

Contextual Specificity in the Relationship between Maternal Autonomy Support and Children's Socio-emotional Development: A Longitudinal Study from Preschool to Preadolescence

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Abstract The benefits of an autonomy supportive environment have been established as a key component in children's development at various ages. Nonetheless, research examining the outcomes of early autonomy supportive environments has largely neglected socio-emotional development. The first objective of the present longitudinal study was to examine the socio-emotional outcomes associated with maternal autonomy support during the preschool period. Second, we explored the contextual specificity of the relationships between maternal autonomy support and children's later socio-emotional outcomes. Finally, we investigated the indirect effect of maternal autonomy support on children's later socio-emotional outcomes through earlier children's socio-emotional outcomes. Sixty-six mothers and their pre-school aged children (41 girls) were followed during preschool (Time 1), elementary school (Time 2) and preadolescence (Time 3). Maternal autonomy support (Time 1) was measured in two contexts (free-play and interference task) using observational coding. Furthermore, the children's internalizing and externalizing problems as well as their social competence were measured at Times 2 and 3. The results revealed the importance of maternal autonomy support during preschool for children's later socio-emotional development, especially during challenging contexts, and the mediating role of children's socio-emotional outcomes during elementary school in the link between maternal

autonomy support during the preschool years and children's later socio-emotional outcomes during preadolescence. The results highlight the contextual specificity of the relationship between maternal autonomy support and children's later socio-emotional development and reveal one of the mechanisms through which the effect of early childhood parental autonomy support on children's later socio-emotional development is carried forward over time.

Keywords Maternal autonomy support · Socio-emotional development · Contextual specificity · Developmental mechanisms

Introduction

Children's healthy development has long been a high societal priority. Developmental researchers, working from a variety of theoretical frameworks, continue to explore factors hypothesized to influence children's development and the subsequent outcomes associated with these factors. According to Self-determination theory (SDT), one of the key components of children's optimal development is autonomy (feeling that one has volition and is the origin of one's own actions). SDT posits that an individual's social development and well-being depend on the extent to which the need for autonomy is satisfied (Deci and Ryan 2000; Ryan and Deci 2000). Autonomy should not be confused with a need for independence. Whereas independence concerns not relying on others, autonomy as defined by SDT, has to do with the relative volition of a person's behaviors (Soenens and Vansteenkiste 2005). In order for a child to satisfy this innate psychological need, and thereby achieve optimal development, the environment must be conducive to the child's autonomy in lieu of controlling the

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child's behavior. A social environment is said to be autonomy-supportive when it provides choices, encourages self-initiation from the child, and promotes full internalization without controlling the thoughts or actions of the child (Joussemet et al. 2005). According to SDT, when children's need for autonomy is supported, their natural tendencies to engage in interesting activities (i.e., intrinsic motivation) and to integrate important values and social norms into their sense of self (i.e., internalization) are likely to function optimally (Joussemet et al. 2008). As intrinsic motivation and internalization are two processes underlying optimal social functioning (Deci and Ryan 2000), autonomy support is stipulated to be particularly important for children's social and emotional development. However, while the benefits of an autonomy-supportive environment have been observed at various ages, in various life domains (e.g. parent-child relationships, academic achievement, well-being, sports and work) and with various populations (see Moreau and Mageau 2013), research examining child outcomes of early autonomy-supportive environments has largely neglected socio-emotional development. Moreover, the outcomes of autonomy support are generally measured concomitantly and only once. Consequently, little is currently known concerning the enduring benefits of early autonomy-supportive environments and the mechanisms through which these might impact later functioning across time. Thus, the goal of this study was to examine the relationships between early (preschool) childhood autonomy-supportive parenting measured in different contexts and children's later socio-emotional outcomes measured at two developmental periods (early elementary school and preadolescence), in order to understand the lasting impact of autonomy support and the mechanism(s) by which this impact is carried forward over time, using a prospective, longitudinal design.

Early and Later Outcomes of Parental Autonomy Support

Although autonomy support can come from any number of sources (e.g. friends, family, teachers, employers), the original and arguably most important source developmentally comes from parents. Parental autonomy support is defined as the degree to which parents encourage independent problem solving, choice, and participation in decisions versus externally controlling children's thoughts and behaviors (Grolnick and Ryan 1989). Autonomy support should not be confused with permissiveness, lack of involvement or promotion of independence (Joussemet et al. 2008), as autonomy-supportive parents actively support their child's capacity to be self-initiating and autonomous (Ryan et al. 2006). The benefits of parental autonomy support can be observed throughout the lifespan

(see Moreau and Mageau, for a review) beginning in infancy. Maternal autonomy support during infancy has been demonstrated to be related to preschoolers' verbal ability (Matte-Gagné and Bernier 2011), executive functioning (Bernier et al. 2010) and security of attachment (Bernier et al. 2014; Whipple et al. 2010). In primary school age children, parental autonomy support has been shown to be positively related to teacher-rated competence, school grades and achievement, and negatively related to teacher-ratings of aggressive, disruptive and impulsive behaviors (Grolnick and Ryan 1989). In addition, maternal autonomy support when children were five-years old was positively related to social and academic adjustment, as well as reading achievement in the third grade (Joussemet et al. 2005). Autonomy-supportive parenting has also been shown to be positively associated with children's sense of competence, self-esteem and achievement in school (Grolnick et al. 1991).

Parental autonomy support has also been found to be important during adolescence, a critical period for autonomy development (Smetana 2011; Wray-Lake et al. 2010). Studies have demonstrated that parental autonomy support is negatively related to adolescent children's depressive symptoms over time (Van der Giessen et al. 2014), but positively related to adolescents' grade point average, social competence and scholastic competence indirectly through its impact on adolescents' self-determination (Soenens and Vansteenkiste 2005). Moreover, the benefits can be seen across cultures as parental autonomy support has been shown to be associated with adolescent students' academic self-motivation and well-being in both the United States and Russia (Chirkov and Ryan 2001), and with the endorsement of intrinsic life goals, which in turn impacts well-being in Chinese, Canadian and American adolescents (Lekes et al. 2010).

While the benefits of autonomy support are observed at various ages and in various cultures, the lasting impact of early parental autonomy support carried forward over time is unknown. Studies on the consequences of parental autonomy support have mainly examined concomitant relationships and only a few have used longitudinal designs (e.g., Grolnick et al. 2000; Joussemet et al. 2005; Luyckx et al. 2007; Bernier et al. 2010). Even in a typical study observing the outcomes of parenting behaviors on the child, parenting is measured at some point early in the life course and the consequences of these behaviors are assessed at another point later in time. If parenting is related to later outcomes, researchers conclude that it played an enduring role in child development, but if parenting is not related to later outcomes, they conclude that it did not play an enduring role. However, the link between early child care experiences and child outcomes may disappear over time (diminishing as the child becomes older),

while early child care experiences can potentially continue to influence later development via earlier development that carries its influence over time. Thus, the influence of parenting on subsequent child outcomes may persist indirectly through its impact on earlier outcomes. There is some empirical support for the mediating role of early child development in the relationship between parenting experiences and later child development during childhood and adolescence (Carlson et al. 2004; Jaffari-Bimmel et al. 2006; Landry et al. 2000), however no studies have examined this question in relation to parental autonomy support. It is possible that early autonomy-supportive parenting behaviors may be influential for children's later optimal development because they shape the earliest developmental patterns, which themselves become important constraining influences on later development. However, this tenet remains to be investigated.

Moreover, although much research has been devoted to uncovering childhood outcomes associated with parental autonomy support, the majority of studies have neglected socio-emotional outcomes and were conducted at a single time point using self-report measures (e.g. questionnaire or interview) of autonomy support. The problem with self-report measures of parenting behavior, in contrast to observational techniques, is that they introduce perceptual and retrospective biases (Henry et al. 1994). Consequently, in order to improve our understanding of the benefits of autonomy support, additional studies using observational techniques, thereby removing the perceptual and retrospective biases rampant throughout most of the literature to date, are required. In addition, more studies using prospective, longitudinal designs are essential in order to determine the lasting impact of early autonomy support on later child development. Accordingly, the objective of the present study was to examine the relationships between early (preschool) childhood autonomy-supportive parenting and children's later socio-emotional outcomes measured at two developmental periods (early elementary school and preadolescence), in order to increase our understanding of the lasting impact of autonomy support and the mechanism(s) by which this impact is carried forward over time.

Socio-emotional Development

Socio-emotional development is a heterogeneous construct referring to multiple aspects of both social and emotional growth (Thompson 1988). Although there is no clear consensus on how best to define or conceptualize socio-emotional development, it is considered critical for many aspects of children's functioning (Cole et al. 1996; Denham et al. 2003; Eisenberg et al. 2001). A broad range of child outcomes are measured and used in the literature to reflect

children's socio-emotional development. For instance, behavioral problems can be used to assess such development (Eisenberg et al. 2001). Behavioral problems can be broadly classified into two categories: internalizing problems, which encompass internal emotional issues such as social withdrawal, anxiety and depression; and externalizing problems, which encompass more overt social behavioral problems such as delinquency and aggression (Achenbach 1991; Eisenberg et al. 2001). Although behavioral problems in childhood and adolescence are problematic in their own right, research suggests that childhood problem behaviors, especially externalizing problems, are related to clinical diagnoses (using the DSM-IV) in adulthood (Campbell et al. 2000; Cole et al. 1996; Hofstra et al. 2002).

There is some evidence to support a link between autonomy support and externalizing problems. An early study by Grolnick and Ryan (1989) showed that parental autonomy support measured with an interview when children were in grades 3 to 6 was negatively related to teachers' ratings of aggressive, disruptive and impulsive behaviors (i.e., externalizing behaviors) in children. In addition, Joussemet et al. (2008) showed that mothers' controlling parenting during kindergarten measured with a self-report questionnaire, and defined as the opposite of autonomy-supportive parenting, resulted in the increased probability of children engaging in physical aggression throughout grade school, beyond the effects of child sex and temperament, parental separation and early motherhood. Moreover, there is some evidence to suggest that autonomy-supportive teachers are related to fewer externalizing problems with adolescent students both in and outside of the classroom (Vansteenkiste et al. 2012). The support for the relationship between autonomy support and internalizing behaviors is not as strong; however a few older studies have shown that children's perceptions of psychological control, the opposite of autonomy support, are related to internalizing problems, such as depressed mood (Barber et al. 1994; Pettit et al. 2001). Although these studies generally relied on self-report measures, and focused on autonomy support with school-aged children, together they suggest that there may be a link between autonomy support and childhood problem behaviors that needs to be further explored.

Another important indicator of socio-emotional development concerns children's social competence. Social competence can loosely be defined as one's ability to effectively interact with others (Denham et al. 2003; Rose-Krasnor 1997). For young children, one of the most important developmental tasks is to successfully develop peer relationships (Denham et al. 2003). It is extremely important that children develop strong social competence, as these skills are not only important for their peer

relationships, mental health and well-being across the lifespan (Denham et al. 2003; Gifford-Smith and Brownell 2003), but are also strongly related to children's school readiness and academic success (Bulotsky-Shearer and Fantuzzo 2011; Durlak et al. 2011; Han 2014). According to Ryan and Deci (2000), autonomy support is important for a child's successful social development. Indeed, Joussemet et al. (2005) found that maternal autonomy support measured with an interview when children were five-years-old was related to social adjustment in grade 3, while Soenens and Vansteenkiste (2005) found parental autonomy support to be indirectly related to adolescents' social competence through a direct impact on adolescents' self-determination. Given that only two studies in the autonomy support literature have thus far examined social outcomes, more research is needed in order to augment our understanding of the relationship between autonomy support, especially during the preschool period, and children's social outcomes later on.

Contextual Specificity of Autonomy Support and Its Impact

Another potential limitation in the literature is that parental autonomy support is generally measured in one context and assumed to have the same effect across contexts. However, the impact of parental autonomy support on child development might depend on the context in which parents use autonomy-supportive behaviors. For example, supporting the child's autonomy in a challenging context versus in a free-play situation may have a different meaning for the child. Autonomy support during a task that is more likely to elicit frustration or bids for attention might be particularly important for children's later socio-emotional development because this context represents a good opportunity for children to learn how to regulate their behaviors. In contrast, free-play sessions are generally less challenging for parents, eliciting low levels of negative affect and/or parent-child conflicts, potentially making the relationship between parental autonomy support in this context and children's later socio-emotional development seem less important. However, both contexts offer sources of knowledge and modeling to children and impart information from parent to child. Among the limited number of studies investigating the contextual specificity of the relationship between some parenting behaviors and children's outcomes, the results are mixed, with some studies showing that the effects of parenting differ as a function of the interaction task (Totsika and Sylva 2004; Volling et al. 2002) and at least one study showing no effect of context (Caron et al. 2006). More research is needed to better understand the contextual specificity of the impact of parenting on child development.

The present study examined autonomy-supportive parenting in two contexts: 1) a free-play context without any additional pressure on the mother, and 2) an interference context in which the mother was asked to remain with her child on the mat while completing a questionnaire and ensuring that her preschool aged child remained on the mat but continued to play alone with the toys provided. No explicit instructions were given to mothers on how they should explain to their child the sudden transition from a joint-play interaction to individual play, nor were they instructed on how to handle their child's subsequent bids for attention during the task. The interference context is a context that mirrors those everyday situations where parents are busy engaging in some activity and are therefore unable to play with their child. This context was expected to elicit some frustration from the child, and therefore potentially be particularly relevant to observing how parents can handle children's frustration and bids for attention in an autonomy-supportive manner.

The Present Study

Due to the lack of longitudinal research on the socio-emotional outcomes of parental autonomy support and the importance of socio-emotional development for children's optimal functioning, the present study's first objective was to examine relationships between early maternal autonomy support (during preschool) and children's later socio-emotional outcomes (measured by numerous indicators) during elementary school and again in preadolescence. It was expected that maternal autonomy support across contexts would be positively related to socio-emotional outcomes during both elementary school and preadolescence. The second objective was to clarify the role of context on the impact of parenting behaviors and their relationship with child development by examining the contextual specificity of the relationship between maternal autonomy support and children's later socio-emotional outcomes. It was anticipated that there would be stronger relationships between children's socio-emotional outcomes and maternal autonomy support during the interference context, where it might be more difficult for the child, and thus especially important, for a parent to be able to remain autonomy-supportive, compared to during the free-play context. The third objective was to examine whether the mediating role of early child development on the relationship between parenting behaviors and later child development could be extended to autonomy-supportive parenting behaviors by examining the mediating role of earlier children's socio-emotional outcomes (during elementary school) on the relationship between maternal autonomy support and children's later socio-emotional outcomes (during preadolescence). It was predicted that

elementary school aged children's socio-emotional outcomes would mediate the relationship between maternal autonomy support and children's socio-emotional outcomes during preadolescence.

Method

Participants

100 mothers and their pre-school aged children (57 girls) participated in this study. The participants constituted a subsample of an ongoing prospective, longitudinal, inter-generational study that began in 1976: The Concordia Longitudinal Risk Project. The original participants constituted a community-based sample of 1,770 children in grades 1, 4 and 7 selected from low-income neighbourhoods in a large Canadian metropolitan area. As the children grew up, some of them became parents and were recruited to be a part of different waves of testing with their children. For a more detailed description of the original participants see Schwartzman, Ledingham, and Serbin (1985) and Serbin et al. (1998). For a review of the studies from the Concordia Longitudinal Risk Project see Stack, Serbin, Matte-Gagné, Kingdon, Doiron, and Schwartzman (in press). The present study focuses on a sub-sample of 100 mothers who met the inclusion criteria of having a child between the ages of 1 and 6 years living with them at the time of recruitment (between 1995 and 1998). Data were collected during three assessment waves when children were in the preschool years (Time 1; $M = 3.55$, $SD = 1.58$, Range = 1.09–6.12), elementary school (Time 2; $M = 7.72$, $SD = 1.06$, Range = 6.15–11.17) and preadolescence (Time 3; $M = 10.99$, $SD = 0.99$, Range = 9.49–13.29). Between Times 1 and 2, 22 subjects were lost due to attrition. Of the 78 remaining participants at Time 2, sixty-six agreed to participate in the follow-up assessment (Time 3). Only the 66 families (41 girls) who participated in all three assessment time points were included in the current study. The remaining participants did not differ from the subjects that were lost due to attrition on any socio-demographic or Time 1 measures, and the final sample did not differ from the original one ($n = 100$) on any measures. The mothers' average age was 30.44 ($SD = 2.57$). They had an average of 11.59 years ($SD = 2.35$) of formal education and an average annual family income of \$38,215.55 CDN ($SD = 24143.25$).

Procedure

At Time 1, dyads were visited at home by research staff trained in the administration of the testing protocol. After describing the protocol, obtaining informed consent, and

ensuring that mothers were aware that they could discontinue their involvement in the study at any time, mothers and children were asked to participate in two videotaped tasks: a five-minute free-play and a three-minute interference task. Mothers were first instructed to play for five-minutes with their child as they normally would, on the mat with the standardized toys provided (free-play). A standardized arrangement of toys (age appropriate books, Lego blocks, a doll, a brush, a comb, a tea set and a toy telephone) was used. A timer signalled to indicate when mothers were to stop playing with their child and to complete a questionnaire (already provided before the beginning of the free-play) while their child continued to play on the mat with the toys provided. Should the mother have completed the questionnaire prior to the end of the task, they were instructed to look through the magazine that was previously provided until the task was completed. The tasks were administered in this sequence in order to observe how mothers handled the transition from a joint enjoyable interaction to individual play, in addition to how mothers handled their child's subsequent bids for attention (i.e. does she use autonomy-supportive strategies to motivate her child to play on their own and to handle the child's interruptions and requests for attention?). No explicit instructions were provided for how mothers should explain the transition to their child, or how mothers should handle their child's bids for attention. The open-ended nature of the interference context parallels every-day situations during which caregivers are busy engaging in various tasks and children are expected to continue to play by themselves. These interactions were videotaped and later coded for maternal autonomy-supportive behaviors (see below).

At Time 2, mothers and teachers were asked to complete questionnaires including a series of parent and teacher-reported measures of children's socio-emotional development (see below). Time 3 consisted of mothers and children completing questionnaires measuring different spheres of children's socio-emotional development (see below).

Measures

Maternal Autonomy Support During the Preschool Period

Using an adaptation of Whipple, Bernier and Mageau's (2011) rating system, maternal behaviors were rated in both the free-play and interference contexts. This coding scheme has been used successfully in previous studies with toddlers and preschoolers from 1- to 6-years-old and was found to be associated with theoretically related outcomes such as mothers' socioeconomic status and psychosocial risk (Harvey et al., under revision), maternal attachment state of mind and sensitivity, as well as children's security of

attachment (Bernier et al. 2014; Whipple et al. 2011), verbal ability (Matte-Gagné and Bernier 2011), and executive functioning (Bernier et al. 2010). In the free-play, maternal autonomy-supportive and controlling behaviors were both rated on five Likert subscales ranging from 1 (non-representative) to 5 (very representative): scaffolding, verbalizations, flexibility and involvement, following the child’s pace and providing choices, and motivation and perspective taking (see Table 1). In order to obtain a high score on autonomy support, the mother needed to be actively autonomy-supportive (rather than being non-involved) and needed to adjust her behaviors according to the child’s age, needs, abilities, rhythm, and emotional state. Therefore, the mothers’ behaviors are not considered in isolation, and are rather interpreted and rated in line with the child’s behaviors, reactions, feelings, and needs at their specific age.

Given the inter-correlations between the subscales (ranging from 0.46 to 0.90), they were averaged into a total autonomy support score and a total controlling behaviors score. According to SDT, autonomy support refers to the use of autonomy-supportive strategies while minimizing the use of controlling behaviors (Joussemet et al. 2008).

The two types of behaviors are seen as opposite ends of a spectrum, indicating that it is possible for a parent to use both types of behaviors with their child in different situations. This is consistent with the moderate to high correlations found between autonomy support and controlling behaviors on each subscale in the present study (ranging from -0.30 to -0.87 with an average correlation of -0.62). Thus, in order to better understand where on the spectrum of behavior a mother falls and avoid a multicollinearity problem, the total controlling behaviors score was reverse coded and averaged with the total autonomy support score to create a composite score of autonomy support ($\alpha = 0.89$). This score represented the degree to which the mother engaged in autonomy supportive strategies (e.g. intervened according to the child’s needs, encouraged her child, provided opportunities to make choices, and took her child’s perspective), while also minimizing the use of controlling techniques (e.g. giving orders, criticizing the child and making all the choices).

Due to the nature of the interference context (i.e. non-interactive, not engaging in dyadic play), the autonomy support and control scales were measured with the only two subscales which could be applied within the

Table 1 Brief operational definitions of extreme scores on the Coding System for Autonomy Support and their associated coefficients of inter-rater reliability

Scales	Autonomy Support Scale	ICC FP/INT	Control Scale	ICC FP/INT
Scaffolding	Mother manages the play <i>to allow the child’s autonomy to unfold</i> : she provides help and support when needed and she adapts the play according to the child’s needs and abilities	0.88/NA	Mother <i>interferes with the child play</i> in order to control it: she intervenes before she is asked or needed, and her intervention is excessive given her child’s needs and abilities	0.94/NA
Verbalization	Mother encourages her child in play, gives useful hints, praises her child and uses a positive tone of voice	0.87/NA	Mother gives unnecessary instructions or hints, uses a stern tone of voice and criticizes her child	0.93/NA
Flexibility and involvement	Mother demonstrates flexibility by following her child’s play and <i>changing as the play requires</i> , and mother is involved in the interaction by speaking to the child, playing with him/her when she is wanted or paying attention to him/her even when she is not wanted in the play	0.91/0.96	Mother is rigid in her efforts to keep her child on task and she does not tolerate any departure from the current play, and mother tries to control the play, inserting herself into the play without being needed or invited	0.92/0.92
Respecting child’s pace and providing choices	Mother respects her child’s pace, promotes the child having an active role and provides the child with opportunities to make choices	0.87/NA	Mother imposes her own pace on her child resulting in the child acting as an observer; the mother interferes frequently and provides no opportunities to make choices	0.89/NA
Motivational strategies and perspective-taking	Mother intervenes at an appropriate moment in using motivational strategies to encourage her child to continue playing (e.g. <i>gives a rational, suggesting an enjoyable game</i>) and takes her child’s perspective by acknowledging his/her feelings	0.99/0.97	Mother uses controlling strategies to force the child to cooperate or to comply (e.g. <i>punishing the child, providing an authoritarian rational</i>). The mother makes no attempts to take her child’s perspective or she is frustrated by the child’s bids for attention	0.97/0.95

FP represents the free-play context; INT represents the interference context; NA indicates no ICC was available due to the scale not being used within the interference context

interference context: flexibility and involvement, and motivation and perspective taking (see Table 1). As in the free-play context, the total controlling behaviors score was reverse coded and averaged with the total autonomy support score to create a composite score of autonomy support ($\alpha = 0.89$). A high score of autonomy support required that the mother was flexible in her attempts to keep the child on the mat, intervened according to the child's needs, provided the child with a rationale for why the child needed to continue to play alone and tried to motivate the child to continue to play, while minimizing the use of controlling strategies in order to keep the child playing on the mat, such as giving orders, using threats of punishment or physically restraining the child. The correlation between the global score of autonomy support in the free-play and the interference context was 0.46 ($p < 0.01$), suggesting moderate stability across contexts.

Thirty percent of the sample was randomly selected and coded by a second coder. Inter-rater reliability was calculated for each subscale (see the ICC column in Table 1) and for the total autonomy support score (ICC = 0.93; 0.97, for the free-play and interference contexts respectively) and the total controlling behaviors score (ICC = 0.95; 0.95, respectively).

Children's Socio-emotional Outcomes During Elementary School and Preadolescence

In this study, socio-emotional development was defined as a broad adaptive construct reflecting multiple components of social and emotional growth (i.e., internalizing and externalizing problems, and social competence), as reported by mothers, children or teachers, at two time points: elementary school (Time 2) and preadolescence (Time 3).

Internalizing and Externalizing Problems At Times 2 and 3, mothers completed the *Child Behaviour Checklist* (CBCL; Achenbach 1991). The CBCL, a widely used and well-established instrument, is comprised of 118 items that are scored in terms of how unlikely (0) to likely (2) it is for a child to exhibit certain behavior problems. The CBCL includes items that can be divided into two categories: internalizing (e.g. “unhappy, sad or depressed”) and externalizing problems (e.g. “physically attacks people”). For the purposes of our study both internalizing ($\alpha = 0.93$ and 0.86, for Times 2 and 3 respectively) and externalizing ($\alpha = 0.92$ and 0.87, for Times 2 and 3 respectively) scores were used. The CBCL has previously been found to have strong convergent validity and to be a reliable measure of child behavior (Nakamura et al. 2009).

At Time 3, preadolescents also completed the *Revised Children's Manifest Anxiety Scale* (RCMAS; Reynolds and Richmond 1978) and the *Children's Depression Inventory*

(CDI; Kovacs 1992). The RCMAS is a 37-item scale that assesses the manifestations of worry, fear, and social concerns. This measure is a widely used instrument, and has been shown to be reliable (Reynolds and Paget 1983). The CDI is a 27-item scale that assesses the frequency and severity of thoughts and behaviors pertaining to sadness and depression. The CDI is the most commonly used measure of depression in children, with strong evidence for reliability and validity (Saylor et al. 1984). The Total scores of both the RCMAS ($\alpha = 0.80$) and the CDI ($\alpha = 0.81$) were employed in the analyses.

Social Competence At Time 2, the *Teacher Social Competence Scale* (TSC; Conduct Problems Prevention Research Group 1995) was used to measure social competence. The TSC is a teacher-report measure including 25 items that assess the child's social competence in academic behavior, prosocial skills, and emotion regulation. Teachers were asked to rate on a scale from “not at all” (0) to “very well” (4), how much each item described the child. Example items include “cooperates with peers without prompting”, “performs academically at grade level” and “expresses needs and feelings appropriately”. The total score on the TSC was calculated as the mean of all items ($\alpha = 0.95$). The TSC has been previously shown to be a very reliable measure, with internal consistency values ranging from 0.88 to 0.93 (Gifford-Smith 2000).

At Time 3, the *Matson Evaluation of Social Skills with Youngsters* (MESSY; Matson 1990) was used to measure social competence. The MESSY consists of 62 items rated by the child and designed to assess the frequency of school-age children's appropriate and inappropriate social behaviors. The MESSY can be used with a broad range of children, aged 4 to 18. Examples of items include “I am bossy”, “I feel good if I help someone”, and “I like to be alone”. The total score was used in the analyses, with higher scores indicating poorer overall social competence ($\alpha = 0.81$). This scale has satisfactory validity, test-retest and internal reliability (Bell-Dolan and Allan 1998; Matson et al. 2010).

Results

Preliminary Analyses

Table 2 presents descriptive statistics for all variables in this study. To reduce the number of analyses, and maximize power, two factor analyses were conducted in order to create scores reflecting children's socio-emotional development. First, a factor analysis using Principal Axis Factoring (PAF) was conducted on the socio-emotional measures at Time 2: CBCL internalizing and externalizing

Table 2 Descriptive statistics for all variables

	<i>M</i>	(<i>SD</i>)	Range
Maternal autonomy support during free-play	3.41	(1.14)	1.44–4.88
Maternal autonomy support during the interference	3.19	(0.91)	1–4.88
Child's socio-emotional outcomes at elementary school			
Internalizing problems (mother)	53.82	(10.46)	33–88
Externalizing problems (mother)	53.81	(9.37)	37–81
Social skills (teacher)	61.40	(19.14)	25–98
Child's socio-emotional outcomes during preadolescence			
Internalizing problems (mother)	52.56	(10.10)	30–72
Externalizing problems (mother)	53.81	(11.14)	26–78
Social skills (child)	16.02	(4.01)	9–24
Depressive symptoms (child)	2.64	(2.16)	0–8
Anxiety (child)	11.04	(6.61)	1–28

scores (mother) and the TSC- total social competence score (teacher). One factor was retained (*Eigen value* = 1.54), which represented 51.45 % of the total variance. Oblimin rotation revealed factor loadings for internalizing (0.81), externalizing (0.86) and social competence (−0.40). This factor solution was used to create a composite variable that was labeled children's socio-emotional problems during elementary school, for which a high score represents high levels of internalizing and externalizing problems, and a low level of social competence.

Second, the socio-emotional indicators at Time 3 were entered into a factor analysis, using Principal Axis Factoring (PAF). This analysis yielded a single factor solution (*Eigenvalue* = 2.35), which represented 46.94 % of the total variance. Oblimin rotation revealed factor loadings for internalizing (0.70), externalizing (0.79), RCMAS (0.75), CDI (0.71), and social problems (measured with the MESSY) (0.41). This factor was labelled children's socio-emotional problems during preadolescence. A high score on this factor represents high levels of internalizing and externalizing problems, depressive symptoms, anxiety and social problems.

Next, we examined the extent to which socio-demographic variables (child gender and age at each time point, and maternal education) were related to maternal autonomy support in both contexts and children's socio-emotional problems during elementary school (Time 2), and preadolescence (Time 3; see Table 3). Child gender ($r = -0.32$, $p < 0.01$) and age ($r = 0.34$, $p < 0.01$) were related to children's socio-emotional problems during elementary school. Girls and younger children were less likely to have socio-emotional problems than boys and older children. Maternal education (i.e., years of schooling) was significantly positively related to maternal autonomy support in the free-play ($r = 0.26$, $p < 0.01$), and the interference context ($r = 0.20$, $p < 0.05$), and marginally related to children's socio-emotional problems during elementary

school ($r = -0.21$, $p = 0.07$). More educated mothers were more autonomy-supportive during both the free-play and interference contexts and had children that were less likely to have socio-emotional problems (trend-effect). Thus, maternal education, child gender and child age were controlled for in subsequent analyses.

Main Analyses

Partial correlations among maternal autonomy support during the free-play and interference contexts and children's socio-emotional problems at elementary school and preadolescence, when accounting for maternal education and child sex and age, were first performed. Maternal autonomy support during the interference context was found to be negatively related to both children's socio-emotional problems during elementary school ($r = -0.47$, $p < 0.01$) and preadolescence ($r = -0.35$, $p < 0.05$). Conversely, maternal autonomy support during the free-play was not related to children's later socio-emotional problems. Supporting the robustness of the results, this pattern of results holds even if autonomy support was calculated with the exact same subscales in both contexts (recall that only two subscales of the coding scheme were used in the interference context because of the specific nature of the task).

Next, we employed a resampling method known as bias-corrected bootstrapping for testing the indirect effect of maternal autonomy support during the interference context on children's later socio-emotional problems during preadolescence through earlier (elementary school) children's socio-emotional problems (see Table 4). Resampling handles small sample sizes better than alternative tests and is thus well suited for our sample size (Dearing and Hamilton 2006; MacKinnon 2008; Preacher and Hayes 2008). Bias-corrected bootstrapping is a nonparametric resampling approach to effect-size estimation and hypothesis testing

Table 3 Correlations between socio-demographics and the main variables

	Child gender (being a girl)	Child age at Time 1	Child age at Time 2	Child age at Time 3	Maternal education
Autonomy support in the free-play	0.08	0.16	0.08	0.02	0.26**
Autonomy support in the interference	-0.05	0.17	0.09	0.13	0.20*
Child's socio-emotional problems at elementary school	-0.32**	0.23*	0.34**	0.41***	-0.21 [†]
Child's socio-emotional problems during preadolescence	0.007	0.04	0.08	0.05	-0.12

* $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$

Table 4 The indirect link between maternal autonomy support during preschool years and preadolescents' socio-emotional problems through children's socio-emotional problems during elementary school

Predictors	Dependent variables							
	Socio-emotional problems during elementary school			Socio-emotional problems during preadolescence				
	Coeff.	SE	p	Coeff.	SE	p		
Maternal autonomy support during the interference	a	-0.4732	0.1540	0.0042	c'	-0.2087	0.2021	0.3094
Socio-emotional problems during elementary school				b	0.4273	0.1991	0.0393	
		$R^2 = 0.3562$			$R^2 = 0.2823$			
		$F(6, 59) = 3.7629,$			$F(7, 58) = 2.1632,$			
		$p = 0.0081$			$p = 0.0521$			

Child sex, age at Time 1, Time 2, and Time 3, and maternal education were controlled for, but did not remain significantly related to child's socio-emotional problems at elementary school or preadolescence when maternal autonomy support was accounted for. Therefore, they were not included in the table

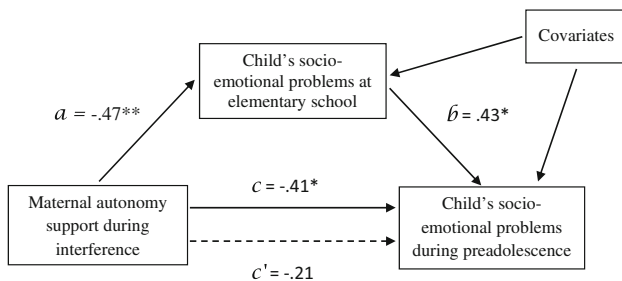


Fig. 1 Early child's socio-emotional problems as a mediator of the relationship between maternal autonomy support during the interference task and child's later socio-emotional problems (controlling for child sex, child age, and maternal education). Note * $p < 0.05$; ** $p < 0.01$

that has become the more widely recommended method for inference about the indirect effect in mediation analysis (Hayes 2013). Bootstrapping generates an empirical approximation of the sampling distribution of a statistic by repeated random resampling from the available data, and uses this distribution to calculate p-values and construct confidence intervals (CI; see Hayes 2013, for details). The PROCESS macro was used to run these analyses (10,000 bootstraps; Hayes 2013).

The bias-corrected bootstrapping method indicated that the indirect effect of maternal autonomy support during the

interference context on children's later socio-emotional problems (preadolescence) through earlier socio-emotional problems (elementary school) was -0.20 ($SE = 0.13$) and was significantly different from zero (95 % CI -0.55 to -0.01). The remaining direct link between maternal autonomy support and children's later socio-emotional problems, after accounting for the indirect effect through earlier children's socio-emotional problems, was non-significant ($\beta = -0.21$, $p = 0.31$). Hence, early children's socio-emotional problems during elementary school mediated the link between maternal autonomy support during the preschool years and children's later socio-emotional problems at preadolescence, above and beyond child gender, child age, and maternal education. The mediational model is presented in Fig. 1. Therefore, the bootstrapping results support our hypothesis for an indirect effect of maternal autonomy support on children's later socio-emotional development through earlier children's socio-emotional development.

Discussion

Socio-emotional development is a foremost developmental task related to several aspects of children's functioning at various ages. An understanding of the factors and processes that characterize socio-emotional development is, therefore,

imperative in order to foster children's optimal development. The results of the current study elucidate the roles of early maternal autonomy support in children's later socio-emotional development across time and contexts.

First, our results revealed that parental autonomy support during preschool was, as anticipated, related to socio-emotional development during elementary school and preadolescence. This finding adds to the literature on autonomy support by showing that autonomy-supportive strategies are related to positive childhood outcomes within the domain of socio-emotional development. This reinforces the notion that autonomy support is universally beneficial for child development across domains (e.g. cognitive development, academic success and now socio-emotional development). Moreover, given that the present study used observational measures and was conducted at three time points covering preschool through preadolescence, it only strengthens the assertion that receiving autonomy support from an early age is beneficial for and has a lasting impact on child development, particularly with regard to children's social and emotional development. While children's socio-emotional outcomes were only examined during childhood and preadolescence, parental autonomy support is also demonstrated to be important in other developmental periods such as during adolescence (Moreau and Mageau 2013). Adolescence has been identified as a critical period of autonomy development (Smetana 2011; Wray-Lake et al. 2010) and previous studies have shown that parental autonomy support is related to adolescents' depressive symptoms (Van der Giesen et al. 2014), social competence (Soenens and Vanssteenkiste 2005) and well-being (Chirkov and Ryan 2001; Lekes et al. 2010). Thus, the results will need to be replicated during adolescence in order to confirm the lasting impact of autonomy support during this critical period of autonomy development.

Second, the present findings suggest that children's socio-emotional development is differentially impacted by parental autonomy support depending on the context in which parental autonomy-supportive behaviors are measured. The use of less autonomy-supportive strategies in favour of controlling strategies during an interference task during the preschool period predicted more internalizing and externalizing problems and lower social competence during the elementary school years and preadolescence. Conversely, maternal autonomy support during the free-play was not found to be associated with children's later socio-emotional outcomes. Based on these results, contexts where the parent needs to handle children's bids for attention or frustration seem to be more salient than less demanding contexts for measuring parental autonomy support when examining its connections with children's socio-emotional outcomes. These findings have important

implications for fostering effective parenting behaviors and children's socio-emotional development. It is possible that engaging in controlling strategies (e.g. ordering children to behave in a certain way and/or resorting to physical interventions) in order to control a child, especially when in challenging situations where the child may not be motivated to behave in a specific way, leads a child to feel a need to overtly express their negative feelings, eventually culminating in externalizing and social problems later on. Conversely, perhaps engaging in autonomy supportive strategies (e.g. providing a rationale, taking a child's perspective and trying to motivate them) when they have to engage in non-autonomous behaviors, such as playing alone when they want to play with their mother, provides preschoolers with important tools to learn how to regulate their emotions and behaviors and appropriately behave in similar social situations (i.e. whenever the child does not get exactly what they want). Importantly, parents are likely to face the kind of challenge presented by the interference context on a daily basis, as this task was designed to parallel everyday situations in which a parent is busy engaging in various activities (e.g. cooking, cleaning or working) but their child is requesting their attention. Thus, how the parent handles their preschool aged child's interruptions and requests for attention on a daily basis may have consequences for the child's later socio-emotional development during pre-adolescence, and perhaps later on as parental autonomy support was demonstrated to be important across the life span (Moreau and Mageau 2013). Replicating the results across other developmental periods, especially adolescence where the need for autonomy is particularly strong, is warranted in order to more deeply understand the contextual specificity of the relationship between parental autonomy support and children's later development across time.

In contrast, free-play sessions are generally less challenging for parents and children, eliciting low levels of negative affect from the child and possibly making the relationship between parental autonomy support in that context and children's later socio-emotional development relatively less important. However, further research is needed to understand the factors and processes underlying the contextual specificity of the relationship between maternal autonomy support and children's later socio-emotional outcomes. Future studies should extend their examination to other aspects of children's functioning such as cognitive development and academic achievement that are well-known outcomes of parental autonomy support, and to other measurement tasks that can also be used to measure autonomy support, such as teaching tasks, in order to further examine the contextual specificity of the present findings.

Lastly, the results are consistent with previous studies showing the indirect effect of parenting behaviors on later

child outcomes through earlier child development (Carlson et al. 2004; Jaffari-Bimmel et al. 2006; Landry et al. 2000). Our results also support the mediating role of early children's socio-emotional outcomes in the relationship between parental autonomy support during the preschool period and later children's socio-emotional outcomes. This is consistent with results showing that early parenting is indirectly associated with adolescents' socio-emotional development through its direct impact on children's earlier social development and emotional health (Carlson et al. 2004; Jaffari-Bimmel et al. 2006). Given the established importance of autonomy support on adolescents' outcomes and the research showing the indirect relationship between early parenting and adolescents' socio-emotional outcomes, there is potential for the present finding showing that autonomy-supportive parenting directly impacts elementary school children's and indirectly impacts preadolescents' socio-emotional development to be extended to the adolescent period as well. As such, it is possible that not only does the impact of autonomy support carry forward in time to impact socio-emotional development during preadolescence, but it may similarly impact socio-emotional development during adolescence. Further studies examining the mediating roles of early child development in the relationship between parental autonomy support and children's later development across longer periods (e.g. infancy to adolescence) are necessary.

Despite numerous strengths, there were a number of limitations in the present study that require consideration. The modest sample size represents a limit to statistical power and generalizability. Furthermore, only children's socio-emotional development was examined and only two measurement contexts of maternal autonomy support were compared. The contextual specificity of the relationship between maternal autonomy support and children's later development, and the mechanism(s) by which the effect of autonomy support is carried forward over time might differ according to the measurement contexts used or the developmental domain examined. More research is warranted to replicate these results and to further understand the contextual specificity of the interrelationships among early parenting behaviors, child development, and the mechanisms through which the effect of early parenting continues over time. Further studies examining other developmental outcomes (e.g. cognitive development and academic achievement) and using different measurement contexts (e.g. teaching task) are necessary to further the understanding of the mechanisms underlying the link between early parental autonomy support and later child development.

In addition, the results of the present study highlight that one of the mechanisms by which the effect of early childhood parental autonomy support is carried forward over time is through its impact on earlier child development. Other

potential mediators should be considered in further research. For example, it is possible that other aspects of children's early development act as mediators in the relationship between maternal autonomy support and children's later socio-emotional outcomes. Results from a previous study showed that a child's language development was a mediator in the relationship between maternal autonomy support during infancy and children's later executive functioning (Matte-Gagné and Bernier 2011). As children's verbal ability has been found to be related to many indicators of children's later socio-emotional development (Beck et al. 2012; Eisenberg et al. 2005; Snowling et al. 2006), it may be another mechanism that carries forward the effect of parental autonomy support on children's later socio-emotional development. However, it and other potential mediating variables remain to be investigated.

Furthermore, this study focused on the effect of parents on the development of their children, however children also influence the parenting they receive (Belsky 1984; Sameroff and MacKenzie 2003). A growing body of empirical evidence has supported these bidirectional, child–parent dynamics (e.g., Burke et al. 2008; Lansford et al. 2011; Newton et al. 2014; Wang et al. 2011). Thus, the possibility cannot be ruled out that depending on the level of the child's socio-emotional development, the mother adjusts her level of autonomy support. Children with more socio-emotional problems may especially bring out more controlling strategies from their parents. Further research is required in order to examine the bidirectional relationship between maternal autonomy support and children's socio-emotional development.

Finally, although it is increasingly well documented that parenting and autonomy support can change across time (Matte-Gagné et al. 2013) and that those changes might impact the child's development (Matte-Gagné et al., in press), maternal autonomy support was measured only once in our study. Thus, studies examining stability and change in maternal autonomy support and its impact on children's socio-emotional development are needed. Finally, extension and replication in different types of populations, cultures, and in higher-SES samples would be theoretically and empirically rich, as the benefits of autonomy support have been demonstrated to some extent in different cultures and samples (Moreau and Mageau 2013).

Conclusions

Results from the present longitudinal study revealed the importance of maternal autonomy support during preschool for children's later socio-emotional development, especially during challenging contexts, and highlight one of the

mechanisms through which the effect of early childhood parental autonomy support on children's later socio-emotional development is carried forward over time. The results from this study support the value of examining parenting behavior in different contexts when predicting the associated outcomes in childhood but also underscore the benefit of using more than one assessment of children's outcomes across time when uncovering the long-term effects of parenting during early childhood and the underlying mechanisms. By demonstrating that maternal autonomy support is linked with later socio-emotional outcomes, the findings add to the literature on the long-term benefits of parental autonomy support and also add to our understanding of the factors and processes that lead to optimal socio-emotional development. Together, the findings underscore the significance of the early stages of the socialization process in laying the groundwork for future development and the benefits of nurturing early parental autonomy support, especially in challenging contexts, for fostering socio-emotional development across time.

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Author contributions C.M.G. conceptualized the study as a part of her postdoctoral work, conducted the literature review, coded autonomy support in 30 % of the sample for reliability testing, performed all statistical analyses, wrote and revised the manuscript; B.H. helped conceptualize the study as a part of her Master's work, coded autonomy support in the entire sample, and participated in the writing, editing and revising of the manuscript; D.M.S. participated in the conceptualization of the present study, helped with the writing in both the original and revised versions of the paper in her role as supervisor, supervised the data collection and conceptualized, designed and implemented the larger study of which the present study is only a part (the Concordia Longitudinal Risk Project); L.A.S. supervised the data collection and conceptualized, designed and implemented the larger study of which the present study is only a part. All authors read and approved the final manuscript.

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