

Sirois, M.-S., & Bernier, A. (2018). Attachment security and maternal behaviors as predictors of children's psychosocial adjustment at school entry. *Parenting: Science and Practice, 18*, 172–189.

ABSTRACT

Objective. This paper aimed to examine the contributions of a second assessment time point of attachment security, along with assessments of maternal behavior (sensitivity and autonomy support), to the prediction of children's behavior problems. **Design.** The sample included 73 mother-child dyads. Maternal behavior and mother-child attachment were assessed when children were between 15 months and 2 years old. Children's internalizing and externalizing problems were reported by their teachers in kindergarten and first grade. **Results.** The results indicated that each assessment time point of attachment security, as well as maternal behavior, explained a comparable portion of the variance in children's anxious/depressed behavior, jointly predicting more than three times the variance that would have been explained by either measure of attachment alone. **Conclusion.** Researchers should consider a multidimensional approach to the assessment of the quality of mother-child relationships, at least when attempting to explain the development of child internalizing problems.

INTRODUCTION

Early childhood is a salient period for social, emotional and cognitive development (Eisenberg, Fabes, & Spinrad, 2006; Goswami, 2008). Research shows that children's psychosocial adjustment during this period is one of the main factors influencing their adaptation to school and academic success (Chen, Rubin, & Li, 1997; Duncan & Magnuson, 2011). Although psychosocial adjustment can be conceptualized in several ways, studies have often focused on the assessment of internalizing and externalizing behavior problems. Research shows that such behavior problems not only are concerning and disruptive in their own right, but also relate to several other important aspects of children's functioning, such as cognitive development (Weyandt et al., 2014), school adjustment (Masten et al., 2005), sleep (Lycett, Sciberras, Mensah, & Hiscock, 2015) and social functioning (Kalvin, Bierman, & Gatzke-Kopp, 2016). Furthermore, behavior problems identified during the early school years tend to persist throughout middle childhood and adolescence (Bosquet & Egeland, 2006; Dodge, Coie, & Lynam, 2006). Therefore, it is important to understand the factors that contribute to the onset and maintenance of internalizing and externalizing problems in early childhood.

One of the most studied factors in this regard is the quality of mother-child relationships, which is often operationalized via measures of attachment security. Attachment security consists of children's ability to use their caregiver as a secure base from which to explore the environment and seek comfort in times of distress (Bowlby, 1982; Waters & Cummings, 2000). A more secure mother-child attachment relationship enables an appropriate balance between proximity-seeking and competent exploration (Cassidy, 2016). The events that children experience in forming relationships with attachment figures are presumed to create a set of expectations about the availability of these figures and their ability to be sensitive and to provide support during

times of stress (Bretherton & Munholland, 2008). With time, these expectations are theorized to generalize to other relational partners and to become an essential part of the child's personality, serving as a guide for future close relationships. Thus, it is expected that early attachment relationships lead children to develop behaviors and ways of relating that ensue from basic relational expectations, such as fear/mistrust, exploration and sociability (Marvin, Britner & Russell, 2008), all of which may be associated with internalizing and externalizing behavior problems.

In line with these claims, several meta-analytic studies have shown that mother-child attachment security is negatively associated with child internalizing and externalizing behavior problems (e.g., Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, 2010; Groh, Roisman, Van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012; Madigan, Atkinson, Laurin, & Benoit, 2013). Children with insecure attachments to their mother are more likely to develop internalizing (Bar-Haim, Dan, Eshel, & Sagi-Schwartz, 2007; Dallaire & Weinraub, 2007) and externalizing behavior problems (Guttman-Steinmetz & Crowell, 2006), especially in high-risk samples (Greenberg, DeKlyen, Speltz, & Endriga, 1997; Stams, Juffer, & Van IJzendoorn, 2002), but also in non-clinical samples (Dallaire & Weinraub, 2007; Moss, Rousseau, Parent, St-Laurent, & Saintonge, 1998; Pauli-Pott, Haverkock, Pott, & Beckmann, 2007). Although they are reliable, these associations are modest in magnitude. For instance, Madigan and colleagues (2013) found a small to medium meta-analytic effect size for the association between insecure attachment and internalizing behavior ($d = 0.37$; 60 studies including 5,236 families) and Fearon and colleagues (2010) found a similar size of association between insecurity and externalizing behavior ($d = 0.31$; 69 studies including 5,947 families).

These reliable yet small to moderate links could partly be due to the fact that attachment security is usually measured just once. However, meta-analytic data show that attachment is only moderately stable (Fraley, 2002; Piquart, Feußner, & Ahnert, 2013; Van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004), whether as assessed categorically or continuously. For instance, Piquart et al. (2013) found an overall stability coefficient of $r = .30$ for the secure/insecure split in the Strange Situation Procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978) and Van IJzendoorn et al. (2004) reported an average stability of $r = .28$ for the security score of the Attachment Q-Sort (AQS; Waters, 1995). Moreover, attachment becomes more stable after toddlerhood (Piquart et al., 2013), yet attachment security is usually measured in infancy or toddlerhood. One assessment of attachment security during these periods is likely to provide a snapshot of the quality of the relationship at a specific time. In contrast, measuring attachment security several times could arguably provide a more accurate estimate of the child's overall relational experience with a specific caregiver.

Moreover, relying only on attachment security as an index of the quality of mother-child relationships may be too narrow an approach, and may lead to an under-estimation of the true importance of parent-child relationships for the development of child internalizing and externalizing behavior problems. Evaluating different facets of caregiving relationships may allow for improving the prediction of child functioning (Grusec & Davidov, 2010; Mesman & Emmen, 2013), including better prediction of behavior problems (Rothbaum & Weisz, 1994). There are numerous ways to assess the quality of early parent-child relationships other than attachment measures (e.g., Feldman, 2003; Kochanska, 2002; Moss, Rousseau, Parent, St-Laurent, & Saintonge, 1998). One approach that has proven especially useful is to focus on the quality of parental behavior during parent-child interactions.

Maternal sensitivity is perhaps the aspect of early parental behavior that has received the most research attention, notably because it is conceptualized as the central predictor of mother-child attachment security (Ainsworth et al., 1978). Sensitivity refers to a mother's capacity to accurately perceive and interpret her infant's emotional cues and to respond promptly and appropriately (Ainsworth, Bell, & Stayton, 1974). It is proposed that by doing so, mothers can model and guide emotion regulation in their children, and thereby gradually influence their adaptation (Morris, Silk, Steinberg, Myers, & Robinson, 2007). Maternal sensitivity can also serve to model empathy as well as foster child self-efficacy (through the experience of behavioral contingencies), which can contribute to the development of healthier psychosocial functioning (Spinrad & Stifter, 2006; Van Aken & Riksen-Walraven, 1992). Maternal sensitivity has been found to predict a variety of child outcomes, including lower internalizing (e.g., Van der Voort et al., 2014; Wagner, Propper, Gueron-Sela, & Mills-Koonce, 2015) and externalizing behavior problems (e.g., Bradley & Corwyn, 2007; Miner & Clarke-Stewart, 2008), notably in longitudinal studies of large population-based cohorts (Kok et al., 2013; NICHD Early Child Care Research Network, 2004).

In line with the contention that sensitivity fosters secure attachment (Ainsworth et al., 1978), De Wolff and Van IJzendoorn's meta-analytic study (1997) revealed a reliable, yet modest association between sensitivity and attachment (combined effect sizes varying from $r = .20$ to $.24$). More recently, Verhage et al. (2016) observed a higher but still moderate meta-analytic effect size ($r = .35$) based on 21 studies ($N = 1,214$). Therefore, one legitimate hypothesis is that maternal sensitivity and attachment security could provide overlapping *as well as* unique (i.e., additive) contributions to the prediction of child functioning. If this is so, considering these two constructs in an additive model could improve the prediction of child

internalizing and externalizing behavior problems. However, we are not aware of studies that have examined this question.

Aside from sensitivity, another aspect of maternal behavior with theoretical and empirical connections to child attachment and adaptation is maternal autonomy support. It is defined as the degree to which mothers encourage children's independent problem-solving, choice, and participation as opposed to externally controlling children's thoughts and behaviors (Grolnick & Ryan, 1989). The notion of autonomy support is part of Self-Determination Theory (SDT; Deci & Ryan, 2000), which posits that humans have a basic psychological need for autonomy and that if this need is satisfied, healthy psychological development will be facilitated. Maternal autonomy support has been observed to allow children to develop self-esteem and perceptions of competence (Bean & Northrup, 2009). In turn, children who have confidence in their abilities tend to present fewer internalizing and externalizing behavior problems (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Sowislo & Orth, 2013). Maternal autonomy support should, therefore, protect children against the development of behavior problems. In line with this, several studies have found that higher autonomy support from parents relates to a lower risk for internalizing and externalizing behavior problems in children (Joussemet, Koestner, Lokes, & Landry, 2005; Matte-Gagné, Harvey, Stack, & Serbin, 2015; McNamara, Selig, & Hawley, 2010; Van der Bruggen, Stams, Bögels, & Paulussen-Hoogeboom, 2010).

Maternal autonomy support also relates moderately to both maternal sensitivity and mother-child attachment security (Whipple, Bernier, & Mageau, 2011). To our knowledge, however, these three inter-related aspects of mother-child relationships have not been considered simultaneously in the prediction of child behavior problems. Thus, the unique or overlapping nature of their contribution to internalizing and externalizing problems remains unknown. It is, in

fact, far from unusual for distinct aspects of parent-child relationships to independently predict unique portions of child functioning (Bradley, Corwyn, Burchinal, McAdoo, & García Coll, 2001; Hubbs-Tait, Culp, Culp, & Miller, 2002; Neitzel & Stright, 2003). Such a multidimensional approach appears, though, less frequently adopted in attachment research; as a result, it remains unclear whether considering measures of attachment along with measures of parental behavior may yield better prediction of child functioning than considering solely one assessment of attachment. There is, however, initial support for this hypothesis: Dallaire and Weinraub (2005) observed that mother-infant attachment security and maternal sensitivity each had a unique contribution to the prediction of children's separation anxiety (often considered to index internalizing problems).

To summarize, meta-analytic data indicate that the associations between mother-child attachment security and child internalizing and externalizing problems, while reliable, are fairly modest in magnitude (Fearon et al., 2010; Madigan et al., 2013). In this context, a multidimensional approach to the assessment of the quality of mother-child relationships, including more than one assessment time point of mother-child attachment security as well as assessments of maternal behavior, could prove useful in improving the prediction of children's behavior problems. Accordingly, this study's objective was to evaluate the contributions of two assessment time points of attachment security along with assessments of maternal sensitivity and autonomy support during early childhood to the prediction of children's internalizing and externalizing behavior problems at school entry. Internalizing problems represent a broad range of behavioral phenotypes, such as fearfulness, sad mood, social withdrawal and somatic complaints, but the focus is often on anxious and depressed behavior. Externalizing problems include noncompliance, tantrums, hyperactivity, and concentration difficulties, but the most

represented manifestation is aggressive behavior. Anxious, depressed and aggressive behavior problems relate to important aspects of child adjustment, such as cognitive development (Derakshan & Eysenck, 2009; Eysenck, Derakshan, Santos, & Calvo, 2007), academic achievement (Henricsson & Rydell, 2006; Masten et al., 2005), and peer relationships (Flouri & Sarmadi, 2015; Nantel-Vivier, Pihl, Côté, & Tremblay, 2014). There is also evidence that different dimensions of mother-child relationships can differentially predict these aspects of child functioning (e.g., Moss, Cyr, & Dubois-Comtois, 2004). Therefore, behavior problems were operationalized in this study as children's anxious/depressed and aggressive behavior, as assessed by their kindergarten and first grade teachers. It was expected that (1) a second assessment time point of attachment security would predict a unique portion of the variance in children's behavior problems, independent of that explained by the first attachment assessment; and (2) that the quality of maternal behavior (sensitivity and autonomy support) would add further, predicting a portion of children's behavior problems not accounted for by the attachment assessments.

METHOD

Participants

The seventy-three mother-child dyads (41 girls) included in this report were part of a larger longitudinal study of children's developmental pathways taking place in a large Canadian metropolitan area (reference omitted for blind review). They were recruited from random birth lists generated by the Ministry of Health and Social Services. Criteria for participation were a full-term pregnancy and the absence of known developmental delays. Socio-demographic information was gathered upon recruitment (8 months). At that time, mothers were between 20 and 45 years old ($M = 31.59$) and had 15.49 years of education on average (varying from 10 to

18 years). The families' average income fell in the \$60,000 to \$79,000 bracket. The majority of mothers were Caucasian (85.5%) and French-speaking (84.9%).

Procedure

Data were collected during five home visits that lasted about 70 to 90 minutes. Maternal sensitivity was assessed during one home visit when children were aged 12 months (T1; $M = 12.60$; $SD = 1.28$) with the Maternal Behavior Q-Sort (MBQS; described below), and mother-child attachment security was assessed during two home visits, when children were about 15 months (T2; $M = 15.57$; $SD = 0.83$) and 2 years old (T3; $M = 26.00$ months; $SD = 0.94$), with the Attachment Q-Sort (AQS; described below). The procedure for these three visits was modeled after the work of Pederson and Moran (1995), and aimed at challenging mothers' capacity to divide their attention between research tasks and infant demands so as to activate infants' attachment system and mothers' caregiving system in response. Research assistants based their observations, and thus their rating of the MBQS or the AQS, on the entire visits that included child-centered tasks, a brief interview with the mother, a videotaped mother-infant interactive sequence, and questionnaires that mothers had to complete while the infant was not looked after by the research assistant. These visits, observations, and subsequent ratings of the MBQS and the AQS were conducted by graduate assistants who had received extensive training based on Pederson and Moran's recommendations (1995).

Maternal autonomy support was measured at 15 months (T2). Mother-infant dyads were asked to complete a challenging problem-solving task, namely puzzles that were designed to be slightly too difficult for the infants, such that they would require some adult assistance to complete them. This interaction was videotaped and later coded for maternal autonomy-supportive behavior. To ensure independence of observations, different observers were used at

T2 to code maternal autonomy support and mother-child attachment security. Home visitors were also different for the T1, T2, and T3 visits, and therefore sensitivity and attachment security were rated independently as well.

When children were in kindergarten (T4; $M = 71.89$ months; $SD = 2.64$) and first grade (T5; $M = 84.87$ months; $SD = 3.18$), their teachers were asked to complete the Preschool Social Behavior Questionnaire to measure children's anxious/depressed and aggressive behavior. Teachers were invited to fill the questionnaire and to return it by mail to our laboratory with a provided pre-paid envelope.

Measures

Attachment Q-Sort (AQS; Waters, 1995). Mother-child attachment security was assessed with the AQS at T2 and T3. The AQS consists of 90 items pertaining to the quality of the child's attachment behaviors toward a specific figure (the mother in this case). Each item of the AQS describes a potential child behavior. Based on observations performed during the entire home visit, research assistants sorted those behaviors into nine clusters of 10 cards each, ranging from very similar to very unlike the observed child's behaviors. The assistant's sort was then correlated with a criterion sort provided by the developer of the instrument, and representing the prototypical securely attached child. Scores could thus range from -1.0 (highly insecure) to 1.0 (highly secure). At T2, 23.1% of the visits were conducted by two research assistants, who later completed the AQS independently. Interrater reliability was found to be ICC (intra-class correlation) = .71. At T3, interrater reliability was conducted for 26.9% of the dyads and was ICC = .72. Meta-analytic data (Van IJzendoorn et al., 2004) suggest that the observer-AQS shows excellent construct validity, with attachment scores converging with maternal sensitivity,

attachment security assessed with Ainsworth's Strange Situation procedure, and child socio-emotional adaptation.

Maternal Behavior Q-Sort (MBQS; Pederson & Moran, 1995). Maternal sensitivity was assessed with the MBQS at T1. The procedure for rating the MBQS was patterned after the AQS procedure described above (except that the 90 items focused on maternal rather than infant behavior). It involved correlating the mother's sort with a theoretical item sort representing the prototypically sensitive mother, and thus yielded scores that could vary from -1 (least sensitive) to +1 (prototypically sensitive). A little over twenty percent (20.8%) of visits were conducted by two research assistants. Agreement between the two raters' sorts was very good, ICC = .85. The MBQS is significantly related to other measures of maternal behavior, such as the HOME Inventory and the Ainsworth scales (see Pederson & Moran, 1995). It shows good temporal stability (Behrens, Parker, & Kulkofsky, 2014; Tarabulsky et al., 2008) and good prediction of child subsequent functioning (Lemelin, Tarabulsky, & Provost, 2006; Moss et al., 2011).

Maternal autonomy support (Whipple et al., 2011). Maternal autonomy support was assessed at T2, based on the videotaped mother-child problem-solving sequence described above. Maternal behavior was coded on four scales ranging from 1 = not autonomy-supportive to 5 = extremely autonomy-supportive. The four scales included the extent to which the mother (1) intervenes according to the child's needs and adapts the task to create an optimal challenge for the child; (2) encourages her child in the pursuit of the task, gives useful hints and suggestions, and uses a supportive tone of voice (verbal support); (3) takes her child's perspective and demonstrates flexibility in her attempts to keep the child on task; (4) follows her child's space, provides the child with the opportunity to make choices, and ensures that the child plays an active role in task completion. Given the inter-correlations among the four scales (ranging from

.53 to .85), they were averaged to obtain a total autonomy-support score ($\alpha = .89$). A randomly selected 29% of videotapes were coded independently by two raters. Interrater reliability was excellent, ICC = .86.

The Preschool Social Behavior Questionnaire (PSBQ; Tremblay, Vitaro, Gagnon, Piché, & Royer, 1992). The PSBQ was completed by teachers when children were in the Spring of their kindergarten (T4) and first grade years (T5). The PSBQ assesses children's behaviors on three dimensions: "aggression" (14 items; e.g., fights with other children), "anxious/depressed" (11 items; e.g., tends to be fearful or afraid of new things or new situations), and "pro-social behavior" (10 items; e.g., will try to help someone who has been hurt). Teachers indicate whether the behavior described does not apply, applies occasionally, or frequently applies to the child (1-3). Only the "aggression" and "anxious/depressed" subscales are considered in this study. Owing to the correlations between T4 and T5 scores ($r = .43$ aggression and $r = .57$ anxious/depressed), these scores were averaged ($\alpha = .90$ aggression and $\alpha = .70$ anxious/depressed). Given that kindergarten and first grade teachers were different individuals, averaging their scores allowed us to derive strong indicators of children's functioning, as assessed by different reporters in two consecutive years. The PSBQ shows excellent internal consistency, good temporal stability across intervals of two to three years, and good convergent validity with peer assessments and maternal ratings (Tremblay et al., 1992).

RESULTS

Preliminary Analyses

Table 1 shows that attachment security, the two dimensions of maternal behavior, and child aggressive and anxious/depressed behavior presented adequate variability. Screening of variable distributions revealed normal or near-normal distributions (all kurtosis and skewness

indices ≤ 1.5). The zero-order correlations among key study variables are presented in Table 2. The correlation between maternal sensitivity and maternal autonomy support ($r = .29, p = .01$) suggests that they are two related yet distinct parenting behaviors. The stability of attachment security ($r = .24, p = .04$) was similar to the meta-analytic estimate ($r = .28$ with the AQS; Van IJzendoorn et al., 2004). As expected, attachment security and the two indices of the quality of maternal behavior were positively associated ($r_s = .23 - .48, p_s < .05$). Finally, as is often the case with young children's internalizing and externalizing problems, child aggression and anxiety/depression were modestly but positively correlated ($r = .27, p = .02$). The two indices of maternal behavior, as well as 2-year attachment security, were negatively related to children's anxious/depressed behavior, which was also marginally related to lower attachment security at 15 months. In contrast, only attachment security measured at 2 years was related to child aggressive behavior.

We also examined whether sociodemographic variables (child sex, maternal and paternal education, and family income) were related to children's functioning. No significant associations were found (all $p_s > .05$); accordingly, sociodemographic variables were not included in the main analyses. The lack of association between SES and child behavior problems is in line with previous studies that reported parental behavior (e.g., parent-child interaction) to be more consistently associated with child functioning than contextual characteristics (e.g., sociodemographic variables; Shaw, Owens, Vondra, Keenan, & Winslow, 1996; Smeekens, Riksen-Walraven, & Van Bakel, 2007). Similarly, other studies with community samples also found no association between child sex and behavior problems (Briggs-Gowan, Carter, Skuban, & Horwitz, 2001; Hinshaw, Han, Erhardt, & Huber, 1992).

Main Analyses

To test our hypotheses while accounting for interrelations among attachment security, maternal sensitivity, and maternal autonomy support, the data were submitted to hierarchical regression analyses predicting children's anxious/depressed and aggressive behavior. The first assessment of attachment security (15 months) was entered in the first block of each equation. To estimate the added predictive value of a second assessment time point (Hypothesis 1), attachment security at 2 years was entered in the second block. Finally, to assess the additional contribution of the quality of maternal behavior, above and beyond the variance explained by attachment, maternal sensitivity and autonomy support were entered last (Hypothesis 2). Given that we had no theoretical reason to enter one behavior before the other, sensitivity and autonomy support were entered simultaneously in the third block.

Table 3 shows that only attachment security measured at 2 years predicted children's aggressive behavior. Neither 15-month attachment security nor maternal behavior was associated with child aggression. The final model accounted for 10.6% of the variance, $F(2,68) = 0.34, p = .72$.

Table 4 presents the results of the regression equation predicting children's anxious/depressed behavior. The model accounted for 16.8% of the variance, $F(2,68) = 2.55, p = .09$. In line with the correlations presented above, attachment security at 15 months initially explained a marginal 5.2% of the variance in children's anxious/depressed behavior. After accounting for this, 2-year attachment security predicted a significant additional 5.4% of variance. Finally, maternal sensitivity and autonomy support together explained a marginal 6.2% of unique variance, above and beyond the contributions of the two attachment time points.

On the one hand, when considering effect sizes only, these results suggest that the two attachment assessment time points as well as maternal behavior had comparable predictive value of children's anxious/depressed behavior, given that each block explained approximately 5% to 6% of the variance. On the other hand, when all mother-child relationship indicators were considered (i.e., in the final model, second column), only maternal autonomy support predicted a unique portion of the variance. Neither attachment security nor maternal sensitivity was uniquely associated with children's anxious/depressed behavior. Combined with the observation that all variables were significantly (or marginally) related to anxious/depressed behavior at the bivariate level, the pattern of results raises the hypothesis that the variance *shared* by the relational indicators may be key to the prediction of anxious/depressed behavior, more so than each indicator separately.

To test this hypothesis, the data were submitted to a structural analysis in which the four relational indicators (15-month attachment security, 2-year attachment security, maternal sensitivity, and maternal autonomy support) were combined into a latent factor representing the quality of the mother-child relationship, which in turn predicted children's anxious/depressed and aggressive behavior (latent factors indicated by kindergarten and first grade scores; see Figure 1). This model was tested using the maximum likelihood (ML) method of estimation in the EQS software (Version 6.1; 2012). The model showed excellent fit to the data, $\chi^2(3) = 5.42$, $p = .24$, $\chi^2/df = 1.81$; comparative fit index = .96; non-normed fit index = .94; standardized root mean square residual = .051; and root mean square error of approximation = .033. The results revealed that the overall quality of the mother-child relationship was negatively related to children's anxious/depressed behavior ($\beta = -.40$, $p < .05$; corresponding to $d = -.87$). This association was stronger than when each relationship variable was considered separately (see

Table 2; highest $r = -.31$). This suggests that the variance shared by the four relational indicators is particularly meaningful in the prediction of child anxious/depressed behavior. However, the link between quality of the mother-child relationship and children's aggressive behavior was still not significant ($\beta = -.12$, *ns*).

DISCUSSION

This study's objective was to evaluate the contributions of two assessment time points of attachment security along with assessments of maternal behavior during early childhood to the prediction of children's anxious/depressed and aggressive behavior at school entry. It was expected that each assessment of attachment security and maternal behavior (sensitivity and autonomy support) would provide a unique contribution to the prediction of children's anxious/depressed and aggressive behavior, as assessed in kindergarten and first grade. The results provided partial support for these hypotheses. We found that each measure of attachment security as well as the quality of maternal behavior (sensitivity and autonomy support considered jointly) explained comparable portions of unique variance in children's anxious/depressed behavior. After accounting for the initial 5.2% of variance explained by the first attachment assessment, the second assessment time point explained a nearly identical portion of variance (5.4%), and entering the quality of maternal behavior next contributed another unique 6.2% of explained variance, although maternal behavior was mostly assessed prior to attachment. It is important to note that some of these findings reached marginal statistical significance only. Nevertheless, they were comparable in magnitude to previous effect sizes involving sensitivity and autonomy support (Kok et al., 2013; Matte-Gagné et al., 2015), and larger than meta-analytic estimates of the link between attachment security and children's internalizing problems (Groh et al., 2012; Madigan et al., 2013). More importantly, the present findings are noteworthy in that

they suggest that a model considering two attachment assessment time points along with two assessments of the quality of maternal behavior allowed us to predict more than three times the variance that would have been explained by either assessment time point of attachment alone. Based on these results, we suggest that researchers should consider a multidimensional approach to the assessment of the quality of mother-child relationships, at least when attempting to explain the development of child internalizing problems.

Also arguing in favor of a multidimensional approach are the follow-up analyses that revealed that the strength of the relation between children's anxious/depressed behavior and a latent factor representing mother-child relationship quality was stronger than the links involving each relational variable separately. The association between this latent factor and child anxious/depressed behavior was also higher than meta-analytic estimates pertaining to attachment and internalizing problems (Groh et al., 2012; Madigan et al., 2013). The exact effect sizes found in this study need to be considered cautiously given that small samples inevitably lead to more uncertainty in the estimates. The present results nonetheless raise the possibility that the variance that is shared by multiple caregiving indicators may be especially salient in the prediction of child internalizing problems, further reiterating the value of a multidimensional approach to the assessment of the quality of parent-child relationships.

However, some results were not as expected. Only attachment security measured at 2 years was related to children's aggressive behavior, and even the latent factor of the quality of mother-child relationships did not relate to child aggression despite its clear link to anxiety/depression. One explanation could be that, in this low-risk community sample, mean levels of maternal sensitivity and mother-child attachment security were relatively high. It is conceivable that the quality of mother-child relationships has more bearing on the development

of children's aggressive behavior at the lower end of the spectrum. In support of this, Madigan and colleagues' meta-analysis (2015) revealed that all forms of insecure attachment (avoidant, ambivalent, and disorganized classifications) were associated with child internalizing problems, but only disorganized attachment, the most maladaptive attachment pattern, was associated with externalizing problems. Thus, the low proportions of very insecure children and very insensitive mothers in this normative sample may partly explain our failure to explain children's aggressive behavior, which also was relatively infrequent according to their teachers.

Another explanation could be that the questionnaire used here to measure children's aggression focuses mostly on physical aggression. There is indication that the frequency of physical aggression tends to decrease from toddlerhood to middle childhood, thus encompassing the period of school entry that was studied here, while indirect aggression (e.g., social aggression) increases (Côté, Vaillancourt, Barker, Nagin, & Tremblay, 2007; NICHD Early Child Care Research Network, 2004). Therefore, it is possible that the age at which we assessed aggressive behavior (especially physical aggression in this case) did not allow for thorough representation of children's aggressive manifestations.

Finally, we did not account for what is arguably a salient parental influence, namely the quality of father-child relationships. Steele and Steele (2005) argued that mother-child relationships may be particularly important for children's self-understanding and dealing with inner conflicts, whereas father-child relationships may be especially salient for dealing with the outside world (e.g., at school and with peers, the context in which we assessed aggression). The quality of father-child relationships has indeed been found to relate negatively to children's behavior problems (Amato & Rivera, 1999) and positively to their self-regulatory capacities (Kochanska, Aksan, Prisco, & Adams, 2008) and committed compliance (Volling, McElwain,

Notaro, & Errera, 2002). It has also been observed that a secure attachment to one parent can compensate for an insecure attachment to the other parent and protect children against behavior problems (Kochanska & Kim, 2013). Thus, it is conceivable that some children in this sample had more harmonious and supportive relationships with their fathers than mothers, and that this positive paternal influence offset the otherwise negative effects of their less than optimal relationships with their mothers.

This study presents some methodological limitations that call for careful interpretation of the results. Given the correlational design, we cannot conclude that the associations observed are indicative of causal processes. The modest sample size (although not unusual in labor-intensive attachment research) weakened statistical power, perhaps contributing to the fact that some of the findings were marginally significant even though their magnitude corresponded to and sometimes exceeded prior studies' results. The low-risk nature of the sample also limited variation in the lower-end of mother-child relationship quality and the higher-end of children's behavior problems. These limitations are to be considered in the context of the study's methodological strengths. The quality of mother-child relationships was derived from four independent observational measures, assessed in the families' homes at three time points and with excellent reliability. In addition, children's internalizing and externalizing problems were reported by different teachers in two consecutive years in which children were part of a different peer group in class. Because mothers may be biased reporters and because their ability to effectively report on their child's behavior may be confounded with the type of attachment relationship they have developed with him or her (Meins, Fernyhough, Fradley, & Tuckey, 2001), overcoming shared-method variance with the use of teacher reports was important. Furthermore, Atkinson and colleagues (2000) found that effect sizes decrease dramatically as

one moves from concurrent to temporally distant assessments. Hence, the intervals of up to six years elapsed here between the assessments of mother-child relationships and child behavior problems provide confidence in the reliability of the underlying phenomenon.

Overall, the current results suggest that there are several benefits to the use of a multidimensional approach when assessing the quality of parent-child relationships. First, each relational dimension may have a unique contribution to the same aspect of children's functioning (thus yielding additive effects and better prediction), or each may be particularly relevant to different aspects of functioning. In this study, attachment security was related to both internalizing and externalizing manifestations, whereas maternal sensitivity and autonomy support were only predictive of children's anxious/depressed behavior. Thus, measuring several dimensions of the mother-child relationship may allow for a better understanding of how they are individually and jointly associated with children's adjustment. Second, a multidimensional approach to assessment also allows creating latent factors encompassing the variance that is shared by multiple caregiving indicators, which the current results suggest may be useful in improving the prediction of children's internalizing behavior problems (or other child outcomes). Third, it is critical for the effectiveness of parenting interventions to target the aspects of parent-child relationships that are most salient to the development of child behavior problems. For example, mother-child interventions tend to focus on mother-child attachment security and maternal sensitivity (Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2003), and for good reason. However, this study's findings suggest that maternal autonomy support may also be a relevant intervention target.

In conclusion, the current results stress the value of using more than one assessment time point of parent-child attachment security. Furthermore, there is a need to go beyond the

attachment construct and consider other facets of parent-child relationships so as to understand how the complex interplay between children and their family context contributes to the development and maintenance of their psychosocial adjustment.

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Table 1

Ranges, Means (M), and Standard Deviations (SD) for Attachment Security, Maternal Behavior, and Children Anxious/Depressed and Aggressive Behavior

Main variables	Range	<i>M</i>	<i>SD</i>
Attachment security (15 months)	-0.37 - 0.82	0.48	0.27
Attachment security (2 years)	-0.42 - 0.83	0.51	0.25
Sensitivity (12 months)	-0.79 - 0.89	0.63	0.32
Autonomy support (15 months)	1.00 - 5.00	3.33	1.21
Anxiety/depression (school entry)	1.00 - 2.18	1.26	0.25
Aggression (school entry)	1.00 - 2.07	1.22	0.27

Table 2

Zero-Order Correlations Among all Main Variables

	1	2	3	4	5	6
1. Attachment security (15 months)24*	.48**	.27*	-.23 ^t	-.11
2. Attachment security (2 years)	28*	.23*	-.28*	-.29*
3. Sensitivity (12 months)		29*	-.27*	-.07
4. Autonomy support (15 months)				...	-.31**	.01
5. Anxiety/depression (school entry)				27*
6. Aggression (school entry)						...

^t $p < .10$. * $p < .05$. ** $p < .01$.

Table 3

Regression Analysis Predicting Children's Aggressive Behavior

Predictors	<i>F</i> change	β	Semipartial <i>r</i> 's	Partial <i>r</i> 's	<i>R</i> ²	ΔR^2
Step 1.	1.03				.014	
Attachment security (15 months)		-.120	-.120	-.120		
Step 2.	6.44*				.097	.083
Attachment security (15 months)		-.048	-.049	-.047		
Attachment security (2 years)		-.297*	-.290*	-.288*		
Step 3.	0.34				.106	.009
Attachment security (15 months)		-.088	-.080	-.076		
Attachment security (2 years)		-.319*	-.303*	-.301*		
Maternal behavior						
Sensitivity (12 months)		.049	.044	.042		
Autonomy support (15 months)		.080	.079	.075		

* $p < .05$.

Table 4

Regression Analysis Predicting Children's Anxious/Depressed Behavior

Predictors	<i>F</i> change	β	Semipartial <i>r</i> 's	Partial <i>r</i> 's	<i>R</i> ²	ΔR^2
Step 1.	3.87 ^t				.052	
Attachment security (15 months)		-.227 ^t	-.227 ^t	-.227 ^t		
Step 2.	4.20 [*]				.105	.054
Attachment security (15 months)		-.170	-.172	-.165		
Attachment security (2 years)		-.239 [*]	-.238 [*]	-.232 [*]		
Step 3.	2.55 ^t				.168	.062
Attachment security (15 months)		-.064	-.060	-.055		
Attachment security (2 years)		-.178	-.181	-.168		
Maternal behavior						
Sensitivity (12 months)		.130	.121	.111		
Autonomy support (15 months)		.217 [*]	.217 [*]	.203 [*]		

^t $p < .10$. ^{*} $p < .05$.