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Children's Externalizing Behaviors and Parenting Practices in School-Related Tasks: Parental Basic Psychological Needs as Mediators

Julie Goulet[1], Catherine F. Ratelle[1], Frédéric Guay[1], André Plamondon[1], Julien S. Bureau[1], David Litalien[1, 2], & Stéphane Duchesne[3]

1. Département des fondements et pratiques en éducation, Faculté des sciences de l'éducation, Université Laval
2. École de counseling et d'orientation, Faculté des sciences de l'éducation, Université Laval
3. Département d'études sur l'enseignement et l'apprentissage, Faculté des sciences de l'éducation, Université Laval

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Abstract

Children's externalizing behaviors can strain parents and contribute to suboptimal parenting practices (Yan et al., 2021). However, the mechanisms through which children's behaviors shape parenting practices are not fully understood. Drawing on a child-driven effects perspective, this study aimed to examine whether the relationship between children's externalizing behaviors and parenting practices in school-related tasks (i.e., parents' levels of autonomy support and psychological control) was mediated by parents' basic psychological need satisfaction and frustration with regard to their involvement in their child's schooling. The data were collected from 1,460 parents (75% mothers; M_{age} = 38 years, *SD* = 5.5) of elementary students in grades one and two over a three-year period. Structural equation models with bias-corrected bootstrapped coefficients were estimated to test indirect relationships. Results revealed that externalizing behaviors (T1) were associated with decreases in autonomy support (T3) through reduced parental need satisfaction (T2) and with higher levels of psychological control (T3) through increased parental need frustration (T2). Unexpectedly, externalizing behaviors were also associated with reduced psychological control through lower parental need satisfaction. These pathways were consistent for both mothers and fathers. By examining the interplay between children's behaviors, parents' psychological needs, and parenting practices, this longitudinal research provides insights into the predictive factors of nurturing and supportive tendencies in parents. Practical implications for families and school practitioners are discussed, including strategies for enhancing parental need satisfaction.

Keywords: child externalizing behaviors, parental basic psychological needs, autonomy support, psychological control, self-determination theory

Children's Externalizing Behaviors and Parenting Practices in School-Related Tasks: Mothers' and Fathers' Basic Psychological Needs as Mediators

As children embark on their schooling journey, parents play an essential role in fostering the development of cognitive, social, and emotional skills essential for academic success (Collins & Madsen, 2019). During the first years of elementary school, parents take on new responsibilities, wherein they must actively engage in supporting their children's academic development (Griebel & Niesel, 2013). This period marks a redefinition of the parental role, placing school-related support at its core and requiring them to not only participate in school events but also to actively engage in tasks such as fostering positive learning attitudes, monitoring progress, and providing consistent academic and homework support. There are different ways in which parents can support children's school needs. According to self-determination theory (SDT), supporting children's autonomy is a key practice for fulfilling their basic psychological needs, essential to their well-being and optimal functioning (Ryan & Deci, 2017). While SDT also highlights the importance of structure and involvement, autonomy support plays a central role in fostering autonomous motivation, which is essential for promoting children's adaptation and success in school (Vasquez et al., 2016). Therefore, being supportive of the child's autonomy is an effective parenting strategy to foster children's optimal development (Ryan & Deci, 2017). Being autonomy-supportive entails being empathic, open, and supportive of the child's perspective, experiences, and choices (Mageau et al., 2015). It involves viewing situations from their perspective, welcoming their thoughts, emotions, and behaviors, offering meaningful choices that consider their interests and preferences, and explaining the rationale behind requests without resorting to pressure or coercion. In school settings, this support includes following children's pace, helping them understand why school tasks matter, and being flexible (Mageau & Joussemet, 2023).

Parents wanting the best for their children may sometimes prioritize their own goals over respecting their child's autonomy, using psychological pressure to make them conform to the

parents' expectations. Psychological control involves employing tactics such as inducing guilt, making threats, and pressuring children into achieving specific goals and standards by comparing them to others (Grolnick & Pomerantz, 2009; Mageau et al., 2015). In school-related tasks, these parenting practices might include manipulating children by threatening to remove privileges for non-cooperation with schoolwork, inducing guilt by expressing disappointment or sadness over their performance, and fostering competition by comparing them to classmates to achieve specific goals. Parenting practices of autonomy support and psychological control respectively shape or hinder motivation at school and children's optimal development (Pinquart, 2017; Vasquez et al., 2016).

Child-Driven Effects

The child-driven effects perspective entails that children's behavior can shape parenting, meaning that it is essential to consider the child's characteristics when examining parenting practices. Externalizing behaviors, characterized by disruptive actions such as aggression, defiance, hyperactivity, and inattention during childhood (Beauchaine et al., 2017), play a critical role in shaping parental functioning and practices, often resulting in the adoption of suboptimal practices (Yan et al., 2021). When children defy rules, have difficulty concentrating, or display excessive physical activity, it can challenge the implementation of appropriate parenting practices, especially in tasks requiring high levels of attention such as school-related activities. Parents may lean towards controlling practices, believing they help foster their child's accomplishment, and sometimes resulting in immediate compliance (Somers et al., 2023). However, overly controlling behaviors can hinder long-term development. According to transactional models (e.g., Belsky, 1984, Patterson, 2002), noncompliance and disruptive behaviors can trigger an increase in parental control and hostility, which may escalate into a reciprocal cycle of punitive reactions that further exacerbate the child's disruptive behaviors. Consistent with the transactional perspective, Yan et al. (2021) identified 37 studies examining the longitudinal association between externalizing behaviors and what they termed "incompetent

parenting," which included harsh parenting, psychological control, and intrusive parenting. Their meta-analysis revealed that externalizing behaviors predicted a small increase in incompetent parenting. Similarly, Pinquart's (2017) meta-analysis found a small positive relationship between externalizing behaviors and psychological control. Within the context of school involvement, Rogers et al. (2009) found that fathers of children with attention deficit/hyperactivity disorder exhibited greater psychological control (e.g., using guilt, punishment, or pressure) when involved in their children's schooling compared to fathers of neurotypical children.

While there is evidence that externalizing behaviors predict more psychological control, the association between these behaviors and lower autonomy support remains unclear. Very few studies have examined these links, and those that did yield inconsistent results (i.e., positive, negative, or no association; Dieleman et al., 2018; Reitz et al., 2006; Vrolijk et al., 2020). Thus, research supports the contribution of externalizing behaviors on parental behaviors, but this association has mainly been confirmed for control and general parenting. Our understanding of how these behaviors relate to parenting in the context of school involvement remains limited. Moreover, since the mechanisms involved have been little studied, it remains uncertain whether variables mediate this association. Serving as a fundamental driver of parental behavior, parents' psychological needs may play a role in explaining the relationship between a child's disruptive behaviors and parenting practices (Ryan & Deci, 2017).

Parental Psychological Needs as Mechanisms Explaining Child-Driven Effects

According to SDT, the fulfillment of three innate and universal psychological needs is crucial for well-being, optimal functioning, and growth (Ryan & Deci, 2017). These basic psychological needs are autonomy, competence, and relatedness. The need for autonomy refers to the need for congruence with one's true self and the sense of being at the origin of one's thoughts, feelings, and decisions. This need is satisfied when individuals feel they can direct their own interests, choices, and behaviors. Alternatively, it is frustrated when they feel pressured or coerced into conforming to specific actions or lines of thought. The need for

competence is the need to perceive oneself as effective in acting upon the environment. Mastery and efficient use of skills are observed when this need is satisfied, whereas feelings of inadequacy and incompetence exemplify its frustration. Finally, the need for relatedness is the need for positive and reciprocal social connections. This need is satisfied when individuals establish positive and meaningful relationships, and frustrated when they experience conflict or feel rejected by others. While the three needs can be distinguished conceptually, research has also shown that they are closely intertwined; satisfaction and frustration of one need co-occur with and may influence satisfaction and frustration of other needs, respectively (Ryan & Deci, 2017). Bartholomew et al. (2011) further emphasized the distinction between the frustration and satisfaction of needs. They found that need frustration might be worse for several outcomes than having one's need be unmet, suggesting we should measure satisfaction and frustration separately rather than as opposites on the same scale.

Need satisfaction provides parents with the necessary psychological energy to consider their child's perspective and to encourage the child's initiatives and exploration (van der Kaap-Deeper et al., 2019). Thus, when parents' needs are satisfied, they are more autonomy supportive towards their child (Costa et al., 2019; van der Kaap-Deeper et al., 2019). Alternatively, when parental needs are frustrated, parents' focus shifts inward and they become less attuned to their child's experience, leading to more controlling parenting. Consequently, when parents feel pressured, incompetent, and disconnected with their child, they may resort to more intrusive behaviors, trying to direct their child's actions, feelings, and thoughts to establish conditions that satisfy their own needs when interacting with their child.

Parental needs could act as a mechanism for why children's externalizing behaviors contribute to parental behaviors. Children with externalizing behaviors experience more school difficulties that can make supporting them more challenging and need-thwarting (e.g., difficulties following routines and organizing materials, conflictual relationships, academic struggles; Coghill et al., 2008; Hasty et al., 2023; Kremer et al., 2016). For instance, when children forget to bring

home homework or refuse to do it, parents may feel burdened, leading them to adopt parenting methods they do not personally endorse, thus frustrating their need for autonomy. As suggested by de Haan et al. (2013), children's externalizing behaviors may also reflect parents' difficulties in effectively managing their child's behaviors. Therefore, parents may feel responsible for children's school difficulties, frustrating their need for competence. Finally, children's externalizing behaviors can make supporting schoolwork a struggle, straining the parent-child relationship and frustrating their need for relatedness. Consequently, externalizing behaviors may undermine parents' sense of satisfaction in their role, reducing the psychological resources available for autonomy-supportive parenting, or they may heighten parental frustration, increasing the likelihood of more controlling parenting behaviors.

Only a few studies have investigated these pathways. Dieleman et al. (2018) examined whether need frustration acted as a mediator between externalizing behaviors and autonomy supportive and controlling parenting, using a sample of 95 parents of autistic adolescents and young adults. Although this pathway was examined cross-sectionally, their findings supported the hypothesis that parental need frustration mediated the relationship between child behaviors and parental control and autonomy support. In a longitudinal study spanning from early to middle adolescence, de Haan et al. (2013) investigated whether need satisfaction mediated the relationship between child aggressive behaviors and three parenting practices—psychological control, overactive discipline, and warmth—within 609 families. Their findings indicated that need satisfaction mediated the relationship between externalizing behaviors and parenting practices. Notably, these studies have generally explored the role of either parental need frustration or satisfaction separately. Despite providing valuable insights into how children's externalizing behaviors contribute to autonomy supportive or controlling parenting, these studies focused on general parenting. To our knowledge, no study has examined all these connections in the context of parental school involvement, nor among younger children (e.g., elementary students). Upon entering school, child inattention, hyperactivity, and oppositional behaviors are the most

common difficulties, making this period crucial for investigation (Vasileva et al., 2021). Moreover, evidence suggests disparities in how mothers and fathers involve themselves in school-related tasks, and differences in their respective parenting practices, highlighting the importance of addressing gender differences in parenting (Kim, 2018; Yaffe, 2023).

Mothering and Fathering Mechanisms

While past research has emphasized the different roles parents adopt in relation to their gender (e.g., Paquette, 2004), more recent research suggests that parenting practices show more similarity than difference, particularly in Western societies (Fagan et al., 2014). Notably, paternal and maternal practices were shown to be interrelated and predictive of one another (Costa et al., 2019; Guay et al., 2018). They are also similarly associated with child behaviors (Pinquart, 2017). Likewise, in person-centered studies, comparable parenting profiles tend to emerge for mothers and fathers (Chung et al., 2020; Volling et al., 2019). Nevertheless, despite similar general parenting patterns, studies continue to show that fathers and mothers do not always behave in comparable ways, especially in specific contexts, highlighting the ongoing importance of exploring gender differences in parenting practices (Yaffe, 2023). For instance, research has shown that compared to mothers, fathers are generally less involved in school-related tasks (Kim, 2018). Furthermore, the factors likely to contribute to their parenting choices may also differ. For example, children's behavior likely to trigger or inhibit parental responses may not be perceived in the same way. Nelson et al. (2013) showed that mothers tend to report higher levels of externalizing behaviors compared to fathers of the same child. Parents may also attribute these behaviors to different causes, which could contribute to mother-father differences in parenting. In a study by Chen et al. (2008), fathers were found to more frequently explain their child's externalizing behaviors as being due to parenting practices or to the child's attempts to provoke their parent's anger. In contrast, mothers were more likely than fathers to attribute these behaviors to global and stable causes. Moreover, externalizing behaviors appear to be linked to parental needs differently. In a sample of parents of elementary school students, Slagt et al.

(2012) reported that children's externalizing behaviors were associated with lower perceived competence among mothers, but not fathers. Therefore, given that externalizing behaviors may be interpreted and experienced differently, potentially resulting in variations in parenting practices, this study examined these processes for mothers and fathers.

The Present Study

The present study aimed to explore key factors and mechanisms underlying psychologically controlling and autonomy-supportive parenting. Specifically, the study examined how parental needs mediate the relationship from children's externalizing behaviors to parenting practices. While these parenting practices are important throughout children's development, this study specifically investigated parental needs and practices during the early years of elementary school, focusing on parents' involvement in their child's schooling. Three hypotheses were formulated: (a) child externalizing behaviors will predict subsequent parents' higher need frustration and lower need satisfaction in school-related contexts; (b) child externalizing behaviors will predict later increases in parental psychological control and decreases in parental autonomy support within school-related tasks; and (c) parental needs will mediate the relationship from child behaviors to parenting practices. This research also aimed to explore whether these processes unfold similarly for mothers and fathers. While there is some evidence suggesting that these processes may be similar for mothers and fathers (de Haan et al., 2013), other studies suggest differences in parenting practices (Yaffe, 2023). Therefore, because mothers may perceive externalizing behaviors as more prevalent and more detrimental to their needs (Nelson et al., 2013; Slagt et al., 2012), they may experience more need frustration, which in turn could contribute to suboptimal parenting (less autonomy support, more control). Finally, to ensure robust hypothesis testing, theoretically and empirically relevant covariates were included in the analysis. This included child (i.e. gender), parental and family characteristics such as immigrant background, socioeconomic status, family structure, and parents' age (Distefano & Meuwissen, 2022; Ryan & Deci, 2017).

Method

Participants and Procedure

This study is part of an ongoing longitudinal project investigating parents' needs in supporting their child's schooling (Ratelle et al., 2022). Our target population consisted of families with children in the first or second grade attending elementary schools in the Canadian province of Quebec. The Quebec Ministry of Education provided a randomly generated list of 5,600 children from their database of all students in these grades. A cluster sampling method was used to ensure representativeness, based on gender, socioeconomic status, and school types (public or private). Students with disabilities or learning and adaptation difficulties (through ministerial identification) were also oversampled, representing 50% of the targeted children.

Parents were initially contacted by telephone to solicit their participation. Those who consented were provided with a follow-up email with instructions for their participation. Among the families who could be reached (n = 2,991), 55% (n = 1,633) declined or failed to respond, resulting in a sample of 1358 families with a target child (overall proportion of child gender: 38% of girls). As both parents of a same child were invited to take part in the study, a total of 1,622 parents participated. Participating parents were invited to complete an online questionnaire in the fall and spring of each school year for three consecutive years (2020-2021 to 2022-2023). They were instructed to answer specifically in relation to the targeted child. For the current study, we utilized data collected in the fall of year 1 (Time 1 [T1]; 2020), the fall of year 2 (Time 2 [T2]; 2021), and the fall of year 3 (Time 3 [T3]; 2022). Parents who did not participate in any of the fall measurement waves (n = 142) or who identified as grandparents or tutors (n = 20) were excluded from the study, resulting in a final sample of 1,460 parents (see Figure S1 in the Supplementary Materials for details).

Parental questionnaires assessed the behaviors of the child as well as parents' psychological needs and parenting practices. Data were reported by mothers (n = 1,091) or fathers (n = 365) and, in rare occasions by the stepmother (n = 2) or stepfather (n = 2). Parents

were on average 38.0 years old (*SD* = 5.5) at T1. Most families were intact nuclear families (81%) or in a blended union (4%), while 15% were single-parent households. Typically, the targeted child had at least one or two siblings (*M* = 1.5 *SD* = 1.1). Most parents were born in Canada (83%). The mean annual family incomes ranged from CAN$75,000 to CAN$100,000, which aligns with the 2020 Canadian median (CAN$83,500; Statistics Canada, 2024). This project was approved by the university research ethic committee. Parents received a $10 gift card for each time point they participated.

Measures

Externalizing Behaviors

Parents assessed their child's behaviors using the French version of the Ontario Child Health Study Emotional Behavioural Scales (Duncan et al., 2019). Subscales assessing attention-deficit hyperactivity symptoms (8 items, e.g., "Makes careless mistakes") and oppositional-defiant symptoms (6 items, e.g., "Loses temper") were used to measure externalizing behaviors. Parents indicated the frequency of each behavior, using a 3-point response scale ranging from 1 (never/false) to 3 (often/completely true). Higher scores indicated greater levels of externalizing behaviors. This scale has demonstrated good psychometric properties in the past (Duncan et al., 2019). Reliability coefficient is presented in Table 1.

Parental Psychological Needs

Parents' basic psychological need satisfaction and frustration were assessed using the French version of the Basic Psychological Need Satisfaction and Frustration Scale (Chen et al., 2015), which was adapted to the current context of parent-child school-related interactions (BPNSFS-PSI; Ratelle et al., in press). Three subscales measured need satisfaction—autonomy (e.g., "I feel a sense of choice and freedom in the things I do"), relatedness (e.g., "I feel close and connected with my child"), and competence (e.g., "I feel capable at what I do")—while three subscales measured need frustration—autonomy (e.g., "I feel forced to do many things I wouldn't choose to do"), relatedness (e.g., "I feel that the relationship I have with my child is cold

and distant"), and competence (e.g., "I feel disappointed in how I am able to support my child"). All items began with "In tasks related to supporting my child's schooling". Each subscale included four items where parents rated the extent to which each item was true, using a 5-point response scale from 1 (completely disagree) to 5 (completely agree). Higher scores on the subscales indicated greater levels of parental need satisfaction or frustration among parents. The BPNSFS-PSI has shown good psychometric properties (Ratelle et al., in press). Reliability estimates at T1 and T2 are presented in Table 1.

Parenting Practices

The parent version of the Perceived Parental Autonomy Support Scale (P-PASS; Mageau et al., 2015; French version) was used to assess autonomy supportive and controlling parental behaviors. The items were slightly rephrased to align with the context of school involvement (e.g., "When my child refuses to follow the homework and lessons routine..."). Psychological control, encompassing threats of punishment, guilt-inducing criticisms, and performance pressures, was assessed by 11 items (e.g., "I tell them that I will have to punish them if they do not do what I ask"). Eleven items measured autonomy support, reflecting the provision of choices, rational, and acknowledgment of the child's feelings (e.g., "I make an effort to see things from their perspective"). Both the autonomy support and psychological control scales originally contained 12 items, from which one item with a low loading was removed to reach an acceptable fit. Parents reported if they agreed with each item using a 7-point response scale, ranging from 1 (do not agree at all) to 7 (very strongly agree). Higher scores indicated greater levels of control and autonomy support. The P-PASS has demonstrated adequate psychometric properties (Mageau et al. 2015). Reliability estimates at T1 and T2 are presented in Table 1.

Covariates

Six variables were utilized as control variables. Parents reported their age, number of children, country of birth (Canada = 1outside of Canada = 2), and their child's sex (1 = boy; 2 =

girl). Additionally, they reported their gross annual family income (1 = less than CAD$25,000; 2 = $25,001 to $50,000; 3 = $50,001 to $75,000; 4 = $75,001 to $100,000; 5 = $100,001 to $125,000; 6 = $125,001 to $150,000; 7 = $150,001 and above), and family structure (0 = single-parent households; 1= two-parent households). Finally, parent's relationship to the child (father/stepfather; mother/stepmother) was also used as a grouping variable to examine differences between mothers and fathers.

Data Analyses

Measurement Models

All structural equation modeling (SEM) analyses were performed using Mplus (version 8.9; Muthén & Muthén, 1998-2023). First, measurement models—exploratory structural equation modeling (ESEM), confirmatory factor analysis (CFA) and their bifactor counterparts—were initially estimated and compared to ensure optimal measurement for all key constructs (see Supplementary Materials for model specifications and full results). Invariance between mothers and fathers was also established following Meredith's (1993) taxonomy (i.e., configural through strict invariance). Bifactor ESEM models were retained for parenting variables, parental needs, and externalizing behaviors. However, bifactor ESEM introduces complexity to structural models as it requires that all factors, G and S-factors, maintain consistent associations with all variables. Thus, to reduce model complexity while enabling partial control for measurement error, we relied on factor scores derived from the strict invariance model between parents (Morin et al., 2020). These factor scores were saved and subsequently treated as observed variables in our hypothesis testing. For this study, only the global factors (i.e., externalizing behaviors, need satisfaction, need frustration, psychological control, and autonomy support) were used to test our hypotheses.

Model Estimation

Descriptive analyses using factor scores were conducted with IBM SPSS Statistics (version 29). Multivariate analysis of variance (MANOVA) was conducted to examine potential

differences between mothers and fathers reports of child behaviors, parenting practices, and parental needs. Bivariate relationships between the variables under study were also examined. Cohen's criteria (1988) were used to interpret correlations as weak ($r \approx .10$), moderate ($r \approx .30$), and strong ($r \approx .50$).

To test hypotheses, SEM was performed. Missing data, ranging from 0 to 39.9%, was statistically handled through full information maximum likelihood (FIML). Since for some children ($n = 217$), both parents answered questionnaires, a sandwich estimator (TYPE = COMPLEX) was applied to obtain unbiased standard errors correcting for the non-independent nature of the data within families (McNeish, 2023). To ensure the appropriateness of the sandwich estimator for clustered data, a sensitivity analysis was conducted on the single-parent subsample. The results, which are detailed in Tables S10 and S11 of the online supplement did not alter the interpretation of the findings. To determine which control variables to include in regression models among those deemed theoretically relevant, a preliminary analysis was performed in which parental needs (T2 mediators) and practices (T3 outcome variables) were regressed on T1 covariates (child gender, parents' age and country of birth, family income, family structure, and number of siblings for the child). To maximize model parsimony only paths that were considered at least of small magnitude were maintained in subsequent models ($\beta \geq .10$; Cohen, 1988; Kline, 2016). Including these covariates as well as T1 mediators and outcome variables initial level, a parallel mediation model was estimated to examine if T2 psychological need satisfaction and frustration mediated the links between T1 externalizing behaviors and T3 autonomy-supportive and controlling parenting. Four indirect pathways were tested simultaneously (see Figure 1): (a) externalizing behaviors → need satisfaction → autonomy support (a1b1); (b) externalizing behaviors → need satisfaction → psychological control (a1b2); (c) externalizing behaviors → need frustration → autonomy support (a2b3); and (d) externalizing behaviors → need frustration → psychological control (a2b4). Indirect pathways were tested using the product of coefficients with 95% confidence intervals (CI) derived from 5000 bias-

corrected bootstrap iterations, a resampling approach that avoids assumptions about the sampling distribution, yielding robust estimates of the mediation relationships (Preacher & Hayes, 2008). If the confidence interval excludes zero, it indicates that the indirect relationship is statistically different from zero.

Comparing Mothers and Fathers

Multigroup analysis was performed to verify if these pathways were equivalent for mothers and fathers. We first estimated the model freely, then constrained all pathways to equality between mothers and fathers. This constrained model was compared to the unconstrained model. A decreasing model fit would entail running a χ^2 difference test on each individual pathway. Pathways with non-statistically significant differences were constrained to be equal in the final structural model comparing mothers and fathers.

Model Fit

The adequacy of model fit was assessed using the χ^2 but, given its sensitivity to sample size, and data non-normality, additional fit indices were considered (Kline, 2016). These include the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), and Root Mean Squared Error of Approximation (RMSEA). Values of CFI and TLI above .95 or .90, along with RMSEA below .06 or .08, were considered indicative of good or acceptable fit, respectively (Hu & Bentler, 1999; Marsh et al., 2005). To compare fit of nested models the loglikelihood ratio difference (TDr) was computed using Satorra–Bentler scaled χ^2 difference test, which considers the scaling correction factor estimated with MLR (Satorra & Bentler, 2010). Differences in fit indices where ΔCFI and ΔTLI $\leq$ -.01, and ΔRMSEA $\leq$ .015 between models suggested no deterioration in model fit (Chen, 2007; Cheung & Rensvold, 2002).

Results

Descriptive and Preliminary Analyses

Descriptive statistics and correlations are reported in Table 1 (see Supplementary Materials Table S5 for fathers' and mothers' correlations separately). Most covariates showed no

association or weak associations with the main variables—child externalizing behaviors, parental needs, and parenting practices; bivariate correlations ranged between r = |.00| and |.26|. Noteworthy relationships pertaining to parents' country of birth and income revealed that parents born outside of Canada and with lower income reported higher levels of psychological control at T1 and T3. These covariates were also associated with T1 externalizing behaviors; parents born outside of Canada and those with higher income perceived their child as exhibiting lower levels of externalizing behaviors. Parents also reported lower levels of externalizing behaviors for girls compared to boys.

Overall, the main variables exhibited weak to strong correlations with each other, ranging from r = |.02| to |.62|. Externalizing behaviors were weakly correlated with parenting practices, especially when evaluated two years later, but they were moderately correlated with concurrent and later need satisfaction and frustration; higher levels of externalizing behaviors were associated with more need frustration and lower need satisfaction. Need frustration and satisfaction variables were negatively and moderately correlated, whereas psychological control and autonomy support variables were positively and weakly correlated. Finally, need satisfaction was weakly associated with higher autonomy support, but did not exhibit associations with psychological control of a magnitude considered at least weak. In contrast, need frustration was negatively associated with autonomy support and positively associated psychological control, albeit with weak correlation coefficients.

Differences between mothers and fathers were further examined in a one-way between-group MANOVA on child behaviors, parenting practices, and needs. There was no statistically significant difference between mothers and fathers on the combined dependent variables, including T1 externalizing behaviors, T2 need satisfaction, T2 need frustration, T3 autonomy support, and T3 psychological control, $F(5, 582) = 1.05$, $p = .389$, Wilks' l= .991, partial $\eta^2 = .01$.

To identify control variables deemed theoretically and empirically relevant for inclusion in the mediation model, T2 need satisfaction, T2 need frustration, T3 autonomy support, and T3

psychological control were regressed onto child gender, parents' age, parents' country of birth, family income, family structure, and the number of children. Only four paths were at least of small magnitude and maintained in the final model. Parent's country of birth was positively associated with need satisfaction (β = .11, p = .003) and psychological control (β = .23, p < .001). Parents born outside of Canada reported higher levels of need satisfaction and psychological control. Parental age was associated negatively with autonomy support (β = -.10, p = .010). Income was negatively associated with psychological control (β = -.14, p < .001). No covariates were associated with need frustration (see full results in Table S6 of the Supplementary Materials; a full mediation model with all covariates is also presented in Table S7).

Mediation Models

To test the predictive model shown in Figure 1, a parallel mediation analysis was conducted. The model included four endogenous variables—need satisfaction and need frustration (T2 mediators), autonomy support, and psychological control (T3 outcomes)—along with their respective T1 levels and covariates identified in the preliminary model (see Table 2). Although the χ^2 test was statistically significant, $\chi^2(26) = 94.60$, p < .001, fit indices indicated that the model fit was acceptable (CFI = .94; TLI = .89; RMSEA = .05).

As reported in Table 2, parental needs and practices exhibited strong stability over time. Externalizing behaviors at T1 was associated negatively with need satisfaction and positively with need frustration at T2, with small magnitude associations. They did not, however, directly predict parenting practices two years later (T3). Results also showed that parental needs at T2 predicted parenting practices at T3. Specifically, need satisfaction was associated positively with autonomy support and psychological control. In contrast, need frustration was associated positively with psychological control. Among the tested covariates, country of birth was the only one presenting at least a small magnitude association with T3 psychological control.

The estimation of indirect pathways based on 95% CIs bootstraps revealed that parental psychological needs mediated the relationship between externalizing behaviors and parenting practices. Externalizing behaviors were associated negatively with autonomy support via lower levels of need satisfaction ($a1b1_{(std)}$ = -.02; 95% CI [-.04, -.01]). For psychological control, both need frustration ($a2b4_{(std)}$ = .02; 95%CI [.01, .04]) and satisfaction ($a1b2_{(std)}$ = -.02; 95%CI [-.04, -.01]) acted as mediators. Specifically, externalizing behaviors were associated positively with psychological control via higher levels of need frustration. However, contrary to our expectations, need satisfaction was associated with more psychological control. Thus, by lowering need satisfaction, externalizing behaviors were associated negatively with psychological control. Need frustration did not mediate the relationship between externalizing behaviors and autonomy support ($a2b3_{(std)}$ = .00; 95%CI [-.01, .01]).

Mothers and Fathers Invariance Models

Multigroup analyses were performed to examine if pathways were equivalent for mothers and fathers. The unconstrained model in which all pathways were estimated freely presented acceptable fit, χ^2 (40) = 122.40, p < .001; CFI = .94; TLI = .88; RMSEA = .05. When constraining all paths to equality (i.e., regression and correlation coefficients), the model yielded a poorer fit, χ^2 (86) = 229.13, p < .001; CFI = .89; TLI = .90; RMSEA = .05. A notable decrease in CFI (ΔCFI = -.04) and a statistically significant Satorra-Bentler χ^2 test, TRd(46) = 107.87, p < .001, indicated that predictions were different for mothers and fathers. We proceeded to examine paths individually from non invariant model (see Table S8 of the Supplementary Materials). Results revealed that three direct paths differed between parents' gender: T1 externalizing behaviors → T2 need frustration, parental age → T3 autonomy support, and birth country → T3 psychological control. Hence, a final multigroup model, presented in Figure 1, was estimated in which these three paths, along with eight correlations between T1 covariates (see Table S8), were estimated freely, while all other paths were constrained to equality. This final model demonstrated acceptable fit, χ^2(75) = 159.67, p < .001; CFI = .94; TLI = .93; RMSEA = .04. A statistically

nonsignificant Satorra-Bentler χ^2 test, $TRd(35) = 39.94$, $p = .260$, and trivial variations in CFI (ΔCFI = .00) and RMSEA (ΔRMSEA = -.01), accompanied by a noticeable improvement in TLI (ΔTLI = .05), suggested that this model was comparable in fit to the unconstrained model. As reported in Figure 1, among fathers, externalizing behaviors was more strongly predictive of need frustration at T2, compared to mothers. The other direct and indirect paths remained the same as those estimated in the previous model. Regarding the other freely estimated paths, which are not presented in Figure 1 (see Table S9 of the Supplementary Materials), age was unrelated to changes in autonomy support at T2 among mothers (β = .01, 95% CI [-.06, .07]); however, older fathers reported decreases in autonomy support at T3 (β = -.16, 95% CI [-.28, -03.]). Additionally, for fathers, country of birth was unrelated to psychological control (β = .03, 95% CI [-.11, .16]), whereas mothers born outside Canada reported an increase in psychological control at T3 (β = .14, 95% CI [.07, .21]).

Discussion

Many studies have supported the child-driven effects perspective, which posits that children's behavior may shape parenting practices and well-being (Yan et al., 2021), but very few investigated the mechanisms that could explain why children's difficult behaviors elicit lower need-supportive parenting. This study focused on need fulfillment as a possible pathway linking child behaviors to parental practices, specifically within the school context. Understanding how children's externalizing behaviors may hinder effective parental practices in this context is crucial, as compromised school adaptation can significantly affect children's developmental trajectories, extending far beyond immediate academic performance to undermine the development of foundational skills essential for educational progress. Thus, identifying key mechanisms through which parents can support their child's adaptation to school becomes paramount. We tested whether children's difficult behaviors during the early school years were associated with less supportive parenting, due to parents experiencing lower satisfaction and

greater frustration with their own needs. We also explored if these processes differed between fathers and mothers.

Overall, our findings tend to support the hypotheses. In line with previous research, we observed that the relationship between externalizing behaviors and parenting was mediated by parental needs (de Haan et al., 2013; Dieleman et al., 2018). While these studies focused on general parental needs and parenting practices, our research has evidenced these processes within the context of school-related tasks, shedding light on a crucial aspect of the parenting experience for parents of school-aged children. First, our results indicate that when a child displays high levels of externalizing behaviors such as inattention and opposition, parents not only experience reduced satisfaction but also heightened frustration regarding their own needs when involved in their child's schooling. As these children face greater challenges regarding school, such as forgetting homework, refusing to do assignments, or struggling to concentrate on them (Coghill et al., 2018), assisting them with schoolwork can be challenging for parents, potentially leading to feelings of inadequacy, perceiving these tasks as burdensome, or straining the parent-child relationship.

Central to our study was the examination of whether the lower need satisfaction and higher need frustration associated with children's externalizing behaviors would relate to parenting quality. Our study findings show that when parents' needs were satisfied, they reported engaging in more autonomy-supportive practices concerning their children's schooling. Therefore, by providing the energy and resources needed to embrace their child's perspective and support their autonomy (van der Kaap-Deeper et al., 2019), parental need satisfaction may enable parents to be involved in school tasks in a more need-supportive manner, such as providing choices on how to do schoolwork or explaining the importance of school tasks. Unexpectedly, while autonomy support was positively associated with need satisfaction, it was not related to need frustration. Given that need frustration is more detrimental to parents' well-being and their available resources (Ryan & Deci, 2017), it was expected to be negatively

associated with autonomy support. One possible explanation for why this association was not observed in our results could be that need satisfaction is not only more crucial for autonomy support but also serves as a necessary condition, providing parents with the resources necessary to prioritize their child's needs. Therefore, when parental need frustration and satisfaction are considered simultaneously, need satisfaction accounts for a larger portion of autonomy support. In contrast, when considering only the bivariate relationship without accounting for other variables, need frustration and autonomy support exhibited a small negative correlation. Nevertheless, this result aligns with findings suggesting that need satisfaction and need frustration represent distinct processes with unique determinants and consequences, rather than being part of the same continuum (Bartholomew et al., 2011).

Furthermore, our findings indicate that need frustration mediates the relationship between externalizing behaviors and psychological control. When parents feel pressured to manage their child's schoolwork, incompetent in doing so, or find that homework battles lead to a conflictual relationship with their child due to children's difficult behaviors, they are more likely to resort to less effective practices such as micromanaging tasks, criticizing their child's schoolwork, or comparing their child to other students. Deprived of essential psychological resources, parents might struggle to see things from their child's perspective or let go of their own perspective, thereby exerting pressure on their child to adhere to it. However, another unexpected finding shows that higher levels of need satisfaction were associated with more psychological control. This finding contrasts with the theoretical perspective that fulfillment of parental autonomy, competence, and relatedness needs would foster the use of more positive parenting practices (Ryan & Deci, 2017). It might be that these parenting practices are expected by parents to be effective in managing their child's school tasks. While controlling parenting is generally more detrimental to child well-being in the long term (Pinquart, 2017), it may be associated with child compliance in certain contexts, such as parental-led tasks (Somers et al., 2023). This short-term compliance may, satisfy parents' psychological needs, reinforcing their

belief that pressuring specific behaviors leads to better results. Therefore, even when equipped with resources to support autonomy, parents may still resort to pressuring specific behaviors when helping their child with schoolwork. This could explain the somewhat frequent coexistence of autonomy support and controlling parenting (Ahn et al., 2023). A phenomenon also evidenced in our study by a positive relationship between autonomy support and psychological control.

Differences Between Fathers and Mothers

We investigated whether mothers and fathers exhibit divergent patterns in their parenting processes. Our findings support the notion that mothers and fathers predominantly share similarities rather than differences in their experiences of parenthood (Fagan et al., 2014), particularly in tasks related to their children's schooling. Specifically, our study revealed that mothers and fathers did not report different levels of externalizing behaviors, parental needs, or parenting practices, and mechanisms between externalizing behaviors and parenting were mostly similar for mothers and fathers. One distinction was observed in the magnitude of the link between children's externalizing behaviors and need frustration, which was stronger among fathers compared to mothers. Fathers might feel more responsible for their child's externalizing behaviors than mothers (Chen et al., 2008), potentially leading to greater frustration when disruptive behaviors make it more challenging to help with schoolwork. Nevertheless, children's externalizing behaviors similarly relate to how parents feel about their school involvement and how they manage these tasks.

Practical Implications

The role of children's externalizing disorders and their associated symptoms extends deeply into different aspects of their lives, particularly within the family system (Yan et al., 2021). Our study highlights how children's externalizing behaviors might substantially impede parental needs and practices when assisting their child's schooling. Evidence has shown that parental support in school-related tasks is crucial for students exhibiting externalizing behaviors, as it serves to protect them from negative school outcomes (Goulet et al., 2024). However, our

research suggests that high levels of opposition and inattention may frustrate parents' own needs for autonomy, competence, and relatedness, contributing to less optimal forms of support. These findings emphasize two crucial practical considerations for better supporting parents in supporting their child: the importance to address children's behaviors through positive parenting and to support parental needs. Research supports transactional theory, which suggests a cyclical relationship between parenting (parent-driven effects) and child behaviors (child-driven effects). Therefore, if externalizing behaviors may frustrate parental needs and ultimately contribute to less supportive practices, these behaviors are also reinforced by negative parenting practices (Pinquart, 2017). In this regard, numerous interventions focusing on supporting parenting skills, with some specifically cultivating autonomy-supportive practices (e.g., Joussemet et al., 2014), have proven effective in reducing externalizing behaviors among young children (Tully & Hunt, 2016). Thus, by assisting parents in better supporting their child, this may lead to lower externalizing behaviors, which will in turn benefits parental needs, and subsequently improved parenting.

Beyond addressing children's challenging behaviors, directly supporting parents' needs of autonomy, competence, and relatedness is also crucial, especially during the school transition phase. As vital collaborators, school practitioners can play a significant role in supporting parents' needs in school-related tasks (Epstein & Sheldon, 2022). This support may involve empowering parents in their decision-making for accompanying their child, fostering their sense of competence by communicating clear expectations, or providing meaningful and engaging schoolwork to enrich the parent-child relationship. Ultimately, while supporting school tasks can be demanding, especially with children exhibit difficult behaviors, prioritizing the well-being of both parents and children remains paramount.

Strengths, Limitations, and Future Directions

This study capitalizes on significant strengths. Namely, the study draws upon robust theoretical frameworks such as SDT and transactional models. By examining significant

characteristics of children that may hinder parental needs and parenting practices, this research contributes to advancing our understanding of these models. While the child-driven effects perspective is widely recognized, very few studies have thoroughly investigated the mechanisms explaining the relationship between child difficult behavior and parenting, especially in the context of school involvement. Although some research has examined isolated components of the process, integration into a cohesive model, particularly through longitudinal designs, remains scarce. By collecting data over a three-year period, our mediation model was able to examine sequential pathways while controlling for initial levels of needs and parenting practices. This was achieved using a large randomly selected sample enhancing the robustness of the analysis. Additionally, we focused on a pivotal period of child development, school entry, which is characterized by heightened demands for both the child and the parent (Griebel & Niesel, 2013). This enabled us to gain insights into how parents perceive and navigate their role in supporting their child during their early years of schooling, particularly when the child faces difficulties.

Nevertheless, some limitations must be acknowledged. Firstly, our study exclusively relied on parental reports, which has potentially introduced common method variance, leading to the overestimation or underestimation of relationships (Richardson et al., 2009). Similarly, the comparison of fathers' and mothers' perceptions may have been hindered by an imbalance in group sample sizes, which could have made it difficult to identify statistically significant differences between them (Yoon & Lai, 2017). In addition, to gain a deeper understanding of how externalizing behaviors contribute to parents' practices in managing school-related tasks, we employed an oversampled design. This strategy ensured that half of the selected children had special needs, thereby allowing for greater variability in their externalizing symptoms compared to a typical population sample. However, this approach may have introduced certain confounders that were not considered, potentially impacting the patterns of results. Namely, as a significant portion of the sample had diverse diagnoses (e.g., attention deficit/hyperactivity disorder, oppositional-defiant disorder, autism spectrum disorder), these children and parents

may already be receiving services which could either mitigate the role of children's difficulties or enhance parenting practices. Furthermore, parents' needs and practices were assessed based on the externalized behaviors of a single targeted child per family. However, siblings' characteristics and the way parents engage with them could also play a role in the examined processes. Finally, while a three-year longitudinal approach effectively reveals long-term trends, it may fail to capture fine-grained interactions within specific parental practices—such as those during homework periods—for which time-momentary assessments might be a more suitable alternative.

The findings and limitations of our study suggest avenues for future research. Although our study expands upon the limited existing research, further studies are necessary to replicate our findings in diverse samples, varying in composition regarding special needs and developmental phases, and across different timescales (e.g., momentary assessment). Doing so would deepen our understanding of child-driven effects. If the model under study explained a significant portion of the variance in parenting practices, there remains a substantial amount of variance to be accounted for. This leaves room for other factors to be considered. Specifically, it would be valuable to explore parents' expectations regarding the effectiveness of parenting practices. This investigation could help clarify the unexpected relationship found between need satisfaction and psychological control. Beyond parental expectations, it would also be relevant to investigate the actual effectiveness of these practices on children's schooling. Future research should also explore how other environmental factors may support and protect parents dealing with child externalizing behaviors. For instance, exploring whether schools and teachers can provide support to parents in effectively assisting their children, thereby alleviating their frustration with unmet needs when the child struggles with regulating their behavior, could offer preventive strategies to support parents.

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Table 1.

Bivariate Pearson Correlations and Descriptives Statistics for Global Factors

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. C sex[a]	–														
2. P. age	-.04	–													
3. Country[b]	-.02	.23*	–												
4. Income	.02	.17*	-.15*	–											
5. Structure[c]	.00	.08*	.03	.33*	–										
6. Nb C	.01	.03	-.02	-.06*	.14*	–									
7. Ext T1	-.26*	-.08*	-.19*	-.13*	-.08*	.01	–								
8. Sat T1	.05	-.02	.07*	-.08*	-.01	-.02	-.25*	–							
9. Sat T2	.05	-.02	.10*	-.05	.05	-.07*	-.32*	.62*	–						
10. Fru T1	-.04	-.02	-.02	-.09*	-.05	.02	.31*	-.53*	-.48*	–					
11. Fru T2	-.02	-.02	.00	-.04	-.08*	.04	.27*	-.38*	-.57*	.47*	–				
12. AS T1	.00	-.10*	-.03	-.04	-.01	-.07*	-.05	.33*	.30*	-.20*	-.21*	–			
13. AS T3	.04	-.09*	.01	-.03	.00	-.04	-.08*	.26*	.27*	-.16*	-.18*	.55*	–		
14. PC T1	-.03	-.04	.16*	-.15*	-.01	.03	.10*	.04	-.05	.15*	.21*	.18*	.13*	–	
15. PC T3	-.02	-.03	.21*	-.17*	-.02	.06	.02	.09*	.08*	.09*	.12*	.09*	.24*	.59*	–
N	1460	1459	1451	1422	1180	1451	1190	1140	879	1137	877	1137	916	1136	915
M	1.38	38.03	1.17	3.98	0.85	2.53	0.08	0.03	0.02	0.08	-0.03	0.17	0.15	-0.17	-0.13
SD	0.49	5.49	0.38	1.86	0.36	1.08	0.95	1.03	1.05	1.10	0.97	1.02	0.91	0.98	0.91
ω	–	–	–	–	–	–	.94	.94	.95	.90	.93	.86	.87	.92	.95

Note. C = children; P = parent; Nb = number; Ext = externalizing behaviors; Sat = need satisfaction; Fru = need frustration; AS = autonomy support; PC = psychological control.

[a] 1= boy, 2 = girl; [b]1= Canada, 2 = elsewhere; [c] 0 = single-parent households, 1= two-parent households.

* $p < .05$.

Table 2

Standardized Regression Coefficients for Parental Needs and Parenting Practices (N = 1460)

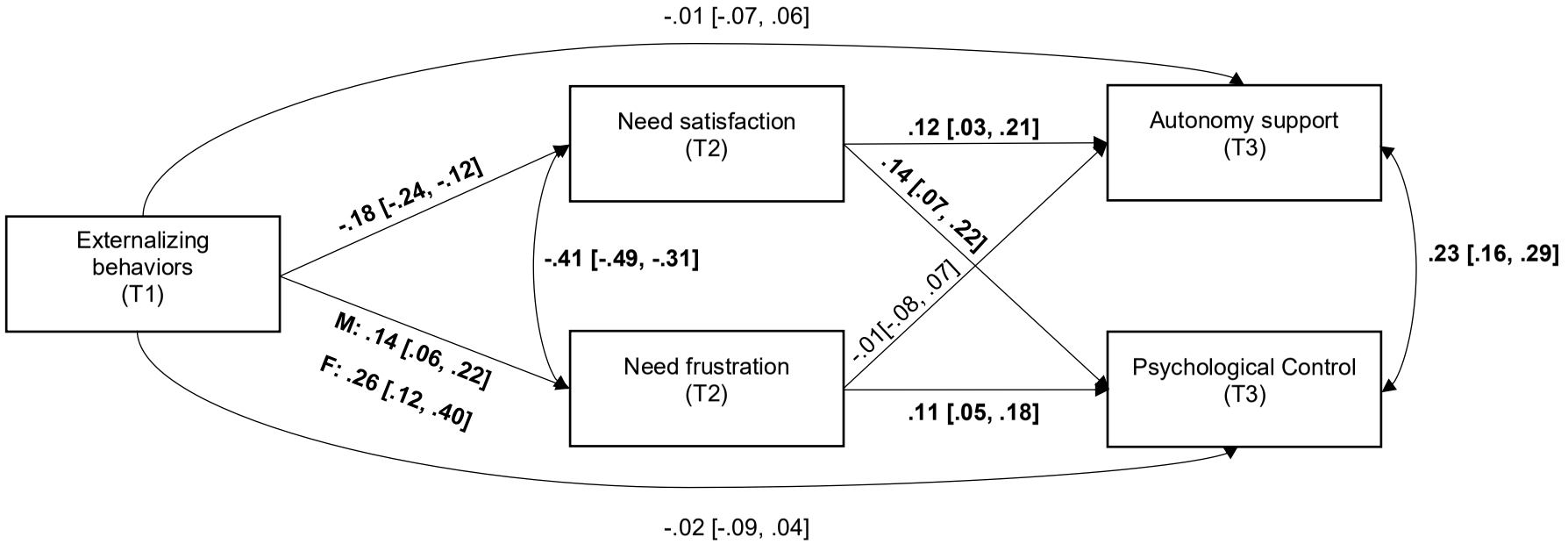
Variables	T2 Mediators				T3 Parenting Practices			
	Need Satisfaction		Need Frustration		Autonomy Support		Psychological Control	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Parental Age					-.04	[-.10, .02]		
Birth Country [a]	.07	[.01, .13]					**.11**	[.05, .18]
Family Income							-.06	[-.12, -.01]
T1 Initial Level	**.52**	[.45, .57]	**.34**	[.27, .42]	**.52**	[.44, .59]	**.55**	[.49, .60]
T1 Ext. Behaviors	**-.18**	[-.24, -.12]	**.16**	[.08, .23]	-.01	[-.07, .05]	-.03	[-.09, .03]
T2 Need Satisfaction	–	–	–	–	**.11**	[.02, .20]	**.14**	[.06, .21]
T2 Need Frustration	–	–	–	–	-.01	[-.09, .07]	**.11**	[.05, .18]

Note. Bolded coefficients represent an effect size that is at least small (β ≥ .10).

[a] 1= Canada, 2 = elsewhere.

Figure 1

Results for the Final Multigroup Mediation Model



Note. M = mothers; F = fathers. Equality constraints were applied on unstandardized coefficients; standardized coefficients may differ very slightly for mothers and fathers. The standardized coefficients from the largest group (mothers) are presented with their 95%CI derived from bias-corrected bootstrapping. Bolded coefficients represent an effect size that is at least small (β ≥ .10). This model includes covariates that have been omitted for clarity. T1 initial levels of parental needs and parenting practices were controlled for as well as, country of birth → T2 need satisfaction; age →T3 autonomy support; and country of birth and income → T3 psychological control. Correlations between T1 covariates were included. Invariant indirect paths: $a1b1_{(std)}$ = -.02, 95%CI [-.04, -.01]; $a1b2_{(std)}$ = -.03, 95%CI [-.05, -.01]. Non invariant indirect paths for mothers: $a2b3_{(std)}$ = .00, 95%CI [-.01, .01]; $a2b4_{(std)}$ = .16, 95%CI [.01, .03]. Non invariant indirect paths for fathers: $a2b3_{(std)}$ = .00, 95%CI [-.02, .02]; $a2b4_{(std)}$ = .03, 95%CI [.01, .06].

Online Supplements for

Children's Externalizing Behaviors and Parenting Practices in School-Related Tasks: Parental Basic Psychological Needs as Mediators

Authors' Note:

These online technical appendices are to be posted on the journal website and hot-linked to the manuscript. If the journal does not offer this possibility, these materials can alternatively be posted on one of our personal websites (we will adjust the in-text reference upon acceptance).

We developed these materials to provide additional technical information and to keep the main manuscript from becoming needlessly long.

Measurement Models

Constructs under study were all multidimensional in nature and have been shown to combine to form an overarching concept making ESEM and bifactor models relevant to test (e.g., Gilbert et al., 2021; Olivier et al., 2020; Tóth-Király et al., 2018). By allowing cross-loadings to be freely estimated, ESEM resolves limitations of CFA, where cross-loadings forced to zero leads to inflated correlations between factors. It also provides all parameters necessary for likelihood testing (Asparouhov & Muthén, 2009). Bifactor models provide a framework for modeling multidimensional constructs by distinguishing a global factor (G-factor) representing the common variance among all items of the construct across dimensions, and specific factors (S-factors) capturing the variance unique to each dimension and that is not accounted for by the G-factor (Alamer, 2022). Thus, to ensure an optimal factor solution for all variables, confirmatory factor analysis (CFA) was first compared to exploratory structural equation modeling (ESEM). If fit of ESEM models were superior to CFA models, ESEM was retained and then compared to a bifactor-ESEM model. If differences between CFA and ESEM models were trivial or if both models did not result in adequate fit, their bifactor counterparts were compared (Swami et al., 2023). Oblique rotation was used in ESEM models whereas orthogonal rotation was used in bifactor-ESEM models (Morin et la., 2020). As for bifactor-CFA models, correlations between all latent factors were set to 0. For models that included categorical indicators (i.e., externalized behaviors), robust weighted least square estimator (WLSMV) with theta parametrization was used, and for models with only continuous indicators (i.e., parental needs and practices) robust maximum likelihood estimator (MLR) was used. The Type=Complex option was used with family membership as clustering variable to account for the nested structure of the data. For identification purposes, factor variances were fixed to one, and all loadings were freely estimated.

After determining the best measurement models, invariance between mothers and fathers was established for each construct. Measurement invariance was evaluated based on Meredith's (1993) taxonomy, involving a series of increasingly restrictive models. The initial model, configural invariance, assumed the same factorial structure across groups, with only the number of latent factors constrained to equality while other parameters were freely estimated. The subsequent model, which tested metric invariance, introduced equality constraints on factor loadings. To assess scalar invariance, constraints were added on item intercepts or thresholds for categorical items. Finally, the strict invariance model further included equality constraints on item

uniquenesses. In models using WLSMV with theta parametrization this meant fixing residuals to one in the second group. Factor scores were saved from these invariant models.

Model fit was assessed through χ^2test as well as other recommended fit indices using common cut-off guidelines. Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) above .95 or .90 and Root Mean Squared Error of Approximation (RMSEA) lower than .06 or .08 were deemed to be indicative of satisfying or acceptable fit, respectively (Hu & Bentler, 1999; Marsh et al., 2005). Changes in CFI and TLI >.01, and RMSEA > .015 were indicative of fit deterioration (Chen, 2007; Cheung & Rensvold, 2002; Morin et al., 2013). Full results of the measurement models are presented in Tables S1-S4.

Table S1

Comparison of Confirmatory Factor Analysis (CFA), Exploratory Structural Equation Modeling (ESEM) and Bifactor Measurement Models

Models	CFI	TL1	RMSEA [90%CI]	ΔCFI	ΔTLI	ΔRMSEA
CFA – Ext. (T1)	.936	.924	.106 [.101, .112]			
ESEM – Ext (T1)	.981	.973	.064 [.058, .070]	.045	.049	-.042
BESEM – Ext (T1)	**.991**	**.985**	**.047 [.040, .055]**	**.010**	**.012**	**-.017**
CFA – Satisfaction (T1-T2)	.868	.838	.071 [.068, .074]			
ESEM – Satisfaction (T1-T2)	.948	.924	.049 [.045, .052]	.080	.086	-.022
BESEM – Satisfaction (T1-T2)	**.965**	**.941**	**.043 [.039, .047]**	**.017**	**.017**	**-.006**
CFA – Frustration (T1-T2)	.973	.967	.031 [.027, .034]			
ESEM – Frustration (T1-T2)	.986	.979	.025 [.020, .029]	.013	.012	-.006
BESEM – Frustration (T1-T2)[a]	**.992**	**.987**	**.019 [.014. .024]**	**.006**	**.008**	**-.006**
CFA – AS (T1-T3) [b]	.912	.894	.045 [.041, .048]			
ESEM – AS (T1-T3) [b]	.952	.936	.035 [.031, .039]	.040	.042	-.010
BESEM – AS (T1-T3)	**.984**	**.975**	**.022 [.017, .027]**	**.032**	**.039**	**-.013**
CFA – Ctl (T1-T3) [c]	.976	.970	.035 [.031, .039]			
ESEM – Ctl (T1-T3) [c]	.989	.984	.026 [.021, .030]	.013	.014	-.009
BESEM – Ctl (T1-T3)	**.997**	**.994**	**.015 [.008, .021]**	**.008**	**.010**	**-.011**

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; BESEM = bifactor exploratory structural equation modeling AS = autonomy support; Ctl = control. Models were compared to preceding model. Model in bold were retained.

[a] To align the need frustration to need satisfaction measurement models, the Bifactor ESEM model was retained, despite the ESEM model fit being close to that of the Bifactor ESEM model.

[b] Fina

Table S2

Goodness-of-Fit Statistics of Mother-Father Invariance Models for Externalizing Behaviors

Models	χ^2 Test of Model Fit						$\Delta\chi^2(\Delta df)$ DIFFTEST					
	χ^2	*df*	*p*	CFI	TLI	RMSEA[90%CI]	$\Delta\chi^2$	Δdf	*p*	ΔCFI	ΔTLI	ΔRMSEA
Configural	232.03	104	<.001	.993	.987	.045 [.038, .053]						
Weak	214.84	137	<.001	.996	.994	.031 [.023, .039]	38.50	33	.235	.003	.007	-.014
Strong	248.50	162	<.001	.995	.994	.030 [.022, .037]	36.75	25	.061	-.001	.000	-.001
Strict b [a]	248.50	162	<.001	.995	.994	.030 [.022, .037]	15.37	14	.353	.001	.002	-.005

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation.

[a] The strict model was compared to a model in which items' residual variance fixed in both groups for identification purpose were liberated ($\chi^2(148) = 254.22$; CFI = .994; TLI = .992; RMSEA = .035 [.027, .042]).

Table S3

Goodness-of-Fit Statistics of Mother-Father Invariance Models for Need satisfaction and Need Frustration

Model	χ^2 Test of Model Fit						Sattora-Bentler χ^2 Difference					
	χ^2	*df*	*p*	CFI	TLI	RMSEA[90%CI]	$\Delta\chi^2$	Δdf	*p*	ΔCFI	ΔTLI	ΔRMSEA
						T1 Satisfaction						
Configural	328.34	48	<.001	.950	.863	.101 [.091, .112]						
Weak	305.09	80	<.001	.960	.934	.070 [.062, .079]	49.72	32	.024	.010	.071	-.031
Strong	359.07	88	<.001	.952	.928	.074 [.066, .082]	139.84	8	<.001	-.008	-.006	.004
Strict	349.67	100	<.001	.956	.942	.066 [.059, .074]	21.86	12	.039	.004	.014	-.008
						T2 Satisfaction						
Configural	233.37	48	<.001	.960	.890	.094 [.082, .106]						
Weak	238.12	80	<.001	.966	.944	.067 [.057, .077]	24.38	32	.830	.006	.054	-.027
Strong	258.11	88	<.001	.963	.945	.066 [.057, .076]	18.22	8	.020	-.003	.001	-.001
Strict	236.89	100	<.001	.970	.961	.056 [.047, .065]	2.45	12	.998	.007	.016	-.010
						T1 Frustration						
Configural	112.36	48	<.001	.985	.960	.049 [.037, .060]						
Weak	116.83	80	.005	.992	.986	.028 [.016, .039]	7.24	32	1.000	.007	.026	-.021
Strong	121.99	88	.009	.992	.989	.026 [.013, .037]	5.03	8	.755	.000	.003	-.002
Strict	133.81	100	.014	.992	.990	.024 [.012, .035]	14.52	12	.269	.000	.001	-.002
						T2 Frustration						
Configural	64.82	48	.053	.996	.990	.028 [.000, .045]						
Weak	110.78	80	.013	.993	.989	.030 [.014, .042]	45.82	32	.054	-.003	-.001	.002
Strong	123.04	88	.008	.992	.989	.030 [.016, .042]	12.63	8	.125	-.001	.000	.000
Strict	127.33	100	.034	.994	.992	.025 [.007, .037]	11.26	12	.506	.002	.003	-.005

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation.

Table S4

Goodness-of-Fit Statistics of Mother-Father Invariance Models for Parental Practices

Model	χ^2 Test of Model Fit						Sattora-Bentler χ^2 Difference					
	χ^2	*df*	*p*	CFI	TLI	RMSEA[90%CI]	$\Delta\chi^2$	Δdf	*p*	ΔCFI	ΔTLI	ΔRMSEA
T1 Autonomy support												
Configural	135.31	50	<.001	.968	.931	.055 [.044, .066]						
Weak	159.17	74	<.001	.969	.953	.045 [.035, .055]	33.38	24	.096	.001	.022	-.010
Strong	173.12	82	<.001	.966	.955	.044 [.035, .053]	12.99	8	.112	-.003	.002	-.001
Strict	184.93	93	<.001	.966	.960	.042 [.033, .050]	16.59	11	.121	.000	.005	-.002
T3 Autonomy support												
Configural	93.95	50	<.001	.980	.956	.044 [.030, .057]						
Weak	133.46	74	<.001	.973	.960	.042 [.030, .053]	40.40	24	.019	-.007	.004	-.002
Strong	149.80	82	<.001	.969	.959	.042 [.032, .053]	16.98	8	.030	-.004	-.001	.000
Strict	181.98	93	<.001	.960	.952	.046 [.036, .056]	28.77	11	.003	-.009	-.007	.004
T1 psychological control												
Configural	98.02	34	<.001	.989	.963	.058 [.044, .071]						
Weak	125.75	62	<.001	.989	.980	.043 [.032, .053]	36.86	28	.122	.000	.017	-.015
Strong	153.42	69	<.001	.985	.976	.046 [.037, .056]	30.04	7	<.001	-.004	-.004	.003
Strict	169.47	80	<.001	.984	.978	.044 [.035, .054]	18.62	11	.068	-.001	.002	-.002
T3 psychological control												
Configural	45.07	34	.097	.998	.993	.027 [.000, .046]						
Weak	70.01	62	.227	.998	.997	.017 [.000, .034]	29.72	28	.534	.000	.004	-.010
Strong	81.74	69	.140	.997	.996	.020 [.000, .035]	13.14	7	.069	-.001	-.001	.003
Strict	89.96	80	.209	.998	.997	.016 [.000, .032]	9.99	11	.531	.001	.001	-.004

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation.

Table S5

Bivariate Pearson Correlations for Mothers (Above Diagonal) and Fathers (Below Diagonal)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. C sex[a]	–	-.02	.00	.02	.01	-.02	-.25*	.09*	.07	-.06	-.06	-.03	.07	.00	.00
2. P. age	-.03	–	.15*	.19*	.05	.04	-.07*	-.05	-.02	-.02	-.05	-.10*	-.04	-.11*	-.06
3. Country[b]	-.07	.37*	–	-.11*	.01	-.04	-.19*	.05	.09*	-.04	-.04	-.02	.01	.15*	.21*
4. Income	.05	.01	-.29*	–	.37*	-.05	-.14*	-.06	-.03	-.08*	-.04	-.02	.00	-.15*	-.18*
5. Structure[c]	-.03	.09	.09	.15*	–	.16*	-.09*	-.01	.05	-.04	-.08	-.01	.00	-.03	-.04
6. Nb C	.08	.00	.02	-.09	.05	–	.01	-.02	-.04	-.03	.02	-.06	-.06	.00	.03
7. Ext T1	-.27*	-.10	-.19*	-.07	-.07	.02	–	-.29*	-.33*	.32*	.26*	-.06	-.10*	.07*	.03
8. Sat T1	-.08	.07	.16*	-.15*	.03	-.02	-.08	–	.60*	-.57*	-.37*	.32*	.27*	.00	.07
9. Sat T3	-.06	-.02	.16*	-.13	.06	-.15*	-.29*	.68*	–	-.48*	-.57*	.28*	.25*	-.07	.07
10. Fru T1	.03	.02	.05	-.12	-.06	.22*	.25*	-.36*	-.49*	–	.46*	-.20*	-.16*	.17*	.10*
11. Fru T3	.13	.05	.10	-.03	-.12	.11	.36*	-.44*	-.54*	.53*	–	-.20*	-.17*	.21*	.11*
12. AS T1	-.18*	-.01	-.01	-.06	.05	-.09	-.02	.39*	.38*	-.24*	-.25*	–	.55*	.18*	.09*
13. AS T5	-.08	-.16*	.04	-.09	.03	.03	.03	.22*	.39*	-.20*	-.21*	.55*	–	.15*	.24*
14. PC T1	-.12*	.06	.19*	-.20*	.02	.13*	.22*	.21*	.07	.09	.16	.25*	.12	–	.58*
15. PC T5	-.05	-.01	.19*	-.15*	.05	.20*	.01	.17	.11	.07	.14	.15	.26*	.59*	–

Note. C = children; P = parent; Nb = number; Ext = externalizing; Sat = satisfaction; Fru = frustration; AS = autonomy support; PC = psychological control.

[a] 1= boy, 2 = girl; [b]1= Canada, 2 = elsewhere; [c] 0 = single-parent household, 1= two-parent household.

* $p < .05$.

Table S6

Standardized Regression Coefficients Between T1 Covariates and Parental Needs and Practices

Covariates	T2 Need Satisfaction	T2 Need Frustration	T3 Autonomy support	T3 Psychological control
	β (*s.e.*)	β (*s.e.*)	β (*s.e.*)	β (*s.e.*)
Child's Sex [a]	.059 (.035)	-.033 (.035)	.034 (.035)	-.004 (.033)
Age	-.040 (.033)	-.019 (.036)	**-.102 (.040)***	-.051 (.036)
Birth Country [b]	**.111 (.037)****	-.005 (.041)	.019 (.041)	**.226 (.041)*****
Family Income	-.063 (.039)	-.012 (.037)	-.031 (.041)	**-.143 (.038)*****
Family Structure [c]	.080 (.039)*	-.074 (.040)	.034 (.039)	.036 (.038)
Nb children	-.076 (.038)*	.050 (.043)	-.061 (.040)	.064 (.035)

Note. Bolded coefficients represent an effect size that is at least small (β ≥ .10; Cohen, 1988).
[a] 1= boy, 2 = girl; [b]1= Canada, 2 = elsewhere; [c] 0 = single-parent household, 1= two parent household.
* $p < .05$. ** $p < .01$. *** $p \leq .001$.

Table S7

Standardized Regression Coefficients for Parental Needs and Parenting Practices for Full Model (N = 1460)

Variables	T2 Mediators				T3 Parenting Practices			
	Need Satisfaction		Need Frustration		Autonomy Support		Psychological Control	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Child's Sex [a]	.02	[-.05, .07]	.01	[-.05, .08]	.01	[-.05, .08]	-.01	[-.06, .05]
Parental Age	-.03	[-.08, .04]	-.02	[-.08, .05]	-.05	[-.11, .02]	-.01	[-.08, .05]
Birth Country [b]	.05	[-.01, .12]	.04	[-.03, .13]	.01	[-.06, .08]	**.12**	[.05, .19]
Family Income	-.05	[-.11, .02]	.04	[-.03, .10]	.00	[-.07, .07]	-.06	[-.12, .01]
Family Structure [c]	.06	[-.01, .12]	-.05	[-.12, .02]	.00	[-.07, .06]	.00	[-.07, .06]
Nb children	-.06	[-.12, .01]	.03	[-.04, .12]	-.02	[-.09, .05]	.08	[.01, .14]
T1 Initial level	**.51**	[.45, .57]	**.34**	[.26, .42]	**.52**	[.44, .59]	**.55**	[.49, .60]
T1 Ext. Behaviors	**-.18**	[-.24,-.11]	**.17**	[.08, .25]	-.01	[-.07, .06]	-.03	[-.09, .04]
T2 Need Satisfaction	–	–	–	–	**.11**	[.02, .20]	**.14**	[.06, .21]
T2 Need Frustration	–	–	–	–	-.01	[-.09, .07]	**.11**	[.04, .18]

Note. Bolded coefficients represent an effect size that is at least small (β ≥ .10).

[a] 1= boy, 2 = girl; [b] 1= Canada, 2 = elsewhere; [c] 0 = single-parent household, 1= two-parent household.

.

Table S8

Fit Indices for Individual Pathway Invariance Testing between Fathers and Mothers

Equality constraints	χ^2 Test of Model Fit					Sattora-Bentler χ^2 Difference	
	$\chi^2(df)$	*p*	CFI	TLI	RMSEA	$\Delta\chi^2(\Delta df)$	*p*
Unconstrained	122.02(40)	<.001	.937	.880	.053		
Ext T1 → Sat T2	122.89(41)	<.001	.937	.883	.052	0.74(1)	.391
Ext T1 → FruT2	125.79(41)	<.001	.935	.879	.053	3.71(1)	**.053**
Ext T1 → AS T3	123.35(41)	<.001	.936	.882	.052	1.63(1)	.202
Ext T1→ Ctl T3	122.88(41)	<.001	.937	.883	.052	0.68(1)	.411
Sat T2 → AS T3	122.87(41)	<.001	.937	.883	.052	1.07(1)	.300
Sat T2 → Ctl T3	121.44(41)	<.001	.938	.885	.052	0.27(1)	.603
Fru T2 → AS T3	122.02(41)	<.001	.938	.884	.052	0.23(1)	.631
Fru T2 → Ctl T3	121.41(41)	<.001	.938	.885	.052	0.79(1)	.375
Control variables							
Sat T1 → Sat T2	122.62(41)	<.001	.937	.883	.052	1.17(1)	.280
Fru T1→ Fru T3	122.16(41)	<.001	.937	.884	.052	1.73(1)	.188
AS T1 → AS T3	121.35(41)	<.001	.938	.885	.052	0.19(1)	.665
Ctl T1 → Ctl T3	122.79(41)	<.001	.937	.883	.052	0.94(1)	.334
Country → Sat T2	122.59(41)	<.001	.937	.883	.052	0.26(1)	.611
Age → AS T3	127.49(41)	<.001	.933	.876	.054	7.07(1)	**.008**
Country → Ctl T3	125.76(41)	<.001	.935	.879	.053	3.79(1)	**.052**
Income → Ctl T3	124.65(41)	<.001	.935	.880	.053	2.65(1)	.103

Note. Ext = externalizing; Sat = satisfaction; Fru = frustration; AS = autonomy support; Ctl = control; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation.

Invariance between correlations (n = 30: 28 correlations between T1 covariates, T2 need satisfaction and need frustration, and T3 psychological control and autonomy support) was also tested. Correlation between twelve T1 covariates were found to be non-invariant: Ext with Sat; Ext with Fru; Ctl with Sat; Ctl with age; Sat with Fru; country with age; country with income; age with income.

Table S9

Standardized Regression Coefficients for the Final Multigroup Mediation Model

Variables	T2 Mediators				T3 Parenting Practices			
	Need Satisfaction		Need Frustration		Autonomy Support		Psychological Control	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Parental Age					**.01**/ -.16	**[-.06, .07]** [-.28, -.03]		
Birth Country [a]	.07	[.02, .12]					**.14**/ .03	**[.07, .21]** [-.11, .16]
Family Income							-.07	[-.13, -.01]
T1 Initial Level	.52	[.45, .58]	.36	[.28, .44]	.53	[.45, .60]	.55	[.49, .60]
T1 Ext. Behaviors	-.18	[-.24, -.12]	**.14**/ .26	**[.06, .22]** [.12, .40]	-.01	[-.07, .06]	-.02	[-.09, .04]
T2 Need Satisfaction	–	–	–	–	.12	[.03, .21]	.14	[.07, .22]
T2 Need Frustration	–	–	–	–	-.01	[-.08, .07]	.11	[.05, .18]

Note. N = 1460; 1093 mothers, 367 fathers.

Mothers' non-invariant coefficients are in Bold, followed by fathers' coefficients. Equality constraints were applied on unstandardized coefficients rather than standardized coefficients. Therefore, standardized coefficients may differ very slightly for mothers and fathers. The standardized coefficients from the largest group (mothers) are presented. Three paths were non-invariant: T1 externalizing behaviors → T2 need frustration; parental age → T3 autonomy support; and country → T3 psychological control.

[a] 1= Canada, 2 = elsewhere; [b] 0 = single-parent household, 1= two parent household.

Table S10

Standardized Regression Coefficients for Parental Needs and Parenting Practices - Subsample with One Respondent per Family

Variables	T2 Mediators				T3 Parenting Practices			
	Need Satisfaction		Need Frustration		Autonomy Support		Psychological Control	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Parental Age					-.04	[-.12, .04]		
Birth Country [a]	.02	[-.06, .10]					**.12**	[.04, .20]
Family Income							-.09	[-.16, -.03]
T1 Initial Level	**.52**	[.44, .59]	**.34**	[.24, .45]	**.48**	[.38, .56]	**.53**	[.47, .60]
T1 Ext. Behaviors	**-.20**	[-.27, -.13]	**.17**	[.07, .26]	.00	[-.08, .08]	-.04	[-.12, .04]
T2 Need Satisfaction	–	–	–	–	**.16**	[.05, .26]	**.17**	[.08, .25]
T2 Need Frustration	–	–	–	–	.02	[-.09, .11]	**.12**	[.04, .21]

Note. $N = 1026$; Bolded coefficients represent an effect size that is at least small ($\beta \geq .10$).

[a] 1= Canada, 2 = elsewhere.

Table S11

Standardized Regression Coefficients for the Final Multigroup Mediation Model - Subsample with One Respondent per Family

Variables	T2 Mediators				T3 Parenting Practices			
	Need Satisfaction		Need Frustration		Autonomy Support		Psychological Control	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Parental Age					**-.01**/ -.17	**[-.08, .07]** [-.47, -.16]		
Birth Country [a]	.02	[-.05, .09]					**.12**/ .04	**[.03, .21]** [-.18, .24]
Family Income							-.10	[-.16, -.03]
T1 Initial Level	.52	[.44, .59]	.34	[.23, .45]	.48	[.39, .57]	.54	[.47, .60]
T1 Ext. Behaviors	-.21	[-.28, -.14]	**.16**/ .36	**[.06, .26]** [.19, .53]	.00	[-.08, .08]	-.04	[-.12, .04]
T2 Need Satisfaction	–	–	–	–	.17	[.06, .27]	.17	[.08, .26]
T2 Need Frustration	–	–	–	–	.02	[-.08, .12]	.12	[.04, .20]

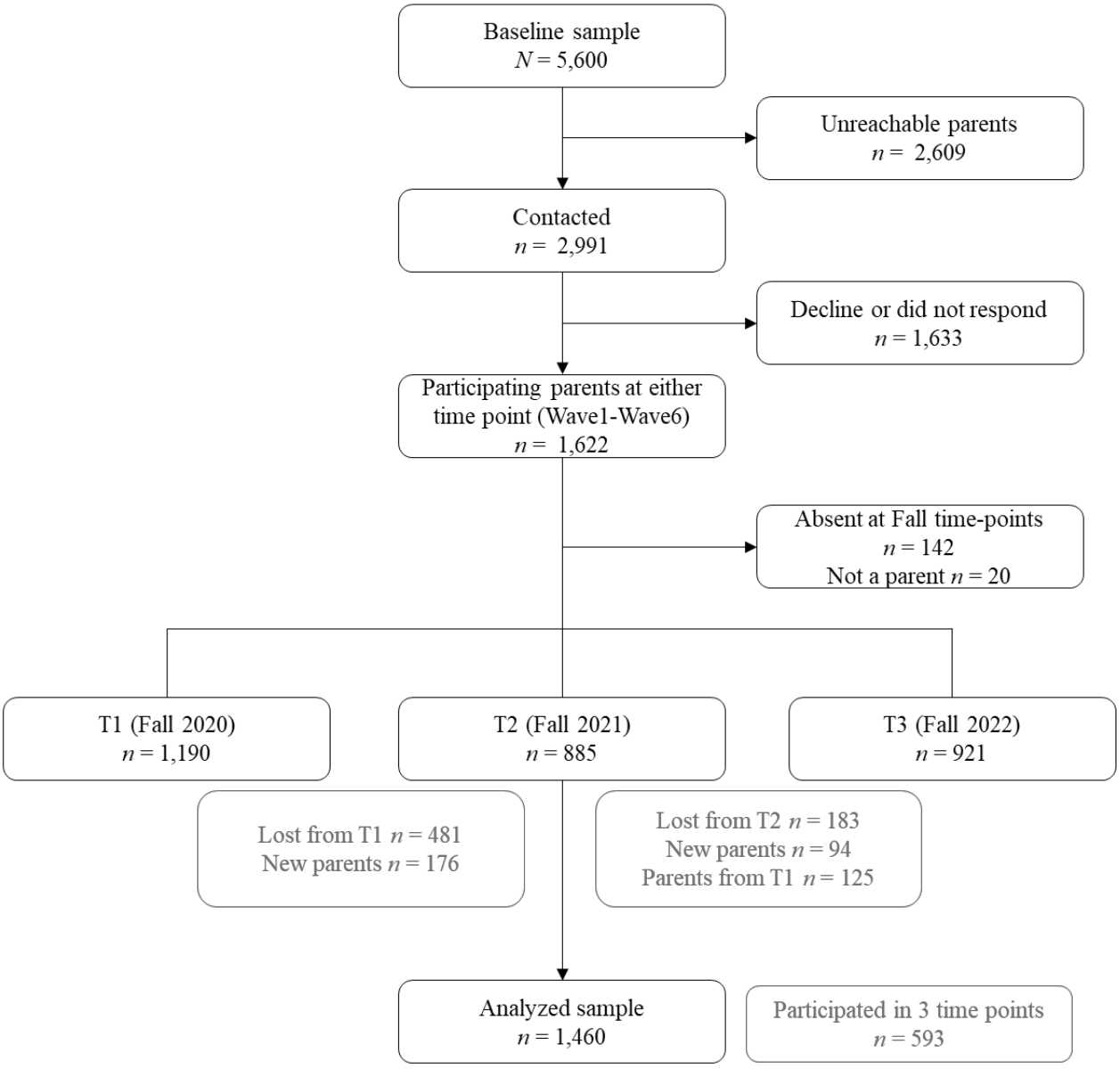
Note. N = 1026; 876 mothers, 150 fathers.

Mothers' non-invariant coefficients are in Bold, followed by fathers' coefficients. Equality constraints were applied on unstandardized coefficients rather than standardized coefficients. Therefore, standardized coefficients may differ very slightly for mothers and fathers. The standardized coefficients from the largest group (mothers) are presented. Three paths were non-invariant: T1 externalizing behaviors → T2 need frustration; parental age → T3 autonomy support; and country → T3 psychological control.

[a] 1= Canada, 2 = elsewhere; [b] 0 = single-parent household, 1= two parent household.

Figure S1

Flowchart of Participant Enrollment



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