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The Interplay of Maternal Sensitivity and Gentle Control When Predicting Children's Subsequent Academic Functioning: Evidence of Mediation by Effortful Control

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Abstract

The goal of this work was to examine the complex interrelation of mothers' early gentle control and sensitivity in predicting children's effortful control (EC) and academic functioning. Maternal gentle control, maternal sensitivity, and children's EC were measured when children were 18, 30, and 42 months of age (T1, T2, and T3, respectively), and measures of children's academic functioning were combined across 72 and 84 months (T5/T6; N s = 255, 222, 200, 162, and 143). Using structural equation modeling, results demonstrated that T1 maternal sensitivity moderated the relation between T1 maternal gentle control and T2 EC, and T3 EC predicted children's later academic functioning. There was evidence for moderated mediation, such that when maternal sensitivity was high, children's EC mediated the relation between T1 maternal gentle control and children's academic functioning, even after controlling for stability of the constructs. The relation between maternal gentle control and children's EC was not significant under conditions of low maternal sensitivity. Implications for parenting programs are offered and future research directions are discussed.

Keywords

maternal gentle control; maternal sensitivity; children's effortful control; academic functioning

Children's transition to elementary school represents an important milestone. Developmental and educational scientists have been interested in understanding children's early scholastic adjustment—a construct that includes school enjoyment, classroom engagement, and academic performance (Birch & Ladd, 1997). Children who exhibit positive attitudes toward school are likely to perform better academically (Ladd & Dinella, 2009), have stronger interpersonal skills (Welsh, Parke, Widaman, & O'Neil, 2001), and have lower risk of developing mental health problems than children who dislike school (Schwartz, Gorman, Duong, & Nakamoto, 2008). Despite the advantages of early school adjustment, many children struggle in this area (Schwartz et al., 2008; van Lier et al., 2012). Over 40% of teachers have noted that half their kindergarten class students underperformed academically

and had difficulty following instructions (Rimm-Kaufman, Pianta, & Cox, 2000). Thus, understanding the determinants of children's early school adjustment warrants attention.

Efforts to understand how children respond to the challenges of elementary school have focused on both children's dispositional characteristics as well as environmental factors. For example, children's dispositional emotionality and regulation have been related to various aspects of children's academic attainment (Blair & Razza, 2007; Blair, Ursache, Greenberg, & Vernon-Feagans, 2015; McClelland et al., 2007; Valiente, Swanson, & Eisenberg, 2012). Regarding environmental factors, emphasis has been placed on understanding the role of children's peer relationships (Welsh et al., 2001), teacher-child relationship quality (Birch & Ladd, 1997; Silva et al., 2011), and parenting behaviors (Farkas & Grolnick, 2010; Stright & Yeo, 2014) on children's academic success. A crucial next step is to examine the processes that may account for the relations between parenting and dispositional characteristics to children's academic functioning. The goal of this study was to examine the relation of parenting behaviors to children's regulatory abilities and later academic adjustment, with particular attention on potential mediating and moderating factors.

The Role of Maternal Gentle Control on Children's Academics

Supportive parenting behaviors, such as warmth and sensitivity, have been shown to predict favorable academic outcomes in children (Razza & Raymond, 2013; Stright & Yeo, 2014). Another dimension of parenting, maternal gentle control, also may be associated with children's academic adjustment. Gentle control reflects supportive, power deemphasizing, and non-coercive parental discipline (Kochanska & Aksan, 1995, 2006). Mothers who use gentle control set expectations and provide constructive guidance in ways that support children's autonomy. Maternal gentle control has been shown to predict young children's successful internalization (Kochanska & Aksan, 1995, 2006).

Although empirical research is lacking, there are reasons to believe that maternal gentle control may play a role in children's early school adjustment. In the early years of development, mothers may use gentle control strategies to guide their toddlers through chores and activities (e.g., cleaning up toys). They also may explain the purpose of such activities, establishing expectations for behavior in other social settings, including school or playgrounds. When children reach elementary school, maternal gentle control may continue to be reinforced in age-appropriate ways, such as monitoring homework completion, setting curfews for social activities, and enforcing a consistent bedtime routine. These developmentally appropriate strategies are likely to support children's autonomy and internalization of parental messages about the importance of academics (Eisenberg et al., 2010b; Grusec & Goodnow, 1993; Hoffman, 2000). Indeed, using a sample of middle-school aged children, Farkas and Grolnick (2010) found that mothers' enforcement of guidelines and school-related rules predicted children's superior academic well-being and school success. The current study is the first to our knowledge to examine whether maternal gentle control in the early years of life predicts children's academic functioning during the transition to elementary school.

The Relations of Children's Effortful Control to Academic Functioning

Researchers have shown that children's EC contributes to their academic functioning (Liew, 2012; Valiente et al., 2011, 2012). EC is a component of temperament and is defined as "the efficiency of executive attention, including the ability to inhibit a dominant response and/or to activate a subdominant response, to plan, and to detect errors" (Rothbart & Bates, 2006, p. 129). It is typically measured using indices of attentional control (i.e., ability to shift and focus attention as needed) and inhibitory control (i.e., ability to suppress inappropriate responses) (Rothbart, 2007). Children's EC emerges in the first year of life and improve substantially in the next few years (Jones, Rothbart, & Posner, 2003; Kochanska, Murray, & Harlan, 2000). EC is relatively stable (in rank order) across childhood (Eisenberg et al., 2010a; Kochanska et al., 2000; Spinrad et al., 2012), and it predicts relatively high social competence (Rothbart & Bates, 2006; Silva et al., 2011) and academic achievement in childhood (Blair et al., 2015; Liew, 2012; McClelland et al., 2007).

Children's EC is thought to play an instrumental role in academic adjustment for a number of reasons. First, children with advanced regulatory abilities are likely to form harmonious relationships with peers and teachers, and such relationships are thought to contribute to children's school enjoyment and academic success (Silva et al., 2011; Valiente et al., 2011). In addition, regulation skills are useful for children's classroom behavior, such as sitting still, taking turns, and attending to lessons. In fact, improvements in children's regulatory capacities have shown to predict academic gains, such as growth in emergent literacy, vocabulary, and math skills (McClelland et al., 2007). As such, EC may be an important foundation for children's school success.

The Prediction of Children's EC and Academic Functioning From Maternal Gentle Control and Sensitivity

Although EC is considered to be a component of temperament (Rothbart, 2007; Rothbart & Bates, 2006) and is assumed to be, at least partially, a product of genetic endowment (Posner, Rothbart, & Sheese, 2007), parental behaviors appear to contribute to its development (Eisenberg et al., 2010a; Rothbart & Bates, 2006). Indeed, in a number of empirical studies, mothers' supportive parenting behaviors have predicted effective self-regulation in young children (Blair et al., 2011; Karreman, van Tuijl, van Aken, & Decovic, 2008; Spinrad et al., 2012). Parenting is thought to play an especially critical role during early toddlerhood, a period marked by the significant improvements in EC (Eisenberg et al., 2010a; Spinrad et al., 2012).

Relevant to the current study, we hypothesized that maternal gentle control would positively predict children's EC abilities. One reason for this association may be because gentle control is a discipline strategy that models regulatory behaviors (Chibucos, Leite, & Weis, 2005; Cole, Michel, & Teti, 1994). Specifically, gentle control reflects parental inductive reasoning and instances of strategic planning when responding to a child's needs, rather than negative reactions to children's misbehavior; thus, gentle control strategies require parents to exert regulatory skills over their own behaviors. In addition, parents' use of gentle control may directly teach children regulatory skills (Karreman et al., 2008; Kopp, 1989; Spinrad, Stifter,

Donelan-McCall, & Turner, 2004). That is, parents may use gentle control to teach ways for children to manage emotional arousal, help with problem-solving, and focus on goals. Additionally, because gentle control is not harsh or overly controlling, this strategy is thought to prevent children's over-arousal and resistance. We expected maternal gentle control to predict superior EC skills in children.

Another maternal behavior, maternal sensitivity, has been shown to predict high levels of EC in children (Conway et al., 2014; Kochanska et al., 2000; Mintz, Hamre, & Hatfield, 2011; Spinrad et al., 2012). For example, Conway and colleagues (2014) reported that mothers who behaved in sensitive ways with their 7-month old infants (e.g., followed infants' cues, talked softly) had toddlers who exhibited high levels of EC at 33 months. Spinrad, Eisenberg, and colleagues (Eisenberg et al., 2010a; Spinrad et al., 2007, 2012) have also found that maternal sensitivity during toddlerhood predicts EC concurrently and over time, even when controlling for initial levels of EC. The prevailing claim is that sensitive mothers set the tone for a positive and secure relationship and help children regulate their arousal (Spinrad et al., 2007).

Both maternal sensitivity and gentle control behaviors are hypothesized to play a vital role in children's development, but the degree to which maternal gentle control relates to children's EC may depend on the level of maternal sensitivity. Indeed, over two decades ago, Darling and Steinberg (1993) suggested that effective parents create an "emotional climate" to communicate and express their socializing goals. They reasoned that parental sensitivity would foster a supportive emotional climate, creating a friendly setting for effective discipline. Similarly, Grusec and Goodnow (1994) suggested that discipline practices might be most effective when children have high quality mother-child relationships because children are likely to internalize their mothers' goals and values under such conditions.

Clearly, the constructs of maternal sensitivity and gentle control somewhat overlap particularly because both parenting behaviors involve some degree of warmth and child-centeredness. Whereas maternal gentle control is a discipline strategy that provides direction in non-threatening ways (Kochanska & Aksan, 1995), parental sensitivity refers to child-centered activities that do not impose any parental agenda. Consistent with Darling and Steinberg (1993) and Grusec and Goodnow (1994), we believe that under conditions of high sensitivity, mothers' socializing efforts and discipline strategies are likely to be most fruitful; under circumstance of low sensitivity, maternal gentle control may be less effective. In the current study, we hypothesized that in the context of sensitive parenting, children may be prone to regulate their behavior that is reflective of mothers' socialization goals.

In addition to testing the moderating role of sensitivity in the relation between maternal gentle control and children's EC, we explored whether children's EC (as a result of moderation) would, in turn, predict their academic functioning. Such mediation is consistent with Eisenberg and colleagues' (1998) heuristic model suggesting that children's EC mediates the relations between parenting and children's developmental outcomes. Adding another level of complexity, we tested whether the aforementioned moderation of supportive parenting (i.e., maternal gentle control and sensitivity) predicted children's EC, and whether EC, in turn, predicted children's academic functioning. To our knowledge, this is the first

study to examine moderated mediation in the relations of maternal gentle control, sensitivity, and children's EC to school-related outcomes.

The Current Study

The current study advances literature in several important ways. We tested the relations among supportive parenting behaviors (i.e., maternal gentle control, sensitivity), children's EC, and academic functioning using structural equation modeling (SEM). Our longitudinal model included a multi-method and multi-reporter latent variable approach with five waves of data from the time children were 1.5 to 7 years of age. The cross-lagged panel design allowed us to control for the stability of most constructs over time. We expected to find significantly positive direct relations between mothers' gentle control, children's EC, and their academic functioning. We also hypothesized that maternal gentle control would be positively related to children's EC, but particularly under conditions of high maternal sensitivity. Finally, we tested whether EC served as a mediator between parenting (i.e., the interaction of gentle control and sensitivity) and children's academic functioning.

There is growing awareness of the potential prediction from children's EC to parenting (Eisenberg et al., 2010a; Lengua, 2006; Spinrad et al., 2012; Valiente et al., 2006). Scant evidence is consistent with the view that poorly regulated children are prone to elicit less supportive and more inconsistent parenting behaviors (Lengua, 2006). However, no studies to our knowledge have examined the cross-lagged associations between maternal gentle control and children's EC in early toddlerhood. Given the advantages of the current cascade model, we tested for this possibility.

In the present study, we controlled for a number of potential covariates, such as children's verbal abilities, sex, and family socioeconomic status (SES). SES was controlled because children from low SES families have been found to be at risk for impaired EC skills (Li-Grining, 2007), which in turn have shown to predict difficulties in school (Blair & Razza, 2007). Additionally, deficits in language skills have been related to low levels of EC (Vallotton & Ayoub, 2011). Lastly, prior work suggests that girls are typically more regulated (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006) and outperform boys on measures of academic achievement (Hyde, Fennema, & Lamon, 1990; Valiente et al., 2011).

Method

Participants

The current study was a part of a longitudinal research project of toddlers' socio-emotional development. The participants were recruited at birth from three hospitals in the Southwest metropolitan area (*blinded for review*). Mothers' average age at the child's birth was 29 years. Data for this study were based on assessments that occurred when children were 18 (T1), 30 (T2), 42 (T3), 72 (T5), and 84 (T6) months of age ($M = 255, 222, 200, 162, \text{ and } 143$). At T1, toddlers (141 boys; $M_{\text{age}} = 17.79$ months, $SD = .51$) were mostly Caucasian (81%) and identified as non-Hispanic (77%).

Attrition and Missing Data

Some data were missing due to families' relocation, difficulty scheduling, or dropping out of the study. A small number of participants ($n = 6$) who attrited at early time points returned to later assessments. In the present study, 33 (12.9 %) families had missing data at T2, an additional 25 (9.8%) families had missing data at T3, and by the last assessment, 3 years after T3 (i.e., T5/T6), an additional 50 (19.6%) families had missing data. Next, we examined the association of demographic and T1 study variables on the likelihood that families have missing data at each time point using multivariate logistic regression. Demographic and T1 study variables were not associated with an increased likelihood of missing data at T2 or T3. However, a one unit decrease in SES ($OD = 1.71, p = .04$) or T1 maternal gentle control ($OD = 4.13, p = .01$) was associated with an increased likelihood of missing data at T5/T6. These results suggest that there was a relation between the study variables and the probability of missing data, and therefore, the data were considered missing at random (MAR; Enders, 2010) rather than missing completely at random (MCAR). To address concerns over missing data, the current study utilized full information maximum likelihood (FIML) to estimate the hypothesized models (Muthén & Muthén, 2007). FIML is an appropriate procedure for handling missing data because it yields unbiased parameter estimates that are superior to those obtained with other methods (Enders, 2010).

Procedures

At T1, T2, and T3, mothers and their children were invited to the research laboratory for observational assessments that lasted approximately 1.5 to 2 hours. During the laboratory visits, maternal warmth/sensitivity, gentle control, and children's EC were observed. Mothers also completed a questionnaire packet pertaining to children's EC. At the end of the laboratory session, mothers were asked for written permission to contact and collect information from non-parental caregivers/teachers. If consent was obtained, non-parental caregivers/teachers were sent a questionnaire packet by mail. At T1, T2, and T3 ($ns = 176, 153, \text{ and } 144$), non-parental caregivers/teachers reported on children's EC. At T5 and T6 ($ns = 144 \text{ and } 133$), teachers reported on children's academic functioning. All participants were paid for their participation, and children received a toy or a t-shirt.

Measures

Maternal gentle control—At T1, T2, and T3, maternal gentle control was assessed through two observational tasks: a clean-up and a prohibition task. Following the free play, mothers were asked to instruct their child to pick up the toys and place them back in a basket. Maternal gentle control reflected instances of gentle verbal control/guidance, which occurred when mothers were affectionate and used polite suggestions and positive incentives to encourage their child to clean up the toys (e.g., "You're such a good helper" or "What a throw!"). Maternal gentle control was coded every 15 seconds ($0 = \text{absent}, 1 = \text{present}$) from the time mothers asked children to pick up the toys. The segment lasted 3 minutes or until all the toys were put in a basket. Scores on the occurrence of maternal gentle control were averaged across the epochs. Kappas for gentle control during the clean-up were calculated on approximately 28%, 26%, and 25% of the data and were .60, .85, and .95 at T1, T2, and

T3. The prohibition task assessed children's ability to restrain from a prohibited activity. While the mother played with her child, an experimenter brought a set of attractive toys and placed them along the empty shelf. Mothers were instructed that children were prohibited from touching those toys. As a reminder, a "do not touch" sign was attached to the shelf. Gentle control reflected mothers' affectionate interaction and encouragement to follow the rule (e.g., "I know, these toys are pretty, but we cannot touch them") and/or suggestions for alternative activities (e.g., "How about we solve this puzzle?"). Coding began when children were tempted or directed their attention to the prohibited toys and ended when children were no longer interested in the toys. Gentle control was coded every 15-second intervals (0 = *absent*, 1 = *present*) and averaged across the epochs. Kappas were based on 28%, 27%, and 25% of the sample and were .70, .71, and .77 for gentle control at T1, T2, and T3. In the current study, the two observational tasks were used as indicators of the latent variable *maternal gentle control* at each time point.

Maternal sensitivity/warmth—At T1, T2, and T3, mothers' sensitivity was assessed during the free-play and teaching task. Maternal warmth was also observed during the teaching task (warmth was not coded during free play). Maternal sensitivity during free play captured the interaction between the mother and a child while they engaged in a 3-minute play with age-appropriate toys. Regarding sensitivity during teaching task, mothers were given 3 minutes to teach/assist their child in completing a difficult puzzle. For both tasks, maternal sensitivity included instances of appropriate responses and attention to the child's current level of arousal, interests, needs, and abilities. Mothers' sensitivity was rated on a 4-point scale (1 = *no evidence of sensitivity* to 4 = *high levels of sensitivity*) and was coded at intervals of 15 seconds for free play and every 30 seconds during the teaching task. ICCs were conducted on approximately 25% of the sample and were .81, .86, and .68 for the free play at T1, T2, and T3 and .82, .71, and .83 for the teaching task at T1, T2, and T3. Maternal warmth during the teaching task reflected mothers' level of physical affection, encouragement, closeness, and positive quality conversations. Maternal warmth was coded in six 30-second intervals and was rated on a 5-point scale (1 = *parent ignored the child and displayed negative affect* to 5 = *parent was engaged and displayed positive affect*). ICCs for maternal warmth during teaching task were conducted on approximately 25% of the sample and were .83, .66, and .88 at T1, T2, and T3. Maternal sensitivity during free play and teaching task and maternal warmth during teaching task were significantly positively intercorrelated at T1 ($r_{[243\text{ to }244]} = .18$ to $.42$, $p < .01$), T2 ($r_{[214]} = .27$ to $.46$, $p < .01$), and T3 ($r_{[190]} = .20$ to $.63$, $p < .01$). To reduce the number of variables, a composite of maternal sensitivity at each time point was created by standardizing and averaging the scores across maternal sensitivity during the free-play and teaching tasks and maternal warmth during the teaching task.

Effortful control—Observed EC was assessed using a snack delay procedure at T1 and T2 and the "waiting for a bow" task at T2 and T3 (Kochanska et al., 2000). Mothers and non-parental caregivers/teachers also reported on children's EC at all time points.

For the snack delay procedure, the experimenter placed a goldfish cracker on the table and covered it with a clear plastic cup. Children were asked to wait for the experimenter to ring a

bell before they could pick up the cup and eat the snack. The assessment of snack delay was measured in four trials which lasted 10, 20, 30, and 15 seconds. Children's scores were rated on a 7-point scale (1 = *child ate the snack immediately* to 7 = *child waited the entire trial to eat the snack*). Additional points (up to two) were given if the child kept their hands on the mat. ICCs were computed on 29% and 28% of the sample and were .98 and .99 at T1 and T2.

During the "waiting for a bow" task at T2 and T3, an attractive gift box with a removable lid was placed in front of a child. The experimenter told the child that she forgot to bring a bow that was supposed to be placed on top of the gift box. The experimenter instructed the child to stay in the seat and not touch the gift box until she came back with a bow. The child's mother was facing away and was asked not to interact with her child. The experimenter left the room for 2 minutes. A child's strategy code was rated on a 5-point scale (1 = *child pulled a gift from the box* to 5 = *child did not touch the box*). ICCs were computed on 30% and 32% of the sample and were .96 and .95 for T2 and T3.

Mothers and non-parental caregivers/teachers rated children's EC using the attention shifting, attention focusing, and inhibitory control subscales of the Early Childhood Behavior Questionnaire at T1 and T2 (ECBQ; Putnam, Gartstein, & Rothbart, 2006) and the Childhood Behavior Questionnaire at T3 (CBQ; Rothbart, Ahadi, & Hershey, 1994). Responses were rated on a 7-point scale (1 = *never* to 7 = *always*) and included 12 items for attention shifting (α s = .69, .73, and .67 for mothers and α s = .76, .71, and .80 for non-parental caregivers/teachers at T1, T2, and T3; e.g., "After having been interrupted, how often did the child return to a previous activity?"), 12 items for attention focusing at T1 and T2 and 14 items at T3 (α s = .76, .81, and .77 for mothers and α s = .79, .85, and .74 for non-parental caregivers/teachers at T1, T2, and T3; e.g., "When playing alone, how often did the child play with a set of objects for 5 minutes or longer at a time?"), and 12 items for inhibitory control at T1 and T2 and 13 items at T3 (α s = .81, .88, and .77, for mothers and α s = .90, .88, and .82 for non-parental caregivers/teachers at T1, T2, and T3; e.g., "The child can wait before entering into new activities if he/she asked to." At T3, non-parental caregivers'/teachers' reports excluded two items (e.g., "Gets angry when told s/he has to go to bed") because these items were relevant to mothers only. Mothers' and non-parental caregivers'/teachers' reports on each subscale were standardized and averaged to create an adult-reported attention shifting, attention focusing, and inhibitory control.

Children's academic functioning—At T5 and T6, teachers rated (1 = *doesn't apply* to 3 = *certainly applies*) children's academic adjustment using the School Liking and Avoidance Questionnaire (SLAQ; Ladd & Price, 1987). This measure includes two subscales: *school liking* (7 items; α s = .85 and .79 for T5 and T6; e.g., "Likes being in school") and *school avoidance* (6 items; α s = .81 and .68 for T5 and T6; e.g., "Makes up reasons to go home from school"). The avoidance items were reversed and averaged within and across subscales to form a single composite reflecting children's school liking (α s = .87 and .83 for T5 and T6). Additionally, at both T5 and T6, teachers rated (0 = *doesn't apply* to 2 = *certainly applies*) children's adjustment to school using the Teacher Rating Scale of School Adjustment (TRSSA; Birch & Ladd, 1997). The measure consisted of two subscales: *cooperative participation* (7 items; α s = .93 and .91 for T5 and T6; e.g., "Follows teacher's

directions”) and *self-directedness* (4 items; α s = .86 and .84 for T5 and T6; “Works independently”). Teacher-reported self-directedness and cooperation subscales were significantly positively correlated at both times (r s[142 and 130] = .69 and .60, p s < .01 for T5 and T6) and were therefore standardized and averaged to create a composite of teacher-reported school adjustment at T5 and T6. These measures have been validated and used to study academic adjustment (Buhs, Ladd, & Herald, 2006; Ladd & Dinella, 2009).

Control variables—Control variables included child sex (0 = *boy*, 1 = *girl*), family SES, and children’s verbal abilities. SES was computed at T1 by standardizing and averaging scores on parental education and family annual income. Children’s verbal abilities were assessed at T1 using the MacArthur Short Form Vocabulary Checklist (Level II) (Fenson, Pethick, Renda, Cox, Dale, & Reznick, 2000). Mothers were presented with a list of 100 words (e.g., “mommy”, “all”, “if”, “this”) and were asked to indicate their child’s use of these words on a 3-point scale (1 = *not yet*, 2 = *sometimes*, and 3 = *often*).

Results

Preliminary Analyses

Independent sample *t*-tests were conducted to test for sex differences in the study variables (see Table 1). In comparison to mothers of boys, mothers of girls received higher scores on various measures of maternal sensitivity. Girls also outperformed boys on some measures of EC and academic functioning. Next, we computed zero-order correlations among the study variables across time (available online). In terms of control variables, SES was positively related to maternal sensitivity and warmth at all times and maternal gentle control at T1 and T2. Parenting variables were generally stable across time and were significantly positively correlated with each other at T1 and T2. Mothers’ and caregivers’ reports of EC (i.e., attention shifting, attention focusing, inhibitory control) showed stability over time and, within reporter, the indices were significantly positively correlated with each other within each time point. Children’s academic variables were concurrently positively correlated and showed some pattern of stability.

Measurement model—Confirmatory factor analyses (CFA) were used to determine whether each indicator loaded onto its latent construct (Cole & Maxwell, 2003). The model contained three latent constructs: maternal gentle control, children’s EC, and academic functioning. At each time point, mothers’ gentle control from the clean-up task and gentle control during the prohibition task served as indicators of the maternal gentle control latent construct. For children’s EC, observed EC (i.e., snack delay at T1 and T2 and waiting for a bow at T2 and T3) and the composites of caregiver- and mother-rated EC were indicators¹. For academic functioning, teacher-rated school liking at T5 and T6 and teacher-reported school adjustment at T5 and T6 (the composites of *cooperative participation* and *self-directedness*) were indicators.

¹Because reported and observed EC were only modestly correlated, we tested a model with both the observed and reported EC as indicators and a model with only reported EC as an indicator. Both models yield similar results, and therefore, we elected to present the model with multi-method indicators of EC.

During this step, each latent variable was correlated with every other latent variable. Error variances of the indicators were allowed to covary within reporter and method (i.e., if the same measure was administered across time) when indicated by the modification indices. This measurement model demonstrated adequate fit to the data: $\chi^2(204) = 272.35$, $p = .001$; CFI = .94; SRMR = .07; RMSEA = .03, 90% CI [.02, .04]. Next, we examined the invariance of the loadings across time by constraining the factor loadings across time and comparing this fully constrained model with the unconstrained model. A non-significant chi-square difference test suggested that the factor loadings were constant across time, $\chi^2(8) = 14.15$, $p > .05$. Therefore, we retained the loading constraints over time. Correlations among the latent variables are presented in Table 2. T2 and T3 maternal gentle control were significantly positively correlated with children's EC within and across time. Although T1 variables were unrelated to academic adjustment, T2 and T3 EC and T3 gentle control were significantly positively associated with children's academic functioning.

Primary Analyses

We used structural equation modeling (SEM) in *Mplus*, Version 7.4 (Muthén & Muthén, 2015) to evaluate the hypothesized models (see Figures 1 and 2). Raw data were analyzed to obtain estimates. Analyses were conducted in several steps. First, we tested a longitudinal model in which maternal gentle control at T1 and T2 predicted children's EC one year later (i.e., T2 and T3, respectively), which in turn predicted higher academic functioning at T5/T6 while controlling for stability in the constructs. In addition, we examined paths from EC at T1 and T2 to maternal gentle control at T2 and T3. Second, we tested the hypothesis that maternal sensitivity moderated the relation of gentle control to children's EC (see Figure 2). Interaction terms (e.g., maternal gentle control by sensitivity) were created in *Mplus*. Significant interactions were probed according to Aiken and West (1991). In the last step, we considered the possibility of moderated mediation. Based on the recommendations of Tein, Sandler, MacKinnon, and Wolchik (2004), moderated mediation was tested at average, high (1 *SD* above the mean), and low (1 *SD* below the mean) levels of the moderator (e.g., T1 maternal sensitivity). Significance of the mediated effect was examined by assessing whether zero was included in the confidence interval (MacKinnon & Dwyer, 1993). All control variables (i.e., SES, child sex, and child verbal abilities) were entered as predictors and if non-significant, were removed for parsimony.

In addition to examining the effects of maternal gentle control on children's EC at subsequent times, we included stability paths (e.g., EC at T1 to EC at T2 and EC at T2 to EC at T3) and concurrent correlations between the variables. The hypothesized longitudinal model fit the data adequately (Kline, 2005), $\chi^2(286) = 350.10$, $p = .01$, CFI = .94, SRMR = .08, and RMSEA = .03, 90% CI [.01, .04]. Factor loadings for the latent variables were all significant at $p < .001$ (range = .18 to .92) and in the expected direction (i.e., all positive loadings; see Table 3).

Regarding the covariates in the model, children's verbal abilities at T1 was concurrently related to T1 EC and significantly predicted children's T2 EC and children's academic functioning (see Figure 1). Children's sex significantly predicted children's academic functioning (favoring girls) and was significantly correlated with children's T1 EC (girls

were higher; see Figure 1). SES positively predicted T1 maternal gentle control and children's academic functioning.

In terms of stability of the constructs, the autoregressive paths for EC and maternal gentle control were positive and significant from T1 to T2 and from T2 to T3 (see Figure 1). In terms of concurrent correlations, children's EC was significantly positively correlated with T1 and T3 maternal gentle control; however, there were no concurrent relations between these variables at T2 once stability was controlled.

The direct relations between maternal gentle control, EC, and academic functioning—We tested the hypothesis that maternal gentle control would be positively related to children's academic functioning. There were no direct effects of mothers' gentle control at T1 ($b = -.26, p = .11$) or T3 ($b = .32, p = .10$) on children's academic functioning. The relation of T3 EC to children's subsequent academic functioning was statistically significant (see Figure 1). These findings did not support the hypothesis that early maternal gentle control directly forecasts children's academic functioning. However, as expected, children's earlier EC predicted academic functioning.

Next, we tested the hypothesis that maternal gentle control would be positively related to children's EC. The path from T1 maternal gentle control to children's EC a year later was significant, even after controlling for stability of the constructs (see Figure 1), however, the path from T2 maternal gentle control to T3 EC was not significant ($b = .03, p = .86$). These results provide partial support to the hypothesis that maternal gentle control is a predictor of increased EC abilities, but only at earliest time point.

Cross-lagged paths from T1 and T2 EC to maternal gentle control at later times were non-significant ($bs = .05$ and $.10$, respectively, and $ps = .82$ and $.75$, respectively; see Figure 1) and, therefore, were removed in subsequent models to reduce the complexity of the moderated mediation model.

Moderation and moderated mediation—Prior to testing the hypothesis that maternal gentle control would be positively related to children's EC, but particularly under conditions of high maternal sensitivity, we included maternal sensitivity at T1, T2, and T3 into the longitudinal model to evaluate the overall fit. This model fit the data adequately, $\chi^2(351) = 463.53, p < .001$, CFI = .92, SRMR = .08, and RMSEA = .03, 90% CI [.02, .04]. Next, moderation was examined by including the interaction effects (i.e., T1 maternal sensitivity by T1 maternal gentle control; T2 maternal sensitivity by T2 maternal gentle control) into the longitudinal model as predictors of children's EC a year later (i.e., T2 and T3). Inclusion of the hypothesized interactions improved model fit, $\Delta(2) = 10.28, p < .05$.

Family SES at T1 marginally predicted maternal sensitivity at T2 ($b = .12, p = .07$), significantly predicted sensitivity at T3 ($b = .28, p < .001$), and was significantly concurrently positively related to maternal sensitivity ($b = .43, p < .001$). The autoregressive paths for sensitivity were positive and significant from T1 to T2 and from T2 to T3 (see Figure 2). In terms of concurrent correlations, children's EC and maternal gentle control

were significantly positively correlated with sensitivity at T1 and T2, but not at T3 (see Figure 2).

The interaction of T1 maternal gentle control and T1 maternal sensitivity was a significant predictor of T2 EC (see Figure 2). Probing of the interactions indicated that T1 maternal gentle control was positively related to T2 EC under conditions of high sensitivity ($b = .27, p = .04$), but not at average and low levels of sensitivity ($bs = .15$, and $.03$ for average and low levels of sensitivity, $ps = .32$ and $.87$, respectively; see Figure 3). Once the interaction effect was entered into the model, the direct paths from T1 maternal gentle control to children's EC a year later was no longer significant ($b = .15, p = .32$). T2 maternal sensitivity did not interact with T2 maternal gentle control to predict T3 children's EC. These findings support the hypothesis of "emotional climate" suggesting that in the early years of life, maternal gentle control is most effective when delivered with high levels of maternal sensitivity.

The relation of children's EC at T3 to children's subsequent academic functioning remained significant in the model that included the interaction between T1 gentle control and T1 maternal sensitivity (see Figure 2). T3 maternal sensitivity was not significantly related to children's academic functioning, $b = -.15, p = .20$. Paths from T1 and T3 maternal gentle control to children's academic functioning were non-significant ($bs = -.28$ and $.21$, respectively, and $ps = .15$ and $.22$, respectively; see Figure 2).

Next, we examined whether EC served as a mediator between parenting (i.e., the interaction of gentle control and sensitivity) and children's academic functioning. At low and mean levels of sensitivity, the paths linking T1 maternal gentle control to T2 EC were not statistically significant ($bs = .15$, and $.03$, respectively); thus, significance levels of the mediated effects were not examined. However, at high levels of T1 maternal sensitivity, EC at T2 and T3 significantly mediated the relations between T1 maternal gentle control and T5/T6 academic adjustment, $\beta = .15, SE = .08, 90\% CI (.01, .32)$. Consistent with our prediction, under high levels of maternal sensitivity, children's EC served as a mediator between maternal gentle control and children's academic functioning in the early years of elementary school.

Discussion

The focus of this work was to better understand the role of supportive parenting behaviors, such as maternal gentle control and sensitivity, to children's regulatory abilities and academic functioning. The findings provided evidence that maternal gentle control is a predictor of increased children's EC abilities and high levels of EC relate favorably to children's academic functioning during transition to elementary school. Additionally, maternal sensitivity moderated the association between maternal gentle control and children's EC, which in turn predicted their academic well-being. These findings have important implications for understanding potential pathways through which supportive parenting behaviors predict children's regulatory abilities and academic well-being.

A key finding of this study was the complex relation between maternal gentle control and sensitivity when predicting children's EC. Maternal sensitivity at 18 months served as a

moderator between maternal gentle control at 18 months and children's EC at 30 months. These results underscore that maternal gentle control promotes children's EC, especially when used in conjunction with supportive and warm behavior. It is quite possible that mothers high on gentle control are likely to be well-regulated, and therefore, may serve as exemplary role models of self-regulatory behaviors to their children. Further, this type of supportive guidance may limit children's arousal and enable them to learn effective regulation strategies. Importantly, when mothers' gentle control strategies are delivered with high level of sensitivity, children are likely to demonstrate increased regulatory skills. Sensitive parenting behaviors, such as maternal sensitivity, positive regard, and developmentally appropriate stimulation, also have predicted children's executive functioning (EF), a construct that overlaps considerably with EC (Blair et al., 2011). The current study is the first to longitudinally examine the interaction of gentle control with sensitivity when predicting children's EC in the early years of life. In further work, it may be useful to test whether maternal sensitivity and gentle control interact to predict other aspects of children's self-regulatory behaviors, such as committed compliance.

Another important finding was the mediating role of EC in the relation between maternal gentle control and children's academic functioning, but only under conditions of high maternal sensitivity (i.e., moderated mediation). In other words, when both early maternal gentle control and sensitivity were high, children were likely to exhibit high levels of EC, which in turn predicted relatively high academic functioning. To our knowledge, this study was the first to find evidence that through children's EC, early supportive parenting, such as maternal gentle control and sensitivity, related positively to children's school adjustment. This finding is unique and adds important implications to literature on parenting, children's socio-emotional development, and early academic functioning because it highlights the importance of directed, but not overly controlling or intrusive, parental discipline in the early years of children's development.

Contrary to our expectations, there were no direct associations between early maternal gentle control and children's subsequent academic functioning independent of the mediated moderation. Our speculation regarding mediation was based on the idea that early maternal gentle control would evolve into parental expectations regarding school-related matters, and thus, predict children's academic functioning. Some correlations between gentle control and school-related outcomes were consistent with our expectations, but the direct relation was not evident when controlling for stability and taking into account mediated relations. Lack of findings could be attributed to the context in which maternal gentle control was measured. Recall that maternal gentle control at each time point was measured using a clean-up and prohibition task that did not necessarily capture children's problem-solving skills (e.g., organizing, planning, and memory) that are important for the assessment of academic well-being. Because of developmental milestones, young children may have been less challenged by the simplicity of such tasks. In future work, it may be useful to measure maternal gentle control in young childhood through advanced tasks that require cognitive demands. Furthermore, it may be beneficial to examine mediating pathways, other than children's EC, in future longitudinal assessments.

Although maternal gentle control at 18 months predicted children's EC at 30 months, maternal gentle control at 30 months had no additional direct effect on children's EC at 42 months. It may be that the relatively high stability of EC over time reduces the ability to predict improvements in later EC. It is also possible that maternal gentle control is most critical in the early stages of development, particularly when children's EC skills begin to emerge. Moreover, once children develop effective EC skills, stability in these skills, rather than parenting, may account for later EC. It seems likely that the strength of maternal socializing behaviors on children's EC reduces as children develop stronger self-regulation skills (Valiente et al., 2006).

There was no evidence to suggest that children's EC predicted maternal gentle control, which further supports the argument that children's EC skills in the early years of development are influenced by parenting behaviors rather than vice versa. Indeed, in a number of studies, the association between the constructs has been unidirectional, suggesting that children's EC is predicted by parenting (Eisenberg et al., 2010a; Spinrad et al., 2012; Taylor, Eisenberg, Spinrad, & Widaman, 2013; Valiente et al., 2006), except when parenting measures reflect teaching strategies (Eisenberg et al., 2010b). Perhaps child-driven associations become more apparent when parenting is studied in other contexts in which children's behaviors are limited by their competencies (Eisenberg et al., 2010b) or in relation to other dispositional characteristics, such as negative emotionality.

This study had a number of notable strengths. First, we used observational and multi-reporter longitudinal data to examine the relations among maternal gentle control, children's EC, and their academic functioning. Second, the predictions were assessed using stringent SEM with autoregressive paths and the relations between some of the study's variables (e.g., parenting and children's EC) were found even after controlling for the stability of constructs. Third, the longitudinal design of the study allowed a rigorous test of mediation (Cole & Maxwell, 2003). Fourth, exploration of cross-lagged links between children's EC and maternal gentle control shed light on potential causal links, particularly in early childhood. Finally, and perhaps most importantly, the stringent panel design enabled to examine the interaction between maternal sensitivity and gentle control when predicting children's later developmental outcomes.

Despite these strengths, there are several limitations that need to be noted. In the interim of approximately a 6-year assessment, a large number of participants were lost between the first and the last wave of the study due to relocation of families and difficulty scheduling. Another shortcoming of the study was the generalizability of the findings. The sample of our study consisted primarily of Caucasian and middle-class families who were considered relatively low-risk. A more diverse sample is needed to extend these results. Additionally, it may be useful to examine whether expectations of mothers high on gentle control reflect children's developmental milestones. In future research, increases in maternal demands should be measured through variety of tasks that are appropriate for each stage of children's development. Further, although we controlled for cognitive measures that were available at this young age (i.e., children's verbal abilities), in future studies, it may be useful to examine whether these relations hold true when controlling for prior academic functioning. Lastly, our investigation was focused solely on maternal behaviors, restricting implications of our

findings to mothers only. There is a growing need for engaging fathers in related to parenting research and intervention programs (Panter-Brick et al., 2014). In future work, it would be useful to assess whether paternal supportive behaviors forecast children's developmental outcomes in similar ways.

Overall, current findings contribute to the growing body of literature and advance the claim that parenting practices and behaviors play an important role in children's development. Importantly, the results of this study could be incorporated into various parenting programs focused on eliciting positive socio-emotional development in children as well as educational interventions that aim to promote children's academic performance and adjustment. Specifically, to elicit children's EC, parenting programs may emphasize the critical role of mothers' sensitivity and gentle control as well as the importance of consistency in practicing these behaviors. Moreover, to ensure or to enhance children's academic well-being, mothers' understanding and implication of sensitivity is crucial. Educating parents on the possible impact of parenting practices may improve children's developmental outcomes and provide children with greater potential for success in school.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Relations between mothers' gentle control, children's EC, and academic functioning.

Dashed lines indicate tested but non-significant paths. Standardized estimates are presented.

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

Figure 2.

Children's T2 and T3 EC mediate the relation between T1 maternal gentle control and children's academic outcomes. Bolded lines indicate significant mediation at high levels of sensitivity. Dashed lines indicate tested but non-significant paths. Standardized estimates are presented.

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

Figure 3.

Interaction between T1 maternal gentle control and T1 maternal sensitivity on T2 children's EC. The effect of T1 gentle control on T2 children's EC at low (i.e., 1 SD below mean) and high (i.e., 1 SD above mean) levels of T1 maternal sensitivity, plotted over the T1 maternal gentle control range of -3 SD to +3 SD.

* $p < .05$, *n.s.* slope is non-significant.

Table 1
Unstandardized Means and Standard Deviations of Study Variables for Children's Sex

	Total		Boys		Girls		t-test
	M	SD	M	SD	M	SD	
<u>18 months (T1)</u>							
Child VA	22.69	18.36	21.55	19.23	24.12	17.19	1.09
Sens (FP)	2.52	.61	2.45	.62	2.60	.59	1.83 [†]
Sens (TT)	3.59	.47	3.57	.46	3.60	.48	.52
Warmth (TT)	3.47	.52	3.50	.47	3.44	.57	-.83
GC (CL)	.79	.30	.78	.31	.80	.28	-.67
GC (Proh)	.39	.27	.37	.27	.42	.27	1.53
M EC (AS)	4.53	.64	4.49	.67	4.57	.60	1.02
M EC (AF)	3.95	.73	3.91	.76	3.99	.70	.79
M EC (IC)	3.56	.86	3.49	.93	3.64	.76	1.36
C EC (AS)	4.74	.76	4.79	.70	4.69	.81	-.86
C EC (AF)	4.04	.87	4.19	.85	3.90	.85	2.20 [*]
C EC (IC)	4.41	1.11	4.31	1.12	4.52	1.10	1.26
EC (SD)	2.60	1.74	2.39	1.52	2.86	1.95	2.03 [*]
<u>30 months (T2)</u>							
Sens (FP)	2.83	.52	2.77	.55	2.90	.47	1.89 [†]
Sens (TT)	3.77	.36	3.73	.39	3.83	.31	2.14 [*]
Warmth (TT)	3.50	.47	3.47	.47	3.55	.46	1.23
GC (CL)	.89	.19	.86	.22	.92	.16	2.07 [*]
GC (Proh)	.64	.33	.62	.34	.65	.33	.67
M EC (AS)	4.78	.62	4.72	.63	4.85	.60	1.63
M EC (AF)	4.40	.77	4.36	.78	4.44	.75	.76
M EC (IC)	3.97	.93	3.83	.95	4.15	.88	2.58 [*]
C EC (AS)	4.86	.73	4.87	.80	4.85	.63	-.18
C EC (AF)	4.52	.83	4.51	.91	4.53	.74	.13
C EC (IC)	4.70	.99	4.68	1.00	4.72	.98	.25

	Total		Boys		Girls		<i>t</i> -test
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
EC (SD)	6.21	2.60	5.94	2.62	6.54	2.55	1.71 [†]
EC (bow)	3.14	1.54	2.92	1.54	3.42	1.50	2.40*
<u>42 months (T3)</u>							
Sens (FP)	3.26	.53	3.21	.58	3.33	.47	1.51
Sens (TT)	2.91	.51	2.91	.51	2.92	.51	.23
Warmth (TT)	2.96	.33	2.96	.31	2.95	.35	-.34
GC (CL)	.72	.30	.73	.30	.72	.30	.26
GC (Proh)	.41	.32	.42	.31	.40	.33	-.41
M EC (AS)	4.07	.61	4.09	.59	4.04	.63	-.65
M EC (AF)	4.55	.72	4.46	.76	4.66	.65	2.03*
M EC (IC)	4.37	.73	4.31	.76	4.45	.70	1.39
C EC (AS)	4.40	.79	4.33	.81	4.48	.75	1.17
C EC (AF)	4.66	.68	4.61	.65	4.74	.71	1.18
C EC (IC)	4.69	.80	4.63	.81	4.79	.78	1.21
EC (bow)	2.85	1.04	2.73	1.11	2.99	.93	1.75 [†]
<u>72 months (T5)</u>							
T SLAQ	4.15	.29	4.11	.32	4.19	.24	1.75 [†]
T self-direct	1.40	.58	1.28	.58	1.55	.54	2.75**
T coop	1.60	.50	1.46	.55	1.78	.37	4.05**
<u>84 months (T6)</u>							
T SLAQ	4.21	.24	4.20	.25	4.23	.23	.65
T self-direct	1.42	.55	1.37	.59	1.49	.50	1.31
T coop	1.62	.45	1.51	.48	1.78	.35	3.75**

Note. VA = verbal abilities, Sens = sensitivity, FP = free play, TT = teaching task, GC = gentle control, CL = clean-up, Proh = prohibition, M = mother-reported, C = non-parental caregiver/teacher reported, EC = effortful control, AS = attention shifting, AF = attention focusing, IC = inhibitory control, SD = snack delay, bow = waiting a bow, T = teacher-reported, SLAQ = school liking, self-direct = self-directedness, coop = cooperative participation.

[†] $p < .10$,

* $p < .05$,

10^{-d}
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Table 2

Correlations of Latent Variables

	1.	2.	3.	4.	5.	6.	7.
<u>T1 (18 months)</u>							
1. Maternal Gentle Control	-	.21	.83**	.40**	.41*	.41**	-.02
2. Child Effortful Control		-	.19	.65**	.20	.65**	.12
<u>T2 (30 months)</u>							
3. Maternal Gentle Control			-	.35*	.52**	.37**	.03
4. Child Effortful Control				-	.28*	.84**	.40**
<u>T3 (42 months)</u>							
5. Maternal Gentle Control					-	.41**	.34*
6. Child Effortful Control						-	.32**
<u>T5/T6 (72/84 months)</u>							
7. CR Academic Functioning							-

Note. Correlations computed in *Mplus* accounting for missing data using FIML.

CR = non-parental caregiver/teacher reported.

* $p < .05$,

** $p < .01$.

Table 3

Standardized Factor Loadings

Manifested Variable	T1 (18) Est. (SE)	T2 (30) Est. (SE)	T3 (42) Est. (SE)	T5 (72)/T6 (84) Est. (SE)
Mothers' gentle control				
Clean-up	.52 (.08)	.57 (.10)	.56 (.09)	
Prohibition task	.60 (.08)	.36 (.07)	.54 (.08)	
Children's EC				
Inhibitory control	.72 (.05)	.82 (.06)	.92 (.04)	
Attention shifting	.47 (.03)	.52 (.06)	.62 (.05)	
Attention focusing	.48 (.05)	.57 (.05)	.64 (.06)	
Snack delay (total score)	.23 (.03)	.18 (.03)		
Waiting for a bow (strategy code)		.22 (.04)	.37 (.06)	
Children's academic functioning				
T TRSSA (T5)				.74 (.07)
T TRSSA (T6)				.72 (.07)
T SLAQ (T5)				.64 (.07)
T SLAQ (T6)				.67 (.08)

Note. EC = effortful control, T = teacher-reported, TRSSA = school adjustment, SLAQ = school liking.

All factor loadings are significant at $p < .001$ Est. = estimate.