistent Parenting)* of mothers exposed to domestic violence will differ from parenting behaviors of mothers not exposed to domestic violence over time. The impact of known covariates including social support, family dysfunction, socioeconomic status (SES), maternal education, maternal depression and the sex of the child are also explored. It is hypothesized that differences will be observed between the parenting practices of mothers exposed to domestic violence and mothers not exposed, even after controlling for the covariates.

Method

Data from the National Longitudinal Survey of Children and Youth (NLSCY), a survey launched in 1994 by Statistics Canada to track the development, health, and well-being of a nationally representative sample of children in Canada over time, was used for the current study. Five cycles of NLSCY data were available at the time of the current study: cycle 1 (1994–1995), cycle 2 (1996–1997), cycle 3 (1998–1999), cycle 4 (2000–2001) and cycle 5 (2002–2003). The study is based on mothers of children who were between 24 and 48 months of age in cycle 1 and participated in at least one subsequent cycle. Specifically, children between the ages of 24 and 48 months of age in cycle 1 (1994–1995) of the NLSCY were identified and followed in subsequent cycles, up to 144 months (12 years of age).

The population of interest in this study was mothers and children exposed to domestic violence in cycle 1; the sample for analysis included mothers and children exposed and not exposed to domestic violence for comparative purposes. Additional selection criteria required that the person providing responses to survey items, known as the person most knowledgeable (PMK) was the biological mother of the child. In total, mothers of 3,245 children were included in the sample for analysis: 208 whose children were exposed to domestic violence between the ages of 24 and 47 months (inclusive) and 3,037 whose children were not.

Parenting Behaviors

The outcome measures for this study were three types of parenting behaviors, derived in a process similar to that described by Chao and Willms (2002), including *Positive Discipline*, *Warm and Nurturing Parenting* and *Consistent Parenting*. Ten items made up the scale for *Positive Discipline* (e.g. "How often do you have to discipline your child repeatedly for the same thing?" and "When your child breaks the rules or does things that he/she is not supposed to, how often do you calmly discuss the problem?"), six items made up *Warm and Nurturing Parenting* (e.g. "How often do you praise your child saying something like 'Good for you!' or 'What a nice thing you did!' or 'That's good going!'?" and "How often do you and your child talk or play with each other, focusing attention on each other for 5 minutes or more, just for fun?"), and five items made up *Consistent Parenting* (e.g. "When you give your child a command, what proportion of the time so you make sure that he/she does it?" and "When your child breaks the rules or does things that he/she is not supposed to, how often do you ignore it, do nothing?") (Sommer et al. 2000). Original item responses ranged from 1 to 5 with reverse coding of some questions, so that higher scores indicate more optimal parenting practices. These scores were converted to a zero to ten scale and the mean of items making up each construct was calculated, providing at least one of the items in the group was valid. The reliabilities of these dimensions in cycle 1 have been calculated as 0.76, 0.80, and 0.66, for *Positive Discipline*, *Warm and Nurturing* and *Consistent*, respectively (Chao and Willms 2002).

Predictors and Covariates

Exposure to domestic violence Exposure to domestic violence was measured by PMK response to the question "How often does the child see adults or teenagers in your house physically fighting, hitting or otherwise trying to hurt others?" This question was asked if the child was 24 months of age or older with potential responses of 'Often,' 'Sometimes,' 'Seldom,' and 'Never.' Responses were recoded into a dichotomous measure, where 'Never' was coded as 0 and all other responses were coded as 1. While this variable does not explicitly measure mothers' exposure to domestic abuse, for the purposes of analysis, it permits the separation of mothers and children exposed to domestic violence from those who reportedly are not exposed.

Social support A modified version of the Social Provisions Scale (Cutrona and Russell 1987) was used to measure global perceptions of support from family, friends and others. The scale included six items, each of which contain four response categories ranging from 0 (strongly disagree) to 3 (strongly agree) so that the total scale score ranged between 0 and 18, with higher scores indicating more social support. Factor analysis on the individual aspects indicated the presence of a single factor measuring global social support; as such, the individual aspects measuring social support were not examined separately in the analysis. The reliability for social support in cycle 1 was 0.82 (Statistics Canada 1998).

Family function Questions related to family functioning, developed by researchers at McMaster University, were used to provide a global assessment of family functioning and indicate the quality of relationships between parents or partners (Epstien et al. 1993). The scale included twelve items, each of which contain four response categories ranging from 0 (strongly disagree) to 3 (strongly agree) so that the total scale score ranged between 0 and 36, with higher scores indicating more family dysfunction. Sample items include "In times of crisis, we can turn to each other for support," "We avoid discussing our fears and concerns," and "There are lots of bad feelings in the family." The scale has been used widely to differentiate dysfunctional from more healthy families (Government of Canada 1996; State Government of Victoria 2001). Cronbach's alpha for the items in this scale in cycle 1 was 0.88 (Racine and Boyle 2002).

Maternal depression Maternal depression was measured as a dichotomous variable based on 12 items from the National Institute of Mental Health's Centre for Epidemiological Studies Depression (CES-D) scale (Radloff 1977). The dichotomous classification of depression used in this study is based on a method described by Somers and Willms (2002). The 12-item version of the CES-D (NLSCY Depression Scale) was rescaled to produce a cut-off proportional to that of the full, 20-item CES-D where scores range from 0 to 60 and a score of 16 represents a classification of depression. As such, the dichotomous cut-off for depression on the 12 item NLSCY Depression Scale, with scores ranging from 0 to 36, was set at 9. Mothers who scored 9 or above were coded 1 (depressed), and mothers who scored 8 or less (not depressed) were coded 0. The Cronbach's alpha of the 12-item scale was 0.82, slightly lower than the reliability of the full 20-item scale (0.85) (Somers and Willms 2002).

Maternal education, socioeconomic status (SES), and sex Maternal education was measured as the total number of years of formal education of the mother. SES was derived from five NLSCY variables including PMK years of schooling, spouse years of schooling, PMK occupational status, spouse occupational status, and household income. The occupational variables used in the derivation of SES were modified versions of the scale developed by Pineo et al. (1977) that groups occupations into 16 homogeneous categories and applies a logit transformation to express the 16 occupational categories on an interval scale. If no spouse was indicated, the primary caregiver's average over the three variables (years of schooling, occupation, and household income) was applied and imputed as the spouse's. The final SES composite was standardized to have a mean of 0 and a standard deviation of 1 for all families (Willms and Shields 1996). Finally, the sex of the child was measured by a dichotomous variable where females are coded 1 and males are coded 0.

Interaction Terms

A set of interaction terms were calculated to examine the differential impact of predictor and demographic variables (social support, family dysfunction, maternal depression, maternal education, SES, and the sex of the child) in combination with *Exposure to Domestic Violence*.

Analyses

Descriptive statistics were calculated to examine sample characteristics over time. Independent *t*-tests were conducted and effect sizes were calculated cross-sectionally to provide comparative data on sample characteristics. Hierarchical linear modeling (HLM) was used to model the data longitudinally, specifically to examine parenting behavior growth trajectories. HLM was used as data are collected on the same cases over multiple time points, rendering the observations dependent, and normal regression analysis inappropriate. Growth curve HLM takes into account the clustering of observations by estimating a single model that describes data at two levels: within-case and between-case (Raudenbush and Bryk 2002). Within-case differences, specified in the level-1 model, summarize an observed pattern of an outcome variable across measurement occasions into a functional relationship with time. A typical trajectory can be specified as follows:

$$Y_{it} = \beta_{0i} + \beta_{1i}X_{it} + \varepsilon_{it}$$

where Y_{it} represents an outcome score for the ith case at time t, X_{it} stands for each measurement occasion for the ith case, β_{0i} is the intercept of the underlying trajectory for the ith case, β_{1i} is the slope of the underlying trajectory of the ith case, and ε_{it} is the error term. Between-case differences are specified in the level-2 model, where the effects of variables on β_{0i} and β_{1i} are calculated using:

$$\beta_{0i} = \gamma_{00i}Z_{1i} + \gamma_{01i}Z_{2i} + \ldots r_{0i}$$

and

$$\beta_{1i} = \gamma_{10i}Z_{1i} + \gamma_{11i}Z_{2i} + \ldots r_{0i}$$

where γ_{00}, γ_{01}, etc. are coefficients denoting the effects of selected predictor variables, Z.

Longitudinal sampling weights are typically used to adjust for a complex multi-stage sample design and non-response of the original cohort over time. However, these weights do not take into account the design effect of the

Table 1 Details of HLM models 1 and 2

	Model 1	Model 2
Level-1 equation	$Y = \beta_0 + \beta_1(\text{age}) + R$	$Y = \beta_0 + \beta_1(\text{age})$
Level-2 equations	$\beta_0 = \gamma_{00} + \gamma_{01}(\text{violence}) + \mu_0$	$\beta_0 = \gamma_{00} + \gamma_{01}(\text{sex of child}) + \gamma_{02}(\text{violence}) + \gamma_{03}(\text{maternal depression}) + \gamma_{04}(\text{maternal education}) + \gamma_{05}(\text{SES}) + \gamma_{06}(\text{social support}) + \gamma_{07}(\text{family dysfunction}) + \gamma_{08}(\text{violence sex of child}) + \gamma_{09}(\text{violence maternal depression}) + \gamma_{010}(\text{violence maternal depression}) + \gamma_{011}(\text{violence SES}) + \gamma_{012}(\text{violence social support}) + \gamma_{013}(\text{violence family dysfunction}) + \mu_0$
	$\beta_1 = \gamma_{10} + \gamma_{11}(\text{violence}) + \mu_1$	$\beta_1 = \gamma_{10} + \gamma_{11}(\text{sex of child}) + \gamma_{12}(\text{violence}) + \gamma_{13}(\text{maternal depression}) + \gamma_{14}(\text{maternal education}) + \gamma_{15}(\text{SES}) + \gamma_{16}(\text{social support}) + \gamma_{17}(\text{family dysfunction}) + \gamma_{18}(\text{violence sex of child}) + \gamma_{19}(\text{violence maternal depression}) + \gamma_{110}(\text{violence maternal education}) + \gamma_{111}(\text{violence SES}) + \gamma_{112}(\text{violence social support}) + \gamma_{113}(\text{violence family dysfunction}) + \mu_1$

survey so that variance estimates are still underestimated (Pfefferman and Sverchkov 2003). Moreover, it may be argued that if the specified model is correct, sampling will not induce bias in the unweighted estimators of the regression coefficients (Chambers and Skinner 2003). Further, as the goal of the study was to examine relationships and not to generalize to the Canadian population, longitudinal weights were not employed in the HLM procedures.

Two models were created and analyzed to explain the relationship between children's exposure to domestic violence and changes in parenting behaviors: model 1 examined the differences in parenting behavior between mothers of children exposed and not exposed to domestic violence (*Positive Discipline*, *Warm and Nurturing Parenting,* and *Consistent Parenting*), and model 2 examined the differences in parenting behavior between mothers of children exposed and not exposed to domestic violence, taking into account the effects of other variables known to impact parenting (social support, family dysfunction, maternal depression, maternal education, SES, and the sex of the child) and interaction terms. Table 1 details each of the models.

Results

Table 2 compares the characteristics of mothers of children exposed and not exposed to domestic violence on the first (earliest) valid value of predictor and demographic variables. Mothers of children exposed to domestic violence appear to have higher levels of depression, less education and less available social support, and live in households with lower SES and higher levels of family dysfunction than mothers of children not exposed to domestic violence.

Cross-sectional comparisons between the mean values of mothers of children exposed and not exposed to domestic violence on the three parenting behaviors (*Positive Discipline, Warm and Nurturing Parenting,* and *Consistent Parenting*) by NLSCY survey cycle were made (Table 3). Effect sizes were also examined. Findings reveal that, for mothers of all children, *Positive Discipline* and *Consistent Parenting* increase, while *Warm and Nurturing Parenting* decreases through the five cycles of data. Moreover, mothers of children exposed to domestic violence have lower mean values on all three parenting behaviors in all cycles than mothers of children not exposed to domestic violence. Independent samples *t*-tests revealed that parent-

Table 2 Predictor and demographic statistics for children exposed and not exposed to violence

	Exposed to violence	Not exposed to violence
N	208	3037
Percent of children that are female	47.6	47.9
Maternal depression score (scale of 0–36 with ≥9 indicating depression)	7.63 (7.07)	5.02 (5.26)
Maternal education (years of formal schooling)	11.6 (1.84)	12.4 (2.10)
SES (number of standard deviations from the NLSCY average)	−0.602 (0.811)	−0.103 (0.962)
Social support (scale of 0 to 18 with higher values indicating more support)	13.7 (3.10)	14.7 (2.78)
Family dysfunction (scale of 0 to 36 with higher values indicating dysfunction)	10.5 (5.38)	8.00 (5.16)

Standard deviations are in parenthesis

Table 3 Cross-sectional outcome statistics for children exposed and not exposed to violence

Outcome variable (parenting behavior)	Cycle 1			Cycle 2			Cycle 3			Cycle 4			Cycle 5		
	Exposed	Not exposed	ES	Exposed	Not exposed	ES	Exposed	Not exposed	ES	Exposed	Not exposed	ES	Exposed	Not exposed	ES
Positive discipline	*6.07* (1.39)	*6.85* (1.22)	0.561	*6.71* (1.34)	*7.04* (1.15)	0.246	6.95 (1.20)	7.12 (1.09)	0.142	*6.93* (1.45)	*7.28* (1.09)	0.241	*6.97* (1.19)	*7.37* (1.10)	0.336
Warm and nurturing	*7.34* (1.50)	*7.93* (1.22)	0.393	*6.98* (1.30)	*7.32* (1.22)	0.261	*6.26* (1.36)	*6.62* (1.23)	0.264	*6.17* (1.40)	*6.42* (1.19)	0.179	5.96 (1.27)	6.22 (1.23)	0.205
Consistent	*6.68* (1.64)	*7.16* (1.70)	0.293	*7.03* (1.67)	*7.40* (1.59)	0.221	*7.16* (1.69)	*7.54* (1.58)	0.225	7.41 (1.59)	7.70 (1.52)	0.182	*7.35* (1.62)	*7.84* (1.50)	0.302

Standard deviations are in parenthesis
Significant differences (at $p<.05$) between means are in *italics*
ES: effect size

ing behaviors between the two groups of mothers significantly differ in every cycle on all outcome variables except *Positive Discipline* in cycle 3, *Consistent Parenting* in cycle 4 and *Warm and Nurturing Parenting* in cycle 5. Effect sizes for the differences between groups were somewhat larger in cycle 1, and declined over time, with the exception of the *Consistent Parenting* variable.

HLM was used to examine the relationship between predictor and demographic variables and initial level (when children were 24 to 48 months) and rate of change for each of the parenting behavior outcomes. Coefficients of each predictor or demographic variable report the effect of the variable (when the child was 24 to 48 months) on the *Positive Discipline*, *Warm and Nurturing Parenting*, and *Consistent Parenting* that mothers displayed between 2 and 12 years of age.

Table 4 reports HLM results for model 1 for each of the parenting behavior outcomes and indicates that mothers of children exposed to domestic violence display lower initial levels of *Positive Discipline*, *Warm and Nurturing Parenting,* and *Consistent Parenting* than mothers of children not exposed to domestic violence. Levels of *Warm and Nurturing* parenting behaviors decrease and *Positive Discipline* and *Consistent* parenting increase over time for mothers of all children. Exposure to violence lessens the degree of the decrease in *Warm and Nurturing*, but makes no difference for *Consistent* parenting. Mothers of children both exposed and not exposed to domestic violence show an increase in levels of *Positive Discipline* over time, but mothers exposed to violence show a sharper increase. Figure 1 portrays the trajectories of *Positive Discipline*, *Warm and Nurturing Parenting* and *Consistent Parenting* for mothers of children exposed and not exposed to domestic violence.

HLM results for model 2 for each of the parenting behavior outcomes are displayed in Table 5 which reveals that the main effect of children's exposure to domestic violence on mothers' initial display of *Positive Discipline*, *Warm and Nurturing Parenting*, and *Consistent Parenting* is negated when the predictor and demographic variables are included in the model. Maternal depression, social support and family dysfunction lower the initial level of *Positive Discipline*, while having a female child raises the initial level of *Positive Discipline,* particularly when exposed to domestic violence. Including the predictor and demographic variables negates the effect of children's exposure to domestic violence on the trajectory of *Positive Discipline* so that mothers of children both exposed and not exposed to domestic violence display the same decrease in *Positive Discipline* over time. Social support lessens this decrease and a significant interaction between exposure to domestic violence and maternal depression indicates that, particularly for mothers of children exposed to domestic

Table 4 Final estimation of fixed effects; HLM output for the trajectory of parenting behaviours; Model 1

Standard errors are in parenthesis
Coefficients in *italics* are significant at an alpha level of 0.05 (two-tailed)

Fixed effect	Positive discipline	Warm and nurturing	Consistent
Intercept (parenting behavior at age 2), β_0			
Intrcpt2, γ_{00}	*6.80* (0.023)	*8.05* (0.022)	*7.10* (0.031)
Violence, γ_{01}	*−0.702* (0.102)	*−0.543* (0.109)	*−0.451* (0.128)
Slope (increase in parenting behavior for one year of child's age), β_1			
Intrcpt2, γ_{10}	*0.069* (0.003)	*−0.235* (0.004)	*0.084* (0.004)
Violence, γ_{11}	*0.054* (0.016)	*0.038* (0.019)	0.002 (0.019)

violence, increased maternal depression lessens the decrease in *Positive Discipline* over time. Although there appears to be a main effect of family dysfunction that lessens the decrease in *Positive Discipline* over time, a significant interaction between exposure to domestic violence and family dysfunction shows that for mothers of children exposed to domestic violence, family dysfunction actually makes the decrease more pronounced. In addition, a significant interaction between exposure to domestic violence and the sex of the child indicates that mothers of female children exposed to domestic violence display a decrease in *Positive Discipline* over time.

Having a female child and increasing levels of family dysfunction decrease initial levels of *Warm and Nurturing Parenting*. *Warm and Nurturing Parenting* decreases with age for mothers in both groups, more so for those with male children.

Finally, no difference was observed in the initial levels of *Consistent Parenting* displayed by mothers of children both exposed and not exposed to domestic violence when the selected predictor and demographic variables are included in the model. Family dysfunction lowers initial levels of *Consistent Parenting* while maternal education and SES increase initial levels. There is no change in levels of *Consistent Parenting* over time for mothers in either group.

Discussion

The current study was an attempt to address gaps in the domestic violence literature by conducting an analysis of the relationships between parents and children exposed to domestic violence, with particular interest in the effects on parenting practices in families exposed to domestic violence with children under the age of four. As one of the most potent predictors of children's developmental success has been found to be the quality of the relationship they have with their parents (Garcia Coll and Meyer 1993; Letourneau et al. 2001; Sternberg and Williams 1995; Sumner and Spietz 1994), changes in this relationship over time is an important research issue and this study adds to the extremely limited collection of literature on the subject. Much of the research examining the effects of children's domestic violence exposure on parent–child relationships has been conducted on older children, even though,

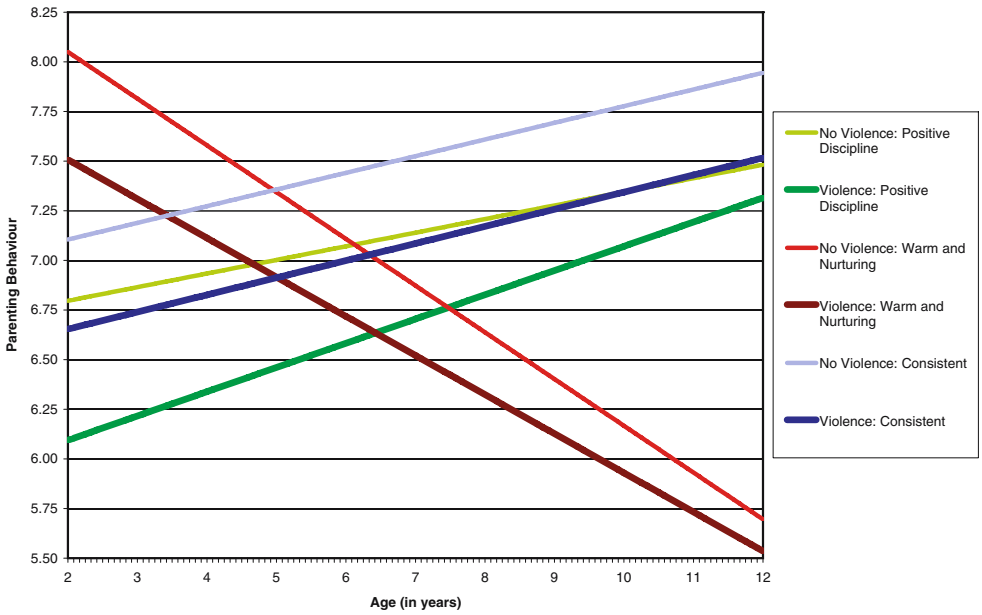

Fig. 1 Parenting behavior trajectories of the PMKs of children exposed and not exposed to violence (Source: NLSCY, 1994–2003)

Table 5 Final estimation of fixed effects; HLM output for the trajectory of parenting behaviours; model 2

Fixed effect	Positive discipline	Warm and nurturing	Consistent
Intercept (parenting behavior at age 2), β_0			
Intrcpt2, γ_{00}	*7.69* (0.253)	*8.23* (0.251)	*6.26* (0.357)
Sex of child, γ_{01}	*0.138* (0.044)	*−0.096* (0.043)	0.004 (0.060)
Violence, γ_{02}	−2.13 (1.20)	−0.912 (1.15)	0.589 (1.45)
Maternal depression, γ_{03}	*−0.044* (0.005)	−0.009 (0.005)	−0.009 (0.007)
Maternal education, γ_{04}	−0.000 (0.016)	0.009 (0.015)	*0.082* (0.022)
SES, γ_{05}	−0.018 (0.035)	0.004 (0.032)	*0.162* (0.048)
Social support, γ_{06}	*−0.058* (0.017)	0.004 (0.009)	0.024 (0.023)
Family dysfunction, γ_{07}	*−0.034* (0.006)	*−0.033* (0.005)	*−0.039* (0.007)
Violence·Sex of Child, γ_{08}	*0.383* (0.187)		
Slope (increase in parenting behavior for one year of child's age), β_1			
Intrcpt2, γ_{10}	0.051 (0.038)	*−0.268* (0.040)	*0.157* (0.053)
Sex of child, γ_{01}	0.004 (0.007)	*0.015* (0.007)	−0.010 (0.009)
Violence, γ_{02}	0.131 (0.164)	−0.078 (0.208)	−0.024 (0.192)
Maternal depression, γ_{03}	*0.003* (0.001)	0.001 (0.001)	−0.001 (0.001)
Maternal education, γ_{04}	−0.004 (0.002)	0.000 (0.002)	−0.006 (0.003)
SES, γ_{05}	0.003 (0.005)	−0.002 (0.005)	−0.008 (0.007)
Social support, γ_{06}	*0.005* (0.003)	0.001 (0.001)	−0.001 (0.003)
Family dysfunction, γ_{07}	0.001 (0.001)	0.001 (0.001)	0.002 (0.001)
Violence·sex of child, γ_{18}	*−0.085* (0.030)		
Violence·maternal depression, γ_{19}	*0.005* (0.003)		
Violence·family dysfunction, γ_{113}	*−0.007* (0.003)		

Standard errors are in parentheses
Coefficients in *italics* are significant at an alpha level of 0.05 (two-tailed)
Of the tested interaction terms, only significant terms are listed

according to Doyle and Moretti (2000) and McCain and Mustard (1999), children's mental health and developmental difficulties are more influenced by the quality of the early interactions that they have with their primary caregivers. The current study addresses this gap by focusing on the effects of exposure to domestic violence and its relationship to changes in the parent–child relationship during children's early years.

The results from model 1 support our first hypothesis that the trajectories of parenting behaviors differ between mothers of children exposed and not exposed to domestic violence. Mothers of children exposed to domestic violence display lower initial levels of all three parenting behaviors (*Positive Discipline*, *Warm and Nurturing* and *Consistent*) than mothers of children not exposed to violence. Parenting behavior scores generally decrease for *Warm and Nurturing* and increase for *Positive Discipline* and *Consistent* parenting as children age in both groups. However, the rates of change in two of the three parenting behaviours are different for mothers of children exposed and not exposed to domestic violence. Mothers of children exposed to domestic violence actually show a greater increase in *Positive Discipline* and less of a decrease in *Warm and Nurturing* behaviors compared to mothers of children not exposed. These findings support the assertion of Levendosky et al. 2003 that mothers exposed to domestic violence appear to compensate in parent–child interactions by being very attentive and sensitive to their children; in this case, with more *Positive Discipline*, *Warm and Nurturing*, and *Consistent* parenting.

Hypothesis 2, that differences in trajectories of parental behaviors between mothers of children exposed and not exposed to domestic violence would remain when maternal depression, maternal education, social support, family dysfunction and the sex of the child were controlled was not supported. The main effects of children's exposure to domestic violence on both the initial levels and rate of change of all three parenting behaviors were negated once these additional factors were introduced into the model. However, consistent with the literature, maternal depression appears to lower initial levels of *Positive Discipline* and family dysfunction lowers levels of all three parenting behaviors (Beck 1995; Leinonen et al. 2003). *Positive Discipline* is a measure of active, responsive disciplinary practices which take time and effort and *Warm and Nurturing* and *Consistent* parenting practices require attention and patience. If the mother is experiencing depressive symptoms or preoccupied with matters of familial discord, even in the absence of physical violence, she may have little energy, time, attention or patience to devote to these demanding types of parenting. Also consistent with the literature, maternal education and

increased SES both increase initial levels of *Consistent* parenting (Blair et al. 2003; Pears and Moses 2003; Prevatt 2003; Tesh and Holdtich-Davis 1997; Wendt 2002).

For both groups, *Consistent* parenting increases and *Warm and Nurturing* parenting decreases as children age. Family dysfunction reduces the initial levels of all three parenting behaviors and the significant interaction suggests that mothers exposed to violence and more family dysfunction have reduced *Positive Discipline* over time. Maternal depression and social support increase *Positive Discipline* over time. The interaction terms also revealed that exposure to violence in combination with maternal depression increase *Positive Discipline*. Perhaps families affected by dysfunction and maternal depression are more likely to be identified as needing and receiving additional community resources and assistance in targeted intervention programs (e.g. public health nursing visits), allowing mothers to parent more positively. However, the social support variable produced a negative affect on the initial level of *Positive Discipline*. These contradictory findings may be due to the truncated nature of the social support variable, developed specifically for the NLSCY, which may be inadequate to measure support received from programs. This deserves further study.

Consistent with the literature (Laflamme et al. 2002; Pevalin et al. 2003), male and female children were parented differently. Female children experience lower initial levels of *Warm and Nurturing* parenting and higher initial levels of *Positive Discipline* than male children, but a steeper increase in warmth and nurturance from their mothers as the children age. Moreover, exposure to violence in combination with being a female child produced less positive discipline over time.

Although this research addresses an important gap in the research literature on domestic violence, there are limitations. The item in the NLSCY that addresses children's exposure to domestic violence was only asked of PMKs of children aged 24 months and older; no information was available in this survey on younger children's exposure to domestic violence. This will be a subject of future studies by the investigators. Moreover, the definition of domestic violence in this research was delineated by the limits of the NLSCY item and, as a result, could not exclusively measure inter-partner violence (i.e. violence between spousal or common-law partners). The item was also limited to physical violence with no mention of exposure to verbal or psychological abuse. Measures of family dysfunction and the quality of relationships between parents or partners were included in the analysis, in part, to address this limitation.

In spite of the limitations, the NLSCY provided a large sample size suitable for the longitudinal analysis. Longitudinal analysis permitted further examination of the observation of Levendosky et al. 2003 that parents of children exposed to domestic violence may compensate in parenting interactions with their preschoolers. This analysis was able to observe a similar compensatory trend observed to age 12.

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