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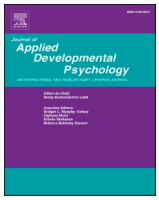

Associations between socioeconomic status, child risk factors, and parenting during guided learning

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ABSTRACT

Researchers have identified socioeconomic status (SES) as a risk factor for suboptimal parenting in guided-learning settings. Yet, the confounding role of co-occurring child risk factors in the SES-parenting linkage is understudied. In this prospective study, we examined how SES, child temperament, and child cognitive abilities of 197 mother-preschooler dyads uniquely predicted later observations of key parenting components during a guided-learning task. We also assessed how family profiles of risk predicted parenting. Results showed that SES was related to affiliation but not to other parenting components when adjusting for child risk factors. Results also revealed that child temperament predicted (non-solicited) structure, whereas cognitive abilities predicted controlling parenting. Latent profile analyses supported an accumulation of risk hypothesis; families scoring high on all risk factors displayed the least optimal parenting. By pointing to the specificity of the relations between risk factors and parenting components, this research may help clarify more specific intervention targets.

In the guided-learning domain of socialization (Grusec & Davidov, 2010), adults have the responsibility to actively support children's learning. They act as teachers and mentors, helping children gain mastery, solve problems, and acquire relevant cognitive and socio-emotional skills. During the preschool years, much of children's mastery and problem-solving efforts occur under the supervision of parents (Rogoff, 1990). Through the quality of their involvement, parents play a leading role in shaping their preschoolers' skills and capacity to solve problems independently while meeting their children's other needs (Wood & Wood, 1996). High-quality parenting during a child's first five years of learning is not only crucial for their cognitive and social development; it also sets the stage for lifelong adaptation and functioning (Edwards, Sheridan, & Knoche, 2010). However, all parents are not equally equipped to behave optimally during these challenging interactions (Van Bakel & Riksen-Walraven, 2002), and several risk factors can impede the quality of parental involvement in the guided-learning domain of socialization (Grolnick, 2003). To prevent suboptimal parenting in these settings, it is crucial to understand the role that these risk factors may play in parents' ability to support their children.

One well-studied antecedent of parenting disparities across developmental stages in guided-learning settings is socioeconomic status (SES) and its associated stress and inequalities (Hoff & Laursen, 2019). A substantial body of research indeed suggests that raising children of all ages in low-SES contexts brings about more severe stressors for parents (e.g., Conger, Conger, & Martin, 2010), which in turn tend to reduce psychological resources that otherwise could be dedicated to parenting, ultimately hampering parenting quality (Mermelshtine, 2017).

While past research focusing on the guided-learning domain shows that lower SES may be a risk factor for parents' ability to support their children's learning, the potentially confounding role of co-occurring child risk factors in the SES-parenting linkage has been understudied. Of particular importance, the confounding role of difficult child temperament and lower child cognitive abilities needs to be considered, as they are not only associated with suboptimal parenting in guided-

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learning contexts (e.g., Gauvain & Fagot, 1995; Robichaud, Bureau, Ranger, & Mageau, 2019) but also with lower SES (e.g., Jansen et al., 2009).

To address this limitation, we aim to revisit the SES-parenting linkage in guided-learning settings while considering the co-occurring role of child temperament and cognitive abilities. To do so, we focused on mother-preschooler interactions, as it is during this developmental stage that relational patterns pertaining to guided learning are first established (Rimm-Kaufman & Pianta, 2000). We also extended past literature by investigating key theoretically distinct parenting components simultaneously (Grolnick, 2009), thereby answering the call for more comprehensive insights on how these parenting components may be differentially related to SES and child risk factors (Kiff, Lengua, & Zalewski, 2011). Finally, we explored how scores on each parenting component differed between families according to their risk profiles. With these aims, we hope to offer more detailed information on the relations among SES, child risk factors, and parenting components to further guide researchers and practitioners dedicated to improving child learning in disadvantaged families.

Need-supportive parenting in the guided-learning domain

According to self-determination theory (Ryan & Deci, 2017), need-supportive parenting encompasses three key dimensions: affiliation, structure, and autonomy support paired with the absence of controlling practices (Grolnick, 2009). These dimensions, though their exact names and conceptualizations vary across studies, have received extensive empirical support in past parenting research (Skinner, Johnson, & Snyder, 2005). For example, they have been individually linked to diverse socio-emotional strengths (e.g., autonomous motivation, pro-social behaviors, social and academic adjustment) and greater mental health (i.e., less externalizing and internalizing problems; Barber, Stolz, Olsen, Collins, & Burchinal, 2005; Joussemet, Landry, & Koestner, 2008). Across developmental stages (e.g., McCurdy, Williams, Lee, Benito-Gomez, & Fletcher, 2020) and socialization domains (including guided learning; Mageau & Joussemet, 2023), they are also hypothesized to play a determining role in supporting children's basic psychological needs of relatedness, competence, and autonomy (i.e., to feel connected, capable, and volitional respectively; Grolnick, 2009; Joussemet et al., 2008).

Although each of these parenting dimensions seems fundamental for children's development, achieving a balance between providing structure, affiliation, and autonomy support without being controlling can be especially challenging during guided learning, as this socialization domain may be a common context for the expression of child difficulties. Child difficulties in turn have been shown to prompt suboptimal parenting behaviors, at least with elementary school children (Robichaud et al., 2019). Examining how different risk factors relate to specific need-supportive parenting components could thus shed light on the exact processes at play in this domain of socialization. Based on prior recommendations (Grolnick & Pomerantz, 2009; Mageau & Joussemet, 2023), we examine seven need-supportive parenting components: affiliation, three aspects of structure (i.e., feedback, non-solicited, and solicited guidance), autonomy support, and two aspects of controlling parenting (i.e., controlling involvement and psychological control).

Parental *affiliation*, also called warmth, refers to parents' supportive and caring interpersonal involvement with their children (Schaefer, 1959). In guided-learning settings, parents may show affiliation by expressing affection or positive emotions, as well as by paying attention to their children's emotions and interests (Eisenberg et al., 2010). Affiliation towards younger children during guided learning is linked to several positive child outcomes, including greater social, emotional, communicative, and cognitive competence (Landry, Smith, & Swank, 2006).

Parental structure refers to parents' organization of their children's environments to promote mastery and effectiveness (Grolnick & Pomerantz, 2009). In guided-learning settings, parents provide structure by helping children engage and persist in tasks so that they may develop their skills (Reeve, Jang, Carrell, Jeon, & Barch, 2004). Parents may achieve this in various ways. First, they may offer *feedback* to help children orient their behaviors and feel competent. Second, they may offer *guidance* to support children's skill development (e.g., through scaffolding; Wood, Bruner, & Ross, 1976; Vygotsky, 1978) and on-task behaviors (e.g., through limit setting, also called behavioral control; Barber & Olsen, 1997). According to recent writings (Mageau & Joussemet, 2023), parental guidance should be distinguished based on whether it is *non-solicited*—that is, scaffolded but offered without a clear child prompt—or *solicited*—that is, cued by children's requests or expressed difficulties to move forward—as children would experience these two forms of guidance differently. Compared to non-solicited guidance that could solely support children's competence, solicited guidance could support both children's autonomy and competence when the task is optimally challenging (Mageau & Joussemet, 2023).

Finally, parental *autonomy support* refers to parents' promotion of their children's volitional functioning (Soenens et al., 2007). In guided-learning settings, parents can provide autonomy support by being empathic (e.g., acknowledging children's feelings), by encouraging children's active participation in decision making or problem solving (e.g., promoting self-paced learning), and by providing information (e.g., giving rationales; Mageau & Joussemet, 2023). Supporting preschoolers' autonomy during guided learning promotes later motivation, executive functions, and achievements (see Joussemet & Mageau, 2023, for a review).

To be autonomy-supportive, parents also need to refrain from being controlling. Parenting behaviors are deemed controlling when they are pressuring, intrusive or domineering (Grolnick & Pomerantz, 2009). In guided-learning settings, controlling behaviors may be distinguished based on whether they target children's completion of the task (i.e., *controlling involvement*; Grolnick et al., 2014) or their psychological experience (i.e., *psychological control;* Barber, 1996). *Controlling involvement* thus refers to behaviors that pressure children into increasing their speed of completion or doing specific actions. These behaviors can take the form of parents taking over the task or imposing their approach to problem solving. As such, controlling involvement greatly differs from non-solicited guidance as the latter is firm but without being pressuring, intrusive or domineering (Grolnick & Pomerantz, 2009). Controlling involvement is hypothetically detrimental to children, notably because it makes them passive recipients rather than active participants in their learning process, thereby undermining their needs for autonomy (Landry, Smith, Swank, & Miller-Loncar, 2000; Neitzel & Stright, 2003) and competence (Grolnick, Price, Beiswenger, & Sauck, 2007). In contrast, *psychological control* refers to behaviors that constrain, invalidate, or manipulate children's psychological experiences. These include threats, performance pressures, criticisms, invalidation of feelings, conditional regard, and shaming (Grolnick & Pomerantz, 2009). Though less frequent than controlling involvement in the context of guided learning (Robichaud et al., 2019), psychological control orients children's focus on adult approval rather than on their own learning process, thereby hindering the child's later autonomy, attention, and conceptual learning (Grolnick, Gurland, Jacob, & Decourcey, 2002).

In sum, self-determination theory posits that need-supportive parenting in guided-learning settings includes parental affiliation, structure (i.e., feedback, non-solicited, and solicited guidance), and autonomy support paired with the absence of controlling behaviors (i.e., controlling involvement and psychological control; see Table 1 for concrete operationalizations). These seven parenting components are key because together they help satisfy children's psychological needs for relatedness, competence, and autonomy. Yet, a range of risk factors may lead parents to be more controlling and less need-supportive (Grolnick, 2003), although their unique relations to distinct parenting components remain unclear (Kiff et al., 2011).

Table 1
Theoretical Parenting Components.

Parenting component	Definition in the guided-learning context	Examples
Affiliation	Behaviors nurturing and communicating a caring and positive affective climate during the task	- Smiles and non-sarcastic laughter - Friendly verbalizations - Non-intrusive displays of affection
Feedback	Speech informing the child of how they are doing or how they can improve	- Confirmations or corrections - Praises - Non-specific positive feedback
Non-solicited guidance	Non-controlling informational guidance provided when the child is already engaged in the task	- Guidance when child is engaged - Structuring questions when child is engaged - Physical help when child is engaged
Solicited guidance	Non-controlling informational guidance cued by child-expressed difficulties or by the child's incapacity to move forward and deemed necessary to restore the child's capacity to be agentic	- Hints when child is stuck - Probing questions when child is stuck - Modeling behaviors when child is stuck
Autonomy support	Behaviors characterized as empathic and supportive of the child's active participation in decision making or problem solving	- Choices - Acknowledgements of child's feelings & perspective - Adaptations to the child's pace
Controlling involvement	Behaviors related to the task that pressure the child's actions and rhythm	- Directives - Completions of task for child - Impositions of pace
Psychological control	Behaviors that constrain, invalidate, and manipulate the child's psychological and emotional experience during the task	- Guilt-inducing comments - Threats - Conditional regard

The role of SES and child risk factors in parenting during guided learning

A noteworthy antecedent of parenting in guided learning is parents' SES. Typically operationalized based on family income and parental education (Duncan, Magnuson, & Votruba-Drzal, 2015), low SES is characterized not only by a chronic lack of material and financial resources, but also by unstable living conditions, social stigma, and a host of other obstacles that cause stress and negative affect (Haushofer & Fehr, 2014). These adverse emotions make parenting more challenging, regardless of parents' actual parenting aptitudes (Hoff & Laursen, 2019). Accordingly, parents from different SES backgrounds have been shown to approach guided-learning situations differently (Mermelshtine, 2017). For example, research conducted with mother-preschooler dyads has linked lower SES with less affiliation (e.g., Leerkes, Blankson, O'Brien, Calkins, & Marcovitch, 2011), less structure (e.g., Carr & Pike, 2012; Thompson, Foster, & Kapinos, 2016), less autonomy support (e.g., Distefano, Galinsky, McClelland, Zelazo, & Carlson, 2018; Huang, Sun, & Tang, 2021), and more controlling behaviors during guided-learning interactions (e.g., Herbers, Garcia, & Obradović, 2017).

Beyond parents' own characteristics and contextual factors, theoretical models identifying risk factors for detrimental parenting practices (Belsky, 1984; Grolnick, 2003) suggest that several types of pressure originating from the child may also impair parenting quality, including difficult child temperament and lower child cognitive abilities. Children's difficult temperament may be defined as high reactivity, frequent negative affect, and low self-regulation (Bates, Schermerhorn, & Petersen, 2012), while lower cognitive abilities refer to lower attention, memory or reasoning skills, which manifest themselves through poorer task performance (e.g., Wechsler, 1989). Both of these child characteristics are relevant parenting antecedents to consider in guided-learning settings, as both can be associated with greater child struggles and frustration during cognitive tasks, which may increase parental distress and trigger suboptimal parental behaviors aimed at alleviating it (Grolnick, 2003).

Research supports the idea that difficult child temperament and lower child cognitive abilities may be linked to suboptimal parenting in guided-learning settings. For instance, difficult child temperament is related to more controlling behaviors and negative affect from mothers in guided-learning interactions with toddlers (Brenning et al., 2020; Gauvain & Fagot, 1995). Although understudied with preschoolers, less advanced cognitive abilities among elementary school children, either directly measured or inferred from poorer task performance, have been associated with more controlling maternal practices and poorer scaffolding observed during problem-solving tasks (Grolnick, Gurland, DeCourcey, & Jacob, 2002; Mulvaney, McCartney, Bub, & Marshall, 2006; Robichaud et al., 2019).

Yet, research also shows that difficult child temperament and lower child cognitive abilities tend to co-occur with lower SES, which may blur their associations with need-supportive parenting. For instance, children from lower SES backgrounds tend to demonstrate lower cognitive abilities than their higher SES counterparts (e.g., Lee & Burkam, 2002; Reardon, 2011). Further, parents with lower SES tend to be more reactive to their child's temperament than their higher SES counterparts (Jenkins, Rasbash, & O'Connor, 2003; Padilla, Hines, & Ryan, 2020). Based on these associations, the relative contribution of SES, child temperament, and child cognitive abilities in parents' ability to guide children in their learning is likely to be confounded. Yet, past research showing a link between SES and suboptimal behaviors during guided-learning interactions has rarely considered the role of co-occurring child characteristics, which may have biased previously reported SES-parenting link estimates. Untangling these associations would be useful to inform intervention strategies that address parents' unique child-rearing challenges.

Cumulative risk

In addition to examining the independent associations among SES, child risk factors, and parenting, it is also essential to explore their interplaying role in parenting (Belsky, 1984). Notably, available evidence suggests that the accumulation of risk factors could play a major role in predicting parenting quality, as it may be increasingly challenging to avoid suboptimal parenting behaviors with each added pressure (Evans, Li, & Whipple, 2013). Thus, even though some parents may possess the internal resources to provide adequate parental care in the face of socioeconomic adversity, their already-limited resources may no longer suffice if they must additionally handle children who require extra care (Trentacosta et al., 2008). The relevance of considering a cumulative risk hypothesis in addition to examining the unique role of different risk factors is also highlighted by recent studies suggesting that mothers of preschoolers with higher cumulative risk tend to adopt more controlling parenting practices during guided learning (Diercks, Lunkenheimer, & Brown, 2021). Examining how SES, child temperament, and child cognitive abilities combine to predict need-supportive parenting components will provide a more nuanced account of the challenges that parents typically face in guided-learning settings during early childhood.

Present research

The overarching goal of this study was thus to expand research on antecedents of parenting in guided-learning settings by disentangling the relations between three risk factors (i.e., SES, child temperament, and child cognitive abilities) and the seven parenting components of

need-supportive parenting (i.e., affiliation, feedback, non-solicited guidance, solicited guidance, autonomy support, controlling involvement, and psychological control). To do so, we used a multi-informant prospective design in which we measured each risk factor at developmentally appropriate time points and then assessed parenting quality during later mother-child guided-learning interactions, when children were 4 years old. We then examined the independent associations between each of the three risk factors and our seven need-supportive parenting components.

Our secondary objective was to examine how SES, child temperament, and child cognitive abilities combined to predict parenting quality. To achieve this, we adopted a person-centered approach. This type of analysis is particularly useful for assessing interactions between multiple risk factors and their relations to other variables, in addition to providing insights into the heterogeneity of risk factors typically experienced within families (Cicchetti, 1993). We thus investigated the risk profiles that characterized our sample of families, based on SES, child temperament as well as child cognitive abilities, and examined how these profiles differed across the seven key parenting components.

Addressing these aims in early childhood is particularly important given that parenting quality during the first years of life can shape children's long-term developmental and adjustment trajectories (Edwards et al., 2010). To the best of our knowledge, no prior study has looked at the independent associations among SES, child risk factors, and distinct parenting components with preschoolers. Our hypotheses were thus tentative. Regarding our main objective, we first expected to observe fewer relations between SES and parenting quality when simultaneously considering the contributive role of child characteristics, compared to their bivariate correlations. We also expected that challenging child characteristics (i.e., more difficult child temperament and lower cognitive abilities) would be associated with poorer parenting quality (i.e., less affiliation, feedback, non-solicited guidance, solicited guidance, and autonomy support, paired with more controlling involvement and psychological control). Regarding our second objective, we first expected to identify a small number of risk profiles, given the documented associations between each risk factor. We also expected that profiles characterized by higher levels of cumulative risk would exhibit poorer quality parenting, compared to profiles characterized by lower risk.

Method

Participants

A total of 197 French-speaking families participated in our study. These participants were recruited as part of a broader longitudinal study on child development (Santé Québec, 1997). This broader study included 1000 French- and English-speaking families from urban areas and varied socioeconomic backgrounds who were randomly selected from the birth registry of the province of Quebec, Canada, from 1996 to 1997. Among these, 572 families qualified and accepted to complete a first data collection when their targeted children were 5 months old. Additional inclusion criteria for participation in the present study's laboratory observations at children's age 48 months were residence in the greater Montreal urban area, availability, ability to understand French, parent gender (only mothers were considered for inclusion), and consent to follow-up contact. Of the original sample, $n = 293$ met eligibility criteria (51.2% of the original sample) and $n = 197$ completed the study assessments (34.4% of the original sample; 67.2% of eligible families) and served as the analytic sample. Participants were mother-child dyads. In our final sample, 56.4% of children were girls. Regarding sociodemographics, 9.4% of mothers had not completed high school, 30.7% had a university degree, 20.6% had a yearly family income under CAD 30,000, 5.1% were single parents, and 96.9% were Caucasian. Comparing mothers who accepted to participate in the laboratory observations with those who declined revealed no difference on most sociodemographic variables assessed when children were 5 months old (i.e., mothers' education, family income, maternal age at first child, and marital status), all $ps \geq 0.24$. There was one exception: relative to those who declined, mothers who accepted to participate in the laboratory observations were more likely to have a girl vs. a boy (Rioux et al., 2020).

Procedure

Participating mothers were first interviewed at home when their targeted children were 5 months old. Next, they filled out questionnaires annually until, in the case of our present study, children were 48 months of age. Mothers' education level was assessed when their child was 5 months of age, while child temperament was assessed at 30 months (2.5 years). Both family income and child cognitive abilities were measured when children were 42 months old (3.5 years), 6 months prior to parenting observations, which occurred at the lab during guided-learning interactions when children were 48 months of age (4 years). Mother-child interactions were filmed during the standardized guided-learning task called Mystero (Lyons & Lyons, 1999). Informed parental consent was obtained at the first assessment and renewed at each follow-up. Mothers received compensation for their time (CAD 20 for each visit), while children were offered a selection of age-appropriate toys to choose from (CAD 5 value). The University of Montreal, the Louis-Hippolyte Lafontaine, and the CHU Ste-Justine research center ethics committees approved this project.

Guided-learning task

The Mystero task requires participants to associate numbered tokens ranging from 1 to 9 with images that are depicted on a problem board. The problem board is a 3 × 3 matrix of squares, for a total of 9 squares. Apart from the square in the middle of the board, which depicts a question mark representing the "mystery" number, each square contains an image that refers to a specific number, ranging from 1 to 9. These images include objects that can be counted, socio-cultural representations of numbers (e.g., a hand showing two fingers), numeric symbols in different calligraphy, and more ambiguous hints (e.g., a square, which has four sides). The goal of the task is to place each numbered token on the appropriate square and find the remaining number (i.e., the number between 1 and 9 that cannot be associated with any of the 8 other images). This task requires skills that have yet to be mastered by 48-month children, including counting skills, cardinality skills, and the ability to recognize written numbers. As a result, 4-year-old children need help to complete it (Rioux et al., 2020).

An experimenter first explained how to complete the task and provided an example directly from the problem board. Mothers were then asked to help their child complete the task like they normally would at home. The experimenter then stepped out of the room. In our study, dyads completed the board in 3 min and 35 s on average ($SD = 1$m31s).

Measures

SES

To obtain an indicator of family SES, we assessed mothers' education level at 5 months and family income at 42 months. Family income was assessed later so that mothers would not be on maternity leave, which would involve a period of depressed incomes. Mothers indicated their highest completed education certification, using a 7-point scale ranging from 1 = *elementary school* to 7 = *graduate school*. Pre-tax family income was measured using an 8-point scale (ranging from 1 = *less than CAD 5000* to 8 = *CAD 80,000 and higher*). Given the high correlation between maternal education and family income ($r = 0.52$), we standardized and averaged these variables to create a global index of family SES (Duncan et al., 2015).

Child temperament

Mothers assessed child temperament at 30 months using 12 items inspired from the Preschool Behavior Questionnaire (Behar & Stringfield, 1974) and the Ontario Health Study (Boyle et al., 1987). These items refer to preschoolers' qualities and behaviors indicative of difficult temperament (e.g., "Constantly moving"). They are rated on a three-point scale (ranging from 1 = *never/not true* to 3 = *often true*). Items were averaged to form a single score with high levels indicating more difficult temperament. Internal consistency was satisfactory, $\alpha = 0.78$.

Child cognitive abilities

Child cognitive abilities were assessed by conducting structured laboratory tasks when children were 42 months old. To assess non-verbal abilities, we used the standardized block design of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI-R; Population average at 42 months = 6–7, range = 0 to 42; Wechsler, 1989). To assess verbal abilities, we used the Peabody Picture Vocabulary Test – Revised (PPVT-R; Population average at 42 months = 35–36, range = 5 to 65; Dunn, 1959, Dunn, Dunn, & Thériault-Whalen, 1993). Both scores were positively correlated ($r = 0.37$, $p < .001$). They were thus standardized and averaged to create a global score of cognitive abilities. When only one score was available, we relied on a single indicator to limit missing data.

Coded parenting practices

To obtain an in-depth behavioral analysis of parenting practices, we coded mothers' behaviors during the Mystero task. To do so, a panel of five researchers first identified a list of 47 potential behaviors of interest in guided-learning settings, based on previous coding systems of parental affiliation (i.e., Eisenberg et al., 2010), structure (i.e., Robinson & Eyberg, 1981), and autonomy-supportive vs. controlling behaviors (i.e., Laurin & Joussemet, 2017; Robichaud et al., 2019; Robichaud, Roy, Ranger, & Mageau, 2020; Whipple, Bernier, & Mageau, 2011), as well as on past literature and validated scales of parental affiliation, structure, autonomy support, and controlling behaviors (e.g., Barber, 1996; Farkas & Grolnick, 2010; Mageau et al., 2015; Ratelle, Duchesne, Guay, & Boisclair Châteauvert, 2018; Reeve, 2009; Skinner et al., 2005). We then categorized the 47 parenting behaviors into the seven parenting components of interest. First, we grouped all *affiliation* behaviors into a single category. Second, we divided structure behaviors into three categories, namely *feedback, non-solicited guidance,* and *solicited guidance,* based on Mageau and Joussemet (2023) recommendations. Third, we grouped all autonomy-supportive behaviors in a distinct category of *autonomy support* and created two categories of controlling behaviors, namely *controlling involvement* and *psychological control*. All 47 behaviors were thus categorized as either *affiliation* (8 initially coded behaviors), *feedback* (4), *non-solicited guidance* (8), *solicited guidance* (6), *autonomy support* (7), *controlling involvement* (3), or *psychological control* (11; see Supplement A for a detailed description of each of the 47 behaviors).

Four graduate students in clinical psychology, including the first author of this paper, underwent coding training with the principal investigator of this research (i.e., this study's last author). They then reviewed and tested the initial coding grid on selected videos ($n = 5$). Once the coding scheme was piloted and refined, they each coded one-fourth of the videos as the main coder, coded another eight videos together at different time points to foster interrater reliability, and coded 5–8% of other videos as an interrater to test reliability. Five videos were discarded due to poor quality footage (e.g., damaged recordings or absent soundtrack) for a total of 192 coded videos. Of these, 26.5% were coded twice for interrater reliability. To ensure good psychometric properties of the coding, all videos were randomly assigned to coders, and all coders were blind to their status as first or interrater coder. The four coders resolved coding discrepancies in the eight videos through discussion. Other videos were not discussed to ensure that inter-rater reliability could be achieved independently. Data from the first coders were retained for the main analyses; data from the interrater coders were used to calculate inter-rater reliability.

To code each identified behavior during the Mystero task, we used a time-sampling coding scheme (Aspland & Gardner, 2003). Specifically, we divided each mother-child interaction during the Mystero task into 30-s time segments for coding, thereby fostering both sensitivity and accuracy of coding. In each video, the first 30-s segment began when mothers intervened for the first time, while the last segment occurred when the dyad signaled that they had finished the task. For each segment, coders rated the occurrence (0 = *absence*, 1 = *presence*) of each of the 47 behaviors. For each code, we summed all recorded scores across all segments, divided that sum by the length of the video (in seconds), and then multiplied it by the length of one segment (30 s). This yielded proportion scores of parenting behaviors, where higher scores indicate that mothers used the coded behavior in a greater proportion of 30-s segments, adjusting for the fact that the last segment ranged between 1 and 30 s. For example, scores of 0.5 would indicate that mothers used the behavior at least once in approximately 50% of the recorded segments. Finally, we standardized the proportion scores for each coder to control for potential biases related to coders' individual differences. Thus, in our final scores, a score of 0 on a given behavior indicates that mothers used this behavior as often as the average mother of our sample (in proportions of the recorded 30-s time segments), regardless of who coded their videos.

We eliminated any parenting behavioral codes that did not meet two inclusion criteria. First, its inter-rater reliability needed to be adequate (i.e., ICC $\geq$ 0.40; Cicchetti, 1994). Second, it needed to have occurred at least once throughout the Mystero task in at least 10% of the families. This resulted in the exclusion of 21 behaviors from further analyses, either because of low ICC ($n = 2$), low occurrence ($n = 12$), or both ($n = 7$). The final coding system thus assessed the seven parenting components based on 26 coded behaviors (i.e., affiliation = 4/8 retained coded behaviors; feedback = 3/4; non-solicited guidance = 3/8; solicited guidance = 4/6; autonomy support = 4/7; controlling involvement = 3/3; psychological control = 5/11). Intra-class correlations for each of the seven parenting components showed moderate to excellent inter-rater agreement (ICC = 0.57–0.91), which supports the overall reliability of the coding system (Cicchetti, 1994; Koo & Li, 2016; see Supplement B for the ICC of all behaviors.)

In terms of validity, correlations among coded parenting components were in the expected directions (see Table 2), which supports the convergent validity of this coding system. First, we observed positive relations between most need-supportive parenting behaviors as well as between controlling parenting components, with stronger correlations obtained between akin components (e.g., autonomy support with solicited guidance, feedback with non-solicited guidance, controlling involvement with psychological control). Both autonomy support and solicited guidance were negatively linked to non-solicited guidance, and need-supportive parenting behaviors were either unrelated or negatively related to controlling behaviors. Additionally, all coded behaviors shared a maximum of 23% of variance (all correlations ranged between −0.47 and 0.28), thereby suggesting that each parenting component captures a unique aspect of parenting in the guided-learning domain. Finally, researchers using the same dataset provided preliminary evidence for the predictive validity of this coding system by documenting expected longitudinal associations with child performance, inattention/impulsivity problems, and aggressive behaviors (Longpré et al., 2023; Laurendeau-Martin et al., 2023; see Supplement C for more details). Overall, these results support the validity of this coding system.

Plan of analyses

Preliminary analyses

We conducted all our analyses on R 4.3.1 except for the profile analyses, which were conducted on Mplus 7.0. Preliminary analyses included descriptive statistics (see Table 3) and bivariate correlations (see Table 2). This revealed four outliers for autonomy support and one

Table 2
Correlations Between All Variables of Interest.

Variable	1	2	3	4	5	6	7	8	9	10
1. Affiliation	–									
2. Feedback	0.28***	–								
3. Non-solicited guidance	0.14†	0.19**	–							
4. Solicited guidance	0.19**	0.12	−0.31***	–						
5. Autonomy support	0.17*	0.01	−0.30***	0.27***	–					
6. Controlling involvement	−0.26**	−0.26***	0.13†	−0.47***	−0.39***	–				
7. Psychological control	0.02	−0.16*	0.07	−0.05	−0.12	0.19**	–			
8. SES	0.25***	0.03	0.03	−0.03	0.15*	−0.09	−0.19*	–		
9. Difficult child temperament	−0.19**	−0.22**	−0.15*	0.08	−0.14†	0.09	0.12†	−0.26***	–	
10. Child cognitive abilities	0.19*	0.13†	−0.05	−0.06	0.23***	−0.25***	−0.18*	0.35***	−0.24**	–
11. Child sex	0.00	−0.04	−0.03	0.07	−0.08	−0.10	0.01	0.06	0.12†	−0.08

Note. † $p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

Table 3
Descriptive Statistics.

Variable	*N*	*M (SD)*	Min	Max
Affiliation	192	0.16[a] (0.16)	0.00	0.63
Feedback	192	0.32[a] (0.15)	0.00	0.87
Non-solicited guidance	192	0.58[a] (0.16)	0.00	0.99
Solicited guidance	192	0.12[a] (0.10)	0.00	0.43
Autonomy support	192	0.08[a] (0.10)	0.00	0.61
Controlling involvement	192	0.41[a] (0.24)	0.00	1.19[b]
Psychological control	192	0.05[a] (0.07)	0.00	0.40
Difficult child temperament	187	1.73[a] (0.35)	1.00	2.58
SES				
Mother's education	189	4.46[c] (2.10)	1.00	7.00
Family income	186	5.76[d] (1.68)	1.00	8.00
Child cognitive abilities				
WPPSI-R	160	8.23 (4.80)	0.00	25.00
PPVT-R	183	32.22 (15.65)	5.00	79.00

Note. 56.4% girls; [a]Proportion of 30-s segments in which the parenting component occurred, adjusting for the length of the last segment; [b]Scores higher than 1 represent mothers who engaged in the behavior in all 30-s segments including the last one, whose length was shorter than 30 s. [c]Completed a post-secondary degree; [d]CAD 30,000–39,000; Average income in 1996 = CAD 66,100 (Statistics Canada, 2023).

or two outliers for child cognitive abilities, psychological control, and affiliation; all other variables had scores no further than the recommended threshold of 3.29 standard deviations from the mean (Tabachnick & Fidell, 2018). Consequently, we transformed outliers into scores no further than 3.29 standard deviations below/above the mean and then verified if the (adjusted) variables were normally distributed (i.e., kurtosis and skewness between −1 and 1; Tabachnick & Fidell, 2018). After adjusting our outliers to this threshold, the distribution of all (adjusted) variables of interest was normal or near-normal (all kurtosis scores between −1 and 3.14, all skewness scores between −1 and 1.59), with the exception of psychological control (kurtosis = 7.39, skewness = 2.27). Regarding the correlations, child sex was unrelated to coded parenting components, and thus we did not include this variable in the main analyses.

Missing data analyses revealed that 3.03 to 9.60% of data were missing per variable ($M = 3.32\%$, $SD = 2.26\%$; see Table 3 for numbers of valid cases). Little's MCAR test suggested that data were not missing completely at random, $\chi^2(52) = 70.8$, $p = .042$. Additional analyses revealed that participants with missing data on at least one of the study's variables were more likely to have higher ratings on maternal autonomy support, $p = .027$, and marginally lower ratings on psychological control than those with no missing data, $p = .051$, all other $ps \geq 0.118$. Thus, in structural models, we used FIML estimation to handle missing data and we used the robust MLR estimator, as some variables were non-normally distributed.

Main analyses

For the main analyses, we conducted structural equation modeling to examine the independent roles of SES, child temperament, and child cognitive abilities in predicting parenting quality. Specifically, we examined the associations between the three risk factors and each parenting component (i.e., affiliation, feedback, non-solicited guidance, solicited guidance, autonomy support, controlling involvement, and psychological control) within a single model.

Profile analyses

We conducted latent profile analyses (LPA) to assess the risk profiles in our sample based on family SES, child temperament, and child cognitive abilities. Standardized scores were used as indicator variables. Models with two to six profiles were examined for model fit. Models with smaller values on the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), and the sample size adjusted BIC (aBIC), with model entropy closer to 1.00, were considered better fitting compared to other models. Also, models with a significant Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (VLMR LRT) at $p < .05$ were considered better fitting compared to the model with one fewer profile (Ferguson, Moore, W, & Hull, 2020). Interpretability of profiles and sufficient sample size within each profile (i.e., >10% of the sample) were also considered in determining the best-fitting model among models with two to six profiles (Nylund-Gibson & Choi, 2018).

Next, profiles derived from the LPA were compared on the observed parenting components. We used the 3-step method to account for participants' conditional probability of membership during profile comparisons (Asparouhov & Muthén, 2014). Chi-square (χ^2) tests, independently conducted for each parenting component, are reported for the 3-step method. A Bonferonni adjustment was applied for multiple comparisons.

Results

Preliminary analyses

Correlations between all variables are presented in Table 2. The assessed risk factors tended to co-occur. Children whose mothers had lower SES tended to display lower cognitive abilities and to be perceived by their mothers as having a more difficult temperament. Children with lower cognitive abilities were also perceived by their mothers as having a more difficult temperament. Examining correlations between predictors and outcomes revealed several statistically significant relations. Mothers with lower SES were coded as demonstrating less affiliation, less autonomy support, and more psychological control. Mothers who rated their children as having a more difficult temperament were coded as providing less affiliation, less feedback, and less non-solicited guidance. Finally, mothers of children displaying lower cognitive abilities were coded as providing less affiliation, less autonomy support, more controlling involvement, and more psychological control.

Main analyses

Results from our path analyses revealed several independent associations between SES, child temperament, and child cognitive abilities on the one hand, and the seven coded parenting components on the other hand (see Fig. 1 for main findings; see Supplement D for all standardized beta coefficients and standard errors). First, mothers with lower SES were coded as demonstrating less affiliation. Second, mothers who previously described their child as having a more difficult temperament were coded as providing less feedback, less non-solicited guidance, and (marginally) less affiliation. Third, mothers whose children were rated as having more cognitive abilities demonstrated less controlling involvement, (marginally) more autonomy-supportive behaviors, and (marginally) less psychological control. This was a saturated model; model fits are necessarily perfect and thus are not interpretable. Effect sizes were small to medium: $R^2 = 0.09$ for affiliation, 0.06 for feedback, 0.03 for non-solicited guidance, 0.01 for solicited guidance, 0.07 for autonomy support, 0.06 for controlling involvement, and 0.05 for psychological control.

Profile analyses

Latent profiles

Model fit statistics for the 2- to 4-profile solutions are shown in Table 4. The 5- and 6-profile solutions did not converge and each had one profile that represented <5% of our sample; they are thus not included in the table and were not examined further. AIC and aBIC decreased with each added profile, while BIC increased with each added profile. Entropy was highest at the 4-profile solution. VLMR LRT was significant at the 2-profile solution, suggesting that exploring data-driven heterogeneity was relevant in our sample. Further, VLMR LRT was significant for the 3-profile solution but not for the 4-profile solution, suggesting that the 3-profile solution was more viable than 2- and 4-profile solutions. Based on these model fit statistics, the 3-profile solution was selected for further analysis. Average latent profile posterior probabilities ranged from 0.76 to 0.89 across the diagonal for the 3-profile solution.

In the 3-profile solution, depicted in Fig. 2, the Highest Risk profile (29.0%) was marked by high overall risk based on low SES, high difficult temperament, and low child cognitive abilities. The Temperament-Related Risk profile (32.9%) showed high difficult child temperament, moderate to high child cognitive abilities but high SES. The Lowest Risk profile (38.1%) was marked by the least overall risk, with high SES, easy child temperament, and high child cognitive abilities.

Table 4
Fit Statistics for the Latent Profile Analysis Models.

Profile solution	AIC	BIC	aBIC	Entropy	VLMR LRT *p*-value
2	1545.16	1577.89	1546.21	0.59	0.00
3	1536.16	1581.98	1537.63	0.61	0.04
4	1531.43	1590.35	1533.33	0.63	0.45

Note. AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, aBIC = sample size adjusted BIC, VLMR LRT = Vuong-Lo-Mendell-Rubin Likelihood Ratio Test.

Profile comparisons

Profile comparisons and effect sizes are presented in Table 5. For the Bonferroni adjustment, the significance was set at $p < .017$ for each comparison for a 3-profile solution. Overall, results showed that mothers in the Highest Risk profile used the least optimal pattern of parenting practices, while those in the Lowest Risk profile used the most optimal practices. Specifically, compared to mothers in the Lowest Risk profile, mothers in the Highest risk profile demonstrated less affiliation, feedback, and autonomy support, as well as more controlling involvement and psychological control. Mothers in the Temperament-Related Risk profile showed better practices than those in the Highest Risk profile, using more affiliation and autonomy support, but their practices were not as positive as those in the Lowest Risk profile, providing less feedback and autonomy support. Mothers' use of solicited and non-solicited forms of guidance did not differ across profiles. Most effect sizes were medium to large in magnitude, with a few small effects.

Discussion

Need-supportive parenting in early childhood plays a major role in

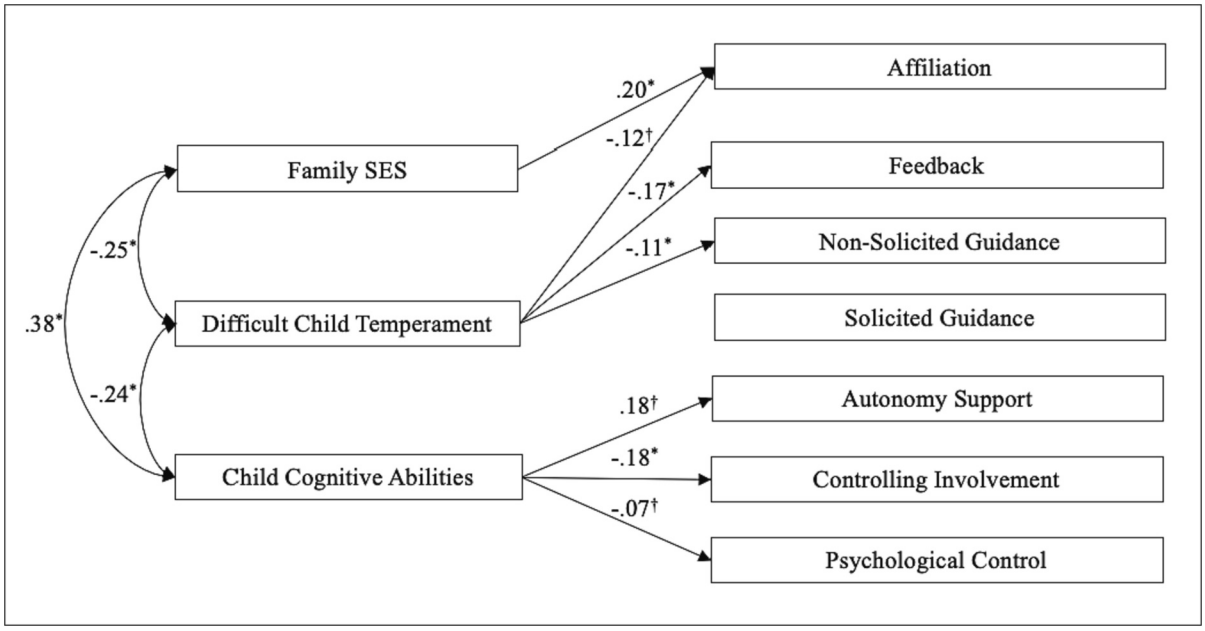

Fig. 1. Relations Between Risk Factors and Parenting Components.
Note. All links between all variables were modeled. For the purpose of parsimony, this figure depicts only the significant and marginally significant standardized beta coefficients. All associations are reported in Supplement D. †$p < .10$, *$p < .05$.

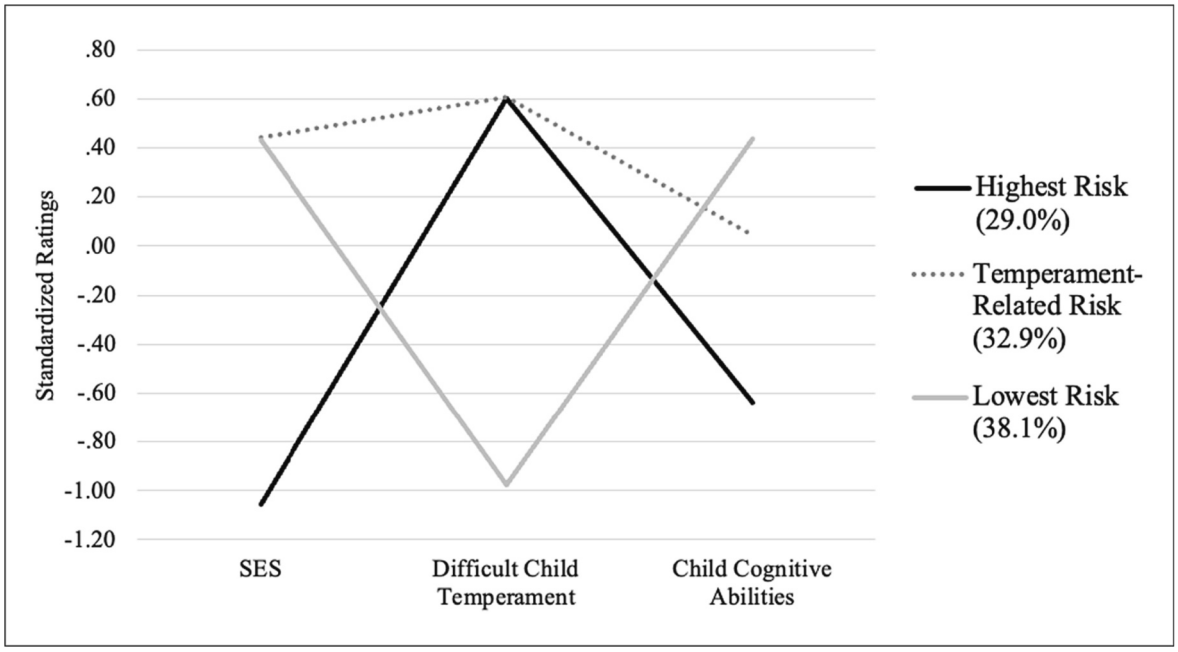

Fig. 2. Three-Profile Solution.

Table 5
Comparisons of Observed Parenting Components by Profile.

				Means for Each Profile		
	Overall χ^2	*p*	*V*	Highest risk (H)	Temperament-related risk (T)	Lowest risk (L)
Affiliation	49.02	<0.001	0.36	$-.42_{TL}$	$.03_{H}$	$.32_{H}$
Feedback	42.22	<0.001	0.33	$-.28_{L}$	$-.34_{L}$	$.51_{HT}$
Non-solicited guidance	1.85	0.397	0.07	−0.11	−0.00	0.09
Solicited guidance	0.42	0.811	0.03	0.09	−0.13	0.04
Autonomy support	114.89	<0.001	0.55	$-.52_{TL}$	$-.10_{HL}$	$.44_{HT}$
Controlling involvement	10.48	0.005	0.17	$.32_{L}$	−0.07	$-.20_{H}$
Psychological control	9.31	0.010	0.16	$.41_{L}$	−0.08	$-.20_{H}$

Note. Scores for each parenting component are standardized. Profiles are labelled as followed: Highest risk (H), Temperament-related risk (T), and Lowest risk (L). Subscripts indicate profiles that significantly differ from the given profile. Manual corrections for *p*-value cutoff are set at $p < .017$ (for 3 comparisons). V = Cramer's V (for a contingency table with $df = 2$, small effect =0.07, medium effect =0.21, and large effect =0.35).

children's cognitive and social development, but also in their lifelong adaptation and functioning (Edwards et al., 2010; Joussemet & Mageau, 2023; Vasquez, Patall, Fong, Corrigan, & Pine, 2016; Wood & Wood, 1996). Yet, behaving in a need-supportive way is not easy, as many factors can trigger suboptimal parenting (e.g., Robichaud et al., 2019). Overall, this research helps refine our understanding of parenting antecedents during guided learning and offers novel areas of intervention to promote family functioning. Differentiating the components of need-supportive parenting enabled us to uncover specific associations with noteworthy risk factors. While low SES was linked to less affiliation, difficult child temperament was associated with less structure, and low child cognitive abilities represented a risk for children's autonomy. Profile analyses also revealed how the accumulation of risk can threaten need-supportive behaviors, highlighting the importance of considering child risk factors in addition to SES when detecting vulnerable families. Together, these findings inform researchers and practitioners of the specific role that different risk factors may play in need-supportive parenting, thereby guiding future research and interventions.

SES, child characteristics, and parenting during guided learning

Our main analyses first revealed that, when adjusting for potential confounding child risk factors, SES was positively associated with mothers' tendency to display affiliation towards their preschoolers during a guided-learning task, but it was not linked to other parenting components. The observed relation between SES and affiliation is consistent with past research showing that relative to higher-SES mothers, mothers from lower SES backgrounds are generally less overtly loving and affectionate towards their children (e.g., McCarty, Zimmerman, Digiuseppe, & Christakis, 2005) and are less emotionally supportive during guided-learning tasks (e.g., Leerkes et al., 2011). According to the Family Stress Model (Conger et al., 2010), such associations may be mediated by the higher levels of stress experienced through living in unfavorable socioeconomic conditions, which in turn may limit parents' opportunities to express warmth within the parent-child relationship (e.g., Xing, Liu, & Wang, 2019). Another explanation might be that lower-SES parents may pursue goals that are less consistent with the expression of warmth during guided-learning interactions. In line with this idea, research has shown that lower-SES parents tend to attach more value to child conformity and obedience compared to their higher-SES counterparts (Luster, Rhoades, & Haas, 1989). Lower-SES mothers might therefore focus on parenting behaviors related to the task at hand, rather than considering the activity as an opportunity for close and affectionate interactions with their children.

Although correlational analyses suggested that SES was also linked to autonomy support and psychological control, our main analyses

revealed that these associations did not persist when accounting for variations in child temperament and cognitive abilities. Rather, only child cognitive abilities were linked to less controlling involvement, and at trend-level significance, less psychological control and higher autonomy support. Such differences between results from correlational and regression analyses suggest that the relation between SES and controlling involvement may be a reflection of the confounding role played by children's cognitive abilities in this specific aspect of parenting during guided-learning interactions. This novel finding offers a potentially new understanding of the role of SES (or lack thereof) in autonomy-supportive parenting.

In addition to offering relevant insights into the associations between SES and need-supportive parenting, our main analyses also shed light on the independent role that child risk factors may play in parenting quality when taking into account variations in family SES. Regarding child temperament, results showed that mothers who rated their children as having a more difficult temperament at 30 months provided less non-solicited guidance and feedback at 48 months. These findings are in line with a meta-analytic review showing that child negative emotionality is negatively associated with supportive parenting (defined as a combination of affiliation and structure, which they labelled behavioral control; Paulussen-Hoogeboom, Stams, Hermanns, & Peetsma, 2007). The present research however adds to this literature by identifying the specific aspects of parenting that may be most compromised by child temperament, namely non-solicited guidance and feedback, which in turn could impede these children's development (Stice & Gonzales, 1998).

In contrast, we observed no associations between child temperament and controlling involvement or psychological control, which was contrary to our expectations. These non-significant associations are nevertheless consistent with a meta-analysis by Paulussen-Hoogeboom et al. (2007), which revealed that links between difficult child temperament and more controlling parenting tend to be significant in questionnaire-based studies but are generally null in studies involving observational methodologies such as ours. Perceptual biases resulting from parent reports may account for part of the variability in these findings. Child cognitive abilities could also have played a confounding role in past associations between child temperament and controlling parenting, as children with a more difficult temperament tend to be perceived as having lower cognitive abilities ($r = -0.24$ in this study). Indeed, when we controlled for child cognitive abilities, the trend-level associations between difficult child temperament and autonomy support or psychological control found in correlational analyses were no longer present. Future observation-based studies are thus needed to revisit the association between child temperament and controlling parenting while considering child cognitive abilities.

Regarding child cognitive abilities, we found that lower abilities at 42 months were associated with more controlling involvement at 48 months during the guided-learning task. This finding echoes past work with elementary school children showing that when children are less competent at a task, parents tend to become more controlling (Mulvaney et al., 2006; Robichaud et al., 2019). It also extends this literature in showing that this relation holds true with preschoolers and when adjusting for both child temperament and parental SES, which are two novel findings. According to Grolnick (2003), parents may perceive their children's lower cognitive abilities as a potential threat to their children's future success and overall healthy development. Such perceived threats in turn are an additional trigger for controlling parenting, which may be viewed as attempts to protect children from potential future harm (Gurland & Grolnick, 2005; Robichaud et al., 2020). The present study suggests that this phenomenon could occur as early as early childhood. Thus, the more parents perceive such threats to their children's prospects, the more they are at risk of engaging in high levels of controlling and low levels of autonomy-supportive parenting behaviors, presumably in an attempt to prepare children to meet future challenges. Yet, such attempts are likely to be unfruitful, as parents' tendencies towards responding with more controlling involvement to children's struggles or to environmental threats seem to perpetuate child difficulties (Vasquez et al., 2016). Structuring behaviors on the contrary seem beneficial for children's achievements and psychological adjustment (Grolnick & Pomerantz, 2009; Levitt, Grolnick, & Raftery-Helmer, 2020; Skinner et al., 2005; Wang, Pomerantz, & Chen, 2007).

Overall, the present investigation stresses the importance of simultaneously examining the contributions of various risk factors in predicting need-supportive parenting during guided learning. By adopting a domain-specific and dimensional approach to parenting, we were able to identify the specific areas of parenting that are vulnerable to specific contextual and child risk factors in guided-learning settings. Our results also suggest that parenting components related to different basic child psychological needs seem to be differentially impacted by contextual and child risk factors. Given that affiliation, structure, and autonomy support have been individually linked to children's developmental outcomes (Barber et al., 2005; Joussemet et al., 2008), our findings help to portray the scope and potential severity of the impacts of the assessed risk factors, whether they occur individually or in combination.

Profiles of risk and parenting during guided learning

In addition to examining the independent relations between each risk factor and need-supportive parenting components, we considered how different risk factors tend to co-occur, and how their combination predicts parenting. In particular, we identified three risk profiles that differed in their tendency to engage in the different parenting components.

First, we found that mothers in the Highest Risk profile (characterized by lower SES and lower child cognitive abilities together with higher child temperamental difficulty) displayed significantly less affiliation, feedback, and autonomy support during the task while also demonstrating more controlling involvement and psychological control compared to those in the Lowest Risk profile (characterized by higher SES and higher child cognitive abilities together with lower child temperamental difficulty). These differences between the highest and lowest risk profiles echo past findings showing that parents who are exposed to fewer contextual and child-related risk factors tend to favor parenting components that best foster child learning and development (e.g., Diercks et al., 2021). The present study also extends this literature in showing that the ability to parent in a more need-supportive way may also be particularly vulnerable to an accumulation of risk. Given that risk factors can co-occur (this study but also Lee & Burkam, 2002; Padilla et al., 2020), it is opportune to emphasize parenting education interventions when supporting at-risk families. Greater socioeconomic and child-related risks may indeed deplete mothers' psychological resources (Trentacosta et al., 2008), which in turn could lead to less need-supportive parenting during challenging parent-child guided-learning interactions (e.g., Brenning et al., 2020).

Second, mothers in the Temperament-Related Risk profile (characterized by higher child temperamental difficulty and moderate-to-high child cognitive abilities together with higher SES) provided less feedback and autonomy support compared to those in the Lowest Risk profile. These findings suggest that in families with similarly high SES, a combination of child risk factors may predict additional suboptimal parenting components during guided-learning interactions. Compared to parents with easier and more competent children, parents of children displaying more difficult temperament and moderate-to-high abilities may focus solely on guiding their children with the task at hand, leaving fewer opportunities for encouraging children's active participation through feedback and autonomy-supportive behaviors.

Finally, we found no significant differences between the risk profiles on the provision of non-solicited or solicited guidance. This was surprising given that we observed a negative association between non-solicited guidance and difficult child temperament in our main analyses. This later association may thus be more apparent when other risk

factors are maintained constant. In contrast, the lack of associations between the risk factors and non-solicited guidance could be due to a floor effect of solicited guidance. Given the difficulty of the Mystero task for preschoolers, mothers may have been inclined to offer guidance without waiting for their children's solicitation, resulting in fewer instances for solicited guidance. Low scores on solicited guidance in turn could have limited our ability to detect associations between this parenting component and other variables. This interpretation is consistent with the relatively low mean of solicited guidance (see Table 3) and the negative correlation observed between solicited and unsolicited guidance. Further investigation of solicited guidance should include an experimental task that is specifically tailored to children's abilities (e.g., Robichaud et al., 2019).

As a whole, our findings underscore the importance of considering how SES and child risk factors co-occur and how these co-occurrences relate to parenting in guided-learning settings. They notably show that greater amounts of risk predict poorer parenting quality. As such, our results offer additional support to prevention policies aimed at reducing the burden of high-risk families. As child risk factors may also reduce parenting quality independently from SES, our findings also suggest that families whose children display more difficult temperament and moderate-to-low cognitive abilities could also benefit from parenting education interventions.

Strengths and practical implications

This study has noteworthy methodological strengths. First, we relied on a prospective design, thereby avoiding key limitations related to cross-sectional studies, such as common variance biases (Kraemer, Yesavage, Taylor, & Kupfer, 2000). Potential common variance biases were additionally reduced by our multi-informant approach to assess our variables of interest. Further, we used time-sampling observational measures to assess a detailed and theory-driven account of parenting components that were relevant to our guided-learning task. This, in turn, enabled us to detect and nuance associations that may go unnoticed when parenting components are merged into global scores.

On a practical level, the present findings provide further evidence that families who face multiple risk factors struggle to engage in need-supportive parenting; the highest and lowest risk profiles differed on many parenting components. These observed differences highlight the relevance of high-quality early interventions aimed at supporting high-risk families of young children (e.g., the *Family Check-Up*; Gill, Dishion, & Shaw, 2014). By helping parents remain attentive to their children's needs in more challenging situations, these types of interventions contribute to closing the gap in parenting quality among families from different SES (e.g., Prime et al., 2023).

Our findings also make a valuable contribution to the field of parenting by untangling the role of child risk factors and SES in parents' ability to support their preschoolers in guided-learning contexts. Extending past research suggesting that the link between SES and parenting components may be largely explained by the high levels of stress associated with lower SES (Conger et al., 2010), our study suggests that child risk factors may also play a confounding role in this association, thereby offering additional support to the idea that low SES is not necessarily the most critical risk factor among more vulnerable parents (Cooper, 2021). Rather, a thorough understanding of each family's unique configuration of risk could prove valuable to effectively support parenting quality.

Difficult child temperament and child cognitive abilities were associated with different aspects of need-supportive parenting regardless of SES. These findings suggests that when it comes to parenting quality, the definition of high-risk families could be broadened to include families with children displaying more difficult temperament and lower cognitive abilities. Broadening our definition of high-risk families could help reach many additional families who could benefit from parenting education. Offering parenting education to more diverse families, in turn, could reduce the stigma associated with receiving parenting support, which would encourage parents from lower SES backgrounds to seek help (Dempster, Davis, Jones, Keating, & Wildman, 2015).

In the present study, parenting components related to each of the different basic child psychological needs (Ryan & Deci, 2017) were differentially associated with noteworthy contextual and child risk factors. These findings suggest that achieving a balance between affiliation, structure, and autonomy support is not only challenging but easily unsettled. As such, parenting education interventions that can support parents in providing all of these need-supportive behaviors simultaneously could be most effective in increasing parents' resiliency in the presence of contextual or child risk factors.

We know of one intervention that is efficacious in increasing parenting behaviors that pertain to all three psychological needs in the general population: the *How to Talk so Kids will listen & Listen so Kids will Talk* parenting program (How-to Parenting Program; Faber & Mazlish, 2010). Results from a randomized controlling trial showed that parents of elementary school children who were randomly assigned to participate in this program reported increased levels of autonomy support at post-intervention, compared to parents assigned to a waitlist condition (Mageau, Joussemet, Robichaud, Larose, & Grenier, 2022). These benefits were observed one year later. Results also showed that parents who attended the How-to Parenting Program and scored low on affiliation and structure at pre-intervention reported higher scores on affiliation and (marginally) structure at post-intervention respectively, compared to those with similar low initial ratings but who did not participate to the program. Importantly, this program was also efficacious in reducing parent reports of child externalizing behaviors over a one-year period (Joussemet et al., 2023). By helping parents provide affiliation, structure, and autonomy support simultaneously, the How-to Parenting Program could be a promising intervention to improve parenting quality in the general population.

Finally, currently available parenting education interventions, including the How-to Parenting Program, could be improved by including more information about the contextual and child risk factors that could make parents more vulnerable to suboptimal parenting such as low SES, difficult child temperament, and lower child cognitive abilities. Being made aware of these triggers could help parents shield the quality of their parenting from their potentially negative influence. By adapting existing skills to more challenging situations, new and more advanced skills could also be developed to help parents respond in a more need-supportive way in diverse situations and across domains of socialization (Mageau & Joussemet, 2023).

Limitations and future research directions

Despite its methodological strengths and practical implications, our study has limitations that should be considered. First, although our research relied on prospective data, our design was correlational in nature and thus could not test causal inferences. A next research step could be to assess the bidirectional relations between SES, child characteristics, and parenting behaviors using cross-lagged models. Second, we did not test the potential mechanisms at play in our observed relations, which limits our understanding of the processes linking our assessed risk factors with parenting (e.g., stress, anticipated negative child reactions).

Third, recent literature (e.g., Roy, 2019) highlights the need for a broader conceptualization and assessment of socioeconomic adversity and social status. The composite measure of SES used in the present study consisted solely of family income and maternal educational level, which may not fully capture the intricate experience of families' socioeconomic conditions (Diemer, Mistry, Wadsworth, López, & Reimers, 2013). This in turn may have reduced the observed associations with this contextual risk factor.

Fourth, though our coding system rests on strong theoretical grounds and empirically validated measurements, its psychometric properties

were not exhaustively tested in our study. Although there is evidence that all retained parenting components were reliably coded, had sufficient occurrence, yielded adequate score variability, and displayed good validity, their associations with validated parenting questionnaires have not been systematically tested. Future research is thus needed to further document the psychometric properties of this coding system and to provide additional evidence of its validity.

Fifth, other child risk factors could have been included in the present study. For example, children who are less achievement oriented (Pomerantz & Eaton, 2001) or intrinsically motivated (Courneya & McAuley, 1991) tend to elicit more controlling behaviors. Parents who hinge their self-esteem on their children's achievements (Grolnick et al., 2007) or who have a strong fear of failure (Elliot & Thrash, 2004) also seem to be at greater risk for engaging in suboptimal parenting behaviors. Future research could examine how these potential risk factors relate to the different components of need-supportive parenting.

Finally, our sample's diversity was restricted in terms of parent gender, family ethnicity, marital status, and mothers' education; all participants were mothers and most of them were Caucasian, married, and had completed post-secondary education. Also, to take part in this study, mothers needed to live in the greater Montreal urban area, be available to come to the laboratory, understand French, and have consented to participate in follow-up assessments. In contrast, family income was below the population's average, which was CAD 66,100 at the time of the study, levels of child difficult temperament were close to the response scale midpoint (i.e., 1.73 on a 3-point scale, where 2 = *Sometimes true*), and child cognitive abilities were slightly below population averages (see Table 3), suggesting adequate range for these variables. Nevertheless, the generalizability of our findings, including the observed parenting profiles, is restricted to populations with similar characteristics. Research with more diverse samples is direly needed to verify if the observed associations hold with fathers, parents from other cultures and rural areas, and less educated parents.

Conclusion

Research in the guided-learning domain has identified several risk factors that may prevent parents from adequately supporting their child's learning, including low SES, difficult child temperament, and low child cognitive abilities. However, the relative role of these risk factors is understudied. Our research highlights the importance of examining such factors simultaneously by documenting the unique association between SES and affiliation, between child temperament and unsolicited structure (i.e., feedback and unsolicited guidance), as well as between child cognitive abilities and controlling involvement. These associations, in turn, clarify the potential detrimental impact of each of these risk factors on different, yet complementary, need-supportive parenting behaviors. It also documents how the combined presence of risk factors may affect parenting quality in guided-learning settings. Overall, these findings may help clarify more specific and effective intervention targets.

Author statement

During the preparation of this work the author(s) did not use AI-assisted technologies.

Author note

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CRediT authorship contribution statement

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Declaration of competing interest

None.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.appdev.2024.101633.

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