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Temperament as a moderator of the effects of parenting on children's behavior

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Abstract

This study examined the role of child temperament as moderator of the effect of parenting style on children's externalizing and internalizing behaviors. A series of structural equation models were fit to a representative sample of 2,631 Canadian children from the National Longitudinal Survey of Children and Youth. In addition to testing for the presence of Temperament × Parenting interactions, these models also examined the direct and indirect effects of a number of additional contextual factors such as neighborhood problems, neighborhood cohesion, social support, and maternal depression. The results indicate that exposure to more positive parenting reduces behavior problems in children with difficult/unadaptable temperaments. No moderating effects of temperament on hostile parenting were found. Such results serve to highlight the pivotal role of positive features of the rearing environment as catalysts for the successful adaptation of children with difficult/unadaptable temperaments. The results of this modeling work also serve to emphasize the importance of considering the ways in which more distal factors can affect children's behavioral adaptation by contributing to changes in proximal family processes.

Early temperamental dispositions represent critically important antecedents of children's future psychosocial adjustment. Temperament is characterized by a combination of innate characteristics regarding specific emotional, motoric, attentional, and self-regulating processes that are first apparent in infancy and maintain a relative stability over time (Rothbart & Bates, 1998). Such innate dispositions exert an impact on the infant's emotional reactivity to external stimuli and his/her capacity to adapt to the changing environment (Allport, 1961; Buss & Plomin, 1984; Rothbart & Bates, 1998). A number of studies have related children's temperamental disposition to the development of two distinct clusters of maladaptive behavioral symptoms, namely, *externalizing* behaviors that reflect the inability to promptly inhibit impulses and the tendency to manifest aggressive behavior, and *internalizing* behaviors such as excessive worrying, general low emotional tone, and social withdrawal. With respect to the development of externalizing behaviors, early negative emotionality, irritability, and frustration (i.e., difficult temperament; Bates, Freeland, & Lounsboury, 1979) have consistently been associated with impulsive and aggressive conduct across childhood (Bates, Bayles, Bennet, Ridge, & Brown, 1991; Eisenberg et al., 1997; Guerin, Gottfried, & Thomas, 1997; Shaw, Owens, Giovannelli, & Winslow, 2001; Stringaris, Maughan, & Goodman, 2010; Zhou et al., 2008). Research has also identified early temperamental traits characterized by fearfulness and withdrawal from novelty (i.e., unadaptable temperament; Bates et al., 1979) as important precursors of children's internalizing behaviors (Bates, 2000; Kagan, Reznick, Clarke, Snidman, & Garcia-Coll, 1984; Keiley, Bates, Dodge, & Pettit, 2002; Manassis & Bradley, 1994; Rapee & Coplan, 2010; Sanson, Hemphill, & Smart, 2004).

Notwithstanding the pivotal role that temperamental dispositions have in predicting problem behaviors in childhood, single risk factors are likely to account for only a small proportion of variance in developmental outcomes. For these reasons, current research has emphasized the need to incorporate other relevant ecological and contextual factors when studying temperament as a predictor of individual differences in behavior (Gallagher, 2002; Nigg, 2006). Among a multitude of contextual factors influencing children's behaviors, parenting practices appear to be an important aspect of children's psychological adjustment (Collins, Macobby, Steinberg, Hetherington, & Bornstein, 2000). Generally, positive parenting has been considered fundamental to all aspects of healthy child development. It is through sensitive and responsive parenting behavior that parents fulfill the child's basic needs for physical proximity, interpersonal relatedness, and intimacy, which are essential to the promotion of children's emotional, social, and intellectual growth (Ainsworth, Bell, & Stayton, 1974; Kochanska, 2002; Kochanska & Murray, 2000; McCain & Mustard, 1999; Pettit, Bates, & Dodge, 1997; Weatherston & Fitzgerald, 2010). Conversely, children

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whose basic developmental needs for emotional closeness, intimacy, and security are not adequately met are at increased risk for compromised mental health. Children raised in hostile parenting environments have been shown to report an increased risk for the emergence of emotional and behavioral problems both in childhood and later in adolescence (Bayer et al., 2008; Rutter, Giller, & Hagell, 1998; although note that an exception applies to studies conducted in high-risk areas where harsh/punitive parenting has been found to be related to better outcomes; Beyers, Bates, Pettit, & Dodge, 2003; Roche, Ghazarian, Little, & Leventhal, 2011).

Despite evidence for the contributions of both parenting and temperament to children's behavior, predictive models based on the main effects of such variables serve to reduce complex interrelationships to relatively simple linear expressions, thereby failing to fully elucidate the mechanisms responsible for developmental outcomes. Conversely, research that emphasizes the interactive effects of biological and environmental factors might be better able to capture heterogeneity in developmental pathways. Such research has typically been conducted within the framework of either the *diathesis stress* or the *differential susceptibility* paradigms. The diathesis–stress/dual-risk model (Monroe & Simons, 1991; Sameroff, 2000; Zuckerman, 1999) is based on the claim that early exposure to adversity contributes to the development of behavior and mental health problems in individuals manifesting early-life vulnerability factors, such as difficult temperament (Belsky, Hsieh, & Crnic, 1998; Belsky & Pluess, 2012), physiological reactivity (Walker & Diforio, 1997), or genetic makeup (Gunthert et al., 2007).

According to the differential susceptibility view (Belsky, 1997, 2005; Belsky, Bakermans-Kranenburg, & van IJzendoorn, 2007; Belsky & Pluess, 2009, 2010), children who manifest negative temperamental dispositions can exhibit a differential susceptibility to rearing influences, either for better or for worse. That is, children characterized as more temperamentally negative might not only be particularly susceptible to aversive parenting practices but also tend to display heightened behavioral malleability in face of favorable environmental influences (e.g., for fearful-inhibited infants see Gilissen, Bakermans-Kranenburg, van IJzendoorn, & van der Veer, 2008; Gilissen, Koolstra, van IJzendoorn, Bakermans-Kranenburg, & van der Veer, 2007; for difficult temperament see Bradley & Corwyn, 2008; Mesman et al., 2009; van Zeijl et al., 2007). A key premise of the differential susceptibility view is that such dispersion of vulnerability/plasticity genes is beneficial to future progeny in terms of both reproductive and inclusive fitness (Pluess & Belsky, 2010). Similar to bet-hedging strategies, generating offsprings who differ in their responsivity to the environment would not only increase the chances of survival of the "physically fit" ones in the face of adversity but also prove to be advantageous for the vulnerable ones when exposed to favorable conditions (Belsky, 2005). In such a way, the differential susceptibility framework has served to shed the light on the role that temperament has, not only as a source of risk, but also as a determinant of adaptive plasticity, thereby moving current thinking beyond the diathesis–stress-driven view.

In a more recent reformulation of their theory, Pluess and Belsky (2012) proposed the adoption of the term "vantage sensitivity" to indicate the propensity of an individual to prosper in a development-enhancing environment, although not necessarily be affected by adverse circumstances (as in the case of differential susceptibility). Correspondingly, vantage sensitivity represents the positive end, or the "bright" side of differential susceptibility, where increases in the level of functioning are manifested by individuals endowed with specific endogenous characteristics that render them more sensitive to exposure to high-quality environments. According to this latter view, temperamental traits are regarded as a marker of enhanced adaptability with respect to the promotion of both emotional and behavioral health. In sum, the research suggests that not all children are affected equally by their rearing experiences and that patterns of Parenting × Temperament interactions are important for understanding the complex relationships among proximal developmental processes, children's inherited dispositions, and behavioral outcomes.

Concurrent with recent advances made in the study of Parenting × Temperament interactions, an underpinning of research focused on the broader social–ecological framework has surged in the past few decades (for a review, see Kotchick & Forehand, 2002). In this vein, the bioecological model of Bronfenbrenner and Morris (1998, 2006) has provided a useful framework for research that aims to study the influence of multiple contextual factors on children's development. This model incorporates the dynamic interplay among innate biological processes (i.e., temperament), and the microlevel (i.e., family) and macrolevel (i.e., societal influences) factors that shape the individual's development over time (Bronfenbrenner & Morris, 1998). In line with such a multidimensional/multifaceted approach, various contextual factors, such as maternal depression and neighborhood quality, are viewed as potential sources of influence on development that exert both direct effects on children's behavior and indirect ones through their impact on parental behavior. As suggested by a large body of studies, children exposed to maternal depression during their early years are at risk for the development of mental health and behavioral problems throughout the life course (Bureau, Easterbrooks, & Lyons-Ruth, 2009; Davis, 2006; Lee & Gotlib, 1991; Lyons-Ruth, Easterbrooks, & Cibelli, 1997; Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997; Weissman et al., 2006). The negative impact of parental depression extends to various aspects of children's mental health, including self-development, self-esteem, and affect regulation (Cicchetti, Rogosch, & Toth, 1998; Cummings & Davies, 1999; Goodman & Gotlib, 1999). In addition, indirect effects of maternal depression on children's behavior are often manifested through parenting. Generally, symptoms of depression can interfere with mothers' ability to experience pleasure in their children's activities and engage in positive dyadic interactions with them (Leve, Kim,

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& Pears, 2005; Lyons-Ruth, Alpern, & Repacholi, 1998; Miller-Lewis et al., 2006; Rottenberg & Gotlib, 2004). Similarly, depressed parents often display impaired attention, withdrawal, and self-absorption that reduce their ability to focus on inputs from their children and limit their effectiveness in directing behavior toward child-oriented goals (Dix & Meunier, 2009). As a consequence, depressed mothers are more likely to engage in insensitive and coercive parenting (Bugental, 1992; Feng, Shaw, Skuban, & Lane, 2007; Hasting & Grusec, 1998; Patterson, 1982) and are generally emotionally unresponsive and less able to engage positively with their children (Jacob & Johnson, 1997; Lovejoy, Graczyk, O'Hare, & Neuman, 2000).

Distal features of the environment can also have an effect on children's developmental outcomes. With respect to such features, both neighborhood structural (i.e., lack of safety, problems, and social disorder) and functional (i.e., neighborhood collective efficacy) characteristics have been regarded as factors that can both directly and indirectly affect the adjustment of the developing child. The research on neighborhood structural characteristics shows that growing up in impoverished or violent communities puts children at increased risk for the development of problem behaviors (Attar, Guerra, & Tolan, 1994; McLeod & Edwards, 1995; Moren-Cross, Wright, LaGory, & Lanzi, 2006). Furthermore, children living in dangerous areas are more likely to be subjected to hostile parenting, given that caregivers tend to adopt such practices to a greater degree under more extreme circumstances (Earls, McGuire, & Shay, 1994; Pinderhughes, Nix, Foster, & Jones, 2001). Moreover, neighborhood problems can also contribute to the risk of children's psychological disorders by increasing the prevalence of parental depression (Belle, 1990; Brown, Bhrolchain, & Harris, 1975; Kim, 2010; Ross, 2000; Ross & Mirowsky, 2001).

Conversely, the presence of social bonds, trust, and social supportive relationships among neighborhood residents plays a crucial role in sustaining well-being under condition of high stress (Cobb, 1976; Leavy, 1983). In support of this notion, findings based on a recent examination of Canadian 0- to 11-year-old children confirmed the role of neighborhood collective efficacy (i.e., cohesion, trust, and reciprocity) as one of the mechanisms by which distal features of the social environment might affect children's behavior (Kohen, Leventhal, Dahinten, & McIntosh, 2008). In this particular study, neighborhood collective efficacy was associated with lower ratings of maternal depression and higher family functioning scores that, in turn, led to more positive parenting, and ultimately to a decrease in children's behavioral problems. Similarly, it has been shown that support provided by both members of the family (i.e., close relative and partner) and other extrafamilial sources of assistance (i.e., friends and health professionals) are essential to the promotion of individual well-being and the improvement of the life of children (Belsky, 1994; Cutrona & Troutman, 1986; Power & Parke, 1984). For instance, mothers who have strong social support networks tend to be less punitive and more responsive with their children (Colletta, 1979; Powell, 1980). Moreover, high levels of social support can help to buffer the effects of maternal depression on children's developmental outcomes through the enhancement of perceived self-efficacy in the parenting role (Cochran & Brassard, 1979).

In general, distal features of the broader contextual living environment, such as neighborhood quality, in addition to more proximal intrafamilial factors, such as the presence of maternal depression, contribute to general well-being of both children and their family members. In this light, any attempt made to understand the manner in which children's behavioral outcomes are influenced by Parenting × Temperament interactions should also account for potential effects of the broader ecological context such as those associated with the immediate family environment as well as other community-level factors. Such a multilayered approach can provide the means through which to detect the multiple co-occurring facets of the social and physical environments that affect the development of children.

The Present Study

Previous investigations have provided useful insights into the moderating effects of temperament on the association between parenting and children's behavior. In the present study, an examination of such interaction effects is conducted while also estimating the simultaneous contribution of a number of other key intrafamilial processes and macrolevel factors associated with children's behavioral outcomes. These relationships are conceptualized within four structural equation models. Two are *risk* models, which, in addition to temperament, include neighborhood problems, maternal depression, and hostile parenting as potential contextual risk factors affecting children's externalizing and internalizing behaviors (see Figures 1 and 2). Within the first risk model, the direct effect that difficult temperament (i.e., early tendency to manifest heightened irritability and frustration in response to environmental demands) has on future externalizing behavior is examined, whereas within the second risk model, the direct effect that unadaptable temperament has on future internalizing behavior is examined. The term *unadaptable* temperament here is used to indicate the child's fearful reactions to novel aspects of the environment (e.g., new people, toys, or places), which has often been examined in relation to internalizing behaviors. Within each of these risk models, the direct effect of hostile parenting and both the direct and indirect effects of neighborhood problems and maternal depression on the respective behavioral outcomes are also examined. Within each risk model, Temperament × Parenting interactions are tested by taking into account the role of temperament as a moderator of the relationship between hostile parenting levels and behavioral outcomes. Specifically, it is hypothesized that the presence of externalizing behavior problems should be greatly enhanced for temperamentally difficult children exposed to more hostile parenting practices. Similarly, higher levels of hostile parenting should have a greater impact on unadaptable children, compared to their more adaptable

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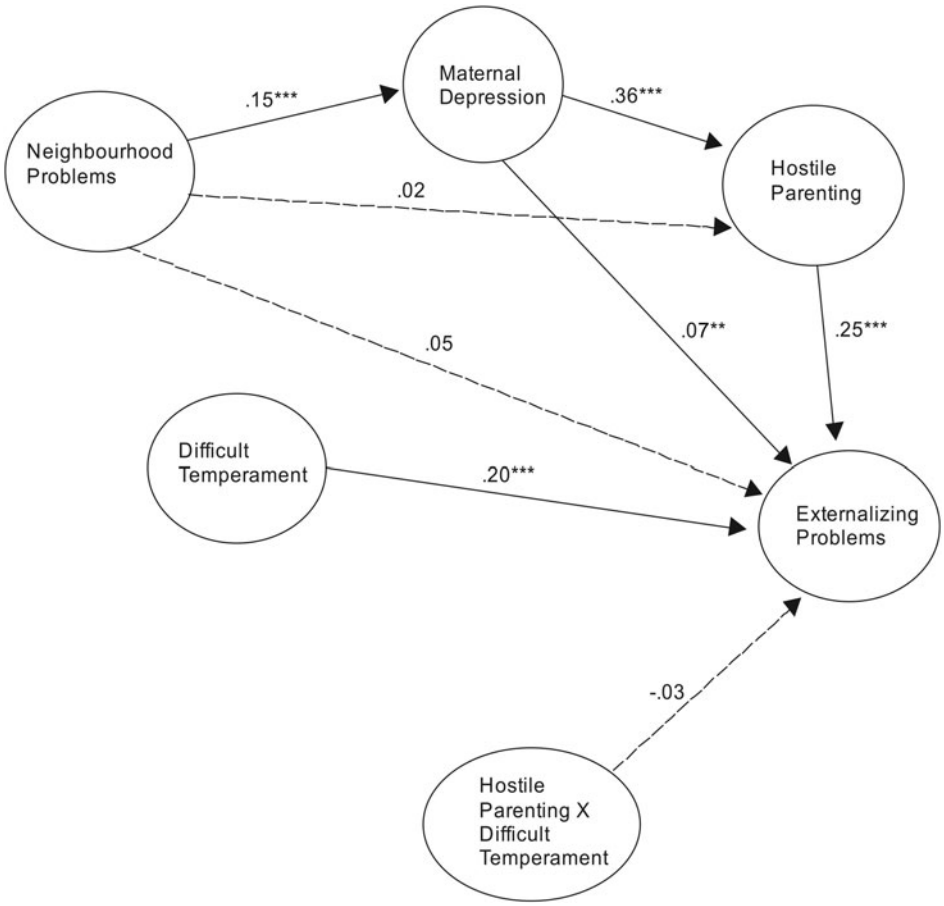

Figure 1. Structural equation modeling results for the first risk model. All path coefficients have been standardized and dashed lines indicate nonsignificant paths. $^{**}p < .01$. $^{***}p < .001$.

counterparts, with respect to the manifestation of internalizing behavior problems. Note that, for both cases, the interactive effects of temperament and hostile parenting are expected to be significant and positive in magnitude (i.e., whereby the combination of higher scores on both the difficult/unadaptable temperament and hostile parenting measures serves to enhance the presence of externalizing/internalizing behavior problems in children).

The other two models are *promotive* models, which, in addition to temperament and maternal depression, include neighborhood cohesion, social support, and positive parenting as potential contextual factors that could be assumed to promote better outcomes for children by reducing the chances of the future development of externalizing and internalizing behavior problems (see Figures 3 and 4). Within each of these promotive models, the direct effects of both neighborhood cohesion and positive parenting and the indirect effects of both neighborhood cohesion and social support on the respective behavioral outcomes are examined. Within each promotive model, Temperament × Parenting interactions are tested by taking into account the role of children's temperament as a moderator of the relationship between positive parenting levels and behavioral outcomes. Specifically, it is hypothesized that, in contrast to temperamentally easy children, difficult children should manifest fewer externalizing behavior problems when they are generally engaged in positive and supportive relationships with their mothers. Similarly, those children displaying unadaptable temperament should exhibit less internalizing behavior problems when their mothers tend to be positive and responsive caregivers. Here, for both cases, the interactive effects of temperament and positive parenting are expected to be significant and negative in magnitude (i.e., whereby the combination of higher scores on both difficult/unadaptable temperament and positive parenting measures serves to reduce the presence of externalizing/internalizing problems in children).

Method

Sample

The data for this research come from the Canadian National Longitudinal Survey of Children and Youth (NLSCY). The NLSCY is a long-term study that includes repeated cross-sectional and longitudinal cohorts designed to give national estimates for the population of Canadian children. Statistics

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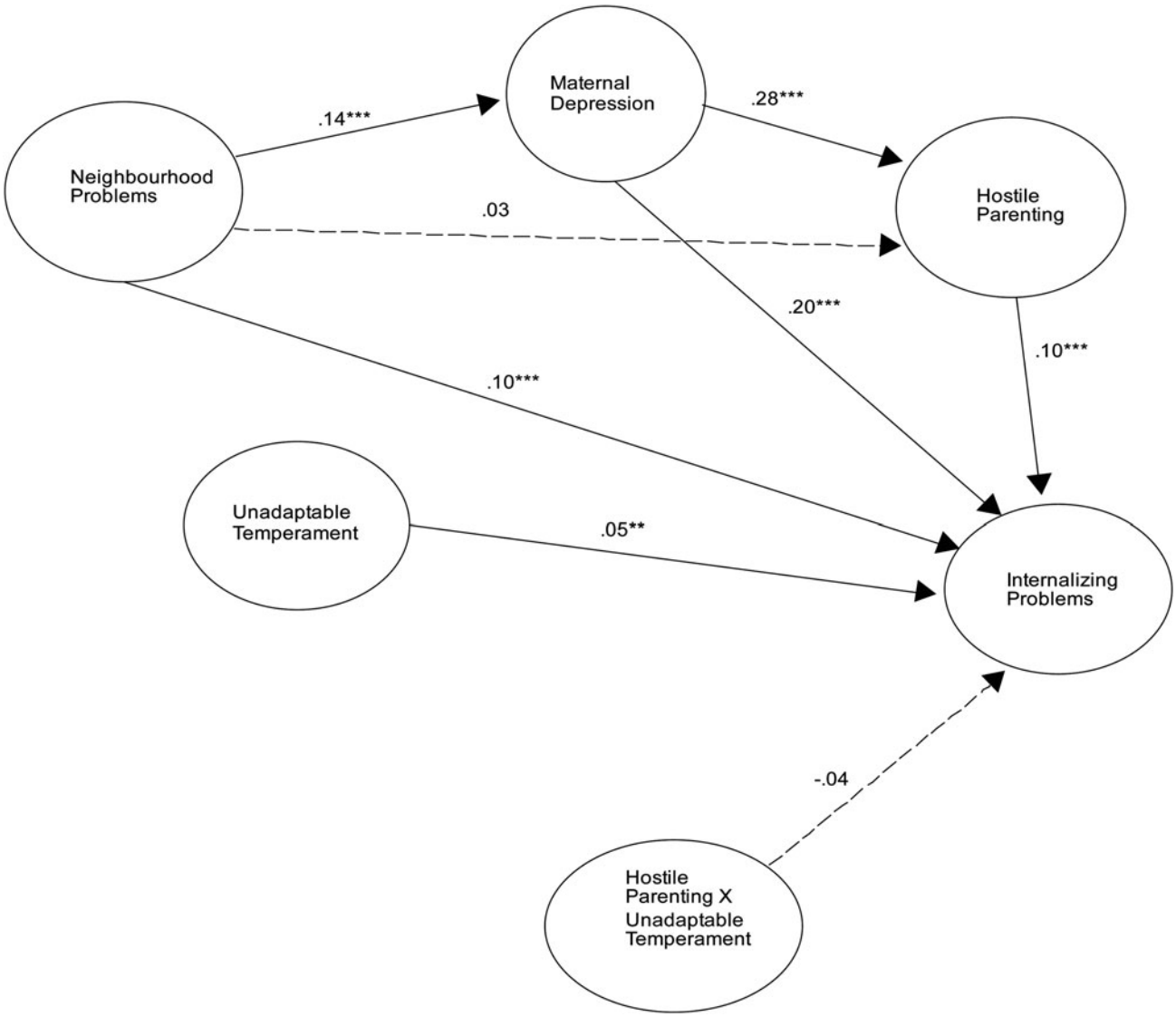

Figure 2. Structural equation modeling results for the second risk model. All path coefficients have been standardized and dashed lines indicate nonsignificant paths. $^{**}p < .01$, $^{***}p < .001$.

Canada has conducted the NLSCY over a 16-year period in biennial data-collection cycles. The main objectives of the NLSCY are to collect data on factors influencing child development, including social and environmental correlates of early childhood development, and to make that information available for people who are developing programs and policies focused on improving the life of children and youth (Statistics Canada, 1996). The original NLSCY sampling strategy relied on household selection through a multistage, stratified cluster, probability-sampling procedure based on basic demographic and other labor force information collected by Statistics Canada's Labour Force Survey. This technique involves the stratification and/or clustering of population units before sampling. City blocks are first selected based on specific characteristics (i.e., province and average income). Subsequently, households are selected from within those blocks, and children from each household are randomly selected (Michaud, 2001).

Data for the present study were obtained from two cycles of the survey, namely, Cycle 1 and Cycle 3. The first wave of data collection was conducted in 1994/95 at Cycle 1 on 13,439 residential households across Canada. It had an overall response rate of 86.3%, resulting in a sample of data for 22,831 newborn to 11-year-old children (Statistics Canada, 1996). The present study focuses on a subsample of children 2–3 years old ($N = 3,909$) for whom a series of potential predictors of behavioral problems were measured at Cycle 1. Subsequently, those children's behavioral outcomes were assessed at 6–7 years old using measures incorporated into Cycle 3 (1998–1999). Approximately 32% ($N = 1,278$) of the selected children were lost at Cycle 3 due to attrition. After deletion of the attrition sample, the matched longitudinal component across the two cycles contained $N = 2,631$ children. In the present study, the mean ages of the children were 2.57 years at Cycle 1 ($SD = 0.49$) and 6.50 at Cycle 3

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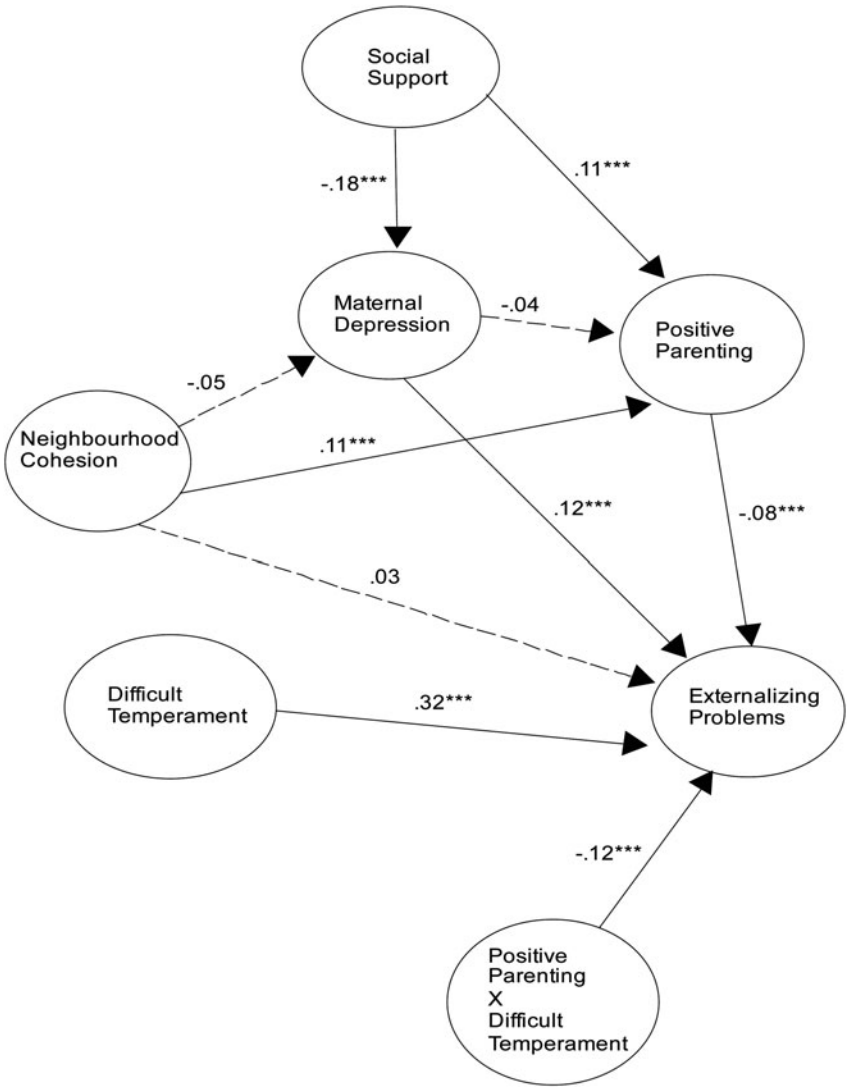

Figure 3. Structural equation modeling results for the first promotive model. All path coefficients have been standardized and dashed lines indicate nonsignificant paths. ***$p < .001$.

($SD = 0.51$). Among these children, 48.8% were males. The majority of them lived with both biological parents (81.4%). In 93% of the cases, the survey respondent was the mother of the child. Mother's average age at the time of the initial interview was 31.7 years ($SD = 5.3$). The majority of mothers had completed their high school studies (67.8%).

For the present research, an attrition analysis was performed to determine whether the loss of panel data from Cycle 1 to Cycle 3 might have had a significant impact on the final estimates and generalization of the study results. For this purpose, a series of cross-sectionally weighted independent *t* tests and contingency table analyses was conducted on the set of demographic and predictor variables measured at Cycle 1 to determine whether there were any significant differences between individuals used in the structural equation modeling (SEM) analyses and study dropouts (i.e., those with no follow-up data at Cycle 3). The attrition analysis revealed statistically significant differences only with respect to parental education, $\chi^2\ (3) = 8.65$, $p = .034$, between the sample of children included in the study and those excluded due to attrition.

Table 1 presents a comparison between the original sample, the final attrition sample, and the Canadian population based upon available demographic information. As shown in Table 1, the similarities between the current subsample and national estimates (when available) provide some evidence for the generalizability of the results to the general Canadian population. It is also important to note that all of the following statistical analyses were conducted utilizing longitudinal survey weights (which were normalized to return the sample to its original size by dividing the weight variable by its average). The use of survey weights in a clustered stratified sample such as the NLSCY allows the results of statistical tests to be generalized to the population, thus increasing the likelihood that the sample remains representative of the original target population despite survey dropout.

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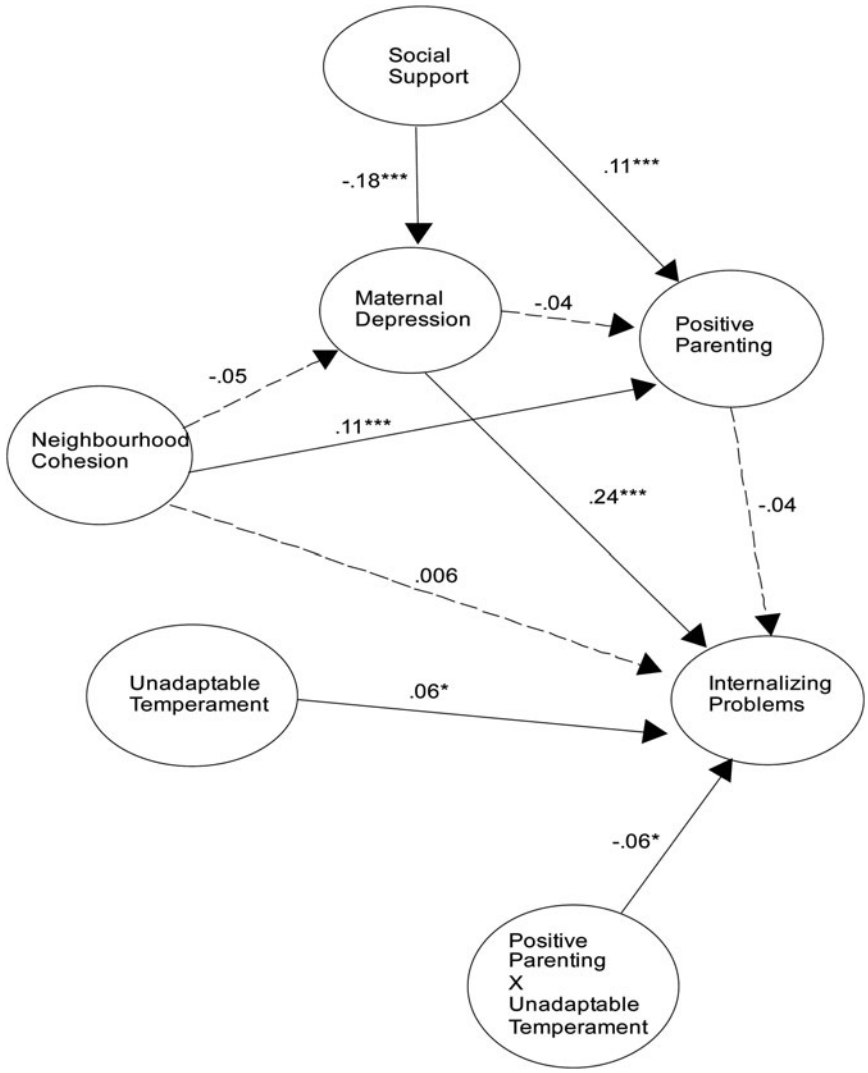

Figure 4. Structural equation modeling results for the second promotive model. All path coefficients have been standardized and dashed lines indicate nonsignificant paths. $*p < .05$. $***p < .001$.

Subsequently, missing data on any of the study variables were imputed in LISREL 8.80 using multiple imputation (with 100 imputed data sets) based on the expectation-maximization algorithm (Schafer, 1997). Proportions of missing data for each of the study variables are listed in Table 2. In the expectation-maximization algorithm, the two expectation and maximization steps are iterated through multiple times using maximum likelihood (ML). In the expectation step, the distribution for the missing data is calculated based on the known values for the observed data, and estimates of the sums of squares and cross products are generated. In the maximization step, the unknown parameters are estimated using all of the other variables as predictors in a regression model, and the estimates of the sums of squares and cross products matrix obtained in the expectation step is then used to estimate a new covariance matrix along with the associated regression coefficients. This two-step procedure is repeated for several iterations until the difference between the estimated covariance matrices from step-to-step falls below some specified convergence criterion (Little & Rubin, 1987; Rubin, 1987). In general, multiple imputation procedures have been shown to produce consistent and unbiased estimates when the missing data are either missing at random or missing completely at random (Kristman, Manno, & Cote, 2004). Moreover, the multiple imputation process attempts to reduce the impact of the loss of residual variability by introducing a random error to the imputation model through repeated random sampling with replacement (Enders, 2010). Table 2 also presents the means and standard deviations for each of the study variables after imputation.

Measures

Neighborhood characteristics (Cycle 1). A revised version of the Simcha–Fagan Neighborhood Questionnaire was used in the NLSCY to assess characteristics of the neighborhood

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Table 1. *Demographic information*

	Preattrition Sample	Sample After Attrition	Canadian Estimates Based on 1996 Census
Gender of child			
Female	51.2	52.3	NA
Male	48.8	47.7	
Household income			
>$40,000	57.8	58.8	Average family income
<$40,000	42.2	41.2	$55,247
Parent status to child			
Two-parent biological	81.4	82.2	NA
Other	18.6	17.8	
Caregiver birth place			
Canada	83.4	83.3	63.3
Other	16.6	16.7	18.6
Not applicable	—	—	18.1
Parental education			
Less than secondary	15.8	15.3	19.0
Secondary school grade	16.3	16.7	20.8
Beyond high school	28.6	27.1	23.8
College or university	39.3	40.9	36.4

(McGuire, 1997). Five items were employed to measure the respondent's perception of neighborhood problems (i.e., litter, broken glass or garbage in the street or road, illicit drug trafficking, and vandalism). Mothers rated each item along a 3-point scale. All item scores were then reversed so that higher scores represented a greater prevalence of neighborhood problems. For this scale, the Cronbach α was 0.73 for the sample of respondents used in this study.

Five items were used to measure neighborhood collective efficacy, a construct that combines both social cohesion (i.e., mutual trust among neighbors and sharing common values) and informal social control (i.e., neighbors can rely on one another to monitor and supervise youth). Mothers rated each item along a 4-point scale. All item scores were then reversed so that higher scores represented a greater prevalence of neighborhood collective efficacy (although note that, for convenience, the term "neighborhood cohesion" is used to refer to this scale). For this scale, the Cronbach α was 0.87 for the sample of respondents used in this study.

Table 2. *Descriptive statistics (after imputation) and amount of missing data for all of the study variables in the final sample (N = 2,631)*

	Mean	*SD*	Min–Max Score	Missing (%)
Maternal depression	16.97	5.23	12–48	2.0
Parenting				
Positive	21.25	2.56	5–25	2.7
Hostile	16.23	3.79	7–35	3.2
Neighborhood				
Problems	6.28	1.74	5–15	3.1
Cohesion	15.43	2.67	5–20	6.4
Social support	20.42	2.88	6–24	0.9
Temperament				
Unadaptable	14.84	7.45	5–35	2.5
Difficult	18.93	6.00	6–42	2.8
Problems				
Externalizing	26.21	5.37	19–57	9.5
Internalizing	10.40	2.41	8–24	8.9

Social support (Cycle 1). The short version of the Social Provision Scale (Cutrona & Russell, 1987) was used to assess the degree of social support received by the respondents from family members and friends. The respondents were asked to report on a 4-point scale the extent to which each item describes their current social network. The scale is composed of six items in total. Examples of items are as follows: "I have family and friends who help me feel safe, secure and happy" and "There is someone I trust whom I would turn to for advice if I were having problems." For this scale, the Cronbach α was 0.82 for the sample of respondents used in this study.

Maternal depression (Cycle 1). Maternal depressive symptoms were assessed using the reduced version of the Center of Epidemiological Studies Depression Rating Scale (Radloff, 1977). The scale is based on 12 items measured on a 4-point scale and is meant to assess the presence of depression in the general population. The frequency and severity of depressive symptoms in the preceding week were measured. Common symptoms include lack of interest in outdoor or fun activities, lack of appetite, apathy, hopelessness, loneliness, crying spells, and sleeping disturbances. For this scale, the Cronbach α was 0.81 for the sample of respondents used in this study.

Parenting quality (Cycle 1). In the NLSCY, the quality of parenting was measured in terms of three dimensions of parental

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behaviors that assess positive, hostile–ineffective, and consistent parenting, respectively (where only the first two are of interest in the present study). Each of the items was scored on a 5-point scale indicating the frequency of the behavior in question. The positive interaction scale (consisting of five items in total) assesses parents' perspective on the positive interactions that they have with their offspring, including contingent praise, sensitivity, and enjoyment of activities with the children. For this scale, the Cronbach α was 0.73 for the sample of respondents used in this study. The hostile–ineffective parenting scale (consisting of seven items in total) is based on the parent-reported use of negative parenting techniques, including frequent punishment, harsh discipline, disapproval, and general management problems. For this scale, the Cronbach α was 0.71 for the sample of respondents used in this study.

Temperament (Cycle 1). The temperament scales utilized in the NLSCY consist of adapted versions of the Infant Characteristics Questionnaire (Bates et al., 1979), which was originally developed for use with 3- to 5-month-olds. The two versions used in the present study were adapted for use with both 24- and 35-month children (i.e., Lee & Bates, 1985). The main intent of the scale is to obtain information from parents regarding the degree of difficulty of the child as well as the quality of their emotionality and reactivity. This scale is composed of 32 items divided into four main subscales reflecting four distinctive temperamental traits. Each of the items is ranked on a 7-point scale. For the purpose of the present study, two temperamental profiles are included in the subsequent analyses, namely, difficultness and unadaptability. Six items from the difficult temperament subscale were utilized to assesses the degree of irritability and moodiness of the child (Cronbach $\alpha = 0.75$ for the sample of respondents used in this study). Five items from the unadaptability subscale were used to assess the degree of unadaptability to new situations (Cronbach $\alpha = 0.67$ for the sample of respondents used in this study).

Behavioral problems (Cycle 3). Caregiver's reports of children's competencies and behavioral problems were obtained using the Child Behavioral Checklist (Achenbach, 1991). This measure allows for the examination of two broad groupings of syndromes: externalizing problems and internalizing problems. Items are scored on a 3-point scale for which a score of 0 indicates an absence of the behavior in question whereas scores of 1 and 2 represent ordered categories indicating increasing severity of the behavior. In the present study, physical aggression, indirect aggression, and hyperactivity items were used to provide a single measure of externalizing problems (Cronbach $\alpha = 0.87$), whereas the emotional disorder subscale was used as an index of internalizing behaviors (Cronbach $\alpha = 0.80$).

Statistical modeling

In the present study, SEM (LISREL 8.80; Jöreskog & Sörbom, 2001) was used to test whether the hypothesized models provided a good fit to the observed data. Given the ordinal nature of the data set, ML estimation procedures were used along with Satorra and Bentler's (1994) scaling corrections, allowing for the calculation of Satorra–Bentler scaled chi-square (SB χ^2) values. This method of analysis, referred to as robust ML, has the advantage of correcting the chi-square and the standard errors (which are dubbed robust standard errors) for multivariate normality violations (Savalei, 2010).

Model fit indices. A commonly reported measure of model fit is the Pearson chi-square statistic χ^2. Generally, significant χ^2 values will be obtained if an SEM model is not supported by the sample data (i.e., there are discrepancies between observed and predicted covariance values). However, it is widely known that chi-square based statistics are extremely sensitive to sample sizes and model complexity (e.g., Kline, 2005). This situation might then result in the rejection of reasonable models due to the presence of large samples and large numbers of latent factors. Hence, to help evaluate the present models, a series of additional comparative fit indices were also examined (Byrne, 1998), which included the root mean square error of approximation (RMSEA; Steiger & Lind, 1980), the comparative fit index (CFI; Bentler, 1990), the standardized root mean square residual (SRMR; Jöreskog & Sörbom, 1986), and the expected cross validation index (ECVI; Browne & Cudeck, 1989). Criterion values for these fit statistics are based on Hu and Bentler's (1999) recommendations for determining a close fit of a structural model, namely, RMSEA < 0.06, CFI > 0.95, and SRMR < 0.08.

Latent interaction factors. Product-term interaction indicators can be obtained by cross-multiplying all of the indicator variables for each of the corresponding first-order factors. In the present study, in order to minimize correlations among the first-order and interaction factors (i.e., nonessential multicollinearity), each product indicator was then residual centered (Marsh et al., 2007). That is, each product term was separately regressed against all first-order indicators simultaneously and the residuals from those regressions were used as indicators for the latent interaction factor. Compared to the mean-centering approach of Marsh, Wen, and Hau (2004), residual centering has the advantage of being able to derive latent interaction factors without having to alter the means of the first-order latent factors (Jöreskog & Yang, 1996).

Generally, though, using all possible product indicators (e.g., $6 \times 7 = 42$ for the difficult temperament and hostile parenting interaction) is not considered a parsimonious practice because it can result in nonconvergence problems for complex models with a large number of latent factors. However, selecting only one or two product indicators can result in a loss of information (Marsh, Wen, & Hau, 2006). In a recent simulation study, Saris, Batista-Foguet, and Coenders (2007) showed that the optimal way to estimate latent interaction factors is to select a set of the most reliable product indicators. For these reasons, in the present study confirmatory factor analyses were used to select 20 of the residual-centered

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product indicators with the highest factor loadings and the lowest measurement errors on the latent interaction factors as the indicators for each of those factors.

With respect to the imputation of any missing values for the product indicators, the "transform, then impute" method suggested by von Hippel (2009) was employed. This two-step procedure involves first computing the product term indicators from the incomplete data and then imputing the missing values on those indicators. In the present study, this second step was done after the imputation of the missing values for all of the noninteraction indicators had been completed (in order to prevent the possibility that the product terms would distort the imputation estimates for the nonproduct indicators if both were inserted in the imputation model in a single step). The use of the "transform and impute" method is justified by its effectiveness in producing more reliable estimates (Allison, 2002) and because it helps to preserve the nature of the covariances among the raw and transformed variables (von Hippel, 2009).

Covariates. To attenuate the effects of any potential confounding factors, covariate adjustment was implemented by regarding child's gender, maternal education, family income, and family structure as control variables. Dummy-coded variables were created for all control variables given their categorical nature (see Table 1). Subsequently, each of the study variable items was regressed onto the full set of covariates. The corresponding regression residuals were then saved and used as the indicators of the latent factors when estimating the structural models (Geldhof, Pornprasertmanit, Schoemann, & Little, 2013).

Results

Measurement models for the latent factors were assessed prior to testing the structural relationships among them. The fit of each of the four measurement models was deemed satisfactory (see Table 3). The estimated factor loadings were all significant at the .01 level and in the expected direction. Such results indicated that the relations among the observed indicator variables and their underlying latent factors were quite strong. The matrix of correlations between all of the latent study variables was also inspected for the presence of any large correlations between pairs of variables, and no multicollinearity problems were detected (see Table 4).

Risk models

For both risk models, goodness of fit indices suggested the presence of a satisfactory fit for this sample, SB χ^2 (2233) = 12888, $p < .001$; RMSEA = 0.043, 90% confidence interval (CI) = (0.042–0.043), CFI = 0.91, SRMR = 0.082, ECVI = 5.04 for externalizing behaviors; SB χ^2 (1389) = 6339, $p < .001$; RMSEA = 0.037, 90% CI = (0.036–0.038), CFI = 0.91, SRMR = 0.070, and ECVI = 2.53 for internalizing behaviors. The full path diagrams for the risk models for externalizing and internalizing behaviors are shown in Figures 1 and 2, respectively. In these two figures, all path coefficients are positive and significant except for the path between neighborhood problems and hostile parenting, the paths connecting both neighborhood problems and the temperament by hostile parenting interaction to the externalizing outcome behaviors, and the path between the interaction and internalizing behaviors. As expected from the literature reviewed earlier, hostile parenting is directly related to the future manifestation of both externalizing and internalizing behaviors. Maternal depression is related to externalizing and internalizing behaviors both directly and indirectly through its relation to hostile parenting. Neighborhood problems is not directly related to externalizing behaviors but is related to it indirectly through its relation to maternal depression (but, surprisingly, not hostile parenting). Although difficult temperament is directly related to the future manifestation of externalizing behaviors, it does not moderate the relation between hostile parenting levels and such behaviors. Similarly, although unadaptable temperament is directly related to the future manifestation of internalizing behaviors, it does not moderate the relation between hostile parenting levels and such behaviors.

Table 3. *Overall fit of the measurement models*

Model	SB χ^2 (*df*)	RMSEA	95% CI	CFI	SRMR
Risk model					
Externalizing	12318 (2229)	0.041	0.041/0.042	0.91	0.046
Internalizing	6311 (1385)	0.037	0.036/0.037	0.91	0.049
Promotive model					
Externalizing	12725 (2423)	0.040	0.040/0.041	0.92	0.045
Internalizing	7990 (1716)	0.037	0.036/0.038	0.93	0.046

Note: RMSEA, Root mean square error of approximation; 95% CI, confidence internal for RMSEA; CFI, comparative fit index; SRMR, standardized root mean square residual.

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Table 4. *Matrix of correlations between all of the latent factors*

	1	2	3	4	5	6	7	8	9	10
1. NP	—									
2. NC	−.31***	—								
3. SS	−.14***	.40***	—							
4. DP	.14***	−.12***	−.20***	—						
5. DF	.06**	−.05**	−.02	.05**	—					
6. UN	.03	−.08***	−.01	.01	.20***	—				
7. HP	.07**	−.07***	−.04*	.32***	.01	.04	—			
8. PP	−.05*	.16***	.16***	−.07***	−.06**	−.01	−.13***	—		
9. INT	.10***	−.04*	−.05**	.24***	.16***	.06**	.17***	−.06**	—	
10. EXT	.08***	−.01	−.01	.16***	.19***	.03	.28***	−.08***	.50***	—

Note: NP, Neighborhood problems; NC, neighborhood cohesion; SS, social support; DP, parental depression; DF, difficult temperament; UN, unadaptable temperament; HP, hostile parenting; PP, positive parenting; INT, internalizing behavior; EXT, externalizing behavior.
*$p < .05$. **$p < .01$. ***$p < .001$.

Promotive models

For both promotive models, the goodness-of-fit indices suggested the presence of a satisfactory fit for this sample, SB χ^2 (2428) = 12816, $p < .001$; RMSEA = 0.040, 90% CI = (0.040–0.041), CFI = 0.92, SRMR = 0.050, ECVI = 5.03 for externalizing behaviors; SB χ^2 (1721) = 8034, $p < .001$; RMSEA = 0.037, 90% CI = (0.037–0.038), CFI = 0.93, SRMR = 0.047, and ECVI = 3.18 for internalizing behaviors. Figure 3 shows the full diagram for the promotive model involving externalizing behaviors. In this figure, all path coefficients are significant except for the paths from neighborhood cohesion to both maternal depression and externalizing behaviors, and the path from maternal depression to positive parenting. As expected from the literature reviewed earlier, neighborhood cohesion is related to externalizing behaviors indirectly through its relation to positive parenting (but, surprisingly, not to maternal depression). Indirect effects of social support on externalizing behavior through both maternal depression and positive parenting are also present. Maternal depression has only a direct effect on externalizing behavior given that it is not related to positive parenting in this model. Furthermore, the direct effects of positive parenting and difficult temperament on externalizing behaviors are significant. However, the relationship between positive parenting and externalizing behaviors is now moderated by difficult temperament. The negative value of the path coefficient associated with this interaction indicates that that the size of the negative relation between positive parenting levels and externalizing behaviors is larger for higher levels of difficult temperament.

The full path diagram for the promotive model involving internalizing behaviors is shown in Figure 4. All path coefficients are significant except for the paths to internalizing behaviors leading from both neighborhood cohesion and positive parenting as well as the paths from neighborhood cohesion to maternal depression and from maternal depression to positive parenting. Hence, of the four nontemperament variables in this model, only maternal depression has a direct relation to the future manifestation of internalizing behaviors, with only social support being related to this outcome indirectly, through its relation to maternal depression. In contrast, unadaptable temperament is directly related to the future manifestation of internalizing behaviors, and although there is no direct main effect of positive parenting, the relationship between positive parenting and internalizing behaviors is moderated by unadaptable temperament. The negative value of the path coefficient associated with this interaction indicates that the size of the small negative relation between positive parenting levels and internalizing behaviors is larger for higher levels of unadaptable temperament.

Interaction analyses

To better characterize the nature of the significant interaction effects in the two promotive models, simple slope testing was conducted (Aiken & West, 1991; Roisman et al., 2012). The average factor score for temperament, as well as scores one standard deviation below and above the average were used to derive simple regression lines for the effects of parenting. For these analyses, standardized latent factor scores for each of the temperament, parenting, interaction, and outcome factors were obtained for each of the two promotive models and used to estimate the required regression coefficients. Simple slope plots for the interactions are presented in Figure 5. The left plot in Figure 5 displays the simple slopes for the relation between externalizing behaviors and positive parenting for difficult (β = –0.208, $p < .001$), average (β = –0.088, $p < .001$), and easy (β = 0.032, $p = .258$) temperaments, respectively. Simple slopes for the relation between internalizing behavior and positive parenting are plotted on the right side of Figure 5 for unadaptable (β = –0.114, $p < .001$), average (β = –0.062, $p = .002$), and adaptable (β = –0.010, $p = .721$) temperaments, respectively. Consistent with the results for the interaction terms in each of the promotive SEM models,

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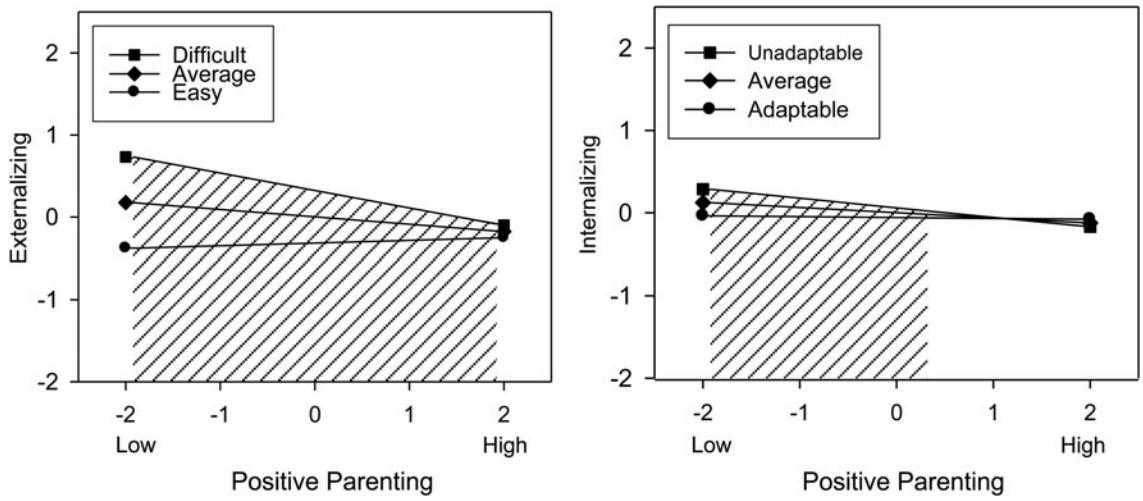

Figure 5. Simple slopes for the relationship between positive parenting and externalizing behavior for children with easy, average, and difficult temperament and between positive parenting and internalizing behavior for children with adaptable, average, and unadaptable temperament (dashed areas represent region of significance on X). Scores on positive parenting are standard deviations.

the simple slopes become substantially more negative as temperamental difficultness and unadaptability increases.

As part of these post hoc interaction analyses, regions of significance (RoS on X) were obtained for each of the promotive models to help determine whether the differential susceptibility or diathesis–stress models provides a better account for these data (Roisman et al., 2012). The RoS on X test identifies the lower and upper bounds of values on positive parenting for which the regression of temperament and the outcome variable reaches statistical significance. For externalizing behaviors, these lower and upper bounds were 1.93 and 3.97, respectively, indicating that the heights of the regression lines were significantly different for all possible cases where the score of positive parenting was either lower than 1.93 or higher than 3.97 (where the actual range of the standardized latent positive parenting scores was –5.13 to 1.44). Hence, children with difficult temperament showed more externalizing problems when positive parenting scores were lower than 1.93, with the upper bound value 3.95 being way above the observed range of positive parenting, thereby providing substantial empirical evidence in support of the diathesis–stress model. For internalizing behaviors, the lower and upper bounds for the RoS on X were 0.32 and 4.89, respectively, indicating that the regression lines were significantly different for all possible cases where the score of positive parenting was either lower than 0.32 or higher than 4.89. Hence, children with unadaptable temperament showed more internalizing problems when positive parenting scores were lower than 0.32, with the upper bound value 4.89 being way above the observed range of positive parenting, thereby also providing substantial empirical evidence in support of the diathesis–stress model. The shaded areas in Figure 5 represents the region of significance within two standard deviations of the mean positive parenting scores for externalizing (left plot) and internalizing behaviors (right plot), respectively.

In addition to the RoS on X testing, the proportion of interaction (PoI) metric was used to quantify the proportion of the interaction uniquely attributable to differential susceptibility/diathesis stress, with values of 0.50 corresponding to differential susceptibility and values close to zero being reflective of diathesis stress (Roisman et al., 2012). The PoI value was close to zero (PoI = 0.02) for externalizing behaviors, indicating that worse outcomes for children with difficult temperament far outweighed better outcomes, again providing evidence for diathesis stress. Similar results were obtained for internalizing behaviors, where the PoI value also approached zero (PoI = 0.07), indicating that, for children with unadaptable temperament, the negative effects on internalizing behaviors resulting from the lack of positive parenting prevailed over the positive impact on behavior due to the influence of positive parenting, once again providing a strong evidence for diathesis stress.

Discussion

Research on child development has increasingly focused on the ways in which individual attributes serve to moderate the effects of environmental exposure in shaping human development. Much of this work has been directed toward understanding the mechanisms through which temperament acts in combination with factors such as the quality of parenting to influence children's outcomes. A number of theoretical frameworks put forward to elucidate the dynamics underlying the complex interplay between nature and nurture have consequently been employed by developmental researchers as a means to classify such interactive effects as distinct categories of phenomena (Pluess & Belsky, 2012). For instance, diathesis–stress/dual-risk views emphasize the synergistic effects that child-intrinsic vulnerability factors and adverse rearing experiences have with respect to increasing negative

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consequences for individuals who are most sensitive to the detrimental effects of low-quality environments. Nonetheless, such pathology-based accounts have recently been extended to incorporate a differential susceptibility view (Belsky, 1997; Belsky & Pluess, 2009, 2010), which proposes that vulnerability/plasticity factors not only predispose individuals to an increased risk of negative outcomes in the presence of adverse environments but also render them more susceptible to the beneficial effects of supportive experiences. Based on these premises, individuals are set to vary in their developmental plasticity due to innate temperamental dispositions that ultimately impact their levels of susceptibility to both positive and negative qualities of the environment. More recently, a reinterpretation of available research evidence has offered new insights based on the notion of vantage sensitivity, which represents the ability of individuals to prosper given the presence of specific endogenous characteristics if exposed to development-enhancing environmental conditions (Pluess & Belsky, 2012). On this latter view, the presence of these specific sensitivity traits constitute an advantage with respect to the development (or production) of favorable outcomes in the presence of ecological contexts that provide adequate social resources and ambient support.

In the present study, Parenting × Temperament interactions were investigated within a number of SEMs containing various combinations of risk and promotive factors in order to clarify the distinct contribution such interactions make in determining children's behavior. With respect to the joint effects of temperament and parenting, the results of the two risk models examined here indicate that neither difficult nor unadaptable children exposed to hostile parenting in early childhood seem to be at a particular increased risk for the development of behavior problems at later age in comparison to easier or more adaptable children, respectively. That is, although direct influences of hostile parenting on both externalizing and internalizing behaviors were observed, the nature of the effects of hostile parenting on children's behavior problems were not conditional upon either of these two temperamental dimensions.

In contrast, the results of the two promotive models examined here indicate that temperamentally difficult/unadaptable children respond more negatively to the effects of unresponsive and uninvolved parenting (i.e., a lack of positive parenting) than do children without such temperamental characteristics. That is, in line with diathesis–stress models, the behavior of difficult/unadaptable children with respect to both externalizing and internalizing behavioral outcomes is worsened from having mothers who are less sensitive and responsive to their needs. However, it is also important to note that high levels of positive parenting resulted in all children achieving about the same levels of behavioral adjustment. Hence, although the pattern of interaction results are consistent with that expected according to diathesis stress, the fact that the presence of positive environmental influences serves to attenuate behavioral differences between temperamentally difficult/unadaptable children and those without such temperamental characteristics makes these latter results seem more in line with the notion that positive parenting represents an adjustment promoting factor rather than a risk factor. Moreover, note that because difficult and unadaptable children generally manifest either the same or worse behavioral problems rather than the same or better distinguishes this interaction effect from that expected according to the notion of vantage sensitivity.

In sum, the present work does provide evidence that the types of rearing strategies employed by parents of temperamentally difficult/unadaptable children when dealing with their children's demands can affect their future development. As shown here, a fundamental dimension for understanding the maladaptive response of such children is the extent to which their parents endorse rearing practices that are unresponsive to and disengaged from their offspring during the first years of life. Generally, parents have the power to nurture and instill positive qualities (i.e., self-esteem and self-efficacy) in the young child who strives to master ongoing challenges and integrate personal experiences into its own sense of "autonomous-relational self" (Kagitçibasi, 1996). Parental guidance is essential in order to enhance children's problem-solving skills and encourage the self-control that is necessary to promote normal development (Landry, Smith, & Swank, 2006). On this view, it is within such appropriate rearing environments that temperamentally difficult/unadaptable children can develop adequate coping skills and manifest positive developmental outcomes that are on par with temperamentally easy/adaptable children.

An additional aspect of the models examined in this study is the fact that they included a number of other key contextually relevant risk and promotive factors. Accordingly, the bioecological system approach (Bronfenbrenner & Morris, 1998, 2006) was used as a framework to shed light on the multiple co-occurring facets of the social and physical environments that affect the development of children. With respect to the effects of those other factors, one interesting finding concerns the fact that a predominant mechanism through which poor neighborhood quality exerts its influence on children's future behavioral outcomes is indirectly by way of its impact on maternal depression. More specifically, consistent with previous research, neighborhood problems significantly contribute to higher levels of maternal depression, independently of the effects of the covariates controlled for in these analyses (Kim, 2010; Ross, 2000; Ross & Mirowsky, 2001). Higher levels of maternal depression, in turn, directly contributed to increases in both externalizing and internalizing behavior (Lyons-Ruth et al., 1997). Furthermore, depressed mothers were significantly more likely to report higher levels of hostile parenting, corroborating prior research, which has demonstrated that depressed mothers tend to interact more negatively with their children (Bugental, 1992; Feng et al., 2007; Hasting & Grusec, 1998).

In contrast with previous research, however, no direct effect of either neighborhood problems on hostile parenting practices (Earls et al., 1994; Pinderhughes et al., 2001) or maternal depression on positive parenting practices (Jacob & Johnson,

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1997; Lovejoy et al., 2000) was evident in this study. In contrast with previous research as well (e.g., Moren-Cross, 2006), neighborhood problems did not exert any direct effect on the future manifestation of externalizing behaviors. However, it was found that neighborhood problems directly contributed to the future development of internalizing behavior problems in this sample of children. Thus, these results provide some evidence for the unique predictive value of neighborhood problems with respect to the later emergence of internalizing behaviors. Such a result is consistent with the findings from recent research conducted by Xue, Leventhal, Brooks-Gunn, and Earls (2005) on a community sample of 5-year-olds living in the Chicago area, which showed that living in disadvantaged areas might increase the likelihood of internalizing problems becoming manifested in children.

In addition to providing insight on the negative effects of poor neighborhood quality, the present results serve to highlight the role that both neighborhood cohesion and social support have to play with respect to contributing to enhancing positive parenting practices (and, hence, the lives of children; Cochran & Brassard, 1979; Powell, 1980). One explanation for such effects would likely be that greater social support and higher levels of cohesion in the neighborhood can help to foster self-confidence and reinforce positive attributions and behavior (Perkins, Hughey, & Speer, 2002; Thompson, Flood, & Goodwin, 2006). However, in contrast with prior findings, higher levels of neighborhood cohesion were not associated with significant decreases in maternal depression (i.e., after accounting for the effects of the other covariates). Conversely, social support seemed to be a particularly relevant and contributing factor to decreasing maternal depression. It could be argued that self-perceived social support should serve to alleviate symptoms of depression by reducing stress and isolation in individuals. Moreover, the presence of a strong social support network would also provide parents with opportunities for discussions regarding how to handle children that misbehave, thus helping them in their efforts to engage in positive interactions with their children (Furstenberg, 1993). Such findings are consistent with prior studies that have indicated that characteristics of the social environment (i.e., social capital) are likely to exert an impact upon children's behavior through their influence on proximal processes at the family level (Dorsey & Forehand, 2003).

Several limitations of this study should be noted because they provide directions for future research. For example, the data employed relied almost exclusively on maternal reports, which then increased the likelihood of shared method invariance bias. Such bias can lead to erroneous conclusions by overestimating the correlation between true scores due to correlated errors attributable to participants' response sets (Campbell & Fiske, 1959; Fiske, 1982). However, the use of SEM does serve to minimize this phenomenon by specifically allowing for correlations among the error terms (Cole, 2006). Furthermore, any sharing of variance due to such bias is much more likely to affect the validity of main effects than it would interaction effects (especially after such effects have explicitly been residualized on the main effects). However, future researchers may want to replicate this study with different measurement methods and multiple informants for all of the constructs.

Another inevitable issue with longitudinal survey data is attrition. Although the sample examined here was relatively large, it may be somewhat unrepresentative due to attrition. Although the use of normalized longitudinal weights serves to attenuate the effects of attrition, it is important to acknowledge that the manner in which the loss of participants due to attrition may have affected the results. In order to be inclusive, researchers should strive to preserve data from more disadvantaged families by either increasing response rates for such individuals or using high-risk population surveys.

Moreover, the dynamics underlying the effects of various proximal and distal factors on children's behavior might also depend on other characteristics such as culture and ethnicity. For instance, the mechanisms through which neighborhood disorder, maternal depression, and parenting influence the behavior of children can vary across different ethnic–cultural groups (Ho, Bluestein, & Jenkins, 2008; Pachter, Auinger, Palmer, & Weitzman, 2006). Given that Canada represents a multicultural society, culturally relevant characteristics related to minority populations require special consideration. The NLSCY sample was selected based on demographic information provided by the Labor Force Survey, which targets 98% of the Canadian population, not including inmates of institutions, full-time members of the Canadian armed forces, children who lived in institutions for more than 6 months, and aboriginal children living on reserve. Although convenient and economic, such sampling procedures could lead to selection bias, thus contributing to underrepresentation of minority groups. Future research should therefore attempt to address these issues and employ surveys that include minority children as target populations.

Moreover, other important components of the child's ecological system, such as the school and peer group, should be given some consideration. Nowadays, young children are spending more time in childcare centers, increasing their exposure to the influence of other socializing forces outside the family. For instance, positive interactions with teachers and other caretakers can assume a positive role in promoting children's feelings of self-worth and belonging that are essential to their healthy development (Birch & Ladd, 1998; Gillian, 1998; Pianta, 1999). This situation invites consideration of how childhood professionals might either support or interfere with children's socialization processes and socioemotional development. For these reasons, future researchers might want to include such educational settings within the conceptual and operational framework proposed here (for some recent work in this regard, see Pluess & Belsky, 2010).

Finally, it is important to consider the possibility of a conceptual overlap between the temperament and problem behavior variables. Although these two constructs might have been operationalized in a slightly different fashion (i.e., in terms of normative behavior in the case of temperament and maladap-

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tive responding in the case of problem behavior), the extent to which they might represent measures of the same trait is an open issue. Future research might attempt to derive refined measures of such traits by identifying confounded items and using factor analysis to determine the unique variance associated with each factor (Lemery, Essex, & Smider, 2002).

Nonetheless, one of the major strengths of the current research is that it is one of the few large-scale longitudinal studies to examine the simultaneous relationships of both proximal and distal factors with the purpose of elucidating the dynamics underlying the successful adaptation of children with difficult/unadaptable temperament. Analysis of such data sets with the statistical techniques used here has the potential to improve the breadth and depth of the knowledge about children's behavioral problems and its precursors. Such findings should be useful to researchers and mental health professionals engaged in the assessment of both the risk and promotive factors associated with the emergence of mental problems in vulnerable populations and, hence, aid them in the rebalancing of a child's environment.

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