

Fathers' Influence on Children's Cognitive and Behavioural Functioning: A Longitudinal Study of Canadian Families

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An emerging body of research illustrates the connections between fathers and their children's development. This topic is particularly relevant in Québec, a demographically and culturally unique province in which female lone parenthood is relatively common; this pattern is related to socioeconomic disadvantages that predict negative cognitive and behavioural outcomes in youth. Using data from the Concordia Longitudinal Risk Project, an intergenerational longitudinal data set collected in inner city areas of Montreal, the current study investigated the prospective relations between fathers' presence and parenting, and children's subsequent cognitive and behavioural functioning. The current sample included 138 families from lower to middle income backgrounds who participated in two waves of data collection: when children were in middle childhood and subsequently three to five years later in preadolescence. The results indicated that for girls only, fathers' presence in middle childhood predicted fewer internalizing problems in preadolescence. For both boys and girls, fathers' positive parental control predicted higher Performance IQ and fewer internalizing problems over six years later. These findings add to the increasing body of literature suggesting that fathers make important contributions to their children's cognitive and behavioural functioning, and point to the benefits of developing policies that encourage fathers to spend time with their children (i.e., parental leave for men) and promote positive fathering and involvement through parenting courses.

Keywords: fathers, behaviour problems, cognitive functioning, Canadian context, socioeconomic risk

One type of family that is becoming increasingly common in North America is the family headed by a single mother. In 2006, approximately 13% of Canadian families and 22% of families in Québec included biological fathers who lived apart from their children (Statistics Canada, 2007a). Families with one parent who does not live at home typically have lower income levels than two-parent families (Ricciuti, 2004). In 2006, 7.7% of Canadian children and youth in two-parent families fell below the low income cutoff, compared with 32.3% of children and youth in female lone-parent families (Statistics Canada, 2009). The developmental outcomes of parental absence and low socioeconomic status (SES), including income level and educational attainment, are important to take into account in Québec, as research has indicated that Québec students who attend public schools in non-disadvantaged areas are one and a half times more likely to graduate high school than students attending schools in economi-

cally disadvantaged areas (Gouvernement du Québec, 2008). SES is related to indicators of success in adolescence, and one factor that is related to lower family SES is the absence of a parent from the home.

Most of the research involving families and child outcomes focuses on associations between mothers' parenting and child development (Roy & Kwon, 2007). A growing minority of existing research illustrates the associations between fathers' presence; specifically, fathers living full-time in their biological children's homes and child development. However, many researchers argue that fathers' presence is not a detailed enough variable to understand children's experiences (Flouri, 2007); thus, fathers' parenting is often measured in conjunction with fathers' presence in their children's homes. In order to more closely examine the role of fathers in children's development, the current study investigated the prospective associations between fathers' presence and parenting and children's cognitive and behavioural functioning in an urban French Canadian context.

In general, studies outside of Canada have demonstrated that fathers' presence in their children's homes and parenting are positively associated with children's cognitive outcomes across time after controlling for various demographic and socioeconomic factors (for review, see Allen & Daly, 2002). The majority of the recent fathering research has been conducted with preschool-aged children. For example, a study conducted in the United States by Ryan, Martin, and Brooks-Gunn (2006) found that children who lived with two highly supportive parents at 2-years-old had higher Bayley Scales of Infant Development-II (Bayley, 1993) Mental Development Index scores (reflecting cognitive and language development) at 3 years of age than children who lived with one or

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no supportive parents after controlling for SES. Studies conducted with the older offspring of absent fathers have supported these findings. For example, a study conducted in the United States indicated that children whose fathers lived with them full-time had higher scores on reading and math tests than children whose fathers did not live with them (Teachman, Day, Paasch, Carver, & Call, 1998). Moreover, paternal parenting has been shown to be positively associated with children's cognitive outcomes for different age groups (Bronte-Tinkew, Carrano, Horowitz, & Kinukawa, 2008; Fagan & Iglesias, 1999). For example, one study found that fathers' supportiveness when children were 2-years-old was associated with children's intellectual functioning scores at 2- and 3-years-old (Cabrera, Shannon, & Tamis-LeMonda, 2007). Another study found that paternal warmth when children were 12-years-old was a predictor of school achievement two years later; this remained true after controlling for the effect of maternal warmth (Chen, Liu, & Li, 2000).

In addition to examining fathers and children's cognitive functioning, the association between fathers' presence in the home and children's behavioural functioning has been considered (for review, see Allen & Daly, 2002). In general, research has indicated that children who experience fathers' absence from the home at various points during childhood are more likely than other children to display internalizing problems, such as sadness, social withdrawal, and anxiety, as well as externalizing problems, such as aggression, impulsivity, and hyperactivity (Amato & Gilbreth, 1999; Carlson, 2006; Demuth & Brown, 2004). For example, one study that was conducted in the United States found that children with absent fathers displayed more antisocial behaviour than children whose fathers were present in their home, even after controlling for the effects of paternal antisocial behaviour, SES, and presence of stepfathers (Piffner, McBurnett, & Rathouz, 2001).

Additional research exists illustrating the relation between paternal parenting and behaviour problems in offspring (Carlson, 2006; Chen et al., 2000; Flouri, 2007; Griffin, Botvin, Scheier, Diaz, & Miller, 2000; Levine Coley, 2003). Notably, research has indicated that fathers' use of parental control accounts for some variance in predicting child outcomes such as aggression (Chen et al., 2000). Studies have illustrated that parental control can result in both appropriate behaviour (Maccoby & Martin, 1983) as well as defiant behaviour (Baumrind, 1971) in children; the direction of the outcome most likely depends on the nature of the control employed by parents, as restrictive and authoritarian forms of control have been found to result in more negative outcomes than nonrestrictive and authoritative forms of control (Becker, 1964; Pettit, Laird, Dodge, Bates, & Criss, 2001).

Whereas the previously described studies all indicate that fathers' presence in their children's homes and parenting predict child cognitive and behavioural outcomes, some other studies have found that this is not the case after controlling for socioeconomic factors (Carlson & Corcoran, 2001; Crockett, Eggebeen, & Hawkins, 1993; DeBell, 2008; Entwisle & Alexander, 1996). Fathers' presence is intimately connected to family SES, as families with two working parents generally have higher incomes than single-income families. Studies also indicate that higher SES families include fathers who display more positive parenting (Cabrera et al., 2007; Pleck, 1997). Additional studies illustrate a direct pathway between SES and child cognitive and behavioural outcomes (Cabrera et al., 2007). Socioeconomic indicators must be

considered when examining outcomes related to fathers' presence and parenting.

Additional factors that are often considered when examining the relation between fathers and child outcomes include the quality of the home environment and the occurrence of conflict within the couple relationship. Regarding the former, previous research has demonstrated that living in a chaotic and unstimulating home environment is related to children's cognitive functioning and behaviour problems at school (Bradley & Rock, 1985; Carlson & Corcoran, 2001; Hetherington, 1989). Regarding the latter, studies indicate that children are more likely to develop difficulties including depression, anxiety, social withdrawal, and school absence if they are regularly exposed to displays of aggression between their parents (Flouri, 2007; Grych & Fincham, 2001). Measuring the quality of the home environment typically involves the measurement of SES, parental absence, and parenting quality, and couple conflict has been shown to be associated with each of these factors (Fergusson & Horwood, 1998; Kaczynski, Lindahl, Malik, & Laurenceau, 2006; Sturge-Apple, Davies, & Cummings, 2006). Therefore, the home environment and couple conflict are both important to control for when predicting child developmental outcomes.

Finally, a factor that is often considered when conducting research in this area is child gender, as research indicates a moderating effect of gender in the relation between fathers and offspring development. Specifically, some studies demonstrate that fathers predict development in sons more than daughters because they serve as male role models for their sons (Biller & Kampton, 1997; Bronte-Tinkew et al., 2008; Mott, Kowaleski-Jones, & Menaghan, 1997). However, a smaller body of research has illustrated that fathers are more important for their daughters' development than that of their sons (Levine Coley, 1998), particularly regarding nonverbal cognitive abilities (Hetherington, Camara, & Featherman, 1983; Sandqvist, 1995). As different and sometimes opposing effects have been illustrated, it is unclear how child gender moderates the association between fathers' presence and children's outcomes.

Many existing studies regarding the association between fathers and their children's development have methodological limitations. For example, mothers who participate in studies are often asked to report on the parenting strategies of the children's fathers (Roy & Kwon, 2007). Research has demonstrated, however, that reports of paternal parenting differ between mothers and fathers (Mikelson, 2008). Furthermore, most studies have not included participants who live in a cultural context in which English is not the primary language spoken and the majority of neighborhoods are socioeconomically disadvantaged (Roy & Kwon, 2007); notable exceptions include the Supporting Father Involvement Project (Cowan, Cowan, Pruett, & Wong, 2009) and the Fragile Families studies (Carlson & McLanahan, 2002). Moreover, the majority of studies in this area measure fathers' presence and parenting and child development concurrently; few prospective studies exist that examine the roles that fathers play on the trajectory of cognitive and behavioural development over the course of childhood (Roy & Kwon, 2007). Finally, many of the prospective studies are designed to examine the relation between fathers' presence and parenting and the development of offspring between the ages of approximately 2- and 5-years-old; more research is required to

understand the ways in which fathers influence the development of children in middle childhood and adolescence.

Current Study

The current study addressed some of these limitations by examining the prospective associations between fathers' presence in their children's homes and their parenting, and cognitive and behavioural outcomes in socioeconomically at-risk children beyond the preschool years. The study was carried out using data from the Concordia Longitudinal Risk Project (Schwartzman, Ledingham, & Serbin, 1985), an intergenerational study of low-income Francophone families in Québec (Statistics Canada, 2007b).

Based on the existing literature regarding the relation between fathers' presence and parenting and children's cognitive and behavioural outcomes, it was hypothesised that (1) children who live with their fathers in middle childhood and whose fathers demonstrated positive early parenting abilities would have increased levels of cognitive functioning and (2) lower levels of behaviour problems in preadolescence than other children. It was also anticipated that (3) gender would moderate the relations between fathers' early parenting and presence in middle childhood and cognitive functioning and behaviour problems later on in preadolescence. As the literature is mixed regarding the direction of the moderation, this hypothesis is exploratory.

Method

Participants

The current sample included 138 children and their families who were participants in the Concordia Longitudinal Risk Project (Schwartzman et al., 1985), a large intergenerational longitudinal research program. Participating families had been previously assessed when their children were in early childhood (2- to 5-years-old), when they had indicated an interest and a willingness to participate in further studies. At Time 1 (T1) of the present study, which occurred in the early 2000s, the children were between 6- and 10-years-old ($M = 7.69$, $SD = 1.01$). Seventy-six of the children were girls and 62 were boys. The families in the study had a median annual family income of \$41,860 (range = \$6,905.31–\$145,600.00; $SD = \$24,918.68$), and 73% of families fell below \$60,118, which was the mean income level in Québec at the time (Institut de la Statistique Québec, 2009). Mothers and fathers had completed an average of 12.23 and 11.77 years of education, respectively ($SD = 2.37$ and 2.14 , respectively), and 17% and 14% of the families had mothers and fathers who had not completed high school, respectively. At T1, 24.6% of the children (34 of 138) did not live with their fathers. This is comparable to the 21% rate of single motherhood for children of all ages in the general population of Québec in 2001 (Statistics Canada, 2003). Moreover, 54 (52%) of the fathers who lived with their children were married to the children's mothers, 46 (45%) of the fathers were cohabiting with the children's mothers, and 3 (3%) were separated from the children's mothers (i.e., custodial fathers); datum regarding civic status was missing for one participant.

The second wave of data collection, or Time 2 (T2), occurred in the mid 2000s between 3 and 5 years after T1 when the children

were between 9- and 13-years-old ($M = 10.06$, $SD = 1.56$). Ninety-six of the 138 families from T1 participated at T2. The families in the study had a median annual income at T2 of \$46,826 (range = \$7,926.10–\$178,573.20; $SD = \$33,295.55$), and 70% of families fell below the mean income level in Québec, which at the time was \$68,452 (Institut de la Statistique Québec, 2009). The mean income at T2 of \$53,394.58 was not significantly greater than the mean income at T1 of \$44,498.88 ($t_{86} = -1.88$, ns). When the eight families with annual T2 incomes of higher than \$100,000 were treated as outliers and excluded from analyses, the results were not significantly different from those of the full sample; therefore, these families were included in the current analyses. At T2, 33.7% of the children (32 of 96) did not live with their fathers, which was not significantly different than the 24.6% rate of fathers' absence at T1 ($\chi^2 = .02$, ns). Forty-three (57%) fathers who lived with their children were married to the children's mothers, 28 (37%) were cohabiting with the children's mothers, and 4 (6%) were separated from the children's mothers (i.e., custodial fathers).

Missing Data

As noted above, there was participant attrition between the two time points as well as missing data within the variable set for the 138 participants in the current study. It was hypothesised that these data were not missing completely at random, as families with lower occupational prestige, more children, and parental absence frequently have chaotic home environments and less time and motivation to provide complete data. The mean level of parental occupational prestige at T2 was significantly greater than the mean prestige level at T1 ($t_{132} = -3.05$, $p < .01$), and the mean number of children at T2 was significantly smaller than the mean number of children at T1 ($t_{135} = -2.30$, $p < .05$), indicating that those families with greater levels of occupational prestige and fewer children were more likely to remain in the study between the two time points. Results from Little's MCAR test confirmed that data were not missing completely at random ($\chi^2 = 553.54$, $p < .05$); therefore, multiple imputation (MI) was employed in the current study in order to estimate missing data for those variables with less than 20% of its cases missing (Allison, 2001; McKnight, McKnight, Sidani, & Figueredo, 2007). The Amelia program (Honaker, King, & Blackwell, 2006), set at a tolerance of .001, was used to impute 20 data sets (number of imputations ranged from 10 to 28). The imputed data were aggregated and used in all subsequent analyses.

Measures

Family demographics and fathers' presence in the home. Annual family income, maternal educational attainment, paternal educational attainment, and child age were determined by participants' responses to demographics questionnaires administered at T1 and T2. Whether or not biological fathers lived with their children was determined by asking: "With whom does your child live?" Responses were coded as 1 when biological fathers were reported as living with their children and 0 when children lived only with their mothers or other adults and siblings. The current analyses focused on fathers' presence in the home at T1 when children were in middle childhood rather than earlier when chil-

dren were preschool-aged in order to achieve greater variance in fathers' presence (i.e., to reflect the fact that some fathers left between early childhood and T1).

Parental control. The Parenting Dimensions Inventory–Short Version (PDI; Power, 2002) is a 27-item self-report measure of five dimensions of parenting that had been administered to fathers 1 to 3 years prior to the current waves of data collection, when their children were between 2- and 5-years-old. It was administered during this period because more fathers were present to participate in data collection when their children were preschool-aged than when their children were older, and it was used to capture the impact that fathering children in this sensitive period had on later development. To assess the type of parental control employed with children, the Type of Control dimension of the PDI was used for the present study. This dimension employs 11 questions with a 4-point Likert scale response format to assess the mechanisms through which parents guide and shape the behaviour of their children, and it includes Physical Punishment, Material or Social Consequences, Reasoning, Scolding, and Reminding scales. For the purposes of the current study, an average of the five scale scores was used in the analyses ($\alpha = .69$, 95% Confidence Interval (CI) = .55–.79, $M = 1.29$, $SD = .53$). Higher scores indicate more positive forms of control. Alpha values for the scales that make up the Type of Control dimension have been found to range from .84 to .92 and have good validity (Power, 2002; Slater & Power, 1987).

Couple conflict. Prior to the current waves of data collection when children were preschool-aged, mothers and fathers in the sample completed the Conflict Tactics Scale (Straus, 1979), a self-report measure of intimate partner and child maltreatment. Scales measure sexual, psychological, and physical attacks committed by both partners over the past 12 months as well as anytime in the past. Nine items that inquire about lifetime occurrences of couple conflict (e.g., *Have you ever thrown anything at your partner, or has your partner ever thrown anything at you?*) were included in the current data analyses ($\alpha = .84$, 95% CI = .82–.86, $M = .11$, $SD = .01$). Item responses were coded as 1 when couple conflict was reported and 0 when couple conflict was not reported. The complete measure has good reliability, indicated by an alpha of .88 for couple conflict, as well as good concurrent and construct validity (Straus, 1979).

Home environment. The quality of the families' home environment was assessed at T2 using the Home Observation for Measurement of the Environment–Revised Edition scale (HOME; Caldwell & Bradley, 1984). This instrument combines observations by trained researchers with structured interviews with both parents (if available) to obtain information about children's home environment. This 59-item tool is broken down into eight scales that assess parental responsiveness, physical environment, learning materials, active stimulation, encouragement of maturity, emotional climate, parental involvement, and family participation; for the purposes of the current study, an overall score was used in the analyses ($\alpha = .61$, CI = .48–.71, $M = 40.66$, $SD = 5.35$). Scores range from 0 to 59, and higher scores indicate higher quality home environments. The HOME inventory is a well-standardized measure that demonstrates good reliability and validity properties (Totsika & Sylva, 2004).

Cognitive functioning. Children's cognitive functioning was assessed at two different times. Three years prior to the two waves

of data collection described in the current study, the Bayley Scales of Infant Development–Second Edition (Bayley, 1993) had been administered to those children who were under 42-months-old ($n = 66$), and the Stanford-Binet Intelligence Scale–Fourth Edition (Thorndike, Hagen, & Sattler, 1987) had been administered to those children between 42- and 72-months-old ($n = 72$). Each child had received an IQ score that was converted into a z -score and then employed in the analyses in order to control for the overall stability of IQ over time.

At T2, the Wechsler Intelligence Scale for Children–Third Edition (WISC–III; Wechsler, 1991) was administered. This commonly used measure of children's intellectual functioning provides Verbal IQ scores, which are an indication of children's skills in language and comprehension, as well as Performance IQ scores, which are an indication of children's visual-spatial and nonverbal analytical reasoning skills. The WISC–III was administered to children when they were between the ages of 9- and 13-years-old by individuals with master's level training or above in clinical psychology. Children's Verbal IQs ranged from 62 to 133 ($M = 98.59$, $SD = 15.82$), and their Performance IQs ranged from 72 to 140 ($M = 101.86$, $SD = 11.87$).

Behaviour problems. Teachers assessed children's behaviour problems at school by completing the Child Behaviour Checklist–Teacher Report Form (TRF; Achenbach & Rescorla, 2001) at T2 when children were between 9- and 13-years-old. This commonly used measure of behavioural functioning includes 120 items for which the respondent assigns a score between 0 and 2 for each question; a score of 0 indicates an absence of the behaviour, a score of 1 indicates that the child performs the behaviour sometimes, and a score of 2 indicates that the child often performs the behaviour. Scores of externalizing and internalizing behaviours are obtained, as well as an overall problem behaviour score that encompasses both internalizing and externalizing scores. Higher scores indicate increased problem behaviours. Teachers were employed as informants of children's behaviour problems rather than mothers, fathers, or the children because fathers' absence can result in parent conflict, maternal distress, and child distress. Teachers were assumed to be a somewhat more independent source of information than mothers, fathers, or children themselves when examining the effects of fathers' absence on offspring behaviour problems. The children in the full sample ranged in TRF externalizing behaviour T scores from 39 to 78 ($M = 53.19$, $SD = 8.10$), and they ranged in TRF internalizing behaviour T scores from 37 to 76 ($M = 54.88$, $SD = 8.30$). Twenty-eight percent of the children had TRF problem T scores in the "borderline" range or above (T score 60), compared with an expected 18% of nonreferred children in the general population (Achenbach & Rescorla, 2001).

Procedure

Families participated in the current study at two different time points (T1 and T2) that were 3 to 5 years apart. At each time point in the current study, the children's families were contacted by telephone to solicit participation. Those who agreed at T1 were mailed a package of questionnaires including a demographics measure assessing family structure. At T2, families were again contacted and consent was obtained over the telephone and subsequently in writing. Children whose families agreed to participate

were tested both at school and at home, in three separate sessions spanning over a 2-week period. Demographics questionnaires were completed, and information regarding family structure, maternal educational attainment, annual family income, and children's age was obtained. Also at T2, the HOME inventory was administered to families. During this wave of data collection, children underwent cognitive testing, and teachers were asked to complete the TRF for the target children. Families were financially compensated for their participation in the first and second waves of the study.

Strategy for Analysis

Hierarchical linear regression analyses were performed with the full sample in predicting children's T2 IQ and TRF scores. Key assumptions of linear regression, including linear relationships, little multicollinearity, and no auto-correlation were tested, and the number of predictors used in each analysis was appropriate for the number of participants in the study. As 138 families participated in the current study, there was power to detect a small to moderate effect or greater; effect sizes as small as .06 were found to be statistically significant in the current analyses.

In the first model of the analyses, children's gender and age at T2 were entered into the equation. Family income, maternal education, and paternal education at T2 were entered into the second model in order to account for socioeconomic factors. Subsequently, fathers' presence at T1, the quality of the home environment at T2, early couple conflict, fathers' use of early control, and early IQ were entered respectively in separate models of the analyses. Additional predictors (e.g., parents' relationship status, mothers' use of early control) were included in preliminary analyses; however, because the number of participants allowed for a maximum number of predictors, those predictors that were not statistically significantly associated with the outcome variables were excluded from the final regression analyses. Interactions between fathers' presence at T1 as well as fathers' use of early control and each of the other predictors were examined in order to ascertain any possible moderation effects by entering the interaction terms in the final models of each of the regression analyses.

Lastly, median splits were conducted with the continuous predictors in order to graphically depict statistically significant and interesting interactions.

Results

The first hypothesis held that children who live with their fathers in middle childhood and whose fathers demonstrated positive early parental control would have higher levels of cognitive functioning later on in development than other children. The point biserial correlation between T1 fathers' presence and T2 Performance IQ was statistically significant, $r(136) = .18, p < .05$, as was the Pearson correlation between fathers' use of positive control and T2 Performance IQ, $r(136) = .35, p < .01$. Preliminary analyses indicated that Verbal IQ was not associated with either fathers' presence, $r(136) = .05, ns$, or fathers' control, $r(136) = .19, ns$ (see Table 1); therefore, the following results describe only analyses with Performance IQ.

Hierarchical linear regression was employed to predict T2 Performance IQ. In the final model of the main effects analysis, $F(10, 137) = 9.99, p < .01$, there was a statistically significant effect for fathers' use of control ($\beta = .38, p < .01$), although the effect of fathers' presence was not statistically significant ($\beta = .13, ns$; see Table 2). Thus, the first hypothesis was supported for paternal control but not for fathers' presence. Statistically significant main effects for T2 home environment, couple conflict, and early IQ were also found.

Interactions between the predictors of T2 Performance IQ were subsequently examined. The interaction between T1 fathers' presence and T2 paternal education predicted T2 Performance IQ when it was entered into the regression analysis, such that for those children whose fathers had fewer years of education, having a father absent predicted lower Performance IQ scores than having a father present ($B = -4.53, p < .01$; see Figure 1).

In summary, children whose fathers displayed more positive early parental control had higher Performance IQ scores at T2 than other children after controlling for family and socioeconomic factors. In addition, fathers' presence at T1 predicted higher Per-

Table 1
Correlations Between All Variables in the Full Sample (n = 138)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. T1 father presence _{pb}	—	-.09	.18*	.07	-.14 ^t	-.15 ^t	.09	-.11	.34**	.20*	.11	.15 ^t	.38**	-.23**
2. Father control		—	.35**	.19 ^t	-.45**	.02	.26**	-.04	-.06	-.37**	.07	.05	.02	.13
3. T2 Performance IQ			—	.59**	-.35**	-.07	.20*	-.02	.20*	.19*	.29**	.50**	.19*	-.24**
4. T2 Verbal IQ				—	-.29**	-.08	.01	-.16	.27**	.41**	.19 ^t	.54**	.29**	-.32**
5. T2 TRF internalizing					—	.26**	-.27**	.05	.07	-.01	.02	-.22*	-.24**	.18*
6. T2 TRF externalizing						—	-.30**	.32**	-.11	-.17*	-.19*	-.24**	-.53**	.18*
7. Child gender _{pb}							—	-.10	-.03	.00	-.06	.21*	.16 ^t	.08
8. T2 child age								—	-.14 ^t	-.13	-.06	.00	-.22*	.16 ^t
9. T2 income									—	.58**	.24**	.20*	.52**	-.27**
10. T2 maternal education										—	.40**	.41**	.47**	-.38**
11. T2 paternal education											—	.26**	.15 ^t	-.17*
12. Early IQ												—	.39**	-.26**
13. T2 HOME													—	-.46**
14. Couple conflict _{pb}														—

Note. T1 = Time 1; T2 = Time 2; _{pb} = point biserial correlations; TRF = Teacher Report Form; HOME = Home Environment.
^t $p < .10$. * $p < .05$. ** $p < .01$.

Table 2
Hierarchical Linear Regressions for T2 Performance IQ in the Full Sample (n = 138)

Model	1	2	3	4	5	6	7		Interactions
	β	β	β	β	β	β	β	Part	<i>B</i>
Child gender	.20*	.22**	.21**	.21*	.24**	.13	.06	.06	
Child age (T2)	-.00	.04	.04	.05	.06	.08	.03	.03	
Family income (T2)		.15	.11	.10	.13	.03	.10	.07	
Maternal education (T2)		-.01	-.01	-.02	-.07	.23 [†]	.07	.04	
Paternal education (T2)		.28**	.27**	.27**	.27**	.14 [†]	.10	.08	
Father presence (T1)			.10	.09	.07	.14 [†]	.13 [†]	.12	
HOME (T2)				.04	-.04	-.13	-.22*	-.16	
Early couple conflict					-.22*	-.23**	-.19*	-.16	
Early father control						.44**	.38**	.31	
Early IQ							.41**	.34	
Father presence \times paternal education									-4.53**
Father control \times gender									-12.48 [†]
<i>F</i>	2.74 [†]	4.73**	4.17**	3.57**	3.91**	6.78**	9.99**		
<i>F</i> -change	2.74 [†]	5.86**	1.30	.16	5.39*	24.19**	26.63**		
<i>R</i> ² (total adjusted)	.03	.12	.12	.12	.15	.28	.40		

Note. T1 = Time 1; T2 = Time 2; HOME = Home Environment. *B* represents the unstandardized *b* coefficient (the effect of an independent variable on the dependent variable, net of the effects of the other independent variables).

[†] $p < .10$. * $p < .05$. ** $p < .01$.

formance IQ scores at T2 for fathers with fewer years of educational attainment.

The second hypothesis held that children who live with their fathers in middle childhood and whose fathers demonstrated positive early parenting skills would have lower levels of behaviour problems later on in development than other children. Preliminary analysis indicated that the point biserial correlation between T2 TRF externalizing and T1 fathers' presence, $r(136) = -.15$, *ns*, as well as the Pearson correlation between T2 TRF externalizing and early paternal control, $r(136) = .02$, *ns*, were not statistically significant. The Pearson correlation between T2 TRF internalizing and fathers' early use of control was statistically significant, $r(136) = -.45$, $p < .01$, although the point biserial correlation between T1 fathers' presence and T2 TRF internalizing was not statistically significant, $r(136) = -.14$, *ns* (see Table 1). Conse-

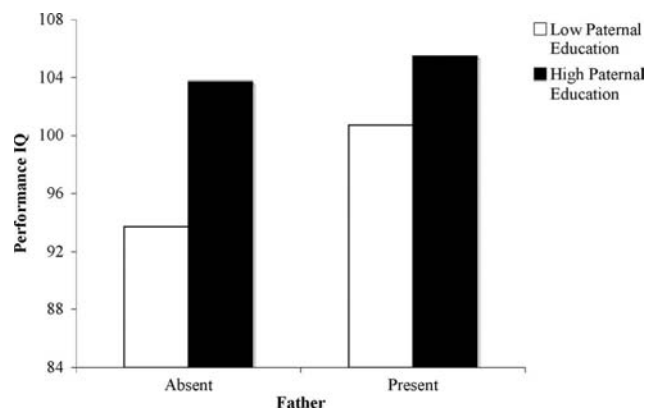


Figure 1. Interaction between fathers' presence in middle childhood and paternal educational attainment in preadolescence in predicting later Performance IQ scores in preadolescence.

quently, the following results describe only results with T2 TRF internalizing problems.

Hierarchical linear regression was used to predict T2 internalizing problems. In the final model of the main effects analysis, $F(10, 137) = 8.55$, $p < .01$, there were statistically significant main effects for early fathers' control ($\beta = -.58$, $p < .01$) and T1 fathers' presence ($\beta = -.18$, $p < .05$) in predicting T2 internalizing problems, supporting the second hypothesis. There were also statistically significant main effects for T2 income, maternal and paternal education, and early couple conflict (see Table 3).

Interactions between the predictors of T2 internalizing problems were subsequently examined. The interaction between children's gender and T1 fathers' presence predicted TRF internalizing problems, such that girls with fathers who were present had lower internalizing problem behaviour scores than girls with fathers who were absent ($B = -5.21$, $p < .05$; see Figure 2), while the same was not true for boys.

Taken together, children whose fathers displayed less positive parental control and whose fathers were absent had higher internalizing scores later on than other children. Further, fathers' presence predicted decreased internalizing problem scores later on for girls but not for boys.

Discussion

The aim of the current study was to illustrate the ways in which fathers' presence in the home and parenting predict developmental outcomes of children over time in a disadvantaged sample living within a Québec context. Overall, the results indicated that fathers' early use of control and fathers' presence in middle childhood predicted cognitive and behavioural outcomes later on in development. This was illustrated utilizing a prospective methodology with a culturally and linguistically distinct longitudinal sample of socioeconomically at-risk families, and after accounting for such

Table 3
 Hierarchical Linear Regressions for T2 Teacher Report Form Internalizing Problems in the Full Sample ($n = 138$)

Model	1	2	3	4	5	6	7	Interactions	
	β	β	β	β	β	β	β	Part	B
Child gender	-.27**	-.27**	-.25**	-.23**	-.23**	-.08	-.07		-.07
Child age (T2)	.02	.03	.02	-.03	-.03	-.04	-.04		-.04
Family income (T2)		.11	.16	.23*	.23*	.36**	.35**		.25
Maternal education (T2)		-.07	-.07	.04	.04	-.35**	-.33**		-.20
Paternal education (T2)		.01	.02	.01	.01	.18*	.18*		.16
Father presence (T1)			-.16 [†]	-.09	-.08	-.18*	-.18*		-.16
HOME (T2)				-.31**	-.25*	-.13	-.12		-.09
Early couple conflict					.15	.17*	.16*		.14
Early father control						-.59**	-.58**		-.47
Early IQ							-.04		-.04
Father presence \times gender									-5.21*
F	5.39**	2.34*	2.50*	3.51**	3.44**	9.53**	8.55**		
F -change	5.39**	.36	3.10 [†]	8.70**	2.62	48.19**	.26		
R^2 (total adjusted)	.06	.05	.06	.11	.13	.36	.36		

Note. T1 = Time 1; T2 = Time 2; HOME = Home Environment. B represents the unstandardized b coefficient (the effect of an independent variable on the dependent variable, net of the effects of the other independent variables).

[†] $p < .10$. * $p < .05$. ** $p < .01$.

potentially confounding factors as annual family income, the quality of the home environment, parental educational attainment, and couple conflict.

The first hypothesis that children whose biological fathers demonstrated positive early parental control and were present in middle childhood would have increased levels of cognitive functioning later on than other children was partially supported, although only for nonverbal cognitive functioning. Specifically, children whose fathers used more positive early parental control had higher Performance IQ scores later in development than other children. Past research suggests that fathers enhance their children's cognitive functioning through play (MacDonald & Parke, 1986; Pruett, 1998); perhaps fathers who demonstrated the positive use of pa-

rental control during play strengthened children's nonverbal abilities. The effect of paternal control on children's nonverbal cognitive functioning was statistically significant over a span of 6 to 10 years (i.e., early childhood to preadolescence) and accounted for more variance in Performance IQ scores than any other predictor, even when "baseline" IQ at preschool age was controlled.

In addition to nonverbal cognitive functioning, results from the current study demonstrated that children whose fathers displayed more positive early control and were present in middle childhood had fewer behaviour problems at school later in development compared with other children, supporting the second hypothesis. However, this was only true for internalizing behaviour problems, a result that contradicts studies that suggest fathers' involvement predicts both internalizing and externalizing problems in children (Carlson, 2006; Chen et al., 2000). On the other hand, a study by Levine Coley (2003) that examined African American father-daughter relationships indicated that daughters whose fathers were absent and who experienced alienation and disengagement in their relationships with their fathers were more likely to also experience symptoms of depression and problem behaviours at school but not aggressive behaviours. It is possible that the results from the current study are similarly due to the quality of preadolescent children's relationships with their present and absent fathers. Father-daughter relationship quality was not measured in the current study, but it might be more predictive of internalizing problems than externalizing problems in offspring.

In examining statistical interactions in predicting internalizing problems in preadolescence, the current results suggest that girls whose fathers were absent in middle childhood had significantly higher levels of internalizing behaviours at school than girls whose fathers were present; the same was not true for boys. Past research has illustrated significant associations between fathers' absence and increased behaviour problems in children (Chen et al., 2000; Carlson, 2006; Demuth & Brown, 2004; Flouri, 2007; Pfiffner et al., 2001); however, this is the first study to our knowledge that has found these associations for daughters and not sons. It is possible

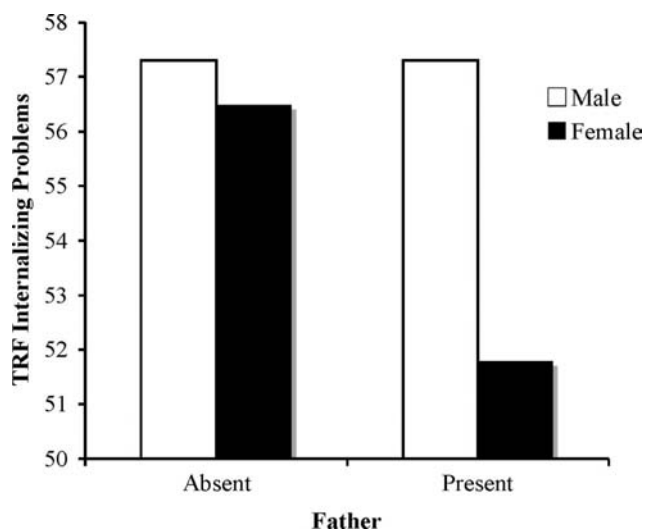


Figure 2. Interaction between fathers' presence in middle childhood and children's gender in predicting later Teacher Report Form (TRF) internalizing problems in preadolescence.

that these findings are a result of girls' increased stress and negative affect because of factors that have been found to be associated with breakdowns in marital relationships and fathers' absence such as family discord, mothers' difficulties upon family disruption, and negative father-daughter relationships (Kerig, Cowan, & Cowan, 1993; Sigle-Rushton & McLanahan, 2004); these factors were not measured in the current study, so this remains a hypothesis for future research. Furthermore, perhaps fathers' presence influenced the type rather than the level of internalizing problems that boys experience at school (i.e., sadness when father is absent vs. anxiety when father is present), a difference that was not captured in the current analyses. Future research with a larger sample could use the Syndrome and DSM-oriented scales of the TRF to examine whether various internalizing symptoms are differentially related to fathers' presence in girls and boys.

In both of the regression analyses, fathers' early use of control enhanced the effect of fathers' presence during middle childhood in predicting preadolescent cognitive and behavioural outcomes. Specifically, fathers' presence marginally predicted Performance IQ and significantly predicted internalizing problems at school only when fathers' control was included in the model. It is possible that this suppression effect is due to the nature of the measurement of paternal control in the current study, as those fathers who reported using the most positive types of early parental control might have also been the fathers who remained living with their children between three and five years later. Past research has indicated a significant association between family structure and paternal parenting (e.g., Carlson, 2006; Griffin et al., 2000); however, fathers' use of early control and fathers' presence during middle childhood were not significantly correlated in the current study. Further research is required to fully understand the relation between fathers' presence and parenting characteristics in predicting outcomes in offspring.

The current study illustrated the significant effects of socioeconomic factors on children's concurrent cognitive functioning and behaviour problems. Specifically, the quality of the home environment predicted children's concurrent Performance IQ. Because the regression coefficient was negative, a suppressor effect might have occurred; this result should be replicated by future research before making further interpretations. Furthermore, family income, maternal education, and paternal education predicted children's concurrent internalizing problems. Unexpectedly, fathers who were more educated had children with higher levels of internalizing problems; this finding had no precedent in the literature and should await replication before interpreting it. In general, fathers' presence and early control predicted children's later development even after accounting for SES factors, supporting results from previous studies (Cabrera et al., 2007; Ryan et al., 2006). These results suggest that fathers' presence in middle childhood and early control might be important for children's later cognitive and behavioural functioning for reasons other than fathers' income contribution to the family, even among socioeconomically at-risk families.

Although the present study contributed to the literature in a number of ways, it also had several limitations. The size of the sample was small; this limited the number of control variables that could be included in the regression analyses. An additional limitation is the use of fathers' presence as a predictor despite the

argument that it is not detailed enough to understand children's experiences (Flouri, 2007), and more specifically, the lack of differentiation between fathers' absence from their children's homes and fathers' absence from their children's lives. It is likely that some children in the sample who did not live with their biological fathers had regular contact with their fathers, which could perhaps account for the small and marginal associations between fathers' presence and child outcomes in the current study. Had father involvement been measured in addition to fathers' presence, it might have mediated the relation between fathers' absence and children's outcomes, as has been demonstrated in some previous research (e.g., Astone & McLanahan, 1991; Allen & Daly, 2002; Carlson, 2006).

Moreover, the measurement of fathers' parenting was restricted to parental control used with young children; an interesting line of future inquiry would involve examining additional parenting dimensions in the interactions between fathers and children later in development, a direction that could not be pursued in the current study due to lack of additional parenting measures in the original data set. Additionally, measurements of fathers' parenting were obtained by self-report questionnaires; richer information regarding father-child relationships could be obtained by observing fathers in interactions with their children. Moreover, some scales that were employed in the current study demonstrated low Cronbach's alpha coefficients (e.g., PDI, HOME); therefore, the correlations that were found might have been attenuated due to greater measurement error. Finally, only teachers' reports of children's behaviour problems were included in the current analyses. As previous research has indicated that reports of the development of behaviour problems vary within and across informants (Keiley, Bates, Dodge, & Pettit, 2000), future analyses could consider reports from parents and the children themselves in addition to teachers' reports to gain a comprehensive view of children's behaviour problems.

In conclusion, fathers' early use of positive control predicted both increased nonverbal cognitive performance and decreased internalizing problems later in development, and fathers' presence in middle childhood predicted decreased internalizing problems later in development. The question of family composition is especially relevant in Québec, as the rate of common-law unions is much higher than in other Canadian provinces (25% of families with children in Québec compared with 5.5% in Canada; Statistics Canada, 2007b). Further, common-law unions are more easily and more often dissolved than marriages (Andersson, 2002; Kamp Dush & Amato, 2005), frequently resulting in single-mother families. Because of Québec's unique demographics and social customs, the current research suggests that it is essential that the province formulate policies that would encourage increased and positive forms of contact between children and their fathers. Initiatives such as parental leave for men and parenting classes that emphasise the role of fathers could help to maximize children's development from early childhood to preadolescence.

Résumé

Une littérature émergente illustre l'influence des pères dans le développement de leurs enfants. Ce sujet est particulièrement pertinent au Québec, une province unique sur les plans culturel et démographique, où la monoparentalité féminine est relativement

commune; cette situation est associée à des désavantages socioéconomiques prédisant des effets cognitifs et comportementaux adverses chez les jeunes. À l'aide des données du *Concordia longitudinal risk project*, une banque de données intergénérationnelle recueillies dans la région de Montréal, la présente étude visait à examiner les relations prospectives entre la présence et la parentalité du père et le fonctionnement cognitif et comportemental subséquent de l'enfant. L'échantillon actuel comptait 138 familles de classe économique faible à moyenne qui ont participé à deux vagues de collecte de données : lorsque les enfants étaient d'âge moyen et trois ou cinq ans après, lorsqu'ils étaient à la préadolescence. Les résultats ont indiqué que pour les filles seulement, la présence du père en enfance prédisait moins de problèmes internalisés à la préadolescence. Pour les garçons et les filles, le contrôle parental positif du père prédisait un meilleur QI de performance et moins de problèmes internalisés jusqu'à six ans plus tard. Ces résultats ajoutent à la littérature croissante suggérant que les pères contribuent de façon importante au fonctionnement cognitif et comportemental de leurs enfants et appuient les politiques visant à encourager les pères à passer du temps avec leurs enfants (c.-à-d., congés parentaux pour les hommes) et qui promeuvent un rôle et une implication positives du père à travers des cours de parentalité.

Mots-clés : pères, problèmes comportementaux, fonctionnement cognitif, contexte canadien, risque socioéconomique

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