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Thérèse Besnard [a], Pierrette Verlaan [a], Marilyne Davidson [a], Frank Vitaro [b], Francois Poulin [c] & France Capuano [c]

[a] Department of Psychoeducation, Université de Sherbrooke, Québec, Canada

[b] Université de Montréal, Québec, Canada

[c] Université du Québec à Montréal UQAM, Québec, Canada

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# Bidirectional influences between maternal and paternal parenting and children's disruptive behaviour from kindergarten to grade 2

Thérèse Besnard[a*], Pierrette Verlaan[a], Marilyne Davidson[a], Frank Vitaro[b], Francois Poulin[c] and France Capuano[c]

[a]*Department of Psychoeducation, Université de Sherbrooke, Québec, Canada;* [b]*Université de Montréal, Québec, Canada;* [c]*Université du Québec à Montréal UQAM, Québec, Canada*

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Empirical evidence suggests that children's disruptive behaviour (CDB) and quality of parenting influence one another bidirectionally. However, few studies have considered the separate contribution of the mother–child and father–child relationships to disruptive behaviours within a longitudinal context. Against this background, the reciprocal influence between CDB and five dimensions of maternal and paternal parenting was examined from kindergarten through grade 2 in a community sample of 644 children. These relationships were investigated using cross-lagged panel correlation and reciprocal effect analysis. Differences and similarities emerged in the direction of effects linking maternal and paternal parenting and CDB. At school entry, a reciprocal parent–child influence was evident for mothers only. However, as children grew older, a unidirectional effect from CDB to parenting was noted for both fathers and mothers. Implications for future research focusing on the link between CDB and the parent–child relationship are discussed.

**Keywords:** parenting practices; disruptive behaviour; school entry; mothers and fathers; transactional links



## Introduction

Research examining the links between parenting practices (PPs) and children's disruptive behaviour (CDB) at school entry has traditionally focused on hostile and inconsistent PPs or rejection by mothers in relation to the onset of CDB (Patterson, 1982; Shaw et al., 1998). Until the 1970s, child development experts studied almost exclusively the role of mothers. Over the past three decades, however, they have turned their attention to fathers, the 'invisible' parent (Saracho & Spodek, 2008), and now acknowledge the significant influence of fathers on child social adaptation (Lamb, 1996; Paquette, 2004). Numerous studies have since been conducted on the links between paternal attachment (George, Cummings, & Davies, 2010; Grossman et al., 2002; Hazen, McFarland, Jacobvitz, & Boyd-Soisson, 2010) or paternal rearing practices and child development (for a review, see Mitchell et al., 2007). The identification of gender-related differences in the parent–child relationship suggests that the link between maternal PPs and the

*Corresponding author. Email: therese.besnard@usherbrooke.ca

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development of CDB, on the one hand, and paternal PPs and CDP, on the other hand, may be differentiated.

Barber, Stolz, and Olsen (2005) stated that PPs can be classified under 'two fundamental domains: (a) *supportive and positive parenting* characterised by warmth, involvement, and synchrony, and (b) *inconsistent or negative parenting* marked by criticism and punitive discipline' (p. 2). Positive PPs have been shown to contribute to reduce the incidence of CDB (Bradley & Corwyn, 2007; Rothbaum & Weisz, 1994). Conversely, parental negativity, hostility, and rejection have been linked to greater CDB (Ackerman, Brown, & Izard, 2003; Deater-Deckard, Ivy, & Petrill, 2006; Rubin, Burgess, Dwyer, & Hastings, 2003). Furthermore, studies have reported increased CDB to be associated not only with negative parenting, but also with lack of positive parenting marked by involvement, cooperation, and positive reinforcement (Johnson, Cowan, & Cowan, 1999; Sim & Ong, 2005). In general, the empirical results of these studies confirm an association between CDB and PPs for mother–child and father–child dyads. Studies have also demonstrated gender-specific differences, with differential dimensions of maternal and paternal parenting predicting the development of CDB in boys or girls (for a review, see Besnard, Verlaan, Capuano, Poulin, & Vitaro, 2011).

However, there are several gaps in the literature on parent and child contributions to the development of CDB over time. First, despite theoretical and empirical support for reciprocal negative exchanges between parents and children, most studies have treated children as passive recipients of environmental impacts (for a review, see Tremblay, 2010). In his initial model, Patterson (1982) hypothesised that coercive parenting was primarily responsible for the development of CDB. Expanding on the theoretical and empirical foundations of the coercion theory, Granic and Patterson (2006) viewed the child's natural attributes (i.e. temperament, hyperactivity, and low emotion regulation) as equally important elements in the development of systemic parent–child response patterns. These characteristics, combined with those of the parents (i.e. depression, marital tensions, and antisocial behaviour) and environmental factors such as low socio-economic status (SES), form the basis for a cycle of coercive interactions. Parents and child feed off one another in developing patterns of escalating coercive response processes. According to these authors, these processes may have an early onset and may become rigid over time. The longer the processes continue, the less tolerant the parent becomes of any CDB; what was once endured now becomes a cue for coercive parenting.

Studies that have tested the bidirectional coercive model with school-aged children and their parents have not tended towards a consensus. Certain authors have observed a bidirectional effect between CDB and PPs (Burke, Pardini, & Loeber, 2008; Carrasco, Holgado, Rodríguez, & del Barrio, 2009; Combs-Ronto, Olson, Lunkencheimer, & Sameroff, 2009; Hipwell et al., 2008; Pardini, Fite, & Burke, 2008). Others have reported evidence only of a unidirectional link where coercive parenting predicts CDB (e.g. Benzies, Keown, & Magill-Evans, 2009; Brannigan, Gemmell, Pevalin, & Wade, 2002; Morrell & Murray, 2003). By comparison, few studies have found evidence that CDB predicted controlling and coercive parenting (e.g. Fite, Colder, Lochman, & Wells, 2006). It is important to note that the samples in these studies comprised mainly mother–child dyads, with father participation reaching 6% at most (Hipwell et al., 2008). To our knowledge, only one study has ever tested bidirectionality in father–child dyads, and it found that a significant decrease in paternal positive PPs predicted an escalation in CDB in five- to nine-year-old children (Schacht, Cummings, & Davies, 2009). This study, however, did not include mothers. Also, to our

knowledge, only one study simultaneously examined bidirectional influences of maternal and paternal parenting and CDB at school entry. The effects it found were all unidirectional (Gadeyne, Ghesquière, & Onghena, 2004): CDB was clearly predictive of both high levels of maternal control and low levels of paternal support, only more strongly so in the case of the former. However, this study presented two important limitations. First, it covered only two dimensions of parenting (support and control), although other dimensions could have played a role in child adaptation as well. Second, both positive and negative forms of discipline were bundled under the control dimension; thus, the significant effects of coercive versus democratic control might have been masked.

Against this background, we set out to test the transactional relationships between maternal and paternal parenting and CDB across the transition from kindergarten to grade 2. An autoregressive cross-lagged longitudinal model with three repeated measures was used to address the following research questions. First, how are maternal and paternal PPs associated with CDB over time? Second, do certain dimensions of parenting predict later CDB and vice versa? Five specific dimensions of PPs were considered: (1) parental involvement, (2) positive reinforcement, (3) inconsistency, (4) hostile practices, and (5) affective rejection. CDB included direct and indirect aggression, opposition, and hyperactivity.



## Method

### *Participants and procedures*

The full study sample consisted of 1095 children from 250 kindergarten classes across 40 schools of a large school board in the suburbs of Montreal (Canada). They were recruited on three consecutive school years (2002–2004) and followed from school entry through the end of grade 2 (Capuano et al., 2010). Of this sample, 330 children (69% boys) were considered 'at risk' for persistent CDB for having scored above the 65th percentile on a screening instrument on the basis of *both* teacher and parent reports. The rest of the sample was made up of students without CDB. These were recruited in the same classrooms and randomly selected among children whose total score on the screening instrument was below the 65th percentile according to one of the both reports ($n = 765$; 60.5% boys).

Of these, a subsample was composed of only those families ($n = 644$) where mother and father participated during at least two times of measurement. Boys made up 62.7% ($n = 404$) of these children. The mean age of children at kindergarten entry (T1) was 65.2 months (SD = 3.7). The mean age of mothers and fathers at T1 was, respectively, 35.1 (SD = 4.7) and 37.3 (SD = 5.2) years. Most of the parents (74.4% of mothers and 69.6% of fathers) had a college education or a better one. Mean family income totalled CAN$60,900 (SD = $22,480). The vast majority of the families were middle class, French speaking, and Canadian born (86.6%). This subsample did not differ from the original sample (Capuano et al., 2010) with respect to the level of CDB, parents' age, fathers' years of schooling, mothers' and fathers' level of depression, and quality of spousal relationship. However, mothers in the subsample had more years of schooling: 16.1 (SD = 3.9) versus 14.5 (SD = 3.9), $F = -6.26$, $p < 0.000$. Also, the dual-parent selection criterion ensured that the subsample had a higher mean family income: $60,900 (SD = $22,480) versus $43,400 (SD = $25,550), $t = -10.62$, $p < 0.000$.

For our longitudinal study, we used data gathered in the fall and spring of the kindergarten school year (T1 and T2), the spring of the first grade (T3), and the spring of the second grade (T4). It should be noted that no fathers participated during the last time of measurement (T4). Overall, attrition reached approximately 40% from T1 to T4 and was not random. As special efforts were made to retain at-risk children and their families in the study, the proportion of children with CDB in the sample increased from 32.6% at T1 to 42.4% at T4.

Maternal and paternal PPs were evaluated based on a self-report questionnaire and CDB on parent report on a different questionnaire. The instruments were sent to parents through their children and were returned to teachers in a sealed envelope. The two parents were invited to fill out their respective questionnaires separately.



### *Measures*

#### *Maternal and paternal PPs*

A 42-item self-report questionnaire was designed regrouping five subscales from three instruments: parent involvement with child (10 items) and use of positive reinforcement (5 items) from the *Alabama Parenting Questionnaire* (Shelton, Frick, & Wooton, 1996); inconsistency (6 items) from the *Parenting Practices Inventory* (Lochman & CPPRG, 1995); and use of hostile educational practices including corporal punishment (6 items) and affective rejection (9 items) from the *Parental Acceptance–Rejection Questionnaire* (Rohner, Chaille, & Rohner, 1980). A mean score was calculated for each scale. All five subscales demonstrated adequate internal reliability across both mother and father reports and across the assessment waves, with Cronbach's alphas ranging from 0.60 to 0.79 for mothers and from 0.63 to 0.82 for fathers.

#### *Children's disruptive behaviour*

A 75-item questionnaire derived from the *Preschool Behavior Questionnaire* (Tremblay, Vitaro, Gagnon, Piché, & Royer, 1992) was used to assess CDB. Informants indicated frequency of child behaviour on a scale of 1 (*never*) to 6 (*often*). Only the dimensions relating to disruptive behaviours were used for the purposes of the study. They included items regarding indirect aggression (5 items), physical aggression (10 items), opposition (6 items), and hyperactivity (11 items). These items were grouped in such a manner as to obtain a single average score ranging from 1 to 6. The internal consistency of the composite scale was high ($\alpha = 0.94$). This questionnaire was completed by one parent only, the mother in 85% of cases.

### *Plan of analysis*

First, means, standard deviations, and correlations between the relevant variables were computed. Next, the longitudinal transactional relationship between the five dimensions of parenting (involvement, positive reinforcement, inconsistency, hostility, and affective rejection) and CDB was examined separately for mothers and fathers using an autoregressive cross-lagged longitudinal model with two repeated measures and subsequently placed in the integrated model with three repeated measures.

The analyses were completed in a sequential format using Mplus 5 (Muthén & Muthén, 2008) to estimate the relationships among the variables and to assess model fit. The missing data were computed using the *maximum-likelihood estimation.* Because the chi-square fit index is highly sensitive to sample size, the fit of the autoregressive

cross-lagged model was evaluated using the comparative fit index (CFI) and Tucker-Lewis index (TLI; Bentler, 1990) and the root-mean-square error of approximation (RMSEA; Steiger, Shapiro, & Browne, 1985), which is relatively independent of sample size. Another reason for choosing these indexes is that both take into account model complexity, which is an important property for comparing several alternative models that might differ in this regard. Thus, the fits of the models were considered good with a CFI of 0.90 or more and with an RMSEA of 0.08 or less (Marsh, Hau, & Wen, 2004). In addition, following recommended practice in longitudinal structural equation modeling, all models included measurement error covariance across time based on the assumption that errors of repeated measures covaried (Kline, 1998). Also, all covariances for exogenous variables and disturbances were modelled regardless of statistical significance to account for common causes not included in the model and for synchronous relationships within time.



## Results

### *Descriptive statistics*

First, we verified the data to determine whether they met the normality assumption. Because maximum-likelihood estimation can produce distorted results when the assumption is severely violated (Curran, West, & Finch, 1996), the normality of each variable was investigated in terms of kurtosis and skewness. According to the guideline for severe non-normality (i.e. skew$>$2; kurtosis$>$7) proposed by Curran et al. (1996), the normality assumption for all the variables was well met. Given that the assumption was satisfied, correlation analyses were computed next and divergent validity was confirmed, with the inter-latent zero-order coefficients being less than 0.85 (Kline, 1998) (Tables 1 and 2). The correlations among all the dimensions of maternal and paternal PPs (involvement, positive reinforcement, inconsistency, hostility, and affective rejection) were 0.44 or higher, indicating all parenting factors to be rather stable constructs. High correlations were also found for CDB across times of measurement ($r_s = 0.68$ to 0.82), indicating this behaviour to be highly stable from the beginning of kindergarten through the second grade.

Finally, although the correlations found between PPs and CDB were weaker than anticipated, they were statistically significant and in the expected direction for mothers ($r = -0.09$ to 0.55). The general pattern for paternal PPs, too, was statistically significant in the expected direction with regard to CDB ($r_s = -0.07$ to 0.42), with the exception of positive reinforcement ($r = 0.01$ to $-0.09$).

### *Model comparisons*

The results of two separate cross-lagged models (one for mothers and the other for fathers) with two repeated measures between each PP and CDB were previously tested and they showed a good fit of the models (Table 3). Fit index results for the integrated model accounting simultaneously for each dimension of maternal and paternal PPs and CDB are summarised in Table 4. All models showed a good fit with the CFI/TLI over 0.90 and the RMSEA at or under the 0.08 threshold.

After assessing the fit of the hypothesised model, it is important first to look at the baseline or stability models, as discussion of any cross-lagged effects presumes 'over and above' variance explained by autoregressive effects (e.g. stability of construct across time). Indeed, without these controls, strong but spurious cross-lagged relationships could emerge between variables of interest (MacCallum & Austin, 2000). Perhaps

Table 1. Correlations, means, and standard deviations for maternal and paternal positive parenting and children's disruptive behaviour.

| Measures | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | *M* | SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. T1 Inv | – | **0.73** | **0.65** | – | **0.65** | **0.56** | **0.50** | – | **−0.19** | **−0.18** | **−0.15** | **−0.16** | 3.84 | 0.65 |
| 2. T2 Inv | **0.64** | – | **0.69** | – | **0.50** | **0.62** | **0.47** | – | **−0.17** | **−0.18** | **−0.15** | **−0.20** | 3.77 | 0.68 |
| 3. T3 Inv | **0.53** | **0.62** | – | – | **0.44** | **0.52** | **0.65** | – | **−0.14** | **−0.10** | **−0.16** | **−0.13** | 3.88 | 0.63 |
| 4. T4 Inv | **0.53** | **0.58** | **0.67** | – | – | – | – | – | – | – | – | – | – | – |
| 5. T1 PR | **0.45** | **0.36** | **0.31** | **0.33** | – | **0.65** | **0.55** | – | **−0.09** | −0.08 | −0.05 | −0.03 | 4.53 | 0.54 |
| 6. T2 PR | **0.34** | **0.51** | **0.38** | **0.36** | **0.53** | – | **0.58** | – | −0.08 | −0.08 | −0.03 | −0.04 | 4.47 | 0.55 |
| 7. T3 PR | **0.36** | **0.41** | **0.54** | **0.42** | **0.53** | **0.58** | – | – | −0.06 | 0.03 | −0.01 | 0.01 | 4.48 | 0.54 |
| 8. T4 PR | **0.34** | **0.33** | **0.40** | **0.56** | **0.44** | **0.45** | **0.57** | – | – | – | – | – | – | – |
| 9. T1 CDB | **−0.24** | **−0.22** | **−0.22** | **−0.24** | **−0.10** | **−0.08** | **−0.16** | **−0.16** | – | **0.75** | **0.68** | **0.68** | 2.27 | 0.65 |
| 10. T2 CDB | **−0.24** | **−0.23** | **−0.22** | **−0.22** | **−0.13** | **−0.13** | **−0.12** | **−0.17** | **0.75** | – | **0.73** | **0.68** | 2.20 | 0.62 |
| 11. T3 CDB | **−0.24** | **−0.24** | **−0.28** | **−0.22** | **−0.11** | **−0.19** | **−0.19** | **−0.20** | **0.68** | **0.73** | – | **0.82** | 2.18 | 0.64 |
| 12. T4 CDB | **−0.20** | **−0.15** | **−0.24** | **−0.18** | **−0.12** | **−0.09** | **−0.14** | **−0.18** | **0.68** | **0.68** | **0.82** | – | 2.13 | 0.68 |
| *M* | 4.19 | 4.18 | 4.23 | 4.21 | 4.71 | 4.70 | 4.70 | 4.70 | 2.27 | 2.20 | 2.18 | 2.13 | – | – |
| SD | 0.47 | 0.52 | 0.48 | 0.52 | 0.35 | 0.37 | 0.41 | 0.42 | 0.65 | 0.62 | 0.64 | 0.68 | – | – |

Note: Correlations for mothers are below the diagonal, and those for fathers are above the diagonal; values significant at $p < 0.05$ are in bold. Inv, involvement; PR, positive reinforcement; CDB, children's disruptive behaviour.

Table 2. Correlations, means, and standard deviations for maternal and paternal negative parenting and children's disruptive behaviour.

| Measures | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | *M* | SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. T1 Inc | – | **0.55** | **0.42** | – | **0.28** | **0.24** | **0.16** | – | **0.35** | **0.26** | **0.18** | – | **0.22** | **0.25** | **0.18** | **0.20** | 2.12 | 0.62 |
| 2. T2 Inc | **0.61** | – | **0.47** | – | **0.17** | **0.25** | **0.21** | – | **0.23** | **0.28** | **0.26** | – | **0.18** | **0.21** | **0.14** | **0.18** | 2.01 | 0.59 |
| 3. T3 Inc | **0.51** | **0.61** | – | – | 0.11 | **0.26** | **0.33** | – | **0.16** | **0.20** | **0.21** | – | 0.07 | 0.09 | **0.11** | **0.16** | 1.97 | 0.57 |
| 4. T4 Inc | **0.45** | **0.53** | **0.53** | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 5. T1 HP | **0.31** | **0.23** | **0.24** | **0.18** | – | **0.63** | **0.47** | – | **0.63** | **0.53** | **0.41** | – | **0.30** | **0.27** | **0.25** | **0.27** | 1.34 | 0.39 |
| 6. T2 HP | **0.25** | **0.29** | **0.30** | **0.24** | **0.62** | – | **0.66** | – | **0.54** | **0.66** | **0.47** | – | **0.30** | **0.32** | **0.33** | **0.30** | 1.32 | 0.34 |
| 7. T3 HP | **0.27** | **0.24** | **0.38** | **0.22** | **0.54** | **0.71** | – | – | **0.30** | **0.40** | **0.57** | – | **0.25** | **0.28** | **0.34** | **0.42** | 1.32 | 0.34 |
| 8. T4 HP | **0.24** | **0.25** | **0.30** | **0.35** | **0.56** | **0.65** | **0.61** | – | – | – | – | – | – | – | – | – | – | – |
| 9. T1 AR | **0.33** | **0.22** | **0.16** | **0.20** | **0.57** | **0.47** | **0.39** | **0.42** | – | **0.65** | **0.48** | – | **0.27** | **0.27** | **0.20** | **0.25** | 1.36 | 0.32 |
| 10. T2 AR | **0.31** | **0.29** | **0.25** | **0.23** | **0.48** | **0.63** | **0.52** | **0.44** | **0.67** | – | **0.55** | – | **0.23** | **0.25** | **0.22** | **0.21** | 1.35 | 0.32 |
| 11. T3 AR | **0.16** | **0.21** | **0.27** | **0.13** | **0.47** | **0.47** | **0.63** | **0.51** | **0.51** | **0.58** | – | – | **0.24** | **0.26** | **0.32** | **0.35** | 1.31 | 0.26 |
| 12. T4 AR | **0.21** | **0.18** | **0.20** | **0.27** | **0.41** | **0.44** | **0.48** | **0.63** | **0.49** | **0.56** | **0.61** | – | – | – | – | – | – | – |
| 13. T1 CDB | **0.18** | **0.18** | **0.14** | **0.16** | **0.46** | **0.42** | **0.36** | **0.38** | **0.33** | **0.30** | **0.29** | **0.26** | – | **0.75** | **0.68** | **0.68** | 2.27 | 0.65 |
| 14. T2 CDB | **0.17** | **0.24** | **0.20** | **0.17** | **0.41** | **0.55** | **0.46** | **0.44** | **0.34** | **0.41** | **0.35** | **0.33** | **0.75** | – | **0.73** | **0.68** | 2.20 | 0.62 |
| 15. T3 CDB | **0.16** | **0.17** | **0.24** | **0.23** | **0.36** | **0.46** | **0.51** | **0.48** | **0.24** | **0.31** | **0.38** | **0.33** | **0.68** | **0.73** | – | **0.82** | 2.18 | 0.64 |
| 16. T4 CDB | **0.18** | **0.16** | **0.17** | **0.28** | **0.39** | **0.45** | **0.45** | **0.50** | **0.28** | **0.27** | **0.34** | **0.39** | **0.68** | **0.68** | **0.82** | – | 2.13 | 0.68 |
| *M* | 2.03 | 2.02 | 1.82 | 1.86 | 1.34 | 1.29 | 1.28 | 1.26 | 1.35 | 1.34 | 1.33 | 1.32 | 2.27 | 2.20 | 2.18 | 2.13 | – | – |
| SD | 0.60 | 0.62 | 0.60 | 0.57 | 0.35 | 0.33 | 0.33 | 0.33 | 0.28 | 0.29 | 0.28 | 0.26 | 0.65 | 0.62 | 0.64 | 0.68 | – | – |

Note: Correlations for mothers are below the diagonal, and those for fathers are above the diagonal; values significant at $p < 0.05$ are in bold. Inc, inconsistencies; HP, hostile practice; AR, affective rejection; CDB, children's disruptive behaviour.

Table 3. Goodness-of-fit indexes for the structural equation models for maternal or paternal parenting, respectively, and children's disruptive behaviour (two repeated measures).

| Model fits | Involvement | Positive reinforcement | Inconsistency | Hostility | Affective rejection |
|---|---|---|---|---|---|
| Mother × CDB | | | | | |
| CFI | 0.977 | 0.979 | 0.968 | 0.977 | 0.967 |
| TLI | 0.956 | 0.962 | 0.943 | 0.948 | 0.937 |
| RMSEA | 0.072 | 0.063 | 0.081 | 0.083 | 0.088 |
| CI inf | 0.054 | 0.045 | 0.064 | 0.064 | 0.070 |
| CI sup | 0.091 | 0.082 | 0.099 | 0.103 | 0.106 |
| Father × CDB | | | | | |
| CFI | 0.985 | 0.990 | 0.986 | 0.981 | 0.976 |
| TLI | 0.970 | 0.979 | 0.975 | 0.961 | 0.953 |
| RMSEA | 0.065 | 0.052 | 0.055 | 0.072 | 0.078 |
| CI inf | 0.044 | 0.029 | 0.034 | 0.050 | 0.057 |
| CI sup | 0.088 | 0.075 | 0.077 | 0.094 | 0.100 |

Note: CFI, comparative fit index; RMSEA, root-mean-square error of approximation; CI, confidence interval; CDB, children's disruptive behaviour.



the most salient findings of these analyses were the very strong stability coefficients obtained for CDB and, to a lesser degree, for maternal and paternal PPs. Figures 1–5 provides the structural path coefficients for all models evaluated for these analyses.

The results indicated, as revealed by the correlations, that stability coefficients were moderate to strong for both maternal ($\beta$s = 0.47 to 0.78, $p < 0.000$) and paternal ($\beta$s = 0.55 to 0.73, $p < 0.000$) PPs across the study period. These coefficients suggested both maternal and paternal PPs to be very stable over time, leaving relatively little variance to be accounted for by other factors, whether related to parenting or otherwise. Stability coefficients for CDB were also high ($\beta$s = 0.62 to 0.78, $p < 0.000$), indicating that children who engaged in high levels of CDB at kindergarten entry (T1) remained at those levels at T2, T3, and T4.

### *Cross-lagged paths*

#### *Parental involvement*

As shown in Figure 1, a significant pathway from maternal involvement at T1 to CDB at T2 emerged, suggesting that this involvement with child at the start of kindergarten (T1) positively influenced a decline in CDB at the end of kindergarten six months later (T2). Inversely, CDB at T1 also positively affected maternal involvement at T2. However, though this reciprocal parent–child effect was present from T2 to T3, the pathways from T3 to T4 were not significant. The reciprocal effect observed in mother–child dyads was not observed in father–child dyads: no significant pathways between paternal involvement and CDB emerged across the time points.

#### *Positive reinforcement (Figure 2)*

A significant pathway was found from maternal positive reinforcement at T1 to CDB at T2 and then again from this positive reinforcement at T2 to CDB at T3, suggesting that

Table 4. Goodness-of-fit indexes for the structural equation models for maternal parenting, paternal parenting and children's disruptive behaviour (three repeated measures)

| Model fits | Involvement | Positive Reinforcement | Inconsistency | Hostility | Affective Rejection |
|---|---|---|---|---|---|
| CFI | 0.961 | 0.973 | 0.940 | 0.950 | 0.940 |
| TLI | 0.938 | 0.958 | 0.908 | 0.910 | 0.902 |
| RMSEA | 0.070 | 0.053 | 0.080 | 0.087 | 0.087 |
| CI inf | 0.058 | 0.041 | 0.068 | 0.075 | 0.075 |
| CI sup | 0.082 | 0.066 | 0.092 | 0.100 | 0.099 |
| *Error term correlations* | | | | | |
| | CDB-T3 w CDB-T2: −0.19** | M-T1 with M-T3: 0.34** | CDB-T1 with CDB-T4: 0.26** | M-T2 with CDB-T2: 0.36** | M-T2 with CDB-T2: 0.26** |
| | CDB-T1 with CDB-T4: 0.29** | CDB-T1 with CDB-T4: 0.30** | CDB-T1 with CDB-T3: 0.31** | CDB-T1 with CDB-T3: 0.17** | M-T3 with CDB-T3: 0.30** |
| | M-T3 with M-T2: −0.26** | CDB-T1 with CDB-T3: 0.23** | M-T3 with CDB-T3: 0.26** | CDB-T4 with CDB-T1: 0.20** | CDB-T1 with CDB-T3: 0.26 |
| | CDB-T1 with CDB-T: 0.22** | CDB-T2 with CDB-T3: −0.19** | | M-T3 with CDB-T3: 0.36** | CDB-T1 with CDB-T4: 0.26** |
| | | | | M-T1 with M-T4: 0.17** | CDB-T2 with CDB-T3: −0.12* |
| | | | | M-T1 with M T3: 0.09* | |
| | | | | CDB-T3 with CDB-T2: −0.15** | |
| | | | | M-T2 with F T2: 0.26** | |

*Note:* CFI, comparative fit index; RMSEA, root-mean-square error of approximation; CI, confidence intervals; CDB, children's disruptive behaviour; M, mother; F, father; P = parenting; $^{*}p < 0.05$; $^{**}p < 0.01$.

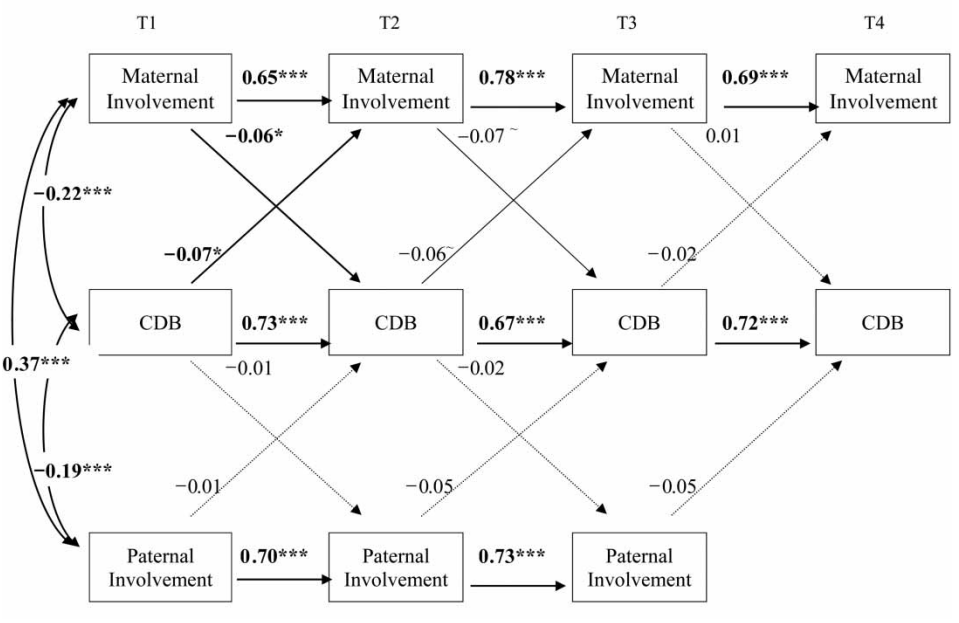


Figure 1. Path diagram of the autoregressive cross-lagged effects for maternal involvement, paternal involvement, and children's disruptive behaviour. $^{\sim}p < 0.10$; $^{*}p < 0.05$; $^{***}p < 0.000$.

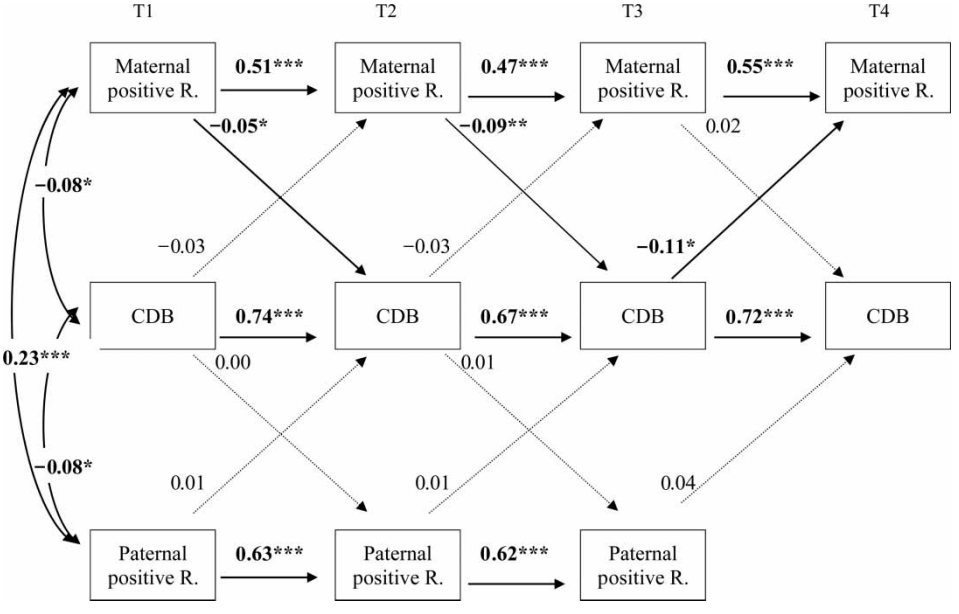


Figure 2. Path diagram of the autoregressive cross-lagged effects for maternal positive reinforcement, paternal positive reinforcement, and children's disruptive behaviour. $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.000$.

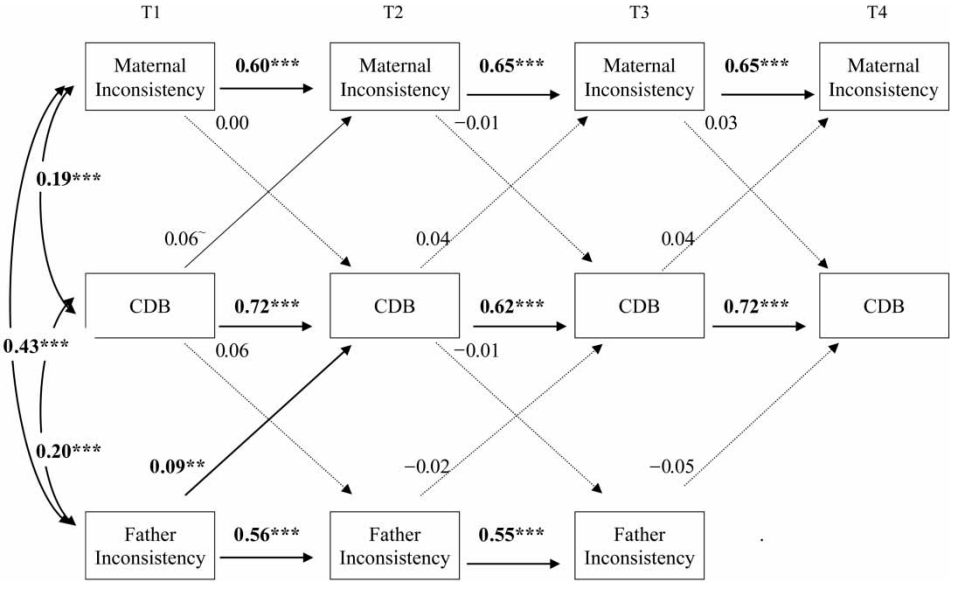


Figure 3. Path diagram of the autoregressive cross-lagged effects for maternal inconsistency, paternal inconsistency, and children's disruptive behaviour. $^{\sim}p < 0.10$; $^{**}p < 0.01$; $^{***}p < 0.000$.

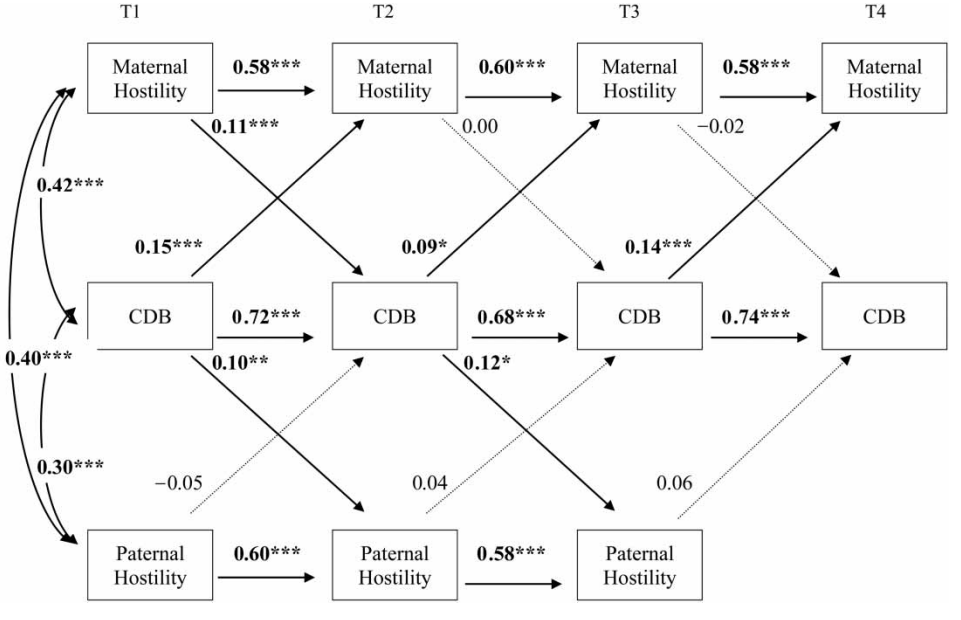


Figure 4. Path diagram of the autoregressive cross-lagged effects for the maternal hostility, paternal hostility, and children's disruptive behaviour. $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.000$.

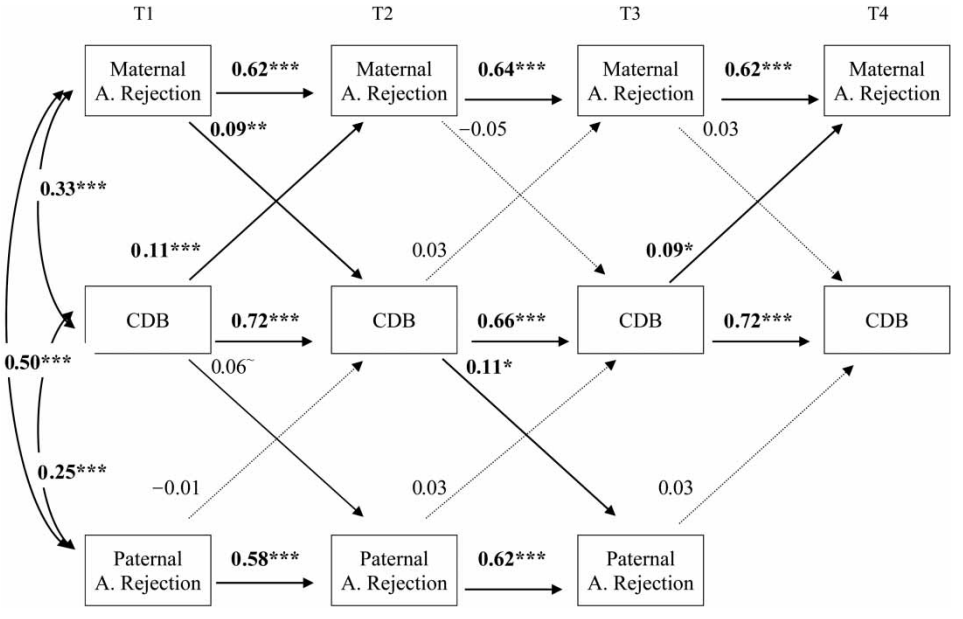


Figure 5. Path diagram of the autoregressive cross-lagged effects for maternal affective rejection, paternal affective rejection, and children's disruptive behaviour. $^{\sim}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.000$.

maternal positive reinforcement behaviours resulted in a significant decrease in child problems. However, a significant pathway from CDB at T3 to maternal positive reinforcement at T4 suggested that, as children matured, their CDB instead had a negative influence on maternal positive reinforcement. No significant cross-lagged paths for father–child relationships were observed.

*Inconsistent parenting (Figure 3)*

There were no significant pathways between maternal inconsistent parenting and CDB across the time points. For fathers, a significant pathway from inconsistent parenting at T1 to CDB at T2 was noted. All other paths in the model were not significant.

*Hostile parenting (Figure 4)*

As expected, a significant reciprocal pathway emerged between maternal hostility at T1 to CDB at T2 and, inversely, CDB at T1 to maternal hostility at T2. However, by the end of kindergarten (T2), only unidirectional pathways from CDB to maternal hostility were significant at T3 and again at T4. Similarly for fathers, CDB predicted hostility at T1 and T2. The results suggested that as early as the end of kindergarten, CDB exerted an influence on hostile parenting, rather than the other way around, for both mothers and fathers.

*Affective rejection (Figure 5)*

A reciprocal pattern of influence was also first observed in kindergarten (T1) between maternal affective rejection and CDB. However, by the end of the second grade (T3),

CDB predicted maternal affective rejection. Similarly, CDB at T2 predicted paternal affective rejection at T3, suggesting that the former was the one to elicit the latter.

## Discussion

Past research examining overt indexes of children's behaviour in relation to specific dimensions of negative or positive PPs has yielded mixed results. Also, the impact of paternal parenting on CDB has been neglected, especially from a transactional longitudinal perspective. The aim of our study was to observe the relationships between dimensions of PPs of both parents and CDB across the transition from kindergarten to grade 2. Unlike most of the other earlier studies, ours recruited dual-parent families so that parent gender-differentiated comparisons could be carried out between dimensions of PPs and CDB. Furthermore, we selected five PP dimensions – two positive (involvement and positive reinforcement) and three negative (inconsistency, hostility, and rejection) – to explore the relationships between these and CDB.

While the stability of early-onset CDB has been documented on various occasions (Biederman et al., 2008; Côté, Tremblay, & Vitaro, 2003; Shaw, Bell, & Gilliom, 2000), few studies have investigated the stability of PPs. Looking at the stability of parenting during early childhood (ages 2–5), Dallaire and Weinraud (2005) concluded that positive domains of child rearing were generally more stable over time than negative domains. They also revealed that parenting behaviours became less flexible over time. Our study provides longitudinal empirical evidence that parenting becomes more rigid over time for the five- to eight-year-old population. What is more, this is as much the case for negative as for positive practices and equally true for mothers and fathers.

Our study is also one of the first to test a transactional model of CDB and PPs in a large sample of dual-parent families. In this sample, associations between CDB and parental parenting reached significance in three domains: inconsistency, hostile parenting, and affective rejection. Transactional effects were observed between mothers and children for three of the five parenting domains at kindergarten entry, while no such effect emerged for fathers. As the children got older (grades 1 and 2), the influence of parenting on CDB decreased and a unidirectional link was observed where CDB was significantly related to maternal and paternal negative child rearing and to maternal positive parenting. The fact that the associations regarding hostile parenting and rejection attained similar levels for both parents underscores the effect of coercive parental practices upon the development of CDB.

It is important to keep in mind that one of our core findings is the stability of our outcome variable, that is, that CDB at T2, T3, and T4 is predominantly a function of problems already present at kindergarten entry. Any unidirectional or reciprocal effect over and above this stability could only be modest at best. However, given the limited amount of variance left to explain, the effects found here are substantively important as they identify a possible shift in influence. In line with the coercion theory (Granic & Patterson, 2006; Patterson, 1982), our results provide evidence of a reciprocal parent–child influence at school entry. As children grow older, however, their CDB seems to become more challenging, eliciting more hostile parenting and affective rejection from both parents. As the CDB becomes more difficult to manage and exasperating, an increase in hostile parental attributions dampens the reflex of positive PPs. Although further bidirectional research is called for, our findings raise caveats about the ability of parenting behaviours to predict CDB after school entry. As noted above, no reciprocal interaction between parent and child was observed past

kindergarten. However, the 24- to 36-month follow-up in this study might not be a sufficiently long time frame to optimally compute parenting prediction coefficients.

Our results converge with those of Gadeyne et al. (2004), who found significant relations to be more frequent in the mother–child dyad than in the father–child dyad. From the beginning to the end of kindergarten, transactional effects were observed between mother and child for three of the five PPs, whereas only paternal inconsistent parenting was a significant predictor of CDB at school entry. No other dimension of paternal parenting was significantly related to CDB, whether positively or negatively. Connell and Goodman (2002) argued that fathers might be less affected by their CDBs. Our results suggest the opposite, that is, that children with CDB were less affected by their fathers' parenting, whether positive or negative. As noted previously, this result could be explained by the different nature of maternal and paternal parenting behaviours.

However, other findings of ours do not coincide with those of Gadeyne et al. (2004) and Schacht et al. (2009), who reported links between fathers' poor positive parenting (support and reinforcement) and increased CDB. We observed no relation between these factors. The structure of their studies was such that the relationships between parenting and CDB were secondary in nature and viewed as a moderating factor between both parents' adaptation (e.g. depressive symptoms, marital conflict, and drinking problem) and children's adaptation (e.g. externalising and internalising problems and academic achievement). Also, these two studies employed different methods to assess parenting: Gadeyne et al. used a grouping of eight domains to assess positive parenting (e.g. expression of affection, responsiveness, and autonomy), whereas Schacht et al. asked mothers and fathers to score paternal parenting. Hence, these methodological differences might account for the divergence with our results.

### *Limitations and future directions*

Our study presents several limitations warranting comment. The sample's representativeness is first and foremost among these. As in other studies where samples were constituted of parent dyads, the children in our sample came from an 'advantaged' population in that the majority of parents enjoyed a rather higher SES, including a higher education level. In this regard, research has shown low SES to be linked to higher CDB levels (e.g. Morgan, Farkas, & Wu, 2009). What is more, mothers and fathers in families with a higher SES are much more similar in terms of PPs (NICHD, 2004; Sim & Ong, 2005). As has been mentioned previously, attrition over time was not random in this study. The primary effect of this was that the proportion of children with CDB in the sample increased, which in turn could explain in part the consistency of CDB over time and, also, negatively impact the presence of significant bidirectional cross-lagged effects 'over and above' variance explained by autoregressive effects.

It is also important to consider that the bidirectional findings are based exclusively on parent report. Though some researchers consider parents the best assessors of CDB (Renk, 2005), others suggest teachers (Dwyer, Nicholson, & Battistutta, 2006). As it happens, in our study, mothers were the primary informants on child CDB. The insufficiently high father participation rate did not allow us to use their CDB evaluations. However, when we compared the correlations for mothers' CDB evaluations versus fathers' CDB evaluations at T1 and T2 where father participation was at its highest, we observed strong correlations (T1: $r = 0.701$, $p < 0.01$, $n = 352$; T2: $r = 0.707$,

$p < 0.01$, $n = 332$). It would not be unreasonable to assume that results would have been similar at T3 and T4 regardless of parent gender. Moreover, the prediction of child behaviour by parents may represent not only parents' responses to CDB but also parents' perceptions of child behaviour. In this regard, parents of children with high levels of CDB are more likely to perceive their parent–child relationship negatively (Gardner, 1989). Consequently, maladaptive parenting reported by parents may be more a reflection of negative views of the parent–child relationship than of changes in child rearing or child behaviour. Further studies might reduce these methodological biases by using multiple informants of family and child factors at different points in time (Bank, Dishion, Skinner, & Patterson, 1990).

Parent characteristics other than parenting may have a direct influence on children's adjustment difficulties as well (Bandura, 1977). For example, fathers' antisocial behaviour has been found to have a significant direct impact on CDB (Verlaan & Schwartzman, 2002). It is important for future research to clarify the potential role of fathers' parenting in child adjustment by including different measures of parental child-rearing practices and of other interpersonal behaviours at different developmental stages. These complex family processes have seldom been studied to date, though it would certainly be useful to be able to compare their respective influences. A more in-depth exploration of these dimensions will depend on the development of adequate theoretical models that take into account the specificity of family influences, including both maternal and paternal influences on child development and adjustment.

Given that previous studies have determined that the two parents contribute differently to the development of social skills and to the CDB of their preschool sons and daughters (Besnard et al., 2011; Rouyer, Frascarolo, Zaouche-Gaudron, & Lavanchy, 2007), future research should focus on the inter-gender transactional effects between parent and child within the parent–child dyad. Observational studies of father–child and mother–child interactions may also be useful in examining gender and bidirectional influences between paternal and maternal PPs and child CDB.

Finally, our findings may have some implications for practice. For one thing, they support the use of intervention models that treat parenting as a possible reaction to or consequence of child behaviour rather than focusing exclusively on parenting behaviours as predictors of CDB (e.g. Szapocznik & Kurtines, 1993). The fact that transactional interactions are observed in parent–child dyads at school entry and that these processes become unidirectional (parents reacting to CDB) over time indicates a need for intervention early on when the structure of the processes is developmentally flexible. Furthermore, evidence-based practices have shown early intervention with parents and child to be significantly more effective than intervention with the child alone (Webster-Stratton, 2003). Our study suggests that intervention with both parents and child should be considered as soon as possible in order to avoid the rigidification of coercive parenting. Our results suggest that intervention strategies should aim to foster maternal positive parenting, decrease maternal hostility, and address paternal inconsistent PPs. In our opinion, ensuring that parents have a good understanding of their child's difficulties and providing adequate parental support could counter the deterioration of PPs over time.



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## Notes on contributors

Thérèse Besnard, ps-éd, PhD, professor in the Department of Psychoeducation, Université de Sherbrooke, member of the Groupe de recherche sur les inadaptations sociales de l'enfance GRISE, Qc, Canada.

Pierrette Verlaan PhD, titular professor in the Department of Psychoeducation, Université de Sherbrooke, Qc, Canada, member of the GRISE.

Marilyne Davidson, ps-éd, MAc psychoéducation, Université de Sherbrooke, Qc, Canada, student member of the GRISE.

Frank Vitaro PhD, titular professor at the École de Psychoéducation, Université de Montréal, Qc, Canada, member of the Groupe de recherche sur l'inadaptation psychosociale chez l'enfant GRIP.

François Poulin, PhD, professor in the Département de Psychologie, UQAM, Qc, Canada, member of the Laboratoire d'études sur le développement social des enfants et des adolescents.

France Capuano, PhD, professor in the Département d'éducation et formation spécialisées - Faculté des sciences de l'éducation, UQAM, Qc, Canada, member of the GRISE.



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