Emotional Expressiveness and Parenting Behaviors in Mothers with Histories of Aggression and Social Withdrawal: An Intergenerational Study

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ABSTRACT

Emotional Expressiveness and Parenting Behaviors in Mothers with Histories of Aggression and Social Withdrawal: An Intergenerational Study

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The development of socio-emotional competence, autonomy, and other positive developmental outcomes in children is strongly related to early parent-child interactions and the quality of parenting behaviors. The present study was designed to investigate maternal emotional expressiveness and parenting behaviors in a high-risk population where mothers had childhood histories of aggression and/or social withdrawal. Two main objectives were addressed: (1) to examine the predictive relationship between maternal childhood levels of aggression and social withdrawal, child age, maternal education and maternal emotional expressiveness, and (2) to investigate the predictive relationship among maternal childhood levels of aggression and social withdrawal, child age and maternal education and parenting practices.

Participants were recruited from the Concordia Longitudinal Risk Project, which began in 1977 by classifying children from disadvantaged neighbourhoods along the dimensions of aggression and withdrawal. One hundred and seven mothers who were original participants of the Concordia Study were videotaped in their homes while they interacted with their children (aged 1 to 6 years) during a puzzle task. Verbal and non-verbal expressions of maternal emotions (i.e., positive and negative) and parenting

behaviors (i.e., teaching, attitude towards error, and limit setting) were coded from the videorecords.

Results supported the hypothesis that maternal childhood risk status influences maternal emotional expressiveness and parenting behaviors. Mothers with histories of social withdrawal were less likely to express positive emotions and more likely to use negative teaching strategies while interacting with their children, whereas mothers with histories of aggression were more likely to use negative limit setting and critical attitude towards error. Child age and maternal education also impacted maternal emotional expressiveness and parenting behaviours. Less educated mothers and mothers of older children were more likely to express negative emotions in an indirect way. The findings are relevant to understanding the mechanisms by which risk and resilience are being transferred, and the role of parents in the origins of social competence. Ultimately, the findings contribute to the development of early preventive interventions designed to advance positive parental behaviors which promote resilience and prevent the intergenerational transfer of risk.

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The study of parenting behaviors is crucial to understanding the foundation of children's socio-emotional development. Children begin to build their repertoire of social skills in infancy, when most socializing occurs in the context of the mother-child relationship (Stack & Poulin-Dubois, 1998).The building blocks for social competence, such as self-confidence, cognitive flexibility and problem solving abilities, are embedded in early parent-child interactions (Denham et al., 2000; Denham & Grout, 1992; Landy, 2002). In addition, maladaptive behaviors and developmental problems in children have been shown to be related to the quality of parenting behaviors (Egeland, Pianta, & O'Brien 1993; McFadyen-Ketchum, Bates, Dodge, & Petit, 1996; Serbin et al., 2004).

Parental child-rearing practices tend to be stable over time and include various behaviors which define a particular parenting style. Parenting styles have been generally defined as a broad pattern of parental attitudes, practices, or activities which characterize parents' attempts to control and socialize their children (Baumrind, 1991; Darling & Steinberg, 1993). Two important dimensions of parenting have been emphasized: parental responsiveness (warmth or supportiveness) and parental demandingness (behavioral control). Parental childrearing practices have been classified according to the amount of warmth and behavioral control that parents exert over their children on a regular basis. Numerous studies in the area of parenting have been focused on identifying parenting styles in specific populations in order to predict children's developmental and behavioral outcomes (e.g., Baumrind, 1991; Maccoby & Martin, 1983; Steinberg, Darling, & Fletcher, 1995; Weiss & Schwarz, 1996).

Parents' personalities are believed to impact children's development through their influence on parenting (Belsky, 1984). Accordingly, parenting might be viewed as a

process that mediates the relation between parental dispositions and children's behaviours. Parents' expression of emotions is an important mediator of these relationships and a central element in parenting. Even in the earliest parent-child interactions, affect is present and might have a direct effect on children's social behavior (Boyum & Parke, 1995); it might also play an indirect role by influencing the way parents behave while interacting with their children as a result of emotional trends or states (Dix, 1991).

Parental emotional expressiveness has been defined as the pattern or style of exhibiting verbal and nonverbal expressions of emotions by parents and it is considered to be an important part of their emotional communication with children (Zhou et al., 2002). The intensity, frequency and ability to manage their emotions have been used as indicators to characterize parental or familial emotional expressiveness and its influence on children's socio-emotional development. Although little is known about the mediators between parental expressiveness (i.e., positive and negative) and children's social development, parents' emotional expressiveness is believed to impact children's development through different pathways: by observing their parents' ways of expressing emotions, children learn how and when to express emotion; by their expression of particular emotions, mothers coach their children about prototypical emotional expressions and the contexts in which they are expressed; and finally, mothers' expression of their emotions in the context of mother-child interactions has been identified as the early foundation for young children's emotional competence with peers (Denham, Renwick-DeBardi, & Hewes, 1994).

Parents' emotions and behaviors have predictive value for the next generation's development and they can also be predicted from parents' developmental histories.

Parenting styles may be considered the crystallization of particular childhood experiences and personality development. As such, they may be based in part in earlier development and experience (Belsky, 1984; Caspi & Elder, 1988; Serbin et al., 1998). Parenting is a central element in the process of socialization by serving as a vehicle for the transfer of social values, emotions, attitudes and behavioral models from one generation to the next. In addition, parental variables have been demonstrated to be critical in the prediction of children's subsequent outcomes in longitudinal and intergenerational studies (e.g., Serbin et al., 2004, Shaw, Keenan, & Vondra, 1994; Zhou et al., 2002).

The present study was designed to examine emotional expressiveness and parenting behaviors in mothers with childhood histories of aggression and/or social withdrawal. When parents have had childhood histories of impoverished social skills and/or behavior problems such as aggression and/or withdrawal, the assessment of parenting behaviours and emotional expressiveness becomes crucial to understanding how early childhood experiences in one's family-of-origin are formative in the development of one's own parenting style (Serbin et al., 2004). Psychosocial risk and maladaptive behaviors in parents' childhoods might result in poor parenting skills and negative behavioral styles that are then reproduced in everyday parent-child interactions. Consequently, children who are exposed to poor parenting are more vulnerable to developing socio-emotional complications and behavioral problems in early childhood and later in life (e.g., Brier, 1995; Cairns, Cairns, Xie, Leung, & Hearne 1998; Serbin, Stack & Schwartzman, 2000).

Parenting

Parenting is primarily a socially defined role and parents have common goals to transmit to their children. The ultimate goal of parents is to socialize their children by transferring social and cultural values, attitudes and goals. Parental child-rearing practices are believed to be determined by parents' psychological resources, the characteristics of the child, and contextual sources of stress and support (Belsky, 1984). Therefore, parents develop particular rearing practices that are a result of their own personality development in a continuous interaction with current personal and contextual factors (Brook, Whiteman, Balka, & Cohen, 1995; Cumberland-Li, Eisenberg, Champion, Gershoff, & Fabes, 2003).

Darling and Steinberg (1993) defined parenting as a contextual variable that moderates the relationship between specific parenting practices and specific child outcomes. They disentangled three different aspects of parenting in order to better understand parental influences on child behavior: a) the goals toward which socialization is directed, b) the practices used by parents to help children reach those goals, and c) the parenting style or emotional climate of socialization. Although the term *parenting style* has been indiscriminately used in the literature, the idea that parenting style is the process through which parental variables (i.e., emotional expression, attitudes, values) shape the parent-child relationship, seems to be an acceptable working definition (Dix, 1991; Darling & Steinberg, 1993). Parenting is believed to have an indirect and moderating effect on child development through parental practices by transforming the nature of their interactions with children, as well as by influencing the child's attitude towards parenting.

Taken together, parenting is generally conceptualized as a complex activity or

interaction where both emotional and behavioral aspects can be identified. Particular parenting behaviors or child rearing practices (e.g., punishment, limit setting) are usually accompanied by emotional expressions and create an emotional climate in which these behaviors are expressed. Although specific parenting practices, attitudes or behaviors can be good predictors of child development, examining isolated behaviors, without taking into account more of the elements that influence parenting, as well as the tone in which they are conveyed to the child, might be misleading (Darling & Steinberg, 1993). Integrative models which incorporate parental values, behaviors, emotions and parents' beliefs about their roles and the nature of their children, seem to be more adequate in predicting children's outcomes (Baumrind, 1971; 1991).

Researchers from different theoretical perspectives have stressed different components of parenting. For example, the psychodynamic model has focused on the emotional nature of the parent-child relationship and parental attributes and their influence on children's psychosocial development (e.g., Schaefer, 1959). In contrast, social-learning theorists have emphasized parental behaviors and practices (e.g., Sears, Macoby, & Levin, 1957). Models, such as the configurational approach developed by Baumrind (1966), include both parental emotions (i.e., warmth) and behaviors (i.e., control) in a broader account of parenting. According to this model, parents' values and the beliefs they hold about their roles as parents help define naturally occurring patterns of affect, practices and values (e.g., authoritative parenting).

Other models that attempt to explain the process of socialization and account for the role of parenting have examined cognitive and behavioral factors involved in parenting such as parents' appraisals, attitudes or specific parenting behaviors. Studies

based on parents' self- reports of their child-rearing attitudes have accounted for parental attitudes such as nurturance (e.g., flexibility, willingness to listen and share feelings) and restrictiveness (e.g., restrictive way of viewing how the child should behave and feel) as well as parents' moral attitudes and their impact on children's behavior (Maccoby & Martin, 1983; Mauro & Harris, 2000; Wiehe, 1990).

However, parenting is also an emotional experience and parental emotions should be acknowledged to fully comprehend the quality of parent-child interactions. At the same time, parent's emotions are an indicator of the health and quality of the parent-child relationship and family functioning (Dix, 1991; Dix & Branca, 2003). Parents' emotions influence childrearing behaviors in different ways: they enhance or hinder parents' motivation to interact with their children (Bousha & Twentyman, 1984); they induce changes in perceptions and cognitions about their child and the parenting context (Maccoby & Jacklin, 1980; Patterson, 1982); and finally they induce positive or negative affective expressions that provoke children's reciprocity and attention, and at the same time convey relevant information to them (Bugental, Mantyla, Lewis, & Cicchetti, 1989; Weiner, Graham, Stern & Lawson, 1982). In addition, the emotional nature of early behavior problems in children (i.e., externalizing, internalizing) underscores the need to take into account the impact of parental emotional expressiveness in predicting children's socio-emotional development (Denham et al., 2000).

Parental Emotional Expressiveness and Parenting Behaviors

Parental emotions and emotional expressiveness are considered at the heart of both effective and ineffective parenting (Brier, 1995; Denham et al., 2000; Saarni, 1999). Parents' tendencies to express verbal and non-verbal emotions, both positive and negative,

have been the focus of several studies examining the impact of parental variables on children's psychosocial development Positive emotions (e.g., physical affection, positive affect, warmth) are believed to promote sensitive, comforting and pro-active parenting, as well as more teaching behaviors and encouragement toward their children (Belsky, 1984). Parents' expressions of positive emotions enhance affective communication and attunement to children, as well as the quality of their interactions. Parental warmth and responsiveness, mediated by maternal positive expressivity, has been associated with children's development of empathy and better social functioning (Zhou et al., 2002). Likewise, preschoolers' social and emotional competence has been associated with maternal expressions of happiness during parent-child interactions (Denham et al., 2003; Denham & Grout, 1992). Moreover, positive child behavior has been linked to positive emotional states arising from warm, affectionate and involved parenting (Russell & Russell, 1996).

Positive emotional expressiveness seems to create a warm and accepting atmosphere which ultimately, reinforces parents' motivation and involvement in parenting. Moreover, the possibility of sharing and expressing positive emotions when interacting with children is fundamental to positive and effective parenting. Results from studies of resilient children who have experienced adversity and risk underscore the importance of a positive parent-child relationship (e.g., agreeableness, acceptance, attunement) as a protective factor for successful social adaptation (Cohn, Patterson & Christopoulous, 1991; Masten & Coatsworth, 1998; Putallaz, 1987).

The impact of parental negative emotionality on the quality of parental practices and ultimately, on children's socio-emotional competence, has been also demonstrated.

Although it is known that heredity accounts for some of the similarities between parents' negative emotional expressiveness and their children's expressiveness with regard to temperamental dispositions such as inhibition or neuroticism (Borkenau, Riemann, Angleitner, & Spinath, 2001), early social interactions with parents sculpt children's social and emotional regulation. Parents who have experienced high levels of psychological distress are more likely to display negative emotions (e.g., anger, negative affect) during their interactions with their children. This is the case for abusive mothers (Tricket & Kuczynki, 1986), depressed mothers (Zahn-Waxler & Radke-Yarrow, 1990), as well as for mothers living in poverty (McLoyd, 1990). However, little is known about the specific mechanisms by which historical and contextual elements determine parents' emotional expressiveness and ultimately, the way they parent.

Studies conducted with distressed parents have shed light on some of the mechanisms by which negative emotionality alters parenting and therefore, children's social development. Parents' unrealistic expectations of children seem to promote more negative emotions due to the levels of frustration resulting from their children's performance. For example, teenage mothers with poor knowledge about child development have been shown to get easily frustrated when children do not meet their expectations (Fry, 1993). As a result of having unrealistic goals for their children, distressed parents tend to develop negative beliefs not only about the nature of their children, but also about their lack of parental skills that serve to further undermine their parental control (Bugental, et al., 1989).

Maternal emotional dysregulation is another domain that has been found to have an important impact on children's behavior and socio-emotional competence via

parenting (Cummings & Davies, 1996; Denham et al., 1994). Caregivers model social relations through their own behavior and these early parent-child interactions are the foundation for children's communication and social skills. Parents who are able to regulate their emotions while interacting with their children are more likely to be sensitive to their children's needs and consequently, to respond creatively and constructively to their demands. Parents' emotional arousal might engender self-focused behaviors and negative reactions that detract parents' attention from their children's needs, resulting in desynchronous interchanges. Since the parental role requires that parents take responsibility for promoting the development of their children, child-oriented concerns should activate stronger emotions than parent-oriented concerns during parent-child interactions (Dix, 1991). Poorly modulated negative emotions have been associated with reactive parenting as well as to excessive prohibitions, yelling, and harsh discipline (Denham et al., 2000). Cooperative interactions and constructive parent-child relations might be compromised by negative parental emotionality, which in turn leads to hypersensitive, avoidant, and overly controlling parenting (Denham & Grout, 1992, Dix, 1991).

Taken together, these results underscore the impact of parental emotional expressiveness on parental practices and parenting styles. Parental emotions provide a pathway to understanding the process through which general goals and models of parenting are assumed by parents and are conveyed in different ways to their offspring. Examining parental emotional expressiveness is important in order to identify the mechanisms and processes by which parenting impinges children's psychosocial development.

Although the relevance of studying parenting as a complex pattern of behaviors which includes various parental variables (i.e., emotional expressiveness, attitudes) have been supported by several studies, analyzing the impact of specific parental practices on children's development, might also shed light on the conceptualization of parenting. Parents' practices might be mediated by parental emotionality or personality (Belsky, 1984, Dix, 1990), but they are also the result of particular life trajectories and parents' experiences associated with specific contents and contexts. Consequently, examining these life trajectories and experiences as predictors adds to our portrait of parenting styles. Parenting practices are domain-specific (i.e., correcting errors, limit setting) and convey parental attitudes toward specific child behaviors rather than toward the child (Darling & Steinberg, 1993). Parenting skills such as the use of structure, discipline, praise, and limit setting have been associated with children's prosocial behavior, popularity, or empathy towards peers (Campbell, Pierce, Moore, Marakovitz, & Newby, 1996; Denham et al., 2000; Peery, Jensen, and Adams, 1985; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). Such findings underscore a direct pathway for the transfer of parental values and concerns to their children beyond the mediator effect of parental emotions or personality. A comprehensive examination of parenting must therefore include both direct and indirect (i.e., via emotional expressiveness) manifestations of parenting. However, there is a paucity of research examining a combination of both direct and indirect influences of parenting on child behavior.

Parental Emotional Expressiveness and Parenting Behaviors in Vulnerable Populations: Aggression and Social Withdrawal

The study of parental emotional expressiveness and their impact on parenting

skills is particularly relevant in high risk populations (e.g., poverty, disadvantaged environments, family stress, and psychopathology). Parenting practices are partly a result of parents' childhoods and psychosocial histories; a retrospective examination of parental trajectories provides a context in which to understand how chronic sources of stress and/or support interact with contextual factors to modulate specific styles of parenting. Due to the substantial influence of the early caregiving relationship in children's future social development, a careful examination of parenting is required in these vulnerable populations in order to identify pathways for the transfer of risk from one generation to the next.

Children's socialization mostly occurs in the context of the parent-child relationship. Through imitation, observation, or explanations of parental attitudes, emotions and behaviors, children begin to build their repertoire of social skills. Early exposure to parental emotional dysregulation or erratic behavior might have detrimental consequences on children's socio-emotional development. Examination of the interactions of high-risk mothers with their children has revealed a lack of affective displays, contingent responsivity, and asynchrony (Field, 1987), as well as unresponsiveness, harsh discipline or an unstimulating parenting environment (Serbin et al., 2004). Conversely, investigations conducted on resilient populations have consistently demonstrated that developing a close bond with caregivers and receiving emotional support are protective factors for children at risk (Masten and Coatsworth, 1998; Werner, & Smith, 1992).

Parenting skills might be further jeopardized by parental levels of psychopathology or impaired emotional development. Parents who have histories of

difficulties with emotional regulation or social skills are more likely to place their children at psychosocial risk by reproducing and modelling nonoptimal behavioral patterns (Bifulco et al., 2002; Johnson, Cohen, Kasen, Smailes, & Brook, 2001). The interaction patterns that mothers establish with their children are also affected by the quality of the interpersonal relationships with their families of origin (Capaldi, Pears, Patterson, & Owen, 2003; Conger, Neppl, Kim, & Scaramella, 2003). Models accounting for the transmission of risk across generations have pinpointed problematic parenting as the vehicle for transferring negative behavioral styles, values or patterns of communication to offspring. Children who are being raised in families with histories of psychosocial problems are more prone to developing adjustment and behavioral problems since parent-child interactions are an important source for acquiring social competence (Caspi & Elder, 1988; Elder, Caspi & Downey, 1986).

Aggressive behavior is an example of aberrant psychosocial development and a well studied phenomenon due to its demonstrated stability (Cairns et al., 1998; Patterson, 1982). Although genetic, neurocognitive, and other biological risk factors might be involved in the onset and maintenance of aggression, psychosocial factors seem to modulate the manifestations of aggressive behavior across contexts and gender. Traditionally, aggressive behavior has been identified with overt and direct expressions of aggression and consequently, mostly studied in boys. Aggression in girls has been largely overlooked since typical manifestations of female aggression tend to be more subtle behaviors and covert hostility (Cairns et al., 1998; Galen & Underwood, 1997). Only recently have researchers started to address these indirect forms of aggression (e.g., Peplar & Craig, 2004; Serbin et al., 2004).

Although aggression in girls might also be overtly directed towards others (e.g., physical aggression, bullying, victimization), women tend to develop alternative pathways to express hostility by using their social relations as a mechanism to inflict harm to others or to themselves by engaging in risk-taking behaviors (e.g., smoking, alcohol and substance abuse, early sexuality and early motherhood). This form of aggression, referred as to "relational aggression", has been associated with measures of overt aggression in girls and is considered an alternative route for expressing behaviors that are partly constrained by gender and social variables (Putallaz, Kupersmidt, Coie, McKnight, & Grimes, 2004).

Aggressive behavior in girls has been identified as a strong predictor of a cascade of maladaptive behaviors (e.g., relational problems, school drop-out, and unhealthy lifestyles) which ultimately jeopardize their future parenting styles and in turn their children's development (Serbin et al., 1998; Serbin et al., 2000). Therefore, when girls with histories of aggression become mothers their children are placed at risk not only through their own risk-taking behaviors, but also through their exposure to detrimental relational patterns (i.e., familial, marital, social). As a result, their parenting styles might be seriously compromised by the psychosocial sequelae of aggressive behaviors.

Another behavioral style that has been shown to have an important impact on social development is social withdrawal. Developmental models that explain children's social competence predict harmonious relations with peers from very early cognitive, emotional and social skills that children acquire in the context of the parent-child relationship (Hay, Paine, & Chadwick, 2004). Like aggression, social withdrawal has been found to be relatively stable over time (Moskowitz, Schwartzman, & Ledingham,

1985) and can be perpetuated in cyclical relations with peers by provoking isolation, rejection and in turn, a deficit of social skills (Farmer & Bierman, 2002).

Due to the relative stability of social withdrawal across time and situations, children coming from vulnerable families are at increased risk for long-term academic and behavioural problems. Consequently, the importance of identifying pathways for the transfer of risk or resilience is accentuated (Pagani, Boulerice, Bitaro, & Tremblay, 1999). Longitudinal studies following withdrawn children into adulthood have revealed the psychosocial vulnerability of these children and the possibility of transferring risk via parenting (Cooperman, 1996; Ledingham & Schwartzman, 1984). Studies conducted with withdrawn-depressed mothers contribute to the understanding of withdrawn behaviors in the mother-child relationship. These mothers tend to be quiet, bored-looking, physically distant, and underinvolved in their marital and parental interactions, suggesting cross-situational stability (Hart, Field, Jones, & Yando, 1999), and they are more likely to be empathic and reactive towards their children's negative behaviors (Jones, Field, Hart, Lundy, & Davalos, 2001). Although the influence of maternal withdrawal seems to be less pervasive than the influence of aggression in the next generation and some elements such as the presence of empathy could operate as buffering factors, the early identification and follow-up of withdrawn children might help to prevent the consequent developmental and socio-emotional complications. In addition, there are few studies examining the specific pathways by which social withdrawal in childhood is maintained through adulthood and ultimately, expressed in ineffective parental styles.

Individuals with both aggression and withdrawal have shown a higher likelihood to develop and transfer risky patterns of behavior. Evidence for the continuity and the

pervasive effects that the co-occurrence of both behavioral styles might have in children has been gathered by following up and comparing groups of school-aged children (i.e., aggressive only, withdrawn only, aggressive/withdrawn and comparison). Children who were aggressive/withdrawn in first grade exhibited deficits in attention and social skills in Kindergarten which in turn contributed to the emergence of behavior problems in first grade, after accounting for Kindergarten levels of aggressive and withdrawn behaviors (Farmer & Bierman, 2002). These children were more likely than children in any other group to display poor peer relations and poor academic performance up to third grade. Similar group comparisons have shown that aggressive/withdrawn children are the ones experiencing more difficulties in establishing relationships with their peers. They have shown higher levels of loneliness, disssatisfaction, lack of friends, dislike, victimization, and maladaptive teacher-child relationships in comparison to normative and other risk groups (Ladd & Burgess, 1999). Results gathered from longitudinal studies have shown that children who are both highly aggressive and highly withdrawn have poor academic achievement, more relational problems, more vulnerability to health and psychopathological problems and consequently, when they themselves have children, deficient parental practices (Serbin et al, 1998; 2004).

Taken together, a vicious cycle, with cumulative detrimental effects, seems to be a pathway by which deficient social skills are transferred from the parent's family of origin to their children's generation during parent-child interactions. Children who have been exposed to poor parental practices are more likely to display undeveloped or maladaptive social skills and therefore enter school as more vulnerable. When school-aged children lack these basic socio-emotional competencies they might develop learning

difficulties and may face a cascade of behavioral, emotional and academic problems which in turn, might jeopardize their peer relations, and perpetuate the cycle of risk.

The continuity of maladaptive behavioral patterns across generations as well as the mediating factors involved in this process can be best captured by longitudinal intergenerational designs. By identifying underlying pathways by which the negative patterns are being transferred from one generation to the next (e.g., nonoptimal parenting), the mechanisms by which children who have been exposed to equally adverse environments become resilient rather than vulnerable, might be revealed. Research has demonstrated that one of the protective factors for children who develop adaptively in adverse or challenging psychosocial conditions is effective parenting (Masten & Coatsworth, 1998; Werner, 1990). From this perspective, parenting has heuristic value not only as a pathway for risk, but also as a way through which to convey resilience in vulnerable populations and therefore an important focus of psychosocial interventions.

Only through prospective, longitudinal studies that follow behaviors across time and contexts, can the continuity and/or disruption of human development across generations be studied. Intergenerational studies with children at risk who are followed into adulthood and parenthood have underscored the stability of aggression, social withdrawal, and depression, for example, and how these impact on parenting practices. Although longitudinal studies are the best approach to understanding the underlying processes in the intergenerational transfer of risk, they are also costly, time consuming and long-lasting. These are some of the reasons that might explain the scarcity of these types of designs regardless of their value and the unique opportunities that they offer for monitoring psychosocial development across generations (Serbin et al., 1998).

In summary, the evidence gathered from longitudinal studies of vulnerable populations underscores the importance of identifying or detecting risk factors that expose the next generation to disadvantaged socialization practices. Explanatory models which identify pathways for the intergenerational transfer of risk point to the stability of psychosocial difficulties across generations and contexts. Dysfunctional emotional and behavioral patterns might be transmitted from one generation to the next via social interactions. Since parenting is a direct route for the reproduction of risk and/or resilience in the next generation, identifying parental practices of individuals who have had histories of behavioral and relational difficulties become germane in designing preventive strategies directed to break the cycle of risk. Due to the critical role that the mother-child relationship plays in children's early socialization, special relevance is accorded to the study of mothers with childhood histories of aggression and/or social withdrawal. Mothers with histories of psychosocial difficulties would be exposing their children to dysfunctional relational patterns and therefore, perpetuating the cycle of risk.

Investigating maternal characteristics that directly impact on their ability to optimally socialize their children, (e.g., aggression and/or social withdrawal), is advantageous in order to describe important parenting factors, both positive and negative, that they are being exposed to. However, there is a paucity of research describing specific mechanisms (e.g., emotional expressiveness, limit setting) that could lead to trajectories of risk or resilience in vulnerable samples, and few studies that include two generations. Longitudinal studies targeting more than one generation within disadvantaged populations and samples where mothers were previously identified as aggressive and/or social withdrawn become crucial in order to design tailored psychosocial interventions to

promote resilient and competent behavioral styles in individuals at risk.

The Concordia Longitudinal Risk Project

The Concordia Longitudinal Risk Project is an ongoing longitudinal study designed to follow the life-course trajectories of children identified as aggressive and/or socially withdrawn (Schwartzman, Ledingham, & Serbin, 1985). This study is a community-based sample of individuals showing atypical and normative patterns of behavior. For more than 30 years these participants have been followed since childhood and their developmental outcomes have been investigated. Thirty years later a unique opportunity to examine intergenerational transactions and how these maladaptive patterns are reproduced in the next generation has arisen (e.g., Serbin & Stack, 1998).

The Concordia study has other characteristics that make it unique. Unlike other longitudinal studies the criteria for risk is atypical social behavior identified in childhood (i.e., aggression, social withdrawal), and not parental psychopathology or adverse social conditions. Another important feature is the inclusion of approximately equal number of boys and girls within each of the risk groups which provides the rare opportunity to observe the development of not only aggressive and/or withdrawn boys, but also the trajectories of aggressive and withdrawn girls. Therefore, this is one of the few designs that has followed girls' aggressive behavior and its consequences for their own development and for the next generation's development once they become mothers. This longitudinal study has documented how girls' aberrant psychosocial development (i.e., childhood aggression and social withdrawal) impacts their subsequent social competence and consequently, their ability to parent. Past studies in the Concordia project have identified maternal childhood risk status as a predictor of problematic parenting, among

other negative outcomes such as school failure, early motherhood, and unhealthy habits (Serbin et al, 1998). These mothers seem to develop particular parental practices as a consequence of a cascade of adverse life events connected with mothers' deficient psychosocial development (Serbin et al., 2004; Serbin et al., 2000). The majority of the studies on parental variables in this project have focused on mothers with histories of psychosocial risk since a direct pathway has been found from maternal childhood histories to children's outcomes.

Although the transfer of negative behavioral patterns via parenting has been identified as a link between maladaptive outcomes for both generations in this project, little is known about the specific mechanisms through which maternal influence is exerted. Consequently, pathways leading to risk and resiliency in the offspring warrant further study. However, some elements of the negative parenting styles that characterize these mothers with histories of aggression and/or withdrawal have been uncovered. Mothers with both histories of aggression and withdrawal have been shown to have the most troubled parenting and consequently, their offspring have shown the worst developmental outcomes. For example, aggressive/withdrawn mothers compared to other groups, expressed higher levels of hostility (Bentley, 1997, 2002), unresponsive behavior (Cooperman, 1996), poor cognitive stimulation and difficulties providing a quality home environment (Saltaris, 1999). Regarding aggressive girls' parenting styles, some elements have been identified such as the employment of severe discipline patterns and an unstimulating parental environment (Serbin et al, 2004). Little evidence has been found showing how social withdrawal in childhood influences maternal practices. However, in one recent study, Grunzeweig (2003) identified the predominant use of physical

intervention as a request strategy in mothers with histories of childhood withdrawal. These mothers were more likely to do repeated requests and no opportunity requests to their children as well. Further exploration of how developmental trajectories of withdrawn girls impact their parenting skills, and therefore the next generation's development, is an important next step.

Mothers' education has been identified as a mediator between mothers' histories and children's developmental outcomes in the Concordia project and therefore, a protective factor that might buffer the transfer of risk across generations. The participants of the Concordia project that managed to complete high school or achieve higher levels of education seem to be exposing their children to more stimulating home environments and to higher quality parenting skills (Saltaris, 1999). In contrast, lower education has predicted mother's aggressive behavior toward offspring, lack of supportive behavior and unresponsiveness (Serbin et al., 2004).

Taken together, previous findings in the Concordia project have demonstrated some of the direct or indirect influences of childhood histories of aggression and/or withdrawal within one generation and across generations. Parenting has been identified as an essential pathway for the intergenerational transfer of risk. However, these studies have addressed specific parenting behaviors (e.g., maternal responsiveness, cognitive stimulation, physical proximity) in order to demonstrate their impact on the next generation, and the emotional nature of parenting has not been sufficiently examined. The inclusion of maternal emotional expressiveness (i.e., positive and negative) will complement our understanding of parenting as a complex pattern of behaviors where emotions have a crucial role. Aggression and social withdrawal are not only expressions

of maladaptive social behavior, but are a result of underlying emotional dysregulation as well. Moreover, the inclusion of both positive and negative parental emotions and behaviors in a model of parenting would provide a wider scope for identifying emotional and/or behavioral mechanisms through which parenting mediates the socialization process across generations in vulnerable populations. Ultimately, an integrated examination of parenting including positive factors (e.g., positive emotions, teaching strategies) opens a new window for identifying potential protective pathways for high-risk individuals in order to circumvent the transfer of risk across generations.

The Present Study

Research on parenting is vast and many of the theoretical models that have been developed to account for the effects of parental influences on children's developmental outcomes are promising. However, most of the research has been focused on either specific behavioral practices (e.g., discipline, punishment, responsiveness) or in previously defined parenting styles (e.g., authoritarian, authoritative, permissive) resulting from the combination of dimensions of warmth and control (Baumrind, 1991). There is a paucity of research on parenting as a broad pattern comprising parental emotional expressiveness (e.g., positive and negative expressions of emotions) and parental behavioral practices (e.g., control, teaching) in order to typify parenting styles. Similarly, the focus has largely been on the consequences of parenting and little is known about its determinants.

A longitudinal intergenerational study such as the Concordia Project offers the possibility of examining not only the impact of parental practices on the next generation, but an examination of parenting styles as the crystallization of parents' developmental

histories. A careful assessment of parenting is especially relevant in a high-risk intergenerational sample because of the mediating role that parenting has been shown to play by serving as a vehicle for the transfer of either risk or resiliency to the next generation. It is crucial to examine the impact of dysfunctional or aberrant parenting on their children's social development as early as possible (i.e., preschoolers) to be able to sort out parental influence from the inarguable influence of school in their processes of socialization, and to identify risk and set in motion targeted preventive interventions. It is also important to examine the impact of dysfunctional parenting on the next generation's development as early as possible.

The present study was designed to investigate the relationships among maternal childhood levels of aggression and social withdrawal and parenting in the Concordia project. Two main objectives were addressed. The first objective was to examine the predictive relationship between childhood levels of aggression and social withdrawal, child age, maternal education and maternal emotional expressiveness (e.g., encouragement, physical affection, sarcasm, etc). Specifically, (a) Does maternal childhood risk status (i.e., childhood levels of aggression and/or social withdrawal) predict emotional expressiveness? (b) Do child age and maternal education predict emotional expressiveness?

Hypothesis 1. It was expected that childhood risk status would predict different pathways for maternal emotional expressiveness. Mothers with histories of aggression were expected to differ from mothers with histories of social withdrawal in terms of emotional expressiveness. Mothers with histories of social withdrawal were expected to have more difficulties in expressing emotions, particularly positive emotions. Similarly, it

was expected that mothers with childhood histories of aggression or both aggression and withdrawal would express more negative emotions during their interactions with children.

Hypothesis 2: Child age was also expected to predict maternal emotional expressiveness. Specifically, as children get older, mothers were expected to express less positive emotions. Based on past findings within the Concordia study regarding the buffering effect that maternal education might have in parenting, it was also hypothesized that maternal education would mediate mothers' emotional expressiveness; mothers with lower levels of education would express more negative emotions to their children.

The second objective was to investigate the predictive relationships among maternal childhood levels of aggression and social withdrawal, child age and maternal education with parenting practices in high-risk mothers. Specifically, (a) Does maternal childhood risk status (i.e., childhood levels of aggression and/or social withdrawal) predict specific parenting behaviors (e.g., attitude towards error, limit setting, teaching behaviors)? ; (b) Do child age and maternal education predict parenting practices?

Hypothesis 3. It was anticipated that maternal levels of childhood aggression and withdrawal would predict maternal teaching behaviors. It was expected that mothers with histories of childhood social withdrawal would display more negative teaching behaviors (i.e., demonstration or providing the answer without explanations) due to their inadequate development of social skills.

Hypothesis 4. It was expected that maternal childhood levels of aggression and withdrawal would contribute to the prediction of maternal use of limit setting. Mothers with histories of aggression were expected to use more negative limit setting rather than positive limit setting.

Hypothesis 5. It was anticipated that mothers' childhood risk status would predict maternal attitude towards children's errors. Mothers who were identified as aggressive in childhood would display more of a critical attitude rather than a constructive attitude towards their children's' mistakes during the interaction.

Hypothesis 6. Child age and maternal levels of education were also expected to predict parenting practices. Specifically, as children get older, mothers were expected to use less positive limit setting during the interaction. Less educated mothers were expected to display less constructive parental behaviors such as a critical attitude towards children's mistakes and negative limit setting.

Method

Participants

The Concordia Longitudinal Risk Project began in 1977 with the recruitment of 4,109 francophone school-age children attending grades 1, 4, and 7. These children and families came from low socioeconomic, inner-city neighbourhoods in Montreal, Quebec. The children were screened along the dimensions of aggression and social withdrawal by using a peer evaluation measure, the French translation of the Pupil Evaluation Inventory (PEI; Pekarik, Prinz, Liebert, Weintraub, & Neale, 1976). The PEI contains 34 items which load onto three main factors: aggression, withdrawal, and likeability. Only the dimensions of aggression and withdrawal were retained for the purposes of the Concordia Project. Based on the PEI scores, 1774 children were classified and assigned to different groups. A significant proportion of the children ($N = 656$) received high scores on dimensions of aggression, social withdrawal, or both. Children from the same schools and neighbourhood who were not high on these dimensions, served as a comparison group. Appendix A summarizes the screening method employed.

Participants in the present study form a subsample of 114 mother-child dyads that were selected from the pool of 1774 original participants to take part in a larger study on parent-child relationships. This subsample comprises 114 mothers who were original participants of the Concordia Study and who had a child between the ages of 12 to 72 months old (1 to 6 years) at the time of testing. Of the 114 participating dyads in this project, 7 were eliminated from the current analyses because of technical difficulties when recording the teaching interaction (e.g., no audio on the tape, damaged tape).

In total, 107 families participated in the present study and were divided into two

cohorts according to the age of the child at testing. Cohort 1 (n = 50), comprised mothers with children from 12 to 42 months, and Cohort 2 (n = 57) included mothers with children between 42 and 72 months old. It was important to obtain a wide age range in order to observe how parenting behavior varies as a function of children's developmental trajectories. Due to the relatively small sample size, the four risk classifications were not used as separate groups. Rather, the sample was oversampled at extreme ends of the distribution and analyzed by dimensions, consistent with previous studies from the Concordia Project (e.g., Bentley, 2002; De Genna, 2001). A skewness test on this sample revealed that the aggression and withdrawal *z*-scores followed a normal distribution.

Table 1 presents the demographic characteristics of the current sample of 107 women and their children. The children (45 boys, 62 girls) ranged in age from 1.09 to 6.07 years ($M = 3.48$, $SD = 1.52$). The age of the mothers at the birth of their first child ranged from 16.51 to 32.38 years ($M = 24.59$, $SD = 3.22$). At the time of testing, mothers' ages ranged from 25.71 to 34.52 years ($M = 30.36$, $SD = 2.55$). Eighty-three mothers were married or living with a common-law partner, and 24 were single mothers, including those who were separated, divorced or widowed. Mothers' years of schooling ranged between 6 and 17 years ($M = 11.64$, $SD = 2.38$). With respect to their occupations mothers' educational prestige ratings ranged from 154 to 656 ($M = 330.80$, $SD = 111.92$). Prestige codes were assessed by the Prestige measure (Rossi, Sampson, Bose, Jasso, & Passel, 1974). The mean prestige rating corresponds to the following types of jobs: manufacturing, miscellaneous mechanics, as well as hairdressers and cosmetologists.

Table 1

Means, Standard Deviations, and Ranges of Demographic Information (N = 107)

	Mean	Standard Deviation	Range
Children's current age	3.48	1.52	1.09 - 6.07
Maternal age at testing	30.36	2.55	25.71 - 34.52
Maternal age at birth of first child	24.59	3.22	16.51 - 32.38
Maternal education (years)	11.64	2.38	6-17
Occupational prestige	330.8	111.92	154 - 656

Demographic data from mothers with childhood histories of aggression and/or social withdrawal were compared to comparison mothers. Important demographic variables such as child age at the time of testing, mothers' age at time of testing, mothers' age at birth of their first child, maternal education, as well as occupational prestige were included. Means and *F*-values are reported in Table 2 and results indicated that mothers were significantly different only with respect to years of education and occupational prestige. More specifically, comparison mothers ($M = 12.31$, $SD = 2.51$) acquired on average 1.37 more years of education than mothers in the risk groups ($M = 10.94$, $SD = 2.02$), $F = 5.47$, $p < .05$). Similarly, comparison mothers achieved a higher average prestige code corresponding to radio and TV workers and/or stationary engineers ($M = 349.93$, $SD = 125.26$), than mothers with childhood histories of aggression and/or social withdrawal who had an average occupational prestige corresponding to machine operatives ($M = 311.32$, $SD = 93.66$). The *F*-value for this comparison of independent samples was 9.66, $p < .01$ (two-tailed).

A comparison to assess the representativeness of the current sample with respect to other participants, from the original Concordia study but who were not part of the current project, was also carried out. The mothers who participated in the present study were compared to a subsample of 360 women who were contacted to participate in studies from 1993 to 1997, as well as a subsample of 373 women (who were part of the original sample) and who were also mothers. These women were compared along the dimensions of aggression and social withdrawal, and demographic data such as years of education, occupational prestige ratings, as well as mothers' age at birth of first child, were also compared. Since no differences were found in terms of aggression and social

Table 2

Comparison of Demographic Variables between High-Risk Mothers and Comparison Mothers: Means, Standard Deviations, and F-values

	Risk mothers (N = 53)		Comparison mothers (N = 54)		
Demographic variable	*M*	*SD*	*M*	*SD*	*F Value*
Child age	3.42	1.61	3.55	1.45	1.11
Maternal age at testing	30.30	2.51	30.43	2.62	0.26
Maternal education (years)	10.94	2.04	12.31	2.517	5.47 *
Occupational prestige	311.32	93.66	349.93	125.26	9.66 **

*$p < .05$ **$p < .01$

withdrawal between the three groups (see Table 3), the current sample was considered representative of the original sample. According to the results from both comparisons, women who were not mothers completed more years of education and had higher occupational ratings than mothers in the present study.

Procedure

Potential participants were contacted by telephone in order to schedule two home visits of approximately 3 hours. At the time of the telephone call, mothers were given a general description of the study and procedures and the Demographic Information Questionnaire was completed (DIQ; see Appendix B). Mothers were informed that they would be paid $80 upon completion of all of the visits and questionnaires. A research team consisting of an M.A level psychologist (examiner), and a research assistant/graduate student (interviewer), visited the participants' homes. The research team was blind to the risk status of the families being assessed and the hypotheses of the present study. At the beginning of each appointment, the experimenter explained the overall procedure to the mother, who was then asked to read and sign an informed consent form (Appendix C).

A comprehensive research protocol was carried out during two home visits. The protocol included children's intellectual assessments, naturalistic observations (e.g., free-play, puzzle task, command task), interviews and questionnaires. For the purposes of the present study the focus was on the puzzle task. A 4-minute mother-child interaction was completed by mothers with children from 12 to 36 months old and a 7-minute interaction was carried out for mothers with children over 36 months old. Puzzles chosen for the

Table 3

Comparison of Selection Variables between Women Contacted 1993-1997 (n = 360), Mothers from Original Sample (n = 373) and the Current Subsample of Mothers (n = 107): Means, and F Values

	Non-Mothers	Representative Mothers	Current Sample	F Value
Aggression z-score	0.16	0.33	0.39	1.56
Withdrawal z-score	0.25	0.4	0.46	1.43
Education in years	13.19	11.85	11.61	24.06**
Occupational prestige	360.9	341.37	325.64	4.77**
Mothers' age at birth of first child		24.39	24.52	0.75

*$p < .05$ **$p < .01$

younger and the older cohorts were age appropriate. (A detailed description of the task protocol can be found in Appendix D).

Before commencing the session, the examiner selected an appropriate room in the home which provided adequate space and lighting for the interaction to take place and to be properly recorded. A mat (12.5 cm length x 16 cm width) was placed on the floor and a Sony Video 8AF camera and a Sony directional microphone attached to the video camera were properly situated so that they were facing the mother and child. Mothers were instructed to first choose one puzzle to complete in the given time (4 or 7 minutes) and to complete a second or a third puzzle until the end of the interaction time. A beeper sound from a timer signalled the beginning and the end of the task. All instructions were provided in French.

Following the interaction, mothers were asked to assess the extent to which the interaction with their child had been natural and representative of their everyday interactions on a scale of 1 to 4 (1 = not at all natural, 4 = very natural). Interactions rated as a 2 or below were recorded again at the next home visit *(n* =1*)*.

Measures

Demographic information. The Demographic Information Questionnaire (DIQ; see Appendix B) was used to gather socio-demographic information on the families participating in the study. Relevant information such as parents' current age, their age at birth of first child, marital status, educational level, current occupation, and income, as well as number of children and their ages was obtained. This questionnaire was completed over the telephone at the time the participants were contacted to schedule the first home visit.

Observational Coding

Coding Scheme for Parental Emotional Expressiveness (PEECS). The PEECS is an observational measure of maternal emotional expressiveness. It was developed by the author for the purposes of the present study and partly relied on previous research on parental emotionality and expressiveness (Bentley, 1997; Denham & Grout 1992; Zhou et al., 2002). Maternal expressions of positive and negative emotions, both verbal and non-verbal, were coded in the context of a videotaped play interaction with their children. The objective of this coding system was to capture and classify every expression of maternal emotions (i.e., positive and negative) during the puzzle task.

Over several months, videotaped mother-child interactions were coded and recoded and the coding scheme was carefully developed and revised in order to identify emotional expressions and to create categories that were able to capture the complexity of maternal expressions. Categories of positive and negative emotional expressions were defined and tested across a variety of children's ages and play interactions while the coder was blind to group membership.

All mother-child interactions coded on the PEECS were viewed twice. Maternal non-verbal behaviors were coded during the first pass and verbal behaviors were coded on the second pass. The start and stop times were registered for every interaction as well as whether it was a 4-or a 7-minute puzzle task depending on the child's age. Maternal emotional expressions were recorded every time they appeared in a 10-second interval and the sequencing was retained; that is, numbers corresponding to what occurred first, second, etc., were assigned to emotions when they appeared during the same interval. Coded behaviors included expressions of maternal positive emotions that were verbal

(e.g., verbal affection, humour, encouragement, surprise) and nonverbal (e.g., smile, assurance gestures, physical proximity, physical affection, and physical contact). Expressions of negative verbal emotions (e.g., critical statements, aggression, and sarcasm) as well as nonverbal negative emotions (e.g., physical intervention with the objects or the child, boredom, frustration, disapproval and disengagement) were also coded. Appendix E provides the operational definitions for the codes included in the *PEECS,* as well as procedural details.

Coding Scheme for Parenting Style (PSCS): A separate coding scheme was developed in order to capture other parenting behaviors that were relevant but different from maternal emotional expressiveness. The PSCS included controlling behaviors, attitude towards error, and teaching behaviors. Although this coding system did not cover all parenting possible behaviors it did capture the parenting behaviors that were specifically planned and designed as part of the present study and it also served as an initial step in building a more comprehensive observational system for future studies.

Consistent with the PEECS, the PSCS behaviors were coded in 10 second intervals and sequences were retained. Two passes through the video record were used. Nonverbal information was coded during the first pass and verbal utterances on the second pass. Controlling behaviors (limit setting) were coded in terms of positive and negative according to the tone in which they were conveyed to the child. Maternal attitudes towards children's mistakes were classified as constructive or critical by taking into account its effectiveness as a corrective strategy. Teaching behaviors were salient due to the didactic nature of the task and were consequently included as an important part of the PSCS observational system. Positive teaching strategies such as problem solving or

providing levels of help (prompts and questions) were systematically recorded, as well as less effective strategies such as demonstration (e.g., providing answers without explanations). Appendix F provides detailed operational definitions.

After the mother-child interactions were coded using the two coding systems, the aggregate frequencies of maternal emotional expressiveness and other parenting behaviors were summed. Proportions of these totals were used in the analyses due to the fact that the puzzle task was either 4 or 7 minutes depending on child age. The total frequencies of maternal behaviors during the interactions were divided by the total duration of the puzzle task (4 or 7 minutes). Table 4 presents the means, standard deviations and ranges for maternal behaviors in both categories: emotional expressiveness and parenting, represented by proportions. Proportions might be greater than 1 since multiple behaviors were coded within a 10-second interval.

Reliability: Two coders were trained in the use of both coding schemes (PEECS and PSCS) by learning to discriminate among emotional expressions and behaviors, and coding practice video-taped interactions. The author and an undergraduate research assistant, who acted as the second coder, were blind to mothers' childhood risk status. In order to assess inter-rater reliability, 22 of the 107 (20%) mother-child interactions, which were randomly selected, were doubled-coded. Cohen's kappa coefficients were calculated to assess reliability on maternal emotional expressiveness and parenting behaviors. Kappa coefficients were also calculated for maternal positive and negative emotions. These values were obtained by tabulating the interrater agreement as a proportion of potential agreement and a correction for chance agreement (Cohen, 1960).

For maternal emotional expressiveness the global value was $r_k = .80$. Separate

Table 4

Means, Standard Deviations, and Ranges of Maternal Behaviours (N = 107)

Behaviour	Mean	Standard Deviation	Range
Emotional Expressiveness			
Verbal Affection	0.24	0.31	0 - 1.08
Humour / Jokes	0.68	0.51	0 - 2.04
Encouragement / Positive Feedback	2.03	1.07	0 - 5
Surprise	1.36	0.86	0 - 4
Smile / Laughter	0.83	0.44	0 - 2.09
Assurance Gestures	0.38	0.42	0 - 1.54
Approach / Physical Proximity	1.00	0.71	0 - 3
Physical Affection	0.13	0.24	0 - 0.87
Physical Contact	0.75	0.41	0 - 1.98
Critical Statements / Negative Feedback	0.52	0.48	0 - 1.75
Verbal Aggression	0.25	0.29	0 - 1.01
Sarcasm	0.26	0.30	0 - 0.93
Physical Intervention (w/ objects)	0.61	0.38	0 - 1.71
Physical Intervention (w/ child)	0.49	0.45	0 - 1.84
Frustration	0.23	0.28	0 - 1.84
Disapproval / Indifference	0.47	0.39	0 - 1.49
Parenting Behaviours			
Problem-Solving	0.73	0.40	0 - 1.83
Prompts / Questions	1.58	1.06	0 - 4.65
Demonstration	1.46	1.17	0 - 4.55
Positive Limit Setting	2.59	1.42	0.43 - 8.44
Negative Limit Setting	0.45	0.36	0 - 1.22
Constructive Attitude t/ Error	0.59	0.38	0 - 1.65
Critical Attitude t/ Error	0.41	0.04	0 -1.37

kappas were calculated for maternal expressions of positive emotions (rk = .81) and negative emotions (r_k = .71). For parenting behaviors, the obtained value was r_k = .82. The values obtained in all the measures ranged from satisfactory to excellent, according to Cohen (1960). These results are consistent with the reliability coefficients cited in the literature for observational coding systems for parenting and emotional variables which have ranged from .68 to .90 in the majority of the studies (e.g., Denham et al., 2000, Mauro & Harris, 2000).

Results

Prior to data analysis, all the data were checked for accuracy, identify missing values and assess the normality of the distribution. There were no missing values in the data set. The next step was conducting descriptive analyses to evaluate the normality of the distribution of each variable, to determine the presence of outliers, and to assess skewness and kurtosis. To correct for outliers, one standard deviation below and above the mean was the method chosen to bring the outliers into the normal range (Tabachnick & Fidell, 2001). The following variables were found significantly skewed and a square root transformation was successful in normalizing the data: verbal affection, humour, smile/laughter, assurance gestures, physical contact, verbal aggression, sarcasm, physical intervention, frustration expressions, disapproval/indifference, constructive and critical attitude towards error, negative limit setting and problem solving. Two of the variables were still significantly skewed after the square root transformation and a log transformation was not suitable due to the low frequency of maternal behaviors. Consequently, boredom, and disengaged were excluded from the statistical analyses due to their low frequency.

Hierarchical multiple regressions were conducted on the data. This type of analysis was selected because it allows for the examination of the specific contribution of a given predictor while partialling out the effects of other independent variables known to be correlated with the independent measure. A series of predictors were entered sequentially (i.e., first generation, offspring). Maternal childhood risk factors were entered first, followed by maternal and child demographic variables, and finally the interaction term.

Since the primary goal of the present study was to assess the relationship between maternal childhood risk status and maternal emotional expressiveness and parenting behaviors during the puzzle task, childhood levels of aggression and withdrawal were included as predictors. Another important predictor was the interaction between aggression and social withdrawal. Previous findings from the Concordia project suggest that the presence of high levels of both childhood aggression and withdrawal put individuals at higher risk for developing psychosocial difficulties and together may be more strongly predictive of negative outcomes than aggression or withdrawal alone. The interaction between childhood aggression and withdrawal was entered in the final step in order to consider the influence of the main effects first (i.e., aggression and withdrawal), (Cohen & Cohen, 1983).

Maternal education was also included as an important marker of psychosocial adjustment in predicting levels of maternal expressiveness and parenting styles. Maternal education has been found to be predicted by levels of childhood aggression and social withdrawal, and also linked to parental rearing practices (Serbin et al., 1998, 2002).

Since maternal emotional expressions and parenting behaviours might vary as a function of children's characteristics, two child variables were used as predictors in the regression analyses. Age of the child was considered since the ways mothers behave and the type of control and teaching strategies they use are partly determined by the developmental stage of the child. Child gender was the final predictor variable.

All the analyses were conducted with the Statistical Package for Social Sciences program (SPSS; Norusis, 1990). A critical alpha level of $p < .05$ was used as the criterion for the analyses and significance levels of .05, .01 and .001 are reported in the text. Only

significant findings are reported; however, results at $p < .10$ were also examined if they were relevant to the theoretical hypotheses of this study and were also consistent with the literature.

Data Reduction

Given the relatively small sample size available for the current study ($n = 107$), the next step was to reduce some of the variables in the analysis to be able to examine the contribution of childhood levels of Aggression and Withdrawal to maternal emotional expressiveness and parenting behaviors. First, intercorrelations between the variables were run in order to assess the extent to which they were related (Tables 5 and 6). Tabachnick and Fidell (2001) recommend the use of factor analysis in order to reduce the number of variables when the predictors are significantly correlated but not high enough to suggest multicollinearity. Since this requirement for factor analysis was met in this study, the use of factor analysis was deemed appropriate and warranted for some of the variables. A principal components factor analysis with a Varimax rotation was conducted for maternal expressiveness (positive and negative emotions). Factor scores were obtained and consequently used as the dependent variables for the regression analyses. Separate regression analyses were conducted for teaching behaviors (i.e., problem solving, prompts / questions and demonstration), limit setting and attitude towards error. Intercorrelations between predictors and dependent variables were assessed for multicolinearity and singularity, which can inflate the error term and therefore weaken the quality of the analyses. The intercorrelation matrices are presented in Tables 7 and 8.

Multiple hierarchical regressions were conducted on all the defined variables in order to assess the contribution of childhood risk status, child age and gender on mother's

Table 5

Intercorrelations Between Positive Emotional Expressiveness Variables (n = 107)

Variables	1	2	3	4	5	6	7	8	9
				(*N* = 107)					
1. Verbal affection	__	0.11	-0.01	0.19*	0.20*	0.05	-0.07	0.10	0.03
2. Humour / Jokes		__	-0.15	0.28*	0.37**	0.11	0.08	0.40**	0.09
3. Encouragement			__	0.35**	0.24*	0.50**	0.14	0.09	0.01
4. Surprise				__	0.40**	0.21*	0.06	0.24*	0.47
5. Smile / Laughter					__	0.29**	0.18	0.23*	0.18
6.Assurance G.						__	0.04	0.11	0.09
7.Approach							__	0.20*	0.08
8. Physical Affection								__	0.09
9. Physical Contact									__

*$p < .05$, **$p < .01$

Table 6

Intercorrelations Between Negative Emotional Expressiveness Variables (n = 107)

Variables	1	2	3	4	5	6	7
		(*N* = 107)					
1. Critical Statements	__	0.35**	0.15	0.29**	0.15	0.11	0.27**
2. Verbal Aggression		__	0.03	0.20*	0.29**	0.14	0.32**
3. Sarcasm			__	0.04	-0.11	0.27**	0.21*
4. Physical Intervention with Objects				__	0.22*	0.22*	0.24*
5. Physical Intervention with Child					__	-0.05	0.09
6. Frustration						__	0.31**
7.Disapproval / Indifference							__

*$p < .05$, **$p < .01$

Table 7

Correlations among Predictor Variables and Maternal Emotional Expressiveness

	1	2	3	4	5	6	7	8	9	10	11	12
						(N = 107)						
1. Childhood Aggression	—	-0.07	0.42**	-0.25**	0.04	0.06	-0.01	-0.03	0.11	-0.15	0.10	-0.07
2. Chidhood Withdrawal		—	0.18	-0.19	-0.05	-0.01	-0.20*	0.02	-0.12	-0.10	0.03	-0.09
3. Childhood Aggression and Withdrawal			—	-0.11	0.10	0.09	-0.14	-0.04	-0.13	-0.04	0.03	-0.09
4. Mothers' Education				—	-0.08	0.13	0.12	-0.27**	0.06	0.09	-0.25**	-0.17
5. Child Age					—	-0.12	-0.24*	-0.10	0.32**	-0.08	0.36**	0.39**
6. Child Sex						—	0.13	-0.09	0.16	0.04	-0.05	-0.03
7. Positive Emotions							—	0.73**	0.74**	0.66**	-0.09	0.16
8. Negative Emotions								—	-0.23*	0.31**	0.77**	0.54**
9. Pure Positive Emotions									—	0.00	0.04	-0.17
10. Reassurance Behaviors										—	-0.06	0.35**
11. Negative Emotions (Direct)											—	0.00
12. Negative Emotions (Indirect)												—

*$p < .05$, **$p < .01$

Table 8

Correlations among Predictor Variables and Parenting Behaviors

	1	2	3	4	5	6	7	8	9	10	11	12	13
						(N = 107)							
1. Childhood Aggression	—	-0.07	0.42**	-0.25**	0.04	0.06	0.02	0.19	0.09	0.21*	0.22	-0.17	0.17
2. Chidhood Withdrawal		—	0.18	-0.19	-0.05	-0.01	-0.07	0.12	0.04	0.05	0.17	0.10	0.24*
3. Childhood Aggression and Withdrawal			—	-0.11	0.10	0.09	0.02	0.21*	-0.10	-0.10	0.16	0.00	0.17
4. Mothers' Education				—	-0.08	0.13	-0.08	-0.35**	-0.07	-0.07	-0.12	0.01	-0.14
5. Child Age					—	-0.12	0.11	0.14	-0.46**	0.00	-0.07	0.01	-0.02
6. Child Sex						—	-0.02	-0.07	-0.03	-0.10	-0.03	0.00	0.00
7. Constructive Attitude towards Error							—	0.25**	0.26**	0.01	0.10	0.36**	-0.01
8. Critical Attitude towards Error								—	-0.06	0.42**	0.33**	0.10	0.12
9. Positive Limit Setting									—	0.19**	0.09	-0.13	-0.11
10. Negative Limit Setting										—	0.15	-0.03	-0.06
11. Problem Solving											—	0.23*	-0.08
12. Prompts / Questions												—	0.05
13. Demonstration													—

*$p < .05$, **$p < .01$

emotional expressiveness and parenting behaviors. Results are presented in the following order: first, maternal emotional expressiveness (positive and negative emotional expressions) followed by significant within-category analyses for these dimensions; second, results for parenting behaviors: teaching behaviors (i.e., problem-solving, prompts/questions and demonstration), limit setting (i.e., positive and negative) and attitude towards error (i.e., constructive and critical). For each of the regression analyses that were found to be significant, a table is provided in the text. When the results of the analysis were not significant, a summary table of the regression is provided in an Appendix (Appendix G, Tables G-1 to G-4). Each table reports the standardized regression coefficient (*Beta*), the semi-partial correlation (sr^2) and the *t* value associated which each predictor, as well as R^2_{ch} and F_{ch} after the entry of all predictors for each step.

Before conducting the regression analyses for the dependent variables included in both categories of maternal behaviors (i.e., maternal emotional expressiveness and parenting behaviors), the relationship between total maternal behavior and the independent variables were analyzed. Three sets of hierarchical regressions were conducted in order to clarify how the overall number of maternal interventions (i.e., total maternal behaviors, total emotional expressiveness, and total parenting behaviors), varied as a function of childhood levels of aggression and/or social withdrawal. Demographic variables were also included in this descriptive analysis. As Appendix H, Table H1 – H3 shows, childhood levels of aggression and social withdrawal did not predict Total Maternal Behaviors or Total Emotional Expressiveness. However, childhood levels of social Withdrawal were significantly related to the total number of Parenting Behaviors. Mothers with histories of childhood withdrawal were more likely to display parenting

behaviors (both positive and negative), while interacting with their children.

Maternal Emotional Expressiveness

After conducting a factor analysis which included all maternal emotional expressions, both positive and negative, two main factors were retained which explained most of the variance. Positive Emotions (Encouragement, Surprise, Approach, Verbal Affection, Humour, Smile, Assurance Gestures, Physical Affection and Physical Contact) loaded on factor number one (this factor had an Eigenvalue of 2.37 and explained 26.4% of the variance) and Negative Emotions (Critical Statements, Aggression, Sarcasm, Physical Intervention with Objects and Child, Frustration and Disapproval) loaded on factor 2 (Eigenvalue = 1.49, 16.6% of the variance explained). Table 9 depicts the factor loadings for each of the variables included under these categories.

Prediction of Maternal Positive Emotional Expressiveness: The regression examining Positive Expressiveness explained 12% (7% adjusted) of the total variance as shown in Table 10. A significant multiple R was obtained after all the independent variables were entered at step 4, $F = 2.31$, $p < .05$. Mother's levels of childhood Withdrawal emerged as significant when entered at the first step, *Beta* = -.20, $p < .05$ and explained 4% of the total variance.

Mothers with higher levels of childhood Withdrawal were less likely to express positive emotions when interacting with their children. Child Age entered at the third step explained an additional 7% of the total variance, *Beta* = -.23, $p < .05$; mothers of younger children expressed more positive emotions during the interaction. Maternal childhood Withdrawal was only a trend at the final step, whereas child Age remained significant when all the predictors were entered in the equation.

Table 9

Factor Loadings for Positive and Negative Maternal Emotional Expressiveness

Variables	Factor Loadings
Factor 1: Positive Emotional Expressiveness	
Encouragement / Positive Feedback	0.54
Surprise	
Approach / Physical Proximity	0.68
Verbal Affection	0.31
Humour / Jokes	0.26
Smile / Laughter	0.48
Assurance Gestures	0.72
Physical Affection	0.59
Physical Contact	0.52
	0.23
Factor 2: Negative Emotional Expressiveness	
Critical Statements / Negative Feedback	0.55
Verbal Aggression	0.61
Sarcasm	0.32
Physical Intervention with Objects	0.56
Physical Intervention with Child	0.23
Frustration	0.52
Disapproval / Indifference	0.72

Table 10

Results of Hierarchical Regression Analysis Predicting Positive Emotional Expressiveness (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.04	2.26
Childhood Aggression	-0.02	-0.02	-0.23		
Childhood Withdrawal	-0.20	-0.20	-2.13 *		
Step 2				0.01	0.73
Childhood Aggression	0.00	0.00	0.02		
Childhood Withdrawal	-0.19	-0.18	-1.89 ^{t}		
Maternal Education	0.09	0.08	0.85		
Step 3				0.07	3.77 *
Childhood Aggression	-0.01	-0.01	-0.06		
Childhood Withdrawal	-0.20	-0.20	-2.12 *		
Maternal Education	0.05	0.05	0.51		
Child Age	-0.23	-0.23	-2.44 *		
Child Gender	0.10	0.09	1.00		
Step 4				0.01	0.87
Childhood Aggression	0.04	0.03	0.35		
Childhood Withdrawal	-0.18	-0.17	-1.83 ^{t}		
Maternal Education	0.06	0.05	0.55		
Child Age	-0.22	-0.22	-2.31 *		
Child Gender	0.10	0.10	1.07		
Childhood Aggression/ Withdrawal	-0.10	-0.09	-0.93		
	R = .12		R^2Adj = .07	F = 2.31*	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Prediction of Maternal Negative Emotional Expressiveness: The regression examining maternal negative emotional expressiveness accounted for 13% (8% adjusted) of the total variance (Table 11). Once all the predictors were entered at the fourth step a significant multiple R, $F = 2.56$, $p < .05$, was obtained. Maternal levels of Aggression and Withdrawal did not explain any of the total variance when entered at the first step. However, when maternal Education was entered into the equation at the second step it explained 9% of the variance, *Beta* = -.31, $p < .01$. Less educated mothers were more likely to express negative emotions while interacting with their children. Maternal Education was still significant at the last step.

Prediction of Within-Category Factors

Positive Emotional Expressiveness:

In order to conduct further investigation within the categories of positive and negative emotional expressiveness, a principal components factor analysis was carried out separately for positive and negative emotional expressions. For Positive Emotional Expressiveness two main factors were obtained. Factor 1 had an Eigenvalue of 2.37 and explained 26.4 % of the variance. It included Verbal Affection, Humour, Smile/Laughter, Physical Affection and Surprise. Variables loading on this factor are shown in Table 12. This factor was labelled *Pure Positive Emotional Expressiveness* since the variables loading on this factor were pure expressions of maternal affect. Factor number 2 was labelled *Reassurance Behaviors* (Eigenvalue = 1.33). It explained 16.6% of the variance

Table 11

Results of Hierarchical Regression Analysis Predicting Negative Emotional Expressiveness (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.00	0.06
Childhood Aggression	-0.03	-0.03	-0.25		
Childhood Withdrawal	0.02	0.02	0.22		
Step 2				0.09	9.63 **
Childhood Aggression	-0.11	-0.10	-1.10		
Childhood Withdrawal	-0.04	-0.04	-0.43		
Maternal Education	-0.31	-0.29	-3.10 **		
Step 3				0.02	1.01
Childhood Aggression	-0.10	-0.10	-1.71		
Childhood Withdrawal	-0.05	-0.05	-0.50		
Maternal Education	-0.31	-0.29	-3.07 **		
Child Age	-0.13	-0.13	-1.34		
Child Gender	-0.06	-0.06	-0.61		
Step 4				0.03	3.30 ^{t}
Childhood Aggression	-0.19	-0.16	-1.71		
Childhood Withdrawal	-0.09	-0.09	-0.93		
Maternal Education	-0.32	-0.30	-3.19 **		
Child Age	-0.15	-0.15	-1.56		
Child Gender	-0.07	-0.07	-0.75		
Childhood Aggression/ Withdrawal	0.19	0.17	1.82		
	R = .13		R^2Adj = .08	F = 2.56*	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Table 12

Factor Loadings for Positive Emotional Expressiveness

Variables	Factor Loadings
Factor 1: Pure Emotions	
Verbal Affection	0.58
Humour / Jokes	0.80
Smile / Laughter	0.61
Physical Affection	0.69
Surprise	0.55
Factor 2: Reassurance Behaviors	
Encouragement / Positive Feedback	0.85
Assurance Gestures	0.71
Physical Contact	0.44
Approach / Physical Proximity	0.51

and included the following variables: Encouragement/Positive Feedback, Assurance Gestures, Physical Contact and Approach/Physical Proximity. Hierarchical regressions were conducted for each factor however, only the regression conducted for *Pure Positive Emotional Expressiveness* was significant.

Prediction of Pure Positive Emotional Expressiveness: The regression examining mothers' childhood Aggression and Withdrawal as predictors of maternal expression of pure positive emotions accounted for 17% (12% adjusted) of the total variance (Table 13). However, childhood levels of Aggression and Withdrawal did not significantly predict the expression of positive emotions. Child Age explained 12% of the variance when entered at the third step (*Beta* = .31, $p < .001$) and it remained significant when all the predictors were entered at the last step. Mothers of younger children were more likely to express pure positive emotions than mothers of older children.

Prediction of Reassurance Behaviors: This regression did not reach significance and only explained 5% of the variance. Appendix G, Table G-1 shows the results.

Negative Emotional Expressiveness:

In the case of mothers' expression of negative emotional expressions as predicted by childhood levels of Aggression and Withdrawal, two main factors were obtained. The first factor comprised direct expressions of negative emotions and the following variables were included: Verbal Aggression, Physical Intervention with the Objects, Physical Intervention with the Child, as well as Critical Statements/Negative Reinforcement. This factor was labelled *Direct Expressions of Negative Emotions* and had an Eigenvalue of 2.14 and explained 30.7% of the variance. A second factor was obtained and explained 19% of the variance with an Eigenvalue of 1.33. This factor was labelled *Indirect*

Table 13

Results of Hierarchical Regression Analysis Predicting Pure Positive Emotional Expressiveness (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.03	1.35
Childhood Aggression	0.11	0.11	1.09		
Childhood Withdrawal	-0.11	-0.11	-1.15		
Step 2				0.01	0.50
Childhood Aggression	0.13	0.12	1.24		
Childhood Withdrawal	-0.10	-0.09	-0.97		
Maternal Education	0.07	0.07	0.71		
Step 3				0.12	6.79 **
Childhood Aggression	0.12	0.11	1.22		
Childhood Withdrawal	-0.12	-0.12	-1.26		
Maternal Education	0.03	0.03	0.29		
Child Age	-0.31	-0.31	-3.36 ***		
Child Gender	0.11	0.11	1.14		
Step 4				0.02	2.90 ^{t}
Childhood Aggression	0.20	0.17	1.85		
Childhood Withdrawal	-0.08	-0.08	-0.82		
Maternal Education	0.04	0.03	0.37		
Child Age	-0.29	-0.29	-3.17 **		
Child Gender	0.12	0.12	1.28		
Childhood Aggression/ Withdrawal	-0.18	-0.16	-1.70		
	R = .17		R^2Adj = .12	F = 3.39**	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Expressions of Negative Emotions and comprised the following variables: Sarcasm, Frustration, and Disapproval/Indifference. Table 14 depicts the factor loadings for each of the variables included under these categories. Factor scores were created for both factors and two hierarchical regressions were conducted in order to examine the contributions of childhood histories of Aggression and Withdrawal to maternal negative emotional expressiveness. Both regressions were significant and the results are presented in Tables 15 and 16.

Prediction of Mothers' Direct Expressions of Negative Emotions: As Table 15 illustrates, the regression predicting direct maternal expressions of negative emotions accounted for 22% (18% adjusted) of the total variance. Neither childhood levels of Aggression nor Withdrawal predicted mothers' direct expression of negative emotions during the interaction. Maternal Education (*Beta* = -.25, $p < .01$) significantly explained 6% of the variance when entered at the second step and remained significant at the final step when all the predictors were entered in the equation. Less educated mothers were more likely to express negative emotions in a direct way than more educated mothers. Child Age explained an additional 15% of the variance at Step 3 (*Beta* = -.39, $p < .001$) and was still significant at the last step where a significant multiple R was obtained, $F = 4.78$, $p < .001$. Mothers of younger children were more likely to directly express negative emotions than mothers of older children.

Prediction of Mothers' Indirect Expressions of Negative Emotions: This regression examining the prediction of childhood levels of Aggression and Withdrawal to the indirect expression of maternal negative emotions and accounted for 22% (18% adjusted) of the total variance (Table 15). Childhood levels of Aggression became

Table 14

Factor Loadings for Negative Emotional Expressiveness

Variables	Factor Loadings
Factor 1: Direct Expressions	
Verbal Aggression	0.72
Physical Intervention with Objects	0.59
Physical Intervention with Child	0.64
Critical Statements / Negative Feedback	0.63
Factor 2: Indirect Expressions	
Sarcasm	0.73
Frustration	0.71
Disapproval / Indifference	0.51

Table 15

Results of Hierarchical Regression Analysis Predicting Direct Expressions of Negative Emotions(N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.01	0.55
Childhood Aggression	0.10	0.10	1.00		
Childhood Withdrawal	0.04	0.04	0.39		
Step 2				0.06	6.11 **
Childhood Aggression	0.03	0.03	0.31		
Childhood Withdrawal	-0.01	-0.01	-0.13		
Maternal Education	-0.25	-0.24	-2.47 **		
Step 3				0.15	9.62 ***
Childhood Aggression	0.04	0.04	0.44		
Childhood Withdrawal	-0.04	-0.04	-0.40		
Maternal Education	-0.27	-0.25	-2.88 **		
Child Age	-0.39	-0.39	-4.38 ***		
Child Gender	-0.06	-0.06	-0.64		
Step 4				0.01	0.98
Childhood Aggression	0.00	0.00	-0.02		
Childhood Withdrawal	-0.06	-0.06	-0.63		
Maternal Education	-0.28	-0.26	-2.92 **		
Child Age	-0.40	-0.39	-4.47 ***		
Child Gender	-0.06	-0.06	-0.71		
Childhood Aggression/ Withdrawal	0.10	0.09	0.99		
	R = .22		R^2Adj = .18	F = 4.78***	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Table 16

Results of Hierarchical Regression Analysis Predicting Indirect Expressions of Negative Emotions(N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.01	0.74
Childhood Aggression	-0.08	-0.08	-0.78		
Childhood Withdrawal	-0.10	-0.10	-0.99		
Step 2				0.05	5.26 *
Childhood Aggression	-0.14	-0.13	-1.39		
Childhood Withdrawal	-0.14	-0.14	-1.47		
Maternal Education	-0.23	-0.22	-2.29 *		
Step 3				0.14	8.90 ***
Childhood Aggression	-0.15	-0.14	-1.58		
Childhood Withdrawal	-0.12	-0.12	-1.32		
Maternal Education	-0.21	-0.19	-2.17 *		
Child Age	0.38	0.38	4.24 ***		
Child Gender	0.05	0.05	0.50		
Step 4				0.02	2.34
Childhood Aggression	-0.22	-0.19	-2.10 †		
Childhood Withdrawal	-0.16	-0.15	-1.66		
Maternal Education	-0.21	-0.20	-2.25 *		
Child Age	0.37	0.36	4.06 ***		
Child Gender	0.04	0.03	0.39		
Childhood Aggression/ Withdrawal	0.15	0.14	1.53		
	R = .22		R^2Adj = .18	F = 4.75***	

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

significant at Step 4 when the rest of the predictors were entered (*Beta* = -.22, $p < .05$) and explained an additional 2% of the total variance. Mothers who were aggressive as children were less likely to show indirect expressions of emotions. However, higher proportions of the variance were significantly explained by maternal Education at Step 2 (*Beta* = -.23, $p < .05$) and child Age at Step3 (*Beta* =.38, $p < .001$) that accounted for 5% and 14% respectively. Less educated mothers and mothers of older children were more likely to show indirect expressions of negative emotions.

Parenting Behaviors

Teaching Behaviors:

The hierarchical regressions predicting *Problem-Solving* and *Prompts / Questions* were not significant. Appendix G, Tables G- 2 and G- 3 show the results.

Demonstration. Table 17 indicates that the hierarchical regression predicting maternal use of demonstration explained 10% (5% adjusted) of the total variance. Although the multiple R did not reach significant at the last step, maternal levels of Aggression and Withdrawal emerged as significant predictors of demonstration when entered at the first step, *Beta* = .18, $p < .05$; *Beta* = .25, $p < .01$ respectively and together accounted for 9.5% of the total variance explained. Only maternal Withdrawal remained significant at the last step once all the predictors were entered, *Beta* = .23, $p < .05$ indicating that mothers with childhood histories of Withdrawal were more likely to use demonstration (i.e., negative teaching strategy) when interacting with their children.

Limit Setting:

Positive Limit Setting: The hierarchical regression predicting positive limit setting explained 25% (21% adjusted) of the total variance. Table 18 indicates that the multiple

Table 17

Results of Hierarchical Regression Analysis Predicting Demonstration (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.10	5.45 **
Childhood Aggression	0.19	0.19	2.02 *		
Childhood Withdrawal	0.26	0.26	2.75 **		
Step 2				0.00	0.25
Childhood Aggression	0.18	0.17	1.80		
Childhood Withdrawal	0.25	0.24	2.57 *		
Maternal Education	-0.05	-0.05	-0.50		
Step 3				0.00	0.01
Childhood Aggression	0.18	0.17	1.77		
Childhood Withdrawal	0.25	0.24	2.53 *		
Maternal Education	-0.05	-0.05	-0.49		
Child Age	-0.01	-0.01	-0.15		
Child Gender	-0.01	0.00	-0.05		
Step 4				0.00	0.35
Childhood Aggression	0.15	0.13	1.34		
Childhood Withdrawal	0.23	0.22	2.30 *		
Maternal Education	-0.05	-0.05	-0.52		
Child Age	-0.02	-0.02	-0.22		
Child Gender	-0.01	-0.01	-0.09		
Childhood Aggression/ Withdrawal	0.06	0.06	0.60		
	R = .10		R^2Adj = .05	F = 1.86 t	

Note: tp<.10" *p<.05, **p<.01, ***p<.001

Table 18

Results of Hierarchical Regression Analysis Predicting Positive Limit Setting (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.01	0.55
Childhood Aggression	0.10	0.10	0.99		
Childhood Withdrawal	0.04	0.04	0.43		
Step 2				0.00	0.14
Childhood Aggression	0.09	0.08	0.84		
Childhood Withdrawal	0.03	0.03	0.34		
Maternal Education	-0.04	-0.04	-0.37		
Step 3				0.23	15.10 ***
Childhood Aggression	0.10	0.10	1.10		
Childhood Withdrawal	0.01	0.01	0.06		
Maternal Education	-0.07	-0.06	-0.70		
Child Age	-0.48	-0.48	-5.49 ***		
Child Gender	-0.08	-0.08	-0.92		
Step 4				0.01	1.52
Childhood Aggression	0.15	0.13	1.53		
Childhood Withdrawal	0.03	0.03	0.35		
Maternal Education	-0.06	-0.06	-0.65		
Child Age	-0.47	-0.46	-5.32 ***		
Child Gender	-0.07	-0.07	-0.83		
Childhood Aggression/ Withdrawal	-0.12	-0.11	-1.23		
	R = .25		R^2Adj = .21	F = 5.57***	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

R was significant at the last step, $F = 5.57, p < .001$. Child Age explained most of the variance (23%) when entered at the third step, $Beta = -.48, p < .001$ and remained significant when all the predictors were entered. Mothers of younger children were more likely to limit set in a positive way than mothers of older children.

Negative Limit Setting: In the regression examining the use of negative limit setting Table 19 indicates that the hierarchical regression accounted for 18% (13% adjusted) of the total variance. A significant multiple R was obtained after all the independent variables were entered at step 4, $F = 3.66, p < .01$. Maternal childhood Aggression emerged as significant when entered at the first step, $Beta = .21, p < .05$ and explained 5% of the total variance accounted for. Mothers with high levels of childhood Aggression were more likely to limit set in a negative manner when interacting with their children. However, when maternal Education was entered at step 2 maternal childhood Aggression was no longer significant and maternal Education explained significantly 12% of the total variance, $Beta = -.37, p < .001$. Maternal education was still significant once all the predictors were entered at the last step indicating that less educated mothers were more likely to limit set in a negative way.

Attitude towards Children's Errors:

Constructive Attitude towards Error: The hierarchical regression examining maternal attitude towards children's errors only accounted for 2 % of the total variance. The multiple R did not reveal significance after all the predictors were entered at Step 4. Neither childhood levels of Aggression or Withdrawal predicted constructive maternal attitude towards children's mistakes, nor did the maternal or child demographic variables (Appendix G, Table G-4).

Table 19

Results of Hierarchical Regression Analysis Predicting Negative Limit Setting (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.05	2.65 ^{t}
Childhood Aggression	0.21	0.21	2.24 *		
Childhood Withdrawal	0.07	0.07	0.70		
Step 2				0.12	14.94 ***
Childhood Aggression	0.12	0.11	1.23		
Childhood Withdrawal	-0.01	-0.01	-0.09		
Maternal Education	-0.37	-0.35	-3.87 ***		
Step 3				0.01	0.35
Childhood Aggression	0.12	0.12	1.30		
Childhood Withdrawal	-0.01	-0.01	-0.10		
Maternal Education	-0.36	-0.34	-3.71 ***		
Child Age	-0.04	-0.04	-0.49		
Child Gender	-0.68	-0.07	-0.74		
Step 4				0.01	0.65
Childhood Aggression	0.09	0.08	0.82		
Childhood Withdrawal	-0.03	-0.03	-0.29		
Maternal Education	-0.36	-0.34	-3.74 ***		
Child Age	-0.05	-0.05	-0.57		
Child Gender	-0.07	-0.07	-0.79		
Childhood Aggression/ Withdrawal	0.08	0.07	0.81		
	R = .18		R^2Adj = .13	F = 3.66**	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Critical Attitude towards Error: Table 20 indicates that the hierarchical regression predicting maternal critical attitude towards children's mistakes accounted for 17% (12% adjusted) of the total variance. A significant multiple R, $F = 3.32, p < .01$ was obtained once all the predictors were entered at the last step. Levels of maternal childhood Aggression was significant at Step 1, *Beta* = .20, $p < .05$ and accounted for 5% of the total variance explained. Mothers with childhood histories of Aggression were more likely to be critical towards their children's mistakes. Maternal Education emerged as significant at Step 2, *Beta* = -.31, $p < .01$ (explained 9% of the remaining variance) and maternal levels of Aggression was no longer significant. Maternal Education remained significant at the last step indicating that less educated mothers were more likely to be critical towards their children's errors during the puzzle task.

Table 20

Results of Hierarchical Regression Analysis Predicting Critical Attitude towards Children's Errors (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.05	2.95 ^{t}
Childhood Aggression	0.20	0.20	2.08 *		
Childhood Withdrawal	0.13	0.13	1.39		
Step 2				0.09	10.11 **
Childhood Aggression	0.12	0.11	1.22		
Childhood Withdrawal	0.07	0.07	0.75		
Maternal Education	-0.31	-0.29	-3.18 **		
Step 3				0.02	0.89
Childhood Aggression	-0.12	0.11	1.22		
Childhood Withdrawal	0.08	0.08	0.84		
Maternal Education	-0.29	-0.28	-2.99 **		
Child Age	0.12	0.12	1.27		
Child Gender	-0.03	-0.03	-0.27		
Step 4				0.01	1.57
Childhood Aggression	0.06	0.05	0.57		
Childhood Withdrawal	0.05	0.05	0.51		
Maternal Education	-0.30	-0.28	-3.05 **		
Child Age	0.10	0.10	1.12		
Child Gender	-0.03	-0.03	-0.37		
Childhood Aggression/ Withdrawal	0.13	0.12	1.26		
	R = .17		R^2Adj = .12	F = 3.32**	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Discussion

The main objective of the present study was to examine parenting in high-risk mothers who had histories of childhood aggression and/or withdrawal. Two main components of parenting were evaluated: maternal emotional expressiveness and parenting practices associated with the use of control and teaching behaviors (i.e. teaching behaviors, limit setting, attitude towards children's mistakes). The results provide partial support that mothers' childhood histories of aggression and/or social withdrawal predict parenting styles, underscoring the importance of including parents' histories in the prediction of parenting and childrearing styles. Support was also obtained for the hypothesis that demographic variables such as child age and maternal education would contribute to the development of specific parental attitudes and behaviors. A detailed discussion of the findings is presented below beginning with prediction of maternal emotional expressiveness and ending with the prediction of parenting behaviors. Implications and future directions follow.

Maternal Emotional Expressiveness

Maternal emotional expressiveness was examined as a crucial element of parenting as well as one of the vehicles by which parenting might function as a pathway for the intergenerational transfer of risk. Mothers' childhood risk status was predictive of maternal emotional expressiveness: specifically, mothers with histories of social withdrawal were less likely to express positive emotions while interacting with their children. This finding is consistent with recent results from the Concordia project regarding withdrawn girls (Grunzeweig, 2003), and underscores the importance of including emotional variables in the prediction of parenting styles. Since emotional dysregulation and deficient social skills might have a pervasive effect on the mother-child interaction, the analysis of parental emotional expressiveness becomes

especially relevant for mothers with histories of psychosocial problems.

The effects of childhood histories of withdrawal on parenting may be related to mothers' less developed social skills which might result in less stimulation to their children. In a study conducted within the Concordia project, Bentley (2002) found that mothers with histories of childhood withdrawal had less responsive children, which was possibly associated with mothers' poor socialization skills. The present findings draw attention to the shortage of positive emotional expressiveness during dyadic interactions that may have a less evident but nonetheless gradual impact on children's development when compared to more pervasive maternal dispositions such as aggression, or depression. The restriction of positive emotions might result in a less favourable caregiving environment for children and ultimately, affect their socio-emotional competence (Dix, 1991). Previous studies of mothers' emotions have demonstrated that large amounts of maternal warmth, for example, serves as a protective factor against risks associated with peer rejection and behavior problems (Patterson, Cohn, & Kao, 1989). Although the present study was not designed to identify the specific effects of maternal variables on the next generation's development, the reduced emotional expressiveness of withdrawn mothers might be a potential pathway for the intergenerational transfer of risk in this population. Further investigations of children's development are warranted to complement this analysis.

Regarding negative emotional expressiveness, childhood levels of aggression and withdrawal was not a strong predictor of maternal negative expressiveness. This weak association might be explained by the fact that maternal behaviors were observed within a short period of time in a setting where mothers were being recorded and possibly, tended to express more socially desirable behaviors. Although a broad range of verbal and nonverbal negative emotional expressions were coded (e.g., critical statements, disapproval gestures, frustration,

boredom, sarcasm, etc.), most of the expressions of negative emotions were low in frequency.

Unlike maternal expression of positive emotions, negative emotions were strongly predicted by mothers' levels of education. Maternal education was negatively associated with both direct and indirect expressions of negative emotions by mothers. This finding is not surprising due to the "buffering" effect attributed to parental education (Serbin et al., 1998; 2004). Well educated mothers have more intellectual resources and easier access to socio-economic resources, relative to less educated mothers. Therefore, more educated mothers are more likely to recognize the negative value attributed to the expression of these emotions in the context of the parent-child relationship. Parental negative emotions such as anger and hostility are socially unacceptable and their negative consequences in children's behavior are largely demonstrated (Denham, 1989; Landy, 2002; McFadyen-Ketchum et al., 1996). Higher levels of maternal education might increase knowledge about adequate child-rearing practices and prevent well educated mothers from expressing emotions that are known to be detrimental to children's socio-emotional development (e.g., aggression, sarcasm, physical intervention).

Maternal education (i.e., academic ability and educational achievement) has been identified as a protective factor within the Concordia sample. Girls with histories of childhood aggression who completed their studies have more positive behavioral outcomes, are more socially integrated and ultimately, provide a more favourable child-rearing environment for their children (Saltaris, 1999). The present finding that maternal education also contributes to parents' emotional expressiveness by modulating the expression of negative emotions to their children corroborates the hypothesis that mothers' education is an important pathway for the transfer of behavioral styles, knowledge, as well as emotions. Future studies within the Concordia study could be designed to disentangle the different pathways by which childhood aggression impacts

maternal education, which in turn, impacts parental practices and therefore, the next generation's psychosocial development. For example, other parenting behaviors that have been shown to be associated with mother's cultural level and educational status, such as the use of discipline, punishment and control (Baumrind, 1991; 1997), could be studied in order to discover other pathways by which childhood aggression is still impacting the development of the second generation, and consequently, develop targeted psychosocial interventions for this high-risk population.

Interestingly, mothers with histories of aggression were less likely to express negative emotions indirectly (e.g., sarcasm, disapproval, frustration). That is, mothers with higher levels of childhood aggression expressed less negative emotions in a passive-aggressive way. A possible explanation for this result is that these mothers might tend to express negative emotions in a direct (e.g., physical aggression, verbal aggression) rather than in an indirect way. However, mothers' levels of childhood aggression did not significantly predict mothers' expression of negative emotions in a direct way in this study. Another possible explanation is the fact that indirect ways of expressing emotions involve more sophisticated ways of communicating, which are not compatible with an aggressive style. Aggressive mothers might lack the necessary emotional regulation in order to control direct negative feelings like anger and physical intervention when interacting with their children. Further studies of parenting should include maternal emotional expressiveness but also some indicators of self-regulation and communication style as well. Measuring current levels of maternal emotionality, stress, and coping mechanisms may also shed light on mothers' impact on children's emotional development.

Bentley (2002) found that higher levels of childhood aggression combined with higher

levels of withdrawal significantly predicted mothers' hostility (i.e., sarcasm, impatience, and boredom) in the Concordia project. Although this was not the case for the present study, childhood withdrawal and its restrictive consequences in terms of social skills, may be aggravating the expression of covert negative affect for these mothers. Further studies should be conducted in order to clarify these findings. The discrepant results may be due to the use of different methods for coding maternal behaviors. Bentley's study (2002) used global ratings of the mother-child interactions, whereas the present study compiled all possible discrete behaviors occurring in each 10-second interval. Moreover, the puzzle task provides a teaching context where mothers were possibly displaying more desirable than undesirable behaviors. Specifically, indirect expressions of emotions (i.e., sarcasm, frustration, boredom, disapproval, disengagement) were low in frequency, and while this might also have been the case for Bentley, the global coding may have handled them differently.

Child age was another variable taken into account in the prediction of parenting styles in the present study. Age-related parental behaviors are important in order to identify sensitive developmental periods in children, especially when they are known to be exposed to psychosocial risk via dysfunctional parenting. Age effects in the present study might also contribute to the understanding of parenting in general, and to help characterize the bidirectional influences occurring within the mother-child relationship. Although this study was mostly focused on the parental side, child characteristics are known to influence parents' emotions and behaviors. Child age was negatively associated with maternal expressions of positive emotions, and particularly of pure positive emotions (i.e., verbal affection, humour, smile, physical affection and surprise) and negatively related to direct expressions of negative emotions (i.e., verbal aggression, physical intervention, and critical statements). That is, as children aged

mothers tended to express less positive emotions as well as less direct expressions of emotions. Increased child age however, predicted more indirect expressions of negative emotions such as sarcasm, frustration and disapproval. The evolution of maternal emotional expressiveness from direct to indirect expressions of emotions is consistent with a developmental view. As children get older, they gain a better understanding of emotions by interacting with parents and other children and therefore, the complexity of parental emotional expressions increases (Denham, 1986; Jenkins & Ball, 2000). Indirect emotions such as sarcasm require a higher level of cognitive and emotional processing in order for the child to understand the significance. In addition, new developmental tasks in older children such as learning or socialization, might substitute for parental efforts in providing emotional comfort or protection to the child.

Parenting Behaviors

The second dimension of parenting investigated in the present study were specific parenting behaviors. The predictiveness of mothers' childhood risk status was greater for parenting behaviors than for maternal expressiveness in this sample of high-risk mothers. Three different aspects were measured under parenting behaviors: teaching behaviors, limit setting, and attitude towards children's mistakes during the task. Childhood aggression and/or social withdrawal in these mothers appeared to define different parenting styles in terms of which behaviors are more salient for previously aggressive and/or withdrawn mothers. Mothers with histories of childhood withdrawal were found to be more likely to display negative teaching behaviors (i.e., demonstration), whereas mothers with histories of childhood aggression were more likely to use negative limit setting and critical attitude towards error. Interestingly, maternal education did not predict mothers' use of teaching strategies.

Different trajectories for parenting behaviors in previously aggressive and/or withdrawn

girls are consistent with recent finding from the Concordia study. DeGenna (2005) found that aggressive and withdrawn girls who became mothers within the Concordia sample, displayed different health trajectories. Aggressive girls compromised the next generation's development by engaging in risk-taking behaviors (e.g., smoking), whereas withdrawn girls presented health-related problems during pregnancy, which ultimately affected their children's health. Results from the present study also suggest different emotional expressiveness and parenting styles for these mothers. Future studies might explore the relationship between expression of emotions, behavior and mothers' physical and psychological well-being.

A possible explanation for the fact that maternal childhood risk status has a direct influence, for example, in the likelihood of displaying more negative teaching behaviors for withdrawn mothers, is that parenting behaviors are a direct result of parents' previous experiences with their own parents. This is the case for the demonstrated replication of disciplinary, abusive and addictive behaviors in the next generation (Belsky, 1984; Fry, 1993; Kalmuss, 1984). Due to the fact that the psychosocial difficulties of these children were detected as early as 6-7 years of age, they might have reflected underlying difficulties in their parents' child-rearing practices. Other socialization entities (i.e., school) were only beginning to influence behavioral patterns already established in their families of origin. However, no data was collected regarding parenting practices at that time of the project and it can only be inferred that these children did not have optimal socialization when they entered school.

The fact that mothers with histories of childhood withdrawal were more likely to display teaching behaviors with their children is also noteworthy. However, it was the use of negative teaching strategies (i.e., demonstration) that was predicted by childhood risk status, and specifically by childhood withdrawal. Negative teaching behaviors were coded when mothers

devoted less effort to helping and guiding their children and they tended to complete the puzzle by themselves without explanations. Therefore, mothers with histories of childhood withdrawal seemed to be predominantly using these non-constructive strategies rather than strategies which provide the child with tools and knowledge to be able to independently solve similar problems in the future. Positive teaching strategies such as problem-solving and giving prompts and questions, which reflect maternal scaffolding abilities and educational skills, were not predicted by childhood risk status.

Studies with depressed mothers with a withdrawn interactive style have shown that although these mothers are able to show more empathy towards their children (Jones et al., 2001), they consistently showed negative behaviors such as boredom, physical distance, underinvolvement, as well as higher levels of distress in their everyday interactions. These interactive styles may color mothers' perceptions of their children and their attitudes towards them and ultimately, limit their capacity to cognitively stimulate their children (Hart et al., 1999; Hart, Jones, & Field, 2003).

In addition, mothers' behaviors have been found to influence children's problem-solving abilities. That is, some mothers tend to intervene and offer levels of help while others become more active during learning tasks, limiting the children's opportunity to discover problem-solving strategies on their own (Fagot, & Gauvain, 1997). This seem to be the case for mothers with histories of withdrawal in this study, who might be limiting their children's cognitive development by displaying teaching behaviors which prioritize demonstrating the answers in learning situations instead of guiding their children's learning processes.

Mothers with histories of childhood withdrawal might lack the necessary social skills to be able to develop and promote their children's cognitive development in more effective ways.

Children's withdrawn behavior has been found to predict more dependent relationships with teachers at school (Lad & Burgess, 1999), an avoidant social style, and more likelihood for peer victimization (Bowker, Bukowski, Hymel, & Sippola, 2000). A vicious cycle is thus established when withdrawn children enter school resulting in more withdrawn behaviors, and therefore, less opportunities to develop social skills and problem solving abilities. Finally, when withdrawn girls become mothers, their history of impoverished social skills might negatively impact on their teaching and parenting styles.

In a previous study with the Concordia project, Saltaris (1999) showed that mothers with histories of childhood aggression were less likely to encourage their children to perform tasks independently or to offer much guidance to ensure that the child would be able to master the task and generalize from it. Therefore, childhood aggression was a strong predictor of the lack of maternal ability to provide cognitive stimulation to their children. However, Saltaris' observational coding system for cognitive stimulation was based on global ratings of the overall interaction. When specific teaching behaviors were systematically coded (i.e., 15 second intervals), the emotional tone of the interaction was also captured (e.g., negative verbal intervention, verbal praise). The present findings complement Saltaris' study by being able to disentangle maternal emotional expressions from teaching behaviors in a larger sample of high-risk mothers, with a broader age range, and by being able to capture more subtle maternal behaviors such as the quality of teaching styles in mothers with histories of childhood withdrawal.

A challenge for future studies is to measure cognitive development in the offspring and how maternal levels of childhood withdrawal might be hindering the cognitive development of the next generation, more than 30 years later. Previous studies within the Concordia project have

been able to demonstrate the pervasive impact of mothers' histories of childhood aggression in their offspring's cognitive and socio-emotional development (Bentley, 1997; 2002; Saltaris, 1999). Studies with other populations at risk, such as divorced mothers, have established a direct link between a withdrawn parenting style and children's cognitive performance (Wood, Repetti, & Roesch, 2004). These mothers have shown a depressive/withdrawn style of parenting which in turn, has predicted higher levels of externalizing and internalizing behaviors in school-aged children and poor academic performance. Further exploration of withdrawn mothers' parenting and teaching styles might shed light on the mechanisms by which maternal influence might be a risk or a protective factor for the next generation's development.

With the objective of establishing a link between maternal childhood risk status and maternal behaviors, two other dimensions of parenting behaviors were explored in this study: limit setting and attitude towards children's errors during the task. Maternal education was the strongest predictor of the use of negative (and not positive) parenting behaviors. However, mothers' histories of childhood aggression primarily predicted both negative limit setting and critical attitudes towards error, but were no longer significant once maternal education was entered in the equation, suggesting an indirect pathway via maternal education. Increased levels of mothers' childhood aggression were associated with increased use of negative limit setting and critical attitudes towards children's mistakes. These results are consistent with previous studies within the Concordia project where a negative parenting style characterized by harsh parenting and higher levels of hostility has been identified for aggressive mothers (Serbin et al, 1998; 2004). A tendency to set limits with a negative tone as well as to be more critical towards children's errors during their interactions might be new elements that the findings from the present study contribute to the characterization of aggressive girls' parenting styles.

The importance of maternal education as a buffer for the negative influences of relatively stable traits such as aggression and social withdrawal is underscored. Based on our findings, lower levels of maternal education predicted the use of negative limit setting and critical attitude towards error. Conversely, higher levels of maternal education might be viewed as a protective factor for these children, whereby they are less exposed to negative parenting behaviors in their everyday life. Although the counterpart of these negative parenting behaviors (i.e., positive limit setting and constructive attitude towards error) were included in the observational coding in order to explore potential resilience, none were significantly predicted by any of the risk status or demographic variables. Taken together, mothers' abilities to effectively parent their children in this high-risk sample were predicted by mothers' childhood histories of aggression and withdrawal and levels of mothers' education.

Another important element underscored by the findings on negative limit setting and critical attitude towards error is the stability of negative behavior and its consequences in the subsequent generations. The fact that more than 30 years later, girls who were identified in childhood as aggressive, are manifesting dysfunctional parenting styles, is remarkable. Since an indirect pathway to negative parenting behaviors via maternal education seems to be a possible explanation for characterizing high-risk mothers' parenting styles, a direct pathway from childhood aggression to parenting might also be explored. Girls' aggression through the lifespan has been characterized by more indirect and covert forms of aggression which mostly impact their significant social relations including motherhood (Peplar & Craig, 2004; Serbin et al., 2004).

Similar to the prediction of maternal emotional expressiveness, child age was inversely associated with maternal use of control, particularly for positive limit setting. Mothers of younger children were more likely to set limits in a positive and warm way than mothers of older

children. The explanation provided for the evolution of maternal emotional expressiveness is also applicable to mothers' use of control. That is, child development brings new demands to the parental role and the provision of emotional support is substituted by other important parenting behaviors such as controlling or teaching the child. In a structured task such as solving a puzzle, limits were important and well defined (i.e., stay on the mat, complete one puzzle at a time) and age differences impact on how parents behaved.

Maternal Emotional Expressiveness and Parenting in the Present Study: Summary and Limitations

Taken together, the results of this study underscore the importance of considering the childhood psychosocial histories of mothers when trying to characterize their parenting styles. Childhood risk status was shown to have a stronger impact on maternal behaviors (i.e., teaching, limit setting, attitude towards error) than on maternal emotional expressiveness in this high-risk sample of mothers. Negative or ineffective parental practices as well as dysfunctional emotional expressiveness seem to be some of the behavioral sequelae of long-lasting detrimental interactional styles for mothers who were identified as aggressive and/or socially withdrawn in childhood. Moreover, mothers' current interactional style reflects a behavior pattern that may have been replicated in successive significant relationships, and ultimately, it may be influencing the mother-child interaction.

The relative stability of negative behavioral styles as well as the ways in which they manifest from one phase of life to the next were revealed to some extent in the present study. Based on the concept of heterotypic continuity (i.e., the outward expression of stable personal dispositions may adapt to changing life circumstances), a specific behavior in childhood might not be predictive of phenotypically similar behavior later in adulthood (e.g., aggression) but it

may still be associated with behaviors that are conceptually consistent with the earlier behavior (Kagan, 1969; Kagan and Moss, 1962, Moffit, 1993). For example, the fact that mothers' levels of childhood aggression did not directly predict verbal aggression as part of the negative emotional expressiveness in this sample of mothers, does not mean that the detrimental consequences of lifetime aggressive behaviors are discontinued in the next developmental period (e.g., adulthood, motherhood). The use of negative parenting strategies (e.g., negative limit setting, critical attitude towards error) by these mothers might illustrate how the continuity of a stable trend like aggression may be manifested differently within the context of the parent-child relationship.

Although the concept of behavioral coherence has been mostly confirmed in studies of aggressive and antisocial behavior (Caspi, 1998; Moffit, 1993; Moss & Susman, 1980), it may also be applicable to social withdrawal, given the relative stability of this personal disposition. The paucity of positive emotional expressions in mothers with histories of childhood withdrawal might be considered a direct pathway of dysfunctional behavioral styles. However, mothers' negative teaching styles might be an indirect manifestation of this stable trend in the context of parenting, but still coherent with the lack of socio-emotional skills for withdrawn children and mothers.

While the main objective of the present study was to characterize the parenting styles of women with childhood histories of aggression and/or social withdrawal, this is only one piece of the puzzle. The relationship of parenting style to child development is clearly important. Numerous studies have shown the impact of parental variables on the next generation's development. For example, Denham et al. (2000) were able to predict more externalizing problems in children whose parents showed higher levels of anger during their interactions as

well as less externalizing problems for children whose parents showed a proactive parenting style (i.e., supportive presence, clear instruction and limit setting). Other studies have demonstrated the impact of parental warmth and positive expressiveness on children's development of empathy, which in turn, inhibits aggressive and violent behavior by motivating prosocial behavior and better social functioning (Zhou et al., 2002). Predicting the next generation's developmental outcomes from parenting style would shed some light on the socialization processes of high risk children and will ultimately, enable the design of tailored interventions directed to promote parental resilient behaviors as a way of preventing the transfer of psychosocial risk across generations.

Findings from the present study regarding child age underscore the importance of the early detection of risk factors within the family. A broader spectrum of child variables should be further examined. Although the present results are promising in understanding how child variables impact on parenting behaviors and emotions, their value might be circumscribed to this particular population. Generalization of these findings should follow a careful assessment of parenting in other samples to be able to disentangle the influence of the parental and children's characteristics in the development of particular parenting behaviors. The building blocks for children's social competence and school adjustment are embedded in early parent-child interactions (i.e., pre-school years) and might serve as protective factors later in life (Stack & Poulin-Dubois, 1998).

Future Directions and Applied Implications

The identification of parenting as a potential pathway to transfer emotions, behavioral patterns and attitudes across generations has implications for intervention. As additional knowledge about the mechanisms involved in the development of successive generations is

accumulated, our conceptions about the inevitability of the transmission of risk decrease. Our mission is then to identify targets in order to develop intervention strategies directed to promote resilient parental practices and children's social competence, despite the exposure to psychosocial risk.

Undoubtedly, a missing component in the present examination of parenting in a high-risk sample is the contribution of children's characteristics (i.e., temperament, level of psychosocial development) to the mother-child relationship. A complete examination of maternal emotional expressiveness would benefit from including children's emotions as some other studies have demonstrated (Belsky, Hsieh, & Crnic, 1998; Dix, 1991), as well as children's' level of cognitive development, in order to capture the bidirectional interactions occurring between parents and children in all contexts.

A greater variety of children's indicators of psychosocial functioning may be predicted from parental variables in order to confirm the pervasive influence of dysfunctional parenting styles. It would be interesting to associate some of the variables analyzed in this study (e.g., encouragement, physical affection, physical intervention, limit setting) to children's emotional regulation, compliance, and development of autonomy. Likewise, parental emotional styles and quality of teaching strategies can be used to predict children's intellectual development (i.e., IQs). Finally, as children's level of social competence has been demonstrated to depend on the quality of parenting (Cumberland et al., 2003; Denham et al., 2000; Landy, 2002), a detailed analysis of this dimension becomes crucial in a high-risk sample.

A longitudinal analysis of children's developmental trajectories is also important. Children's outcomes might be predicted at different time points (i.e., preschool and school age) in order to identify important influences outside the family that might function as resilient

pathways to compensate for a pervasive familial effect. Children's social competence, empathy, or their capacity to solve conflicts or make friends might result in better adjustment to school, academic success, and finally, protect the child from social isolation or peer victimization (Bowker et al., 2000; Steinberg et al., 1995; Zhou et al, 2002).

Despite the different directions that future research might take, the results of the present study have important practical implications. First, the findings point toward the potential impact of parenting on children's socio-emotional development, especially in high-risk populations. Programs directed at promoting parental emotional regulation and stress management might have an important impact on children's development via a more favourable home environment which facilitates other parental functions (e.g., cognitive and social stimulation). In addition, the design of not only intervention, but preventive strategies for parents with histories of psychosocial risk is warranted. Longitudinal studies that enable a constant monitoring of children's development would be useful in detecting psychosocial malfunctioning in a timely manner, and in providing educational and practical resources to foster competency and resilience. Parents with histories of more subtle behavioral patterns such as social withdrawal may benefit from interventions directed to promote their emotional regulation (i.e., expression of positive emotions) and to coach effective strategies to cognitively stimulate their children. Due to the strong association between maternal education and parenting, it is particularly important to promote completion of schooling and higher levels of education in children with psychosocial difficulties (i.e., aggression and/or social withdrawal).

Conclusions

Results of the present study contribute to our understanding in two important areas: (a) the intergenerational transfer of risk, and (b) the role of emotional expressiveness and parenting

behaviors within the mother-child relationship. Regarding the intergenerational transfer of risk, the findings underscore that elements of parenting such as parent's emotional expressiveness and other teaching or controlling behaviors, may be some of the mechanisms by which previous psychosocial difficulties are being reproduced within the mother-child relationship. As a result, a new generation of children might be exposed to dysfunctional parenting (e.g., lack of positive emotional expressivity, negative teaching strategies), and their chances of being resilient and socially competent might be drastically reduced. This study has also contributed to the understanding of the different behavioral manifestations that relative stable traits might adopt across generations (i.e., heterotypic continuity). Different manifestations of aggression and/or withdrawal were found in the context of parenting and traced back to the underlying childhood disposition. Finally, the findings underscored the importance of monitoring other behavioral styles like social withdrawal, due to their potential impact via parenting on the next generation's development.

By putting together two important processes of parenting (i.e., emotional expressiveness and parenting behaviors), the present results shed light on the importance of understanding parenting as a complex pattern of behaviors. The fact that not only the excess of negative emotionality, but the scarcity of positive expressivity might be influencing the effectiveness of child-rearing practices and styles, offers a new angle to this body of literature. In addition, the importance of parental education was highlighted for both dimensions of parenting: emotional expressiveness and parenting behaviors. Future studies are warranted to explore the complex interrelations and mediational effects that occur between parents' previous histories, their current functioning and level of education, and child's characteristics.

The findings from the present study seem to support how enduring behaviors such as

aggression and social withdrawal might crystallize in a pattern of child-rearing behaviors and be reproduced in the mother-child relationship. Although this study sheds new light on some of the components of parenting such as maternal emotional expressiveness and parenting behaviors (i.e., teaching and control), our comprehension of parenting styles as a complex activity is far from complete. Systematic examinations of other contributions of both the mother and the child during and outside their interactions are warranted in order to better comprehend the impact of parenting on the next generation's development.

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Appendix A

Screening Method for the Original Sample of the Concordia Longitudinal Risk Project

The children in the original Concordia Longitudinal Risk Project were screened for aggression and social withdrawal using a French translation of the Pupil Evaluation Inventory (PEI; (Pekarik et al., 1976), a peer nomination procedure that has been used in several other research projects. The PEI contains 35 items, which load onto three different factors: aggression, withdrawal, and likeability. Peer nominations have been found to represent children at risk for a variety of psychosocial problems (Landau, Milich, & Whitten, 1984), and they have been found to be more reliable than teacher or parent evaluations in the identification of behaviour problems in children (Lyons, 1988).

The PEI was administered to 4109 children in 152 classrooms. Children were asked to select four boys and four girls who were best described by each item of the inventory. The total number of nominations for the aggression and withdrawal dimension was calculated. In order to reduce skewness, a square root transformation was then performed on the total nominated scores for the two dimensions. The transformed aggression and withdrawal scores were then converted to *z*-scores for each gender, and within each class. This procedure allowed for each child to be scored according to relevant norms for his or her own age and gender. The samples of girls and boys were approximately equal.

Children were then assigned to the Aggressive group ($n = 198$) if they obtained Aggression scores at the 95th percentile ($z = 1.65$) or higher and Withdrawal scores below the 75th percentile ($z = 0.68$); the opposite criteria were used to create the Withdrawn group ($n = 220$). Children who obtained z-scores above the 75th percentile on both dimensions were classified as Aggressive/Withdrawn ($n = 239$). Due to the low probability of scoring very high on both the Aggression and Withdrawal scales, a lower

cut-off score was used to establish this group so that a large enough sample could be ensured. The children who comprised the comparison group (n = 1117) scored between the 25th and 75th percentile on both dimensions.

Appendix B

Demographic Information Questionnaire

N° d'identification _____

L'INDIVIDU DANS SON MILIEU

Renseignements sociodémographiques additionnels

Tous ces renseignements sont traités de façon totalement confidentielle

1. **Informations sur la famille de la mère de l'enfant:**

a. Nombre de frères : _____; de soeurs : _____; rang dans la famille _____

Frères ou soeurs décédé(e)s? NON _____ OUI _____ --> préciser : _____

b. Mère : Âge _____. Si décédée, à quel âge : _____ ; cause du décès : _____

Niveau de scolarité _____ ; en quoi _____

Occupation principale de ces 20 dernières années : _____

c. Père : Âge _____. Si décédé, à quel âge : _____ ; cause du décès : _____

Niveau de scolarité _____ ; en quoi _____

Occupation principale de ces 20 dernières années : _____

d. Les parents se sont séparés/divorcés en _____:

2. **Informations sur la famille du père de l'enfant:**

a. Nombre de frères : _____; de soeurs : _____; rang dans la famille _____

Frères ou soeurs décédé(e)s? NON _____ OUI _____ --> préciser : _____

b. Mère : Âge _____. Si décédée, à quel âge : _____ ; cause du décès : _____

Niveau de scolarité _____ ; en quoi _____

Occupation principale de ces 20 dernières années : _____

c. Père : Âge _____. Si décédé, à quel âge : _____ ; cause du décès : _____

Niveau de scolarité _____ ; en quoi _____

Occupation principale de ces 20 dernières années : _____

d. Les parents se sont séparés/divorcés en _____:

3. **Informations sur la famille du conjoint**: si n'est pas le père

a. Nombre de frères : _____; de soeurs : _____; rang dans la famille _____

Frères ou soeurs décédé(e)s? NON _____ OUI _____ --> préciser : _____

b. Mère : Âge _____. Si décédée, à quel âge : _____ ; cause du décès : _____

Niveau de scolarité _____ ; en quoi _____

Occupation principale de ces 20 dernières années : _____

c. Père : Âge _____. Si décédé, à quel âge : _____ ; cause du décès : _____

Niveau de scolarité _____ ; en quoi _____

Occupation principale de ces 20 dernières années : _____

d. Les parents se sont séparés/divorcés en _____:

4. **Historique personnel: mère de l'enfant.**

A été élevée principalement par :

____ père et ma mère	____ mère
____ père	____ grands-parents
____ oncle / tante	____ foyer d'accueil

Âge : _____ premier mariage - première fois conjointe de fait
Âge : _____ premier enfant
Âge : _____ séparation - divorce

5. **Historique personnel: père de l'enfant.**

A été élevé principalement par :

____ père et ma mère	____ mère
____ père	____ grands-parents
____ oncle / tante	____ foyer d'accueil

Âge : _____ premier mariage - première fois conjoint de fait
Âge : _____ premier enfant
Âge : _____ séparation - divorce

6. **Historique personnel: conjoint** (si n'est pas le père)

A été élevé principalement par :

____ père et ma mère	____ mère
____ père	____ grands-parents
____ oncle / tante	____ foyer d'accueil

Âge : _____ premier mariage - première fois conjoint de fait
Âge : _____ premier enfant
Âge : _____ séparation - divorce

4. **Père de l'enfant**. Si la mère vit seule ou si le conjoint n'est pas le père de l'enfant ...

a) Nom : _____

Date de naissance: _____ _____ _____
AN MO JR

b) Niveau de scolarité _____ ; en quoi _____

c) Occupation :_____

Son salaire : _____ $/ heure Nombre d'heures : _____ / semaine

Travaille là depuis : date _____ _____
AN MO

d) Cause de séparation/divorce : _____

e) Verse-t-il une pension alimentaire? NON _____ OUI _____ --> _____ $ / mois
Devrait mais ne le fait pas _____

f) Fréquence et durée des visites : _____

Appendix C

Consent Form

"L'INDIVIDU DANS SON MILIEU: Les parents et leurs enfants"

Directeurs du projet: - Lisa A. Serbin, Ph.D.
- Dale M. Stack, Ph.D.
- Alex E. Schwartzman, Ph.D.

FORMULAIRE DE CONSENTEMENT

Je,_____, m'engage volontairement avec mon enfant, _____, à participer à l'étude "L'individu dans son milieu: Les parents et leur enfant" de l'Université Concordia. Les buts du projet m'ont été expliqués. L'étude comprend une série de questionnaires, une évaluation du fonctionnement intellectuel de mon enfant, ainsi que trois périodes de jeux lors desquelles nous serons observés et filmés. L'étude comporte deux sessions d'une durée maximale de 3 heures chacune et une rémunération totale de $50.00 me sera allouée aussitôt que les questionnaires seront remis. En signe de courtoisie, les résultats sommaires de l'évaluation de mon enfant me seront communiqués par téléphone. De plus, les chercheurs seront prêts à effectuer une ou deux visites additionnelles, au besoin, pour terminer l'évaluation, discuter de résultats problématiques, ou m'offrir un service de référence.

Je comprends que toutes les informations que nous fournissons, qu'elles soient écrites ou filmées, sont strictement confidentielles et qu'elles ne serviront qu'à des fins de recherche. Dans toutes les circonstances, je suis assuré(e) que l'anonymat sera conservé. Cependant, selon la loi sur la protection de la jeunesse, toute information indiquant de l'abus physique ou sexuel devra être divulguée à l'Office de la Protection de la Jeunesse.

Je comprends aussi que je suis libre de cesser notre participation à n'importe quel moment. Comme le projet "L'individu dans son milieu" est à long terme, je comprends que je pourrais être appelé(e) dans l'avenir pour participer à d'autres étapes de ce projet. Je me réserve le droit de décider, à ce moment, de donner suite ou non à la demande de participation.

Signature:_____

Nom:_____ Date:_____

Assistant(e) de recherche:_____

Appendix D

Puzzle Task Protocol

PARENT-CHILD/HEALTH CANADA:
Puzzle Task

PUZZLES (7 MIN, 4 MIN for 12-36 cohort)

"A ce moment-là, pousse les jouets de côté et choisis un casse-tête à faire avec (ENFANT). (FOR OLDER COHORT, EXPLAIN TO MOTHER THE LABELLED BAGS OF PUZZLE PIECES AND THEIR CORRESPONDING BOARDS). Si vous finissez ce casse-tête-là, vous pouvez travailler sur un autre. Après quelques minutes, l'alarme va sonner de nouveau et je vais entrer pour m'asseoir ici." (PRESS BEEPER WHEN THEY BEGIN WORKING ON THE PUZZLE)

Interviewer comes in at the beep and waits next to the door until mother has left. Then s/he puts the barrier in place (for 12-36 mo. cohort) and sits down on a chair so as not to face child directly. Interviewer then gets busy with paperwork interacting as little as possible with child (i.e., s/he should not look at, speak to, or touch the child unless s/he is in danger of harming him/herself).

Appendix E

Coding Scheme for Parental Emotional Expressiveness (PEECS)

CODING SCHEME FOR PARENTAL EMOTIONAL EXPRESSIVENESS (PEECS)

In order to code a broader emotion spectrum, positive and negative emotions are coded separately. Verbal and nonverbal emotional expressions are also coded. Child behaviours will not be registered at this time. Verbal and nonverbal caregiver's emotional expressiveness will be coded in one pass since the emergence of emotions might be sporadic, depending on the quality of the interaction. A second pass is used to code parenting behaviours. (See Parenting Style Coding Scheme, Appendix E).

Behaviors are coded in 10 seconds intervals and their sequence or order of appearance is retained. For example a mother could verbalize a positive reinforcement, then smile, and then kiss the child. For this sequence we would check a 1 in the Positive Reinforcement/Encouragement box, a 2 would be placed in the Smile/Laughter box and a 3 would be checked in the Physical Affection box.

Positive Emotions: This general category includes emotions labelled as positive such as affection, humour, surprise and positive reinforcement and/or encouragement. These emotions provide a better quality to mother-child interactions and they represent resilient elements of this relationship.

Verbal:

1. *Affection*: The coder checks this box only when verbalizations of overt affection show up. Examples of this code are the following:
   - ❖ Est-ce que tu m'aimes?
   - ❖ Embrasse moi!
   - ❖ Approche moi!

   This code is also used when the mother uses loving expressions to talk to the child in any of the given situations, while completing the task, giving feedback, asking him/her to comply. Expressions such as "mon amour", mon chaton, ma chérie, are good examples of affection.

2. *Humour/Jokes*: This code is used when the mother displays behaviors in order to make more pleasant the interaction. She aims to motivate or encourage the child to complete the task. She can express any of the following behaviours:
   - ❖ The mother makes funny voices or imitates the child's tone to make him/her laugh
     1. Repeats what the child says with a childish tone

2. Makes animal voices while reading the book, or talks as the doll or as someone on the telephone. She could also role playing and acts like a child.

- ❖ The mother uses a humour statement to cope with child's mistakes or to follow child's initiatives during the play.
- ❖ Other positive actions to express cheerfulness and to make the interaction more positive (singing, motivating the child, proposing a toast, proposing a competition, whispering)
- ❖ *Only* code humour when the mother is obviously representing another character by *changing the voice.* (Not only for the tone; should the representation of a funny character be evident). This is also applicable to the role-play.

3. *Encouragement and positive reinforcement*: The coder checks these boxes when positive verbalization related to the child's performance during the task are made. Positive feedback accompanying an action that the child completed correctly is recorded in this category (e.g., complying with a request, ascertaining with a puzzle). Positive feedback is coded even when no emotional expression is displayed (e.g when the mother says "Oui" or "OK after every correct answer or action the child completes). If a non-verbal emotion is displayed while giving verbal feedback, this emotion is coded under the corresponding positive nonverbal emotion box (e.g. smile, clapping). General encouragement related to child performance is also included in this category such as the following examples of maternal verbalizations:
   - ❖ "Tu es capable"
   - ❖ « On est jamais découragé »
   - ❖ « Moi-même, je peux me tromper »
   - ❖ « Merci!!! »
   - ❖ « Bravo »
   - ❖ 'Encore »

   Other verbalizations expressing assurance or affirmation such as: "Aha", "Mais oui" are included in this category.
   Every statement the mother uses to motivate the child with the task (ils sont beaux, hein?, c'est la fun, c'est plus facile maintenant"), as well as motivating questions and expressions such as: "veux tu jouer avec...", do you want to play with mommy? Are included here.
   Note: If the mother says more than one expression to praise the same child's behaviour within the same statement, this is coded as only one encouragement. (e.g.: Oui, Bravo, tu es bonne!). If she gives reinforcement, then says or does something else, and gives another reinforcement statement, then it is coded as two separate encouragements. (There should be a behavior in between the verbal or nonverbal, or a 1 second-pause in order to consider it as two separate statements).

4. *Surprise:* This code is marked when the mother expresses surprise as a way to call child's attention. The mother could pretend to be shocked or puzzled with the task

or the potential answer in order to encourage the child's interest in the task. It could also be a neutral statement with an exclamatory tone. Bellow are some examples:

- ❖ "Wow!" Ah! Mmmm!!! Regarde!
- ❖ The mother repeats what the child says with an exclamatory tone
- ❖ Any other verbalization of surprise or joy

At some points mother could express a positive reinforcement with surprise. For example "Ah, mais oui". In this case, if the surprise is obvious and is separate from the other statement, surprise and encouragement /positive reinforcement would be coded. Statements such as: "Ah, regarde, maman a trouvé quelque chose." or any other expression with an exclamatory tone, regardless of the content.

Non-Verbal:

1. *Smile/Laughter*: When mothers show these behaviours in relation to:
   a. Uses a smile / laughter as a response to whatever the child says (including mistakes)
   b. When mother accompanies a command or a statement with smile/laughter
   c. Any other expression of cheerfulness, or joy.

   (Includes laughter related to some non-positive event even if it accompanies a sarcastic display).

2. *Assurance gestures*: Gestures of approval, cheerfulness, or positive reinforcement. It includes clapping hands and nodding. Assurance gestures are coded even when the mother makes the gesture to accompany a joy or an encouragement expression such as raising hands or clapping attempts. It also includes reassurance behaviours that include child's participation such as "give me five".

3. *Approach or Physical proximity*: Approach is coded every time that the mother brings her to be physically engaged with the child. It includes:
   a. Leaning towards the child (the mother seeks to get close to the child without the intention of physical interference or physical contact)
   b. Changing posture to be comfortable for the task
   c. When the mother approaches the child, but no physical contact is made (but she still looks to be more engaged with the task)
      - ❖ Code every time she changes posture to pay more attention to the task they are completing. (e.g.: every time she approaches to ask a question or to see a puzzle piece).
      - ❖ **When not to code approach**

      1. Sometimes the mother is leaning towards the child (if she is sitting in front of him/her) but only because she is organizing the toys or the pieces without paying direct attention to or trying to reach the child.
      2. When she is making room at the beginning of the task or cleaning up the mat to facilitate the task, or even when she is moving towards the child to put a piece by herself or to hand in a piece to the child.

3. When she only moves hands without changing posture (at least she should lean her head and upper body towards the child).
4. When the posture change is out of the task (for her to be more comfortable, when she moves onto the opposite direction of the child).
5. When the approaching movement is part of another physical contact category like affection, or physical intervention.

4. *Physical Affection*: Overt expressions of affect such as:
    a. Caressing
    b. Kissing
    c. Hugging
    d. Patting on child's back
    e. Pinching
    f. Tickling
    g. Mother's head on child's shoulder
    h. Cheek to cheek

5. *Physical contact*: Physical contact that is sought by the mother but is not necessarily an expression of affection. Do not code when the child reaches the physical contact and she did not respond and when the contact is not with her hands. (An exception would be when they touch each other's faces, but this would be affection).
    a. Touching fingers, hands, feet
    b. Fixing child's hair or clothes
    c. Pulling child towards her (not forcefully)
    d. Sitting the child on her laps
    e. Every physical contact during the play interaction although it is not purposely sought by the mother. (while seeking the same piece, or when organizing the toys)

    - The difference between physical affection and physical contact is that although the mother seeks the contact with the child, the demonstration of affect is not the main purpose.

<u>Negative Emotions:</u>

<u>Verbal:</u>

1. *Critical statements/Negative reinforcement*: This code includes maternal utterances that are critical, non constructive and that are mainly directed to scold the child, by pointing toward the negative elements of his/her behaviour. It is more of a punitive than a constructive intent. A <u>critical statement</u> can be identified because *the mother is criticizing some behaviour that the child has already displayed.* (It is usually related to correcting or preventing errors).
    a. "Hey, doucement, on fait pas comme ça"
    b. "C'est très mal"

c. "C'est trop tourné"
d. Any expression followed by "comme il faut" is considered a critical statement if the expression is accompanied by some other nonverbal negative information or a negative tone. Special attention should be given to the expression "regarde comme il faut", as sometimes it is just a colloquial expression. If the mother says "Regarde" to call child's attention, this is considered Guidance, and not a critical statement. (The differences are in the intention of mother's behaviour and the tone she uses).
e. Expressions like "Mais non" or Attends are coded as critical statements.

Negative reinforcement is identified when the mother emphasizes negative aspects of child's behaviour or the bad consequences of his/her actions. This is the opposite of positive reinforcement or encouragement. Includes any expression mother uses to underline the difficulty of the task or that somehow intimidates the child instead of encouraging him to work better. It increases the chances that the child continues to work poorly.

Useful hints to identify a Critical Statement:

- A critical statement is rarely a question
- The mother uses an authoritarian tone (she speaks from a power position)
- Some restrictive words are often included in the statement such as "No, Mais Non, Il faut pas". But note that these expressions are not necessarily critical statements by themselves.
- The mother says what she wants to say directly. Her intention is to scold the child or make him/her comply with a task rule or with an everyday life interaction.
- She could use the imperative tone and words such as "trop, très"
- If the mother just recalls a rule, without directly scolding the child directly, this would be more of a limit setting action.
-

2. *Aggression:* This code refers either to expressions of aggressive statements or to the tone with which neutral content are expressed. While overt aggressive expressions by their content do not usually show up, we will use this category primarily to code any expression with an aggressive tone, regardless of the content. Aggression should be overt and identifiable. It should be directed to the child's performance or to more general traits that the mother openly verbally attacks. (Covert aggression is coded in the next category). Examples are "tu n'es pas capable", "il faut pas que tu te trompes".
    - Aggressive behaviours represent threats for the child, mostly to his/her confidence or assurance during the task.
    - Aggressive statements have a negative emotional tone, coming from mother's frustration. She seems to lose her temper or to be emotionally out of control.

3. *Sarcasm:* This code refers due to more indirect expression of aggression and hostility. Sarcasm is generally identifiable due to the mocking tone that the

mother uses and some gestures accompanying the statement (like eyes and arms movements, sighs, and faces). It could also be as simple as making fun of the child by repeating what he/she just said with a different tone. (It is usually represented by a keen, reproachful expression or a remark uttered with some degree of scorn, a taunt, a cutting jest). It might be differentiated from humour for the meaning of the expression the mother uses, that is: she often does not mean what she is literally saying. It often shows up in situations when the child has annoyed her somehow and the aggression is not directly expressed. Because the aggression is indirect, the statement should not threaten the child directly. Although attitude towards children's mistakes is coded separately, sarcasm should be marked every time the mother makes fun of the child's errors directly or indirectly. Indirect critical statements are also included here, for example when mothers refer to the baby (doll) by using it to criticize a child's attitude (e.g.: tu es chanceuse d'avoir un bébé comme ça).

a. « Tu parles encore au téléphone, toi? »
b. « Si tu ne veux pas que je t'aide... »
c. « Tu n'avais même pas besoin que je t'aide »
d. « Tu ne voyais pas, hein? »

Hints to identify a sarcastic statement :

- The aggression or the critique is covert, so it will not be directly expressed.
- The tone is rarely negative or emotional, since mother is trying to cover up her aggression
- It often looks like humor or jokes or like a non threatening question but mothers intent to criticize the child indirectly with the statement they made.

General rules for verbal negative statements:

1. See the content of the statement. If the content is negative, restrictive, or critical by itself and the critique is directly expressed, this is considered a Critical Statement/Negative Reinforcement.
2. If the critique or the negative appraisal of the child's behaviour is not directly expressed, but through a question, an observation, or a humorous statement (the distinctive features are the mocking intention plus the sarcastic tone), then code Sarcasm.
3. If the statement itself is neutral in content, but still negative (pay attention to the tone), then Aggression is coded. This category is also used to code direct threats to the child, or for critiques that goes beyond the action itself and are more related to the child's behaviour and personality.
4. If any of the above negative verbalizations are accompanied by one of the parenting behaviours (correcting error, limit setting or guidance), then check both categories. If some verbalizations show up in the context of parenting behaviours and cannot be judge as negative (critical/aggressive/sarcastic), but still represent the parenting style, then only code error (critical/constructive), limit setting (positive/negative), or guidance.

General rule for repetition of verbal statements (including parenting style's behaviours)

1. Code as only one behaviour when she repeats the same statement without pauses or performing another verbal on non verbal action in between. As long as she's praising or criticizing the same child behaviour.
2. Code two separate behaviours when she does or says something in between with a different content or intention or when she makes a pause of at least 1 second between statements with the same content.
3. Do not code unfinished statements as verbal statements. However use the tone information and the non verbal expressions associated with it as a reference in defining the quality of the parenting behaviour.

Non Verbal :

1. *Physical intervention*: Any action directed to controlling directly or stopping the child behaviour. Forceful or abrupt movements are displayed, or at least child is moved against his/her will.

    a. Physical intervention towards objects: When mother intervenes abruptly to get a toy or a piece from child hands or mouth, also closing the book or moving objects while the child is playing with them. (Do not code when the child is giving her the piece/toy).

    Do not code when:

    - ❖ The mother touches a piece after the child finishes with it (with a corrective intention), this is not considered physical intervention.
    - ❖ The mother touches the piece or the object which the child is playing with, but she does not take it away. She just moves it to facilitate the task.

    **Code physical intervention even when the child moves consequently away and mother cannot complete the intervention.

    b. Physical intervention over the child:
        1. Abrupt moves mother uses to get child's attention or to keep him/her on task (pulling arms, holding hands or feet, pushing)
        2. Overt physical punishment

2. *Negative affect*: Negative affect is broken down into the following categories of behaviours:

    a) Frustration expressions: (Are more related to situations when the mother is annoyed by the child and does not show or release her aggression. Generally accompanies critical and aggressive statements).
        a. Sounds of discontent
        b. Crossing arms
        c. Raising hands

d. Showing pain or discontentment with child's actions

b) Boredom:
    a. Yawning
    b. Sighs
    c. Holding chin (as a sign of boredom or tiredness).

c) Disapproval/ Indifference: Is related more to child's behaviours and usually accompanies a sarcastic expression.
    a. Disapproval facial expressions (frowns, makes faces, opening and rolling of the eyes)
    b. Moving head as a sign of disapproval (saying NO)
    c. Other gesture to scold the child (pointing, angry look, staring, reproachful look)
    d. Also shrugging shoulders, or any "I don't know" body expression.

d) Disengaged: A time criteria is used to code some acts of disengagement for at least 5 seconds out of the 10 during the interval when the mother expresses one of the following behaviours:
    a. Looking somewhere else (5 out of 10 seconds per interval)
    b. Changing posture (going away from the play area) No time criteria
    c. Leaving the mat. No time criteria
    d. She talks to someone else (husband, other child, testers) No time criteria
    e. She plays or pays attention to pets or any other source of distraction (5 out of 10 seconds per interval)

EVEN WHEN THE MOTHER DOES NOT CHANGE POSTURE OR SEEMS TO BE ON TASK, THE DISANGAGED CODE IS MARKED IF SHE MAKES ONE OF THE ACTIONS ABOVE FOR AT LEAST 5 SECONDS.

Appendix F

Coding Scheme for Parenting Style (PSCS)

CODING SCHEME FOR PARENTING STYLE (PSCS)

Other important variables that are also part of the parenting style are also coded such as attitude towards error (in terms of constructive or critical), as well as limit setting, by characterizing the emotional tone with which the mother structures the task and requests the child's compliance with the task settings. (This is coded as positive or negative tone).

Behaviors are coded in 10 seconds intervals and their sequence or order of appearance is retained. They are related to specific situations such as a child's mistakes while completing the task, or the need to make the child comply with one of the rules of the interaction setting. It is important to first identify that an utterance is one of the targeted parenting behaviors and then to register the quality of maternal behaviour (e.g., positive, negative).

1. *Attitude towards error:* When the mother corrects mistakes during the interaction (matching the tea set, choosing the blocks, completing the puzzle) or language error. (Sometimes the mother ask the child to repeat a word or correct any utterance emitted by the child). It is not usually an answer to the child's questions about the task. The critique or reinforcement should be *directed to the child* and it always comes after an action performed by the child.

    a. Constructive: The mother points out the mistake and corrects it in a positive and warm way. Both the content and the tone when communicating the mistake and giving the correction, are positive and no aggression is involved.

    (Includes when the mother corrects the error by moving a puzzle piece or a toy nicely or neutrally. This could also be coded non-verbally)

    Hints:

    - The statement could include a "No" or a negative expression that is given in a warm or neutral tone.
    - The mother should accomplish some corrective or guidance action after she acknowledges the mistake

    b. Critical: Either the content of the correction or in most of the cases the tone of the corrective statement is aggressive or very critical, or includes some sarcasm.

        i. The mother can ask the child to repeat or to correct a mistake by yelling, or displaying any of the negative emotions
        ii. Some verbalizations that emphazises the mistakes are:
            - No, no, pas comme ça!

- Arrêt!
- Attention!
- C'est _____ ça?

Hints :

- The error is only underlined or reinforced but it is not corrected
- The "No" statement should have an obvious negative emotional tone

(This code is used every time that a corrective action is displayed. If the corrective action is accompanied by an emotion (mainly non-verbal) the emotion is coded separately)
If the mother laughs or makes fun of child's mistakes, just note the tone to define if it sounds sarcastic, humour could be used to correct error in a non critical way. The expression should not include a critique to be considered constructive.
"No" answers when the child makes a mistake will be coded as constructive if a negative emotional tone is not identifiable. If some other expression accompanies the "no", it can be evaluated it for the other phrase or for the appearance of disapproval or frustration expressions.

2. *Limit Setting*: Every time the mother structures the task by verbalizing or exerting rules to monitor or control child's behaviour. Statements related to staying within the play area, respecting to the setting or any other rule (playing only with those toys, changing tasks, etc) are coded. Every time that one of this set-up actions is displayed we also register the tone in which the mother communicates the rules in order to make the child comply.

    a. Positive tone: The mother uses a warm tone and she could also use loving expressions while communicating rules to the child (mon chérie, mon amour, mon chaton). Neutral expressions are better coded as positive if no overt negativity is expressed.
    b. Negative tone: She communicates rules with an aggressive tone or with harsh manners. If other non-verbal emotions show up in this context they should be coded separately.
        - ❖ If critical, aggressive or sarcastic expressions have a limit-setting content, code it always as negative.
        - ❖ It should be always regarding the task and not when criticizing child's mistakes or other behaviours.

    - Limit setting is also every action or direction the mother gives to the child in order to set up the task, such as dividing roles, tasks, or making room in the mat. It includes the instructions for the task, as well as the statements she uses to make the child comply by changing tasks as well as reminders of what is appropriate.
    - Code every statement, request or command related to general aspects of the task, and not specific ways to solve the current task (e.g.: problem-solving strategies for the puzzle).

- It also includes all the statements related to collaboration, when the mother asks or offers help with the task completion.

3. *Guidance*: We use this code to record every verbalization (questions or affirmations) that the mother uses to facilitate the completion of the task. This maternal behaviour could be seen as a teaching strategy and a way of directing the task and at the same time to control for the chil behavior in a non-intrusive manner.

   a. P.S: Providing a problem-solving strategy: In this case the mother makes an observation or guides the child by suggesting potential ways of solving the problem (e.g. puzzle). Examples are: "Start with the corners", "Look at the shapes in the table", "Il faut trouver un morceau comme ça", "Cherche a quoi se ressemble ça". She refers to more general guidelines to complete the task instead of giving specific clues. For example, she could talk about shapes and colors in general.

   b. P/Q: Prompts and Clarification questions: The mother gives prompts and clues to the child without providing the final answer. E.g.: "You should look for the lion's family". In the case of the puzzle task, she would use prompts or questions without pointing or showing where the piece should go. This strategy is better characterized by suggestions, attracting the child's attention and making him/her think about the possible solution to the task. All questions and suggestions related to the task are coded here. Do not code the questions that the mother poses in order to check the child's knowledge of the objects and that are only labelling the figures in the puzzle, the book, and so forth. Expressions starting with "Regard" will be included in this category, since they intend to suggest, point to or highlight important clues that would facilitate the completion of the task by the child. (Refer to critical statements for ways to differentiate).
   c. Questions in the lines of "C'est quoi ça?, that only aim to label the puzzle's figures are not included as guidance. However, if mothers asks something related to the figures or images in order to give him/her clues, the question will be considered as guidance. (e.g: óu est que va la poule? Est que tu vois les pieds du lion? Also code suggestions like « peut être, tu penses que c'est bien? », where she does not give the answer for sure: " ça va ici, tu crois?"
   Also coded are when the mother gives ambiguous answers (by using a conditional or a subjunctive verbal tense e.g.: ça devrait y aller, je crois, je pense...), since this is a suggestion or a cognitive stimulation. She returns the question to the child and makes him/her decide on the right answer.
   Questions such as " que tu penses tu?, tu crois que c'est bien? » are also considered prompts.
   Also include as prompts expressions of "something is missing here"

   d. Demonstration: She demonstrates behaviours, provides the correct answer or finishes the action by herself. The mother points to the place where the piece should go, or even puts it there herself. She provides the answers directly without promoting any action by the child. Her intention is more showing than teaching

here. Use this category to code any explanation she gives about the toys, or the use of them. (e.g.: how to feed the baby, how to use the telephone).

- Use this code when the mother finds a puzzle piece and makes the child acknowledge it. When the mother completes an action (placing the puzzle piece, or completing a figure with the blocks) but she does not show it to the child, do not code demonstration since she is just doing her part of the play interaction.
- On the contrary, if she accompanies her action with a demonstrative statement to make the child acknowledge the right answer, demonstration is coded.
- Also code demonstration when mother attempted to demonstrate something with a wrong action or statement, even if she does not ascertain, she is still willing to show.
- It is essential that the mother calls child' attention by saying or doing something. Otherwise, she is not demonstrating or providing effective answers.

Rule for Attends!

- If it comes after a mistake, that would be a critical attitude towards error because it emphasizes the mistake
- If it comes after any action the child does and the mother is trying to stop him or make him comply, it is coded as Limit Setting, either as positive or negative depending on the tone
- If it comes at some other point, do not code, unless it has an obvious aggressive tone

Rule for Regards!

- Code as guidance, if is accompanying an explanation or prompt
- Observe what comes after to code error, or limit setting
- If the tone is aggressive, code it as Aggression

Code as guidance as long as the content of the statement is intended to guide the child's completion of the task, even when the mother is showing the way it should be done or if she is giving the answer. In this case both Prompts or Problem-Solving and Demonstration are coded. That is:

- She could be giving the child a problem solving strategy (some non-specific guidance that the child could use for future similar situations) and showing where the piece goes this time.
- She could be asking something to make the child think about the answer, or giving clues, while showing the right answer or completing the puzzle by herself.

Appendix G

Nonsignificant Regression Analyses

Table G-1

Results of Hierarchical Regression Analysis Predicting Reassurance Behaviors (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.04	1.88
Childhood Aggression	-0.16	-0.16	-1.63		
Childhood Withdrawal	-0.11	-0.11	-1.16		
Step 2				0.00	0.13
Childhood Aggression	-0.15	-0.14	-1.47		
Childhood Withdrawal	-0.10	-0.10	-1.05		
Maternal Education	0.04	0.04	0.36		
Step 3				0.01	0.39
Childhood Aggression	-0.15	-0.14	-1.48		
Childhood Withdrawal	-0.11	-0.11	-1.10		
Maternal Education	0.02	0.02	0.23		
Child Age	-0.07	-0.07	-0.73		
Child Gender	0.04	0.04	0.41		
Step 4				0.00	0.33
Childhood Aggression	-0.18	-0.16	-1.58		
Childhood Withdrawal	-0.13	-0.12	-1.20		
Maternal Education	0.02	0.02	0.20		
Child Age	-0.08	-0.08	-0.79		
Child Gender	0.37	0.04	0.37		
Childhood Aggression/ Withdrawal	0.58	0.06	0.58		
	R = .05		R^2Adj = -.01	F = .81	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Table G-2

Results of Hierarchical Regression Analysis Predicting Problem Solving (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.03	1.61
Childhood Aggression	0.03	0.03	0.35		
Childhood Withdrawal	0.17	0.17	1.79		
Step 2				0.01	0.75
Childhood Aggression	0.01	0.01	0.10		
Childhood Withdrawal	0.06	0.15	1.56		
Maternal Education	-0.09	-0.08	-0.87		
Step 3				0.01	0.26
Childhood Aggression	0.01	0.01	0.14		
Childhood Withdrawal	0.15	0.15	1.50		
Maternal Education	-0.09	-0.08	-0.86		
Child Age	-0.07	-0.07	-0.69		
Child Gender	-0.03	-0.03	-0.28		
Step 4				0.02	2.16
Childhood Aggression	-0.06	-0.05	0.61		
Childhood Withdrawal	0.11	0.11	0.27		
Maternal Education	-0.10	-0.09	0.35		
Child Age	-0.09	-0.08	0.39		
Child Gender	-0.04	-0.04	0.70		
Childhood Aggression/ Withdrawal	0.16	0.14	0.15		
	R = .06		R^2Adj = .00	F = 1.10	

Note: $^{t}p<.10$, $^{*}p<.05$, $^{**}p<.01$, $^{***}p<.001$

Table G-3

Results of Hierarchical Regression Analysis Predicting Prompts and Questions (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.02	1.12
Childhood Aggression	-0.10	-0.10	-1.06		
Childhood Withdrawal	0.10	0.10	0.99		
Step 2				0.00	0.00
Childhood Aggression	-0.10	-0.10	-1.01		
Childhood Withdrawal	0.10	0.09	0.96		
Maternal Education	0.00	0.00	0.02		
Step 3				0.01	0.31
Childhood Aggression	-0.10	-0.09	-0.92		
Childhood Withdrawal	0.10	0.10	0.98		
Maternal Education	0.02	0.02	0.15		
Child Age	0.01	0.01	0.08		
Child Gender	-0.08	-0.08	-0.77		
Step 4				0.00	0.14
Childhood Aggression	-0.11	-0.10	-0.99		
Childhood Withdrawal	0.09	0.08	0.86		
Maternal Education	0.01	0.01	0.13		
Child Age	0.00	0.00	0.04		
Child Gender	-0.08	-0.08	-0.79		
Childhood Aggression/ Withdrawal	0.04	0.04	0.37		
	R = .02		R^2Adj = -.03	F = .49	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Table G-4

Results of Hierarchical Regression Analysis Predicting Constructive Attitude towards Errors (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.01	0.27
Childhood Aggression	0.02	0.02	0.09		
Childhood Withdrawal	-0.07	-0.07	-0.70		
Step 2				0.01	0.97
Childhood Aggression	-0.01	-0.01	-0.09		
Childhood Withdrawal	-0.09	-0.09	-0.89		
Maternal Education	-0.10	-0.10	-0.99		
Step 3				0.01	0.51
Childhood Aggression	-0.01	-0.01	-0.10		
Childhood Withdrawal	-0.08	-0.08	-0.82		
Maternal Education	-0.10	-0.09	-0.90		
Child Age	1.00	0.10	1.01		
Child Gender	0.01	0.01	0.06		
Step 4				0.00	0.06
Childhood Aggression	-0.02	-0.02	-0.20		
Childhood Withdrawal	-0.09	-0.08	-0.85		
Maternal Education	-0.10	-0.09	-0.90		
Child Age	0.10	0.10	0.97		
Child Gender	0.00	0.00	0.04		
Childhood Aggression/ Withdrawal	0.03	0.03	0.25		
	R = .02		R^2Adj = -.03	F = .43	

Note: $^{t}p<.10$, $^{*}p<.05$, $^{**}p<.01$, $^{***}p<.001$

Appendix H

Regression Analyses for Total Maternal Behaviors

Table H-1

Results of Hierarchical Regression Analysis Predicting Total Maternal Behaviors (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.01	0.76
Childhood Aggression	0.11	0.11	1.14		
Childhood Withdrawal	0.05	0.05	0.53		
Step 2				0.02	1.98
Childhood Aggression	0.07	0.07	0.72		
Childhood Withdrawal	0.02	0.02	0.23		
Maternal Education	-0.14	-0.14	-1.40		
Step 3				0.16	10.16 ***
Childhood Aggression	0.08	0.07	0.83		
Childhood Withdrawal	0.00	0.00	-0.04		
Maternal Education	-0.18	-0.17	-1.85		
Child Age	-0.41	-0.40	-4.48 ***		
Child Gender	0.00	0.00	-0.04		
Step 4				0.00	0.00
Childhood Aggression	0.08	0.07	0.74		
Childhood Withdrawal	0.00	0.00	-0.04		
Maternal Education	-0.18	-0.17	-1.85		
Child Age	-0.41	-0.40	-4.43 ***		
Child Gender	0.00	0.00	-0.04		
Childhood Aggression/ Withdrawal	0.00	0.00	0.01		
	R = .19		R^2Adj = .14	F = 4.03***	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Table H-2

Results of Hierarchical Regression Analysis Predicting Maternal Emotional Expressiveness (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.02	0.82
Childhood Aggression	0.02	0.02	0.16		
Childhood Withdrawal	-0.12	-0.12	-1.25		
Step 2				0.00	0.32
Childhood Aggression	0.00	0.00	0.00		
Childhood Withdrawal	-0.13	-0.13	-1.34		
Maternal Education	-0.06	-0.06	-0.56		
Step 3				0.14	8.24 ***
Childhood Aggression	0.00	0.00	-0.04		
Childhood Withdrawal	-0.16	-0.16	-1.70		
Maternal Education	-0.10	-0.09	-1.03		
Child Age	-0.36	-0.35	-3.86 ***		
Child Gender	0.08	0.08	0.84		
Step 4				0.00	0.10
Childhood Aggression	0.01	0.01	0.10		
Childhood Withdrawal	-0.15	-0.14	-1.56		
Maternal Education	-0.10	-0.09	-1.01		
Child Age	-0.35	-0.35	-3.77 ***		
Child Gender	0.08	-0.08	0.86		
Childhood Aggression/ Withdrawal	-0.03	-0.03	-0.32		
	R = .15		R^2Adj = .10	F = 3.10**	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001

Table H-3

Results of Hierarchical Regression Analysis Predicting Parenting Behaviors (N = 107)

Variables	Beta	sr^2	t	R^2_{Ch}	F_{Ch}
Step 1				0.09	5.36 **
Childhood Aggression	0.19	0.19	1.99 *		
Childhood Withdrawal	0.26	0.26	2.73 **		
Step 2				0.03	3.88 *
Childhood Aggression	0.14	0.13	1.40		
Childhood Withdrawal	0.22	0.21	2.29 *		
Maternal Education	-0.19	-0.18	-1.97 *		
Step 3				0.09	5.55 **
Childhood Aggression	0.15	0.14	1.61		
Childhood Withdrawal	0.20	0.20	2.21 *		
Maternal Education	-0.20	-0.19	-2.09 *		
Child Age	-0.29	-0.28	-3.22 **		
Child Gender	-0.11	-0.11	-1.20		
Step 4				0.00	0.20
Childhood Aggression	0.13	0.11	1.25		
Childhood Withdrawal	0.19	0.18	2.02 *		
Maternal Education	-0.20	-0.19	-2.10 *		
Child Age	-0.29	-0.29	-3.24 **		
Child Gender	-0.11	-0.11	-1.23		
Childhood Aggression/ Withdrawal	0.05	0.04	0.45		
	R = .21		R^2Adj = .16	F = 4.55***	

Note: ^{t}p<.10, *p<.05, **p<.01, ***p<.001