Published in final edited form as:

J Youth Adolesc. 2010 November ; 39(11): 1357–1367. doi:10.1007/s10964-009-9485-x.

Self-Regulation in Early Adolescence: Relations with Mother–Son Relationship Quality and Maternal Regulatory Support and Antagonism

Kristin L. Moilanen,

Child Development and Family Studies, Department of Technology, Learning and Culture, West Virginia University, P.O. Box 6122, Morgantown, WV 26506-6122, USA

Daniel S. Shaw, and

Department of Psychology, University of Pittsburgh, Pittsburgh, PA, USA

Amber Fitzpatrick

Child Development and Family Studies, Department of Technology, Learning and Culture, West Virginia University, P.O. Box 6122, Morgantown, WV 26506-6122, USA

Kristin L. Moilanen: klmoilanen@mail.wvu.edu

Abstract

The purpose of the current investigation was to examine relations among maternal regulatory support, maternal antagonism, and mother–son relationship quality in relation to boys’ self-regulation during early adolescence. As part of a larger longitudinal study on 263 low-income, ethnically diverse boys, multiple informants and methods were used to examine associations among parenting practices and mother–son relationship quality in relation to boys’ self-regulation at ages 10 and 11. Multivariate analyses indicated that high levels of regulatory supportive parenting and relationship quality and low levels of antagonistic parenting independently predicted high levels of boys’ self-regulation at age 10. Only antagonistic parenting and relationship quality explained variance in levels of boys’ self-regulation at age 11 after accounting for prior self-regulation. The findings suggest that parenting and the context of the parent–child relationship are linked to self-regulation during early adolescence; however, it appears that parental antagonism and relationship quality, not maternal regulatory supportive parenting, contribute to rank-order change in self-regulation abilities. Implications of these results for research and practice are discussed.

Keywords

Self-regulation; Mother–son relationships; Parent–child relationship quality; Parenting practices; Early adolescence

Introduction

Self-regulation is an individual’s ability to actively or passively monitor, evaluate, modify and inhibit their behavior or emotions in accordance with societal standards or to attain personal goals (Thompson 1994). Empirical research indicates that self-regulatory abilities are relatively stable from early childhood through early adulthood (Lengua 2006; Mischel et

al. 1989; Moilanen et al. in press; Raffaelli et al. 2005). Although important throughout the lifespan, the ability to self-regulate behaviors and emotions is particularly vital in the prevention of psychopathology and the promotion of optimal psychological adjustment during the period of adolescence (Gestsdottir and Lerner 2008). Young teens must deal with physical, cognitive, and socio-emotional changes, and are expected to start making adult-like decisions that can tax teenagers' self-regulatory skills and carry significant consequences. When this delicate balance is taken into account, it should not be surprising that teens who experience regulatory difficulties are at elevated risk for a variety of maladaptive outcomes, including internalizing problems (d'Acremont and Van der Linden 2007), externalizing problems (Brody and Ge 2001), and sexual risk-taking behavior (Raffaelli and Crockett 2003).

Thus, to promote optimal self-regulation and prevent psychopathology, substantial attention has been dedicated to studying parenting behaviors and family environmental characteristics associated with the development of this vital capacity during childhood. Recently, researchers' interest in the antecedents of self-regulation has expanded to the period of adolescence, but to date, far less is known about the role of parenting and family influences during adolescence than is known about earlier periods of childhood. Notwithstanding, for childhood and adolescence alike, little attention has been devoted to examining whether, in addition to specific parenting behaviors, the context of the parent-child relationship independently promotes self-regulation. Thus, the primary goal of this study was to examine the nature of associations between maternal regulatory support and antagonism, children's appraisals of parent-child relationship quality, and young adolescents' developing self-regulatory skills. The study was carried out with a sample of low-income boys from an urban location at high risk for externalizing problem behaviors.

The Socialization of Self-Regulation in Adolescence

Growth in self-regulation during childhood, especially early childhood, is frequently attributed to children's individual characteristics and family influences, the most proximal of which is parental socialization. Socialization is the process through which individuals adopt and internalize a group's shared beliefs, worldviews, and behaviors consistent with these values (Jones and Gerard 1967). Although part of this process is shaped by siblings within the nuclear family (e.g., Bedford and Volling 2004), parents are thought to be responsible for transmitting the family's shared beliefs, values, and norms for appropriate behavior. As specified in the tripartite model of the impact of the family on children's emotion regulation and adjustment (Morris et al. 2007), three mechanisms are implicated in the socialization of self or emotion regulation. According to this model, children's self-regulation develops through their observations of other family members, the specific parenting practices they encounter, and the overall emotional climate of the family. Morris et al. (2007) argue that the associations between these mechanisms and children's emotion regulation and other individual characteristics are bidirectional in nature, such that children's regulatory abilities influence the family's emotional climate, the parenting they receive, and so forth. Morris et al. (2007) also assert that negative socialization experiences directly lead to adjustment problems and indirectly impact adjustment by undermining children's self-regulatory abilities. A portion of this model is tested in the current study, as described below.

Parenting Practices

Theoretically, children's socialization is facilitated through discrete parenting behaviors, which communicate to children the limits of acceptable behavior (e.g., positive reinforcement for acceptable behaviors, harsh punishment for unacceptable emotional displays). Much of what is known about parenting and the development of self-regulation is based on research with young children (e.g., maternal encouragement of preschoolers'

appropriate behaviors; Dennis 2006). As less is known about the period of adolescence, investigations from the period of early childhood through adolescence are discussed in the literature review below, with special attention granted to the few studies involving adolescents.

Regulatory Supportive Parenting—In the current study, the term “regulatory supportive parenting” is used to describe maternal caregiving behaviors such as responsiveness, engagement, support, or empathy. These ingredients of supportive parenting have been studied extensively in relation to children’s regulation skills, and to a lesser degree, adolescents’ self-regulatory abilities. They are thought to promote the development of self-regulatory capacities by reducing children’s negative affect (Baumrind 1991), which can limit individuals’ abilities to effectively self-regulate (Brody and Ge 2001). Supportive parents are sensitive to their children’s emotional states and promptly respond to their children in a manner that down-regulates their children’s expressions of negative emotions before they become overwhelmed by such feelings (Sroufe 1996). By responding early and effectively, parents may be able to keep their children from experiencing emotional extremes, which in turn may facilitate children learning adaptive regulatory strategies for handling unpleasant emotions (Kochanska and Aksan 1995).

This link is supported in many studies on the specific practices that promote or inhibit the development of self-regulatory abilities during childhood (e.g., Martin 1981; Shaw et al. 1998). In one longitudinal study, while controlling for children’s initial levels of observed effortful control, high levels of maternal responsiveness at 22 months predicted high levels of effortful control observed at 33 months (Kochanska et al. 2000). In another longitudinal investigation, high levels of maternal positive behavioral support at age 2 were associated with children’s faster growth in inhibitory control between ages 2 and 4 (Moilanen et al. in press). In a cross-sectional study conducted with a small sample of middle-class children aged 6–8 years, Davidov and Grusec (2006) found that maternal and paternal responsiveness to children’s distress was predictive of children’s better regulation of negative emotions, and that maternal warmth was related to children’s regulation of positive emotions. High levels of maternal warmth in early childhood also have been linked to better regulation in middle childhood (Colman et al. 2006). This pattern has emerged in cross-sectional research on adolescent self-regulation (Finkenauer et al. 2005; Purdie et al. 2004) and in relation to dimensions of psychological adjustment attributed to self-regulation during childhood and adolescence (e.g., Scaramella et al. 1999). Thus, it is reasonable to expect that maternal regulatory supportive parenting would be associated with individual differences in at-risk youths’ self-regulation during the early adolescent years.

Maternal Antagonistic Parenting—Empirical evidence also suggests that harsh or antagonistic parenting undermines the development of self-regulation during childhood and early adolescence. Maternal antagonistic parenting was conceptualized as parental behaviors that inspire children’s negative feelings (e.g., negative verbal comments, controlling others through guilt). Psychologically-controlling parenting behaviors such as these may frighten children into suppressing displays of negative emotion (Sroufe 1996) or quickly squelch misbehavior (Coplan et al. 2002), but at the cost of depriving children of chances to practice self-regulation in a supportive context (Colman et al. 2006; Scaramella and Leve 2004). Theoretically, antagonistic parenting would also be hypothesized to be associated with elevated levels of children’s negative affect, which would then increase their need for having effective regulation strategies (Barber and Harmon 2001; Scaramella and Leve 2004). Finally, maternal antagonistic parenting may shift attention from the parenting message to youth’s feelings, reducing the likelihood that adolescents would internalize parental expectations, and limiting their subsequent willingness to adhere to parental directives (Grusec and Goodnow 1994).

There is a growing body of empirical evidence to support negative associations between harsh, antagonistic parenting and self regulation during childhood and adolescence. For example, one investigation with teenagers demonstrated negative associations between high levels of conflicted-harsh parenting and young adolescents' contemporaneous self-regulation (Brody and Ge 2001). In a sample of Dutch youth ages 10–14, Finkenauer et al. (2005) revealed that low levels of psychological control were linked to high contemporaneous self-control. The few longitudinal studies that have explored change in self-regulation in relation to harsh aspects of parenting show a similar pattern. In one study, physically punitive discipline in early childhood was related to a modest negative contribution to change in self-regulation between early and middle childhood (Colman et al. 2006). In another study examining parallel latent growth models of parenting and effortful control during the transition to adolescence, initial levels of parental rejection and inconsistency were linked to initial levels in children's effortful control (Lengua 2006). In sum, past research on associations between psychologically controlling, antagonistic parenting and adolescents' self-regulatory development is limited, with some evidence to suggest that harsh parenting undermines children's and teens' self-regulatory development. As with regulatory supportive parenting, however, more information is needed about the role of antagonistic parenting in the development of self-regulation during adolescence, especially for youth at risk for poor socioemotional adjustment.

The Emotional Climate of the Family

In the current study, the role of parent–child relationship quality was also examined, and was operationalized as sons' perceptions of conflict and closeness with their mother. To date, aside from studies on attachment (e.g., Kobak et al. 1993), research on the parental socialization of self-regulation has generally emphasized specific parenting strategies or combinations of parenting dimensions (e.g., authoritativeness) versus global qualities that characterize the quality of the parent–child relationship. This gap is puzzling given the widespread understanding that parenting behaviors are fully embedded within the broader affective context of parent–child relationships (Laible and Thompson 2007), and that increases in parent–child conflict and declines in closeness are fairly typical in early adolescence (Furman and Buhrmester 1992). Likewise, several theorists posit that children's self-regulatory development is most likely facilitated by positive relationships with significant others (Daniels et al. 1985; Grusec and Goodnow 1994). Thus, it is plausible to expect that specific types of parenting and qualitative aspects of the parent–child relationship contribute independent variance to child self-regulation.

Indirect support for this link can be inferred from studies on parent–adolescent relationship correlates of emotional and behavioral problems that are believed to stem from self-regulatory deficiencies. For example, youth experiencing clinical or sub-clinical levels of depressive symptoms reported greater parent–child conflict than youth with few or no depressive symptoms (Sheeber et al. 2007). In another study, parent–child conflict at age 11 predicted increases in externalizing behaviors between children's ages 11 and 14 (Burt et al. 2005). Outside of the developmental psychopathology literature, three examples provide direct evidence that high-quality relationships support the development of self-regulation in typically-developing youth populations. In one study with youth ages 8–16 years, mothers who reported high-quality parent–child relationships reported that their offspring had better behavior regulation (Bynum and Brody 2005). In another study conducted with a college-age sample, adaptive family functioning was linked to lower levels of negative affect following parent–child conflict (McCarthy et al. 2004). Finally, high levels of adolescent-reported negative family relations were associated with low levels of effortful control in a sample of European American and Latino 10-year-olds (Loukas and Roalson 2006). As two of these studies were cross-sectional and all three employed a single informant and method

design, confirming or dis-confirming these links in a longitudinal context using multiple methods and reporters is crucial before any firm conclusions can be drawn about direct and independent effects of the parent–child relational context.

The Current Study

Three limitations of previous studies on self-regulation during adolescence are addressed in the current investigation. First, previous studies have been primarily cross-sectional in nature, which limits the conclusions that may be drawn about change (e.g., Finkenauer et al. 2005). Both cross-sectional and longitudinal models were examined in the present inquiry, providing new information about short-term longitudinal change in self-regulation during early adolescence. Second, only rarely have existing investigations examined interrelations among different aspects of the caregiving context in relation to youth regulation (e.g., Brody et al. 2005). Two dimensions of parenting behavior (maternal regulatory support and antagonism) were considered in this research. Finally, existing studies typically have not included observed measures of parental behavior, and have instead relied upon parental or youth perceptions of parenting (e.g., Bynum and Brody 2005; Loukas and Roalson 2006). In addition to being vulnerable to respondent bias, these types of questionnaires likely blur the border between parental behaviors and the affective context of the parent–child relationship. This shortcoming is addressed in the current study, for which we utilized observed indices of maternal parenting behaviors and son's reports of their perceptions of the mother–son relationship. Overall, studies in which parental behavior and the parent–child relational context can be distinguished are needed to clarify which elements directly promote self-regulatory development. Thus, the current study sought to advance our understanding of relationships between and among parenting factors and youth self-regulation in early adolescence within the framework of a longitudinal design and using multiple methods and informants.

Based on prior research, we expected to find evidence of direct associations between observed parenting behaviors and mother–son relationship quality assessed when boys were age 10 and their self-regulation at ages 10 and 11. We anticipated that both parenting and parent–child relationship quality would contribute independent variance to boys' contemporaneous and subsequent self-regulation. In both cross-sectional and longitudinal models, we predicted that high levels of self-regulation would be associated with high levels of maternal regulatory support, low levels of maternal antagonism, and high levels of mother–son relationship quality.

Methods

Participants and Procedures

This study used data from a larger project on vulnerability and resiliency from a sample of boys from low-socioeconomic backgrounds. The sample was restricted to boys because the original intent of the study was to examine precursors of antisocial behavior. Funding did not permit recruitment of a sufficiently large sample of girls who were expected to show serious levels of antisocial behavior. Recruitment took place at Women, Infants and Children (WIC) Nutritional Supplement Program clinics throughout the metropolitan Pittsburgh area. Four-hundred and twenty-one mothers with male infants 6–17 months of age were asked to take part in a longitudinal study on child development. Three-hundred and ten mothers ranging in age from 17 to 43 years ($M = 27.82$, $SD = 5.33$) participated in the first assessment at boys' age 1½ years. Two-hundred seventy-one families participated in the age 10 or 11 assessments (87% of the original sample), and 263 boys had sufficient data for inclusion in analyses. The resulting analytic sample was composed primarily of European American (50%) and African American boys (40%), with a small number of

biracial and Hispanic participants (10%). As the vast majority of non-European American boys were part or fully African American, we refer to non-European American boys as African American for the duration of this manuscript. Mean yearly family income at boys' age 10 was \$28,702 (SD = \$18,534), corresponding to a per capita average of \$6,506 (SD = \$4,636). 60% of the primary caregivers identified themselves as being married or living with a partner, 23% identified as single (never married), and the remaining 17% were separated, divorced or widowed. Attrition analyses indicated that boys with missing data at age 11 did not differ from boys present at age 11 on any age 10 study or demographic variables.

Data were collected during study visits when the target children were ages 10 and 11. One research assistant interviewed the primary caregiver (96% of the primary caretakers were mothers at age 10), while another interviewed the target child and alternate caregiver (60% of boys had alternate caregiver reports at age 10, and nearly all were fathers; 22% of boys had father reports at age 11). Families also participated in a videotaped discussion task at the age 10 assessment. Research assistants completed short questionnaires about the family and home environment following the study visit.

Measures

Self-Regulation (Ages 10 and 11)—Mothers and alternate caregivers completed the self control subscale from the elementary level version of the social skills rating system (SSRS; Gresham and Elliott 1990) at boys' ages 10 and 11. Mothers and alternate caregivers responded to ten items (e.g., "Controls temper when arguing with other children"), using a three-point response scale ranging from 0 (*Never*) to 2 (*Very often*). Internal consistency was acceptable for both reporters at the two time-points (primary caregiver Cronbach α s = .81, and alternate caregiver α s = .80 at both assessments). Scale scores were computed by summing the responses to the items. Maternal and alternate caregiver scores were averaged for analyses, as their scores were positively correlated (r s were .37 and .63 at ages 10 and 11, p s < .001, respectively).

Observed Parenting (Age 10)—During the age 10 home visit, boys, mothers, and if available, alternative caregivers, participated in a videotaped discussion task designed to examine how the family discussed and solved typical family conflicts. The interaction task was based on procedures developed by Hetherington et al. (1992) and adapted by Conger and colleagues (Melby and Conger 2001). During the 8 min task, the family discussed two issues that served as regular sources of parent-child conflict. These issues were identified through mothers and sons' responses on a 24-item questionnaire of typical family conflicts (e.g., child's choice of friends, child keeping room tidy; Prinz et al. 1979). Family discussions were videotaped and subsequently coded by trained research assistants and graduate students in clinical psychology.

Maternal regulatory support consisted of seven global codes of maternal behavior directed toward the son during the discussion task, including expression of ideas, acknowledging/responding to the son's ideas, nonverbal expressions of engagement, clear communication, and consistency/firmness of rule enforcement, supportive family talk, and empathy. Maternal antagonism toward the son was measured by nine codes, including nonverbal expressions of disengagement, put downs of person/ideas, negative humor/sarcasm, complaining, use of guilt, mindreading, controlling feelings, and rejection versus acceptance, interruptions, and emotional reactivity. Research assistants rated each dimension using a ten point scale, ranging from 0 (*Not present*) to 9 (*A lot*). Codes for each scale were averaged to form the two scale scores. The internal consistency for each parenting dimension was sufficiently high (regulatory support α = .81; antagonism α = .79). To assess interrater reliability, approximately 25% of the tapes ($n = 30$) were assigned randomly to a

primary coder (whose ratings were used in the analyses) and a reliability coder (Criss et al. 2003). The coders independently rated their assigned tapes and were blind as to which tapes had been assigned for reliability purposes. Interrater reliability was in an acceptable range (interrater reliability: $r = .73$; $p < .001$; within 1% agreement = 81%).

Mother–Son Relationship Quality (Age 10)—Mother–son relationship quality was measured using son’s reports on ten items adapted from the Student–Teacher Relationship Scale (Pianta and Steinberg 1991; sample item: “If I get upset, I seek comfort from my mother”). This measure was selected because it taps attachment-related dimensions of relationship quality, and has demonstrated associations with multiple adjustment difficulties (e.g., Criss and Shaw 2003; Ingoldsby et al. 2001). Boys responded to each item using a response scale ranging from 1 (*Definitely not*) to 5 (*Definitely*). Responses to items were averaged to form a single scale score, and higher scores indicate better mother–son relationship quality (Cronbach’s $\alpha = .67$).

Missing Data

Patterns of missing data were examined prior to conducting all substantive analyses. This exploration indicated that 72% of the sample ($n = 188$) had complete study data, 13% of boys were missing one study variable ($n = 33$), and the remaining 15% ($n = 42$) were missing two or more study variables. The concentration of missing data was highest for the observed parenting indices. At the age 10 visit, a subset of families who completed other study procedures were unavailable or declined to participate in the videotaped discussion task (16%; $n = 41$), but this sub-sample did not differ from the larger study sample on any demographic or study variables. SPSS Missing Values Analysis indicated that data were missing completely at random, Little’s MCAR test $\chi^2(54) = 52.38$, $p > .05$. Following recommendations by McCartney et al. (2006), missing values were singly imputed using the expectation-maximization (EM) method. A new dataset with imputed values was used for all subsequent analyses.

Results

Preliminary Analyses

Our first step was to examine direct associations between dimensions of maternal parenting, mother–son relationship quality and child self-regulation, which was addressed via correlation analyses (see Table 1). All correlations were in the expected directions. High levels of self-regulation at age 10 were associated with high levels of self-regulation at age 11. In turn, high levels of self-regulation at ages 10 and 11 were associated with high levels of observed maternal regulatory support, high levels of mother–son relationship quality and low levels of antagonism at age 10. Maternal regulatory support and antagonism were negatively correlated, indicating that maternal support was low when levels of antagonism were high. Mother–son relationship quality was not correlated with either maternal regulatory support or antagonism.

Regression Analyses

Cross-Sectional Model—In this model, self-regulation at age 10 was predicted using the age 10 variables, which were entered in three steps. Ethnicity and family per capita income were controlled on the first step, and was followed by parenting behaviors (regulatory support and antagonism) on the second step. Mother–son relationship quality was added on the third and final step. On the first step, the demographic controls of child ethnicity and family per capita income accounted for a significant portion of the variance in boys’ self-regulation at age 10, $F(1, 260) = 12.51$, $p < .001$, $R^2 = .09$ (see Table 2). Child ethnicity was not a significant predictor, but high annual per capita income levels were associated with

high levels of self-regulation at age 10. The addition of regulatory supportive and antagonistic parenting on the second step improved the model significantly, $\Delta F(2, 258) = 11.29, p < .001, \Delta R^2 = .07$, as did the addition of mother–son relationship quality on the third step, $\Delta F(1, 257) = 22.94, p < .001, \Delta R^2 = .07$. On both the second and third steps, high levels of regulatory supportive parenting and low levels of maternal antagonism predicted high levels of sons' contemporaneous self-regulation. High levels of mother–son relationship quality were associated with high levels of age 10 self-regulation. The association for annual per capita income remained when parenting and relationship quality were added on the second and third steps.

Longitudinal Model—A similar strategy was employed to predict self-regulation at age 11. Age 10 self-regulation was entered on the first step, and ethnicity and family per capita income were included on the second step. The third and fourth steps added parenting behaviors and mother–son relationship quality, respectively. On the first step, boys' age 10 self-regulation explained a significant portion of the variance in age 11 self-regulation, $F(1, 261) = 234.20, p < .001, R^2 = .47$. High levels of self-regulation at age 10 were associated with high levels of self-regulation at age 11. Ethnicity and per capita annual income failed to explain an additional portion of the variance on the second step, $\Delta F(1, 259) = 2.43, p > .05, \Delta R^2 = .01$. The addition of maternal parenting behaviors on the third step significantly improved the model, $\Delta F(2, 257) = 3.11, p < .05, \Delta R^2 = .01$. Controlling for prior self-regulation, maternal regulatory support did not contribute to the model at this step. However, maternal antagonism emerged as a significant predictor such that high levels of maternal antagonism were associated with low levels of self-regulation at age 11. Per capita income also explained a small but significant portion of the variance in age 11 self-regulation. On the fourth and final step, the inclusion of mother–son relationship quality explained additional variance in age 11 self-regulation, $\Delta F(1, 256) = 8.67, p < .01, \Delta R^2 = .02$. High levels of mother–son relationship quality were associated with high levels of boys' self-regulation at age 11 (Table 3).

Discussion

The goal of the current study was to examine patterns of associations between observed maternal regulatory supportive and antagonistic parenting, mother–son relationship quality, and boys' self-regulation. As predicted, mother–son relationship quality and regulatory supportive and antagonistic parenting were associated with boys' self-regulation. It was also hypothesized that mother–son relationship quality would predict additional variance in self-regulation beyond that explained by maternal parenting. This hypothesis was also supported cross-sectionally at age 10 and longitudinally at age 11, even after controlling for boys' prior self-regulation. Overall, results of this investigation provide initial evidence in favor of a portion of the tripartite model of the impact of the family on children's emotion regulation and adjustment, and highlight the importance of the parent–child relationship context, which previously has been an under-studied socialization pathway (Morris et al. 2007). The current study's findings challenge the assumption that adolescent self-regulation is primarily socialized through parenting practices, particularly through the provision of high levels of parental warmth (e.g., Finkenauer et al. 2005). Instead, results of this longitudinal, multi-method and multi-informant study suggest that it is the absence of maternal antagonism and the presence of high-quality mother–son relationships that are most important for positive change in self-regulation over the course of 1 year.

Maternal Parenting and Mother–Son Relationship Quality

Theoretically, self-regulation is socialized during childhood and adolescence through discrete parenting practices. Dimensions of parental warmth and psychological control have

reliably emerged as critical covariates of children's and adolescents' self-regulatory abilities. Consequently, it was hypothesized that high levels of maternal regulatory support and low levels of maternal antagonism would be positively linked to boys' self-regulation skills at ages 10 and 11. Analyses revealed that boys with mothers who showed higher levels of regulatory support and lower levels of antagonism demonstrated better contemporaneous self-regulation, and in the case of maternal antagonism, also better future self-regulation. These results are consistent with prior research on parenting and children's self- and emotion regulation. In keeping with this study's observed effects of maternal support, Davidov and Grusec (2006) revealed that maternal and paternal responsivity to children's distress was related to children's better regulation of negative emotions, and that maternal warmth was indicative of children's regulation of positive emotions. Furthermore, in two separate cross-sectional studies with adolescents, high levels of maternal acceptance/involvement were associated with high levels of adolescents' self-regulation (Finkenauer et al. 2005; Purdie et al. 2004). Also consistent with this study's observed effects of maternal antagonism, Finkenauer et al. (2005) reported that high levels of perceived parental psychological control were indicative of youths' poor contemporaneous self-regulation. Overall, results of this longitudinal study compliment and extend these existing findings, emphasizing the importance of maternal antagonism for longitudinal rank-order change in self-regulatory abilities.

With the exception of Bynum and Brody's (2005) study, substantially fewer studies have directly examined the associations between parent-child relationship quality and children's self-regulation, and even fewer studies have examined the contribution of relationship quality and parenting on self-regulation simultaneously. Thus, we also explored the possibility that parent-child relationship quality would contribute independent variance to the prediction of child self-regulation after accounting for the effects of maternal regulatory supportive and antagonistic parenting. Again, results were consistent with this prediction. In both the cross-sectional and longitudinal models, high quality mother-son relationships were associated with high levels of self-regulation. The current results suggest that the affective context of the mother-son relationship has an additive effect upon boys' self-regulation in addition to associations with maternal parenting behavior. The current study suggests that the more global construct of relationship quality is associated with children's self-regulation above and beyond the contribution of specific parenting actions. This extends the findings of these two areas, which up until this study have remained rather distinct.

Although there are some exceptions, the vast majority of scholarship on adolescent self-regulation has been cross-sectional in nature, which has left unanswered questions about whether longitudinal change in adolescent self-regulation may be attributed to parenting practices or the parent-child relationship context. Thus, in order to explore whether maternal parenting or mother-son relationship quality was associated with change in youths' self-regulation abilities, we reexamined these associations within a multivariate framework controlling for initial youth self-regulation. Not surprisingly, youths' self-regulation at age 10 was strongly associated with their self-regulation at age 11. This is consistent with other work in this area, which suggests that regulatory abilities are rather stable in middle childhood and the early adolescent years (Murphy et al. 1999; Raffaelli et al. 2005). In the context of the longitudinal model that controlled for boys' prior self-regulation, maternal regulatory support was no longer significantly related to boys' self-regulation, but the effects of maternal antagonism and mother-son relationship quality remained. The pattern of findings suggests that the absence of antagonism, rather than the presence of supportive parenting, promotes rank-order improvements in boys' self-regulatory abilities during early adolescence. Furthermore, the portion of variance explained by antagonism was not reduced when relationship quality was added to the model, suggesting that the longitudinal effects of maternal antagonism and mother-son relationship quality are distinct. Taken together, these

findings are consistent with the hypothesis that the negative affect aroused by antagonistic, conflicted mother–son relations prevents or slows short-term longitudinal growth in self-regulation (Sroufe 1996).

Contributions, Limitations, and Future Directions

The current study should be interpreted with several caveats in mind. First, the measurement of parenting, mother–son relationship quality, and self-regulation were construed rather narrowly. For example, the measure of self-regulation employed in this study does not distinguish between the regulation of emotions and behavior, and focuses primarily on short-term self-regulation (Moilanen 2007). Aspects of parenting beyond regulatory support and antagonism or manifestations of parent–child relationship quality may be differentially associated with youth's long-term self-regulation, with the regulation of behavior, or with their regulation of negative and positive emotions, as was suggested in a recent study by Davidov and Grusec (2006). Future research should more fully address these important issues.

Second, the study sample was comprised entirely of low-income boys from an urban context who were primarily of European American or African American ethnicity. Prior studies have revealed gender differences in self-regulation (e.g., Raffaelli et al. 2005) and ethnic differences in parenting (e.g., Steinberg et al. 1995). Although no ethnic differences in parenting behaviors were observed, we controlled for ethnicity in the current study and explored the possibility of moderation by ethnicity in a separate set of analyses not described in this manuscript. Results of these regressions provided no evidence for moderation of effects by ethnicity. Replication of the current findings in ethnically diverse samples of boys *and* girls from different community contexts (e.g., rural, suburban) is necessary to determine whether these findings are applicable to both genders, and across ethnic groups and community types.

Third, we focused on maternal parenting behavior and the mother–son relational context in the current study. Undoubtedly, fathers also play a critical role in the development of children's self-regulation; however, many of the study children live in mother-headed, single-parent households, and thus fathers were not available for participation for the majority of study families. Data were collected from fathers when they were available and when they chose to participate, but this represents a minority of families in the study. For example, at age 10, alternate caregiver reports of boys' self-regulation were obtained for 78% of boys with two-parent families (115 of 147 families) and for 25% of boys with single-parent families (24 of 97 families). Such limited father participation precluded conducting separate analyses on paternal parenting and the father–son relational context as part of the study. Whether these same associations found for mother–son relationships would be replicated in father–child relationships should be considered in future research.

Finally, firm conclusions about directions of effects cannot be drawn due to the short-term nature of this longitudinal study. We interpreted these findings to suggest that maternal regulatory supportive parenting, high quality mother–son relationships, and low levels of maternal antagonism promote the development of boys' self-regulation. It is equally likely, however, that children's regulation may affect parents' behaviors and/or the parent–child relationship (as is suggested by the theoretical model; Morris et al. 2007), or that these effects may be transactional in nature (e.g., Scaramella and Leve 2004). For example, parents may struggle to provide support or find it difficult to maintain positive relationships with highly reactive, dysregulated sons, which may impede subsequent improvements in children's regulatory abilities. It seems possible that parent–child relationship quality may have particular importance during adolescence than in childhood because teens are better able to make meaningful contributions to the parent–child relationship (Denissen et al.

2009). The notion that adolescents are able to contribute to their own self-regulatory socialization warrants further attention, and is a necessary step in future evaluations of the theoretical model underlying this investigation. Furthermore, additional longitudinal studies focused on disentangling the directions of effects will support the development of effective, targeted interventions to promote youth's self-regulation and optimal adjustment.

Despite these limitations, the current investigation adds nuance to the story of the development of self-regulation during early adolescence, and has several important implications for research and applied settings. This study offers partial support for a portion of the tripartite model of the impact of the family on children's self-regulation and adjustment (Morris et al. 2007) and provides direct evidence for the assertion that teenagers' social-emotional development is fostered by specific types of maternal behavior and the quality of the parent-child relationship (McCarthy et al. 2004). These findings also reinforce the value of multifaceted interventions such as the Strong African American Families program (Brody et al. 2005), which has produced improvements in children's self-regulation in conjunction with enhanced parent-child relationship quality and parenting behavior. These and other promising interventions may best support adolescents' developing self-regulatory abilities and prevent youth risk behaviors by targeting parent-child relationships in addition to parenting behaviors.

Most importantly, results of this study indicate that dimensions of maternal regulatory support (warmth, acceptance, etc.) may be less important than maternal antagonism (rejection, psychological control, etc.) or mother-son relationship quality during adolescence. Young children's self-regulation may benefit from maternal support, and thus may be better able to control their behavior and emotions through receiving appropriate maternal warmth and support (e.g., Moilanen et al. in press). The current investigation hints that youth have already enjoyed the full benefit of maternal regulatory support on their self-regulatory development by age 10, although this question cannot be addressed conclusively using these data. In other words, adolescents have learned what they can from maternal supportive parenting, and may no longer require such parenting behaviors in order to assist them with everyday self-regulation. However, it seems that their self-regulation is still vulnerable to being hurt through antagonistic parenting and poor quality mother-son relationships. This may be due to typical cognitive developments and changes in social relationships during early adolescence: For example, around this time youth start to resemble adults in their understanding of sarcasm (Capelli et al. 1990), and simultaneously, youth also experience elevated levels of conflict and decreased closeness in their relationships with parents (Furman and Buhrmester 1992). With their increased understanding of parental antagonism and awareness of changes in their parent-child relationship, adolescents experiencing atypically high levels of antagonism and parent-child conflict may be bothered to the point that their self-regulatory development occurs more slowly over the following year. These developmental differences must be considered in future research on the development of adolescent self-regulation, as results of the current investigation ultimately suggest that what is beneficial during childhood is not equally beneficial during adolescence.

Acknowledgments

The research reported in this paper was supported by grants to the second author from the National Institute of Mental Health, grants MH 50907 and MH 01666. We are grateful to the work of the staff of the Pitt Mother & Child Project for their years of service, and to our study families for making the research possible. We also would like to thank Jennifer Silk for providing feedback on an initial draft of the paper, and Michael Criss for providing assistance with study data.

References

- Barber, BK.; Harmon, EL. Violating the self: Parental psychological control of children and adolescents. In: Barber, BK., editor. *Intrusive parenting: How psychological control affects children and adolescence*. Washington, DC: American Psychological Association; 2001. p. 15-52.
- Baumrind D. The influence of parenting style on adolescent competence and substance use. *Journal of Early Adolescence*. 1991; 11:56–95.
- Bedford, VH.; Volling, BL. A dynamic ecological systems perspective on emotion regulation development within the sibling relationship context. In: Lang, FR.; Fingerman, KL., editors. *Growing together: Personal relationships across the lifespan*. New York: Cambridge University Press; 2004. p. 76-102.
- Brody GH, Ge X. Linking parenting processes and self-regulation to psychological functioning and alcohol use during adolescence. *Journal of Family Psychology*. 2001; 15:82–94. [PubMed: 11322087]
- Brody GH, Murry VM, McNair L, Chen Y, Gibbons FX, Gerrard M, et al. Linking changes in parenting to parent-child relationship quality and youth self-control: The strong African American families program. *Journal of Research on Adolescence*. 2005; 15:47–69.
- Burt SA, McGue M, Krueger RF, Iacono WG. How are parent-child conflict and childhood externalizing symptoms related over time? Results from a genetically informative cross-lagged study. *Development and Psychopathology*. 2005; 17:145–165. [PubMed: 15971764]
- Bynum MS, Brody GH. Coping behaviors, parenting, and perceptions of children's internalizing and externalizing problems in rural African American mothers. *Family Relations*. 2005; 54:58–71.
- Capelli CA, Nakagawa N, Madden C. How children understand sarcasm: The role of context and intonation. *Child Development*. 1990; 61:1824–1841.
- Colman RA, Hardy SA, Albert M, Raffaelli M, Crockett L. Early predictors of self-regulation in middle childhood. *Infant and Child Development*. 2006; 15:421–437.
- Coplan RJ, Hastings PD, Lagacé-Séguin DG, Moulton CE. Authoritative and authoritarian mothers' parenting goals, attributions, and emotions across different childrearing contexts. *Parenting: Science and Practice*. 2002; 2:1–26.
- Criss M, Shaw DS. Parent-child synchrony and antisocial behavior in middle childhood. *Social Development*. 2003; 12:379–400.
- Criss M, Shaw DS, Ingoldsby EM. Mother-son positive synchrony in middle childhood: Relation to antisocial behavior. *Social Development*. 2003; 12:379–400.
- d'Acremont M, Van der Linden M. How is impulsivity related to depression in adolescence? Evidence from a French validation of the cognitive emotion regulation questionnaire. *Journal of Adolescence*. 2007; 30:271–282. [PubMed: 16600359]
- Daniels D, Dunn J, Furstenberg FF, Plomin R. Environmental differences within the family and adjustment differences within pairs of adolescent siblings. *Child Development*. 1985; 56:764–774. [PubMed: 4006577]
- Davidov M, Grusec JE. Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development*. 2006; 77:44–58. [PubMed: 16460524]
- Denissen JA, van Aken MAG, Dubas JS. It takes two to tango: How parents' and adolescents' personalities link to the quality of their mutual relationship. *Developmental Psychology*. 2009; 45:928–941. [PubMed: 19586171]
- Dennis T. Emotional self-regulation in preschoolers: The interplay of child approach reactivity, parenting, and control capacities. *Developmental Psychology*. 2006; 42:84–97. [PubMed: 16420120]
- Finkenauer C, Engels RCME, Baumeister RF. Parenting behavior and adolescent behavioural and emotional problems: The role of self-control. *International Journal of Behavioral Development*. 2005; 29:58–69.
- Furman W, Buhrmester D. Age and sex differences in perceptions of networks of personal relationships. *Child Development*. 1992; 63:103–115. [PubMed: 1551320]
- Gestsdottir S, Lerner RM. Positive development in adolescence: The development and role of intentional self-regulation. *Human Development*. 2008; 51:202–224.

- Gresham, FM.; Elliott, SN. Social skills rating system manual. Circle Pines: American Guidance Service; 1990.
- Grusec JE, Goodnow JJ. Impact of parental discipline methods on the child's internalization of values: A reconceptualization of current points of view. *Developmental Psychology*. 1994; 30:4–19.
- Hetherington EM, Clingempeel WG, Anderson ER, Deal JE, Stanley Hagan M, Hollier AE, et al. Coping with marital transitions: A family systems perspective. *Monographs of the Society for Research in Child Development*. 1992; 57:12–3. 227.
- Ingoldsby E, Shaw DS, Garcia M. Intra-familial conflict in relation to boys' adjustment at school. *Development and Psychopathology*. 2001; 13:35–52. [PubMed: 11346051]
- Jones, EE.; Gerard, HB. Foundations of social psychology. New York: Wiley; 1967.
- Kobak RR, Cole HE, Ferenz-Gillies R, Fleming WS, Gamble W. Attachment and emotion regulation during mother-teen problem solving: A control theory analysis. *Child Development*. 1993; 64:231–245. [PubMed: 8436031]
- Kochanska G, Aksan N. Mother-child mutually positive affect, the quality of child compliance to requests and prohibitions, and maternal control as correlates of early internalization. *Child Development*. 1995; 66:236–254.
- Kochanska G, Murray KT, Harlan ET. Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology*. 2000; 36:220–232. [PubMed: 10749079]
- Laible, D.; Thompson, RA. Early socialization: A relationship perspective. In: Grusec, JE.; Hastings, PD., editors. *Handbook of socialization: Theory and research*. New York: Guilford; 2007. p. 181–207.
- Lengua LJ. Growth in temperament and parenting as predictors of adjustment during children's transition to adolescence. *Developmental Psychology*. 2006; 42:819–832. [PubMed: 16953689]
- Loukas A, Roalson LA. Family environment, effortful control, and adjustment among European American and Latino early adolescents. *Journal of Early Adolescence*. 2006; 26:432–455.
- Martin J. A longitudinal study of the consequences of early mother-infant interaction: A microanalytic approach. *Monographs of the Society for Research in Child Development*. 1981; 46
- McCarthy CJ, Lambert RG, Seraphine AE. Adaptive family functioning and emotion regulation capacities as predictors of college students' appraisals and emotion valence following conflict with their parents. *Cognition & Emotion*. 2004; 18:97–124.
- McCartney K, Burchinal MR, Bub KL. Best practices in quantitative methods for developmentalists. *Monographs of the Society for Research in Child Development*. 2006; 71(3) Serial No. 285.
- Melby, JN.; Conger, RD. The Iowa family interaction rating scales: Instrument summary. In: Kerig, PK.; Lindahl, KM., editors. *Family observational coding systems: Resources for systemic research*. Mahwah, NJ: Lawrence Erlbaum Associates; 2001. p. 33–58.
- Mischel W, Shoda Y, Rodriguez ML. Delay of gratification in children. *Science*. 1989; 244:933–938. [PubMed: 2658056]
- Moilanen KL. The adolescent self-regulatory inventory: The development and validation of a questionnaire of short-term and long-term self-regulation. *Journal of Youth and Adolescence*. 2007; 36:835–848.
- Moilanen KL, Shaw DS, Dishion TJ, Gardner F, Wilson MN. Predictors of longitudinal growth in inhibitory control in early childhood. *Social Development*. in press.
- Morris AS, Silk JS, Steinberg L, Myers SS, Robinson LR. The role of the family context in the development of emotion regulation. *Social Development*. 2007; 16:361–388. [PubMed: 19756175]
- Murphy BC, Eisenberg N, Fabes RA, Shepard S, Guthrie IK. Consistency and change in children's emotionality and regulation: A longitudinal study. *Merrill-Palmer Quarterly*. 1999; 45:413–444.
- Pianta, RC.; Steinberg, M. Relationship between children and kindergarten teachers: Associations with home and classroom behavior. Paper presented at the meeting for the Society for Research in Child Development; Seattle, WA. 1991 April.
- Prinz RJ, Foster SL, Kent RN, O'Leary KD. Multivariate assessment of conflict in distressed and non-distressed mother-adolescent dyads. *Journal of Applied Behavior Analysis*. 1979; 12:691–700. [PubMed: 541311]

- Purdie N, Carroll A, Roche L. Parenting and adolescent self-regulation. *Journal of Adolescence*. 2004; 27:663–676. [PubMed: 15561309]
- Raffaelli M, Crockett LJ. Sexual risk taking in adolescence: The role of self-regulation and attraction to risk. *Developmental Psychology*. 2003; 39:1036–1046. [PubMed: 14584983]
- Raffaelli M, Crockett LJ, Shen YL. Developmental stability and change in self-regulation from childhood to adolescence. *Journal of Genetic Psychology*. 2005; 166:54–75. [PubMed: 15782678]
- Scaramella LV, Leve LD. Clarifying parent–child reciprocities during early childhood: The early childhood coercion model. *Clinical Child and Family Psychology Review*. 2004; 7:89–107. [PubMed: 15255174]
- Scaramella LV, Conger RD, Simons RL. Parental protective influences and gender-specific increases in adolescent internalizing and externalizing problems. *Journal of Research on Adolescence*. 1999; 9:111–141.
- Shaw DS, Winslow EB, Owens EB, Vondra JI, Cohn JF, Bell RQ. The development of early externalizing problems among children from low-income families: A transformational perspective. *Journal of Abnormal Child Psychology*. 1998; 26:95–107. [PubMed: 9634132]
- Sheeber LB, Davis B, Leve C, Hops H, Tildesley E. Adolescents' relationships with their mothers and fathers: Associations with depressive disorder and subdiagnostic symptomatology. *Journal of Abnormal Psychology*. 2007; 116:144–154. [PubMed: 17324025]
- Sroufe, AL. *Emotional development: The organization of emotional life in the early years*. New York: Cambridge University Press; 1996.
- Steinberg, L.; Darling, NE.; Fletcher, AC. Authoritative parenting and adolescent development: An ecological journey. In: Moen, P.; Elder, GH.; Luscher, K., editors. *Examining lives in context*. Washington, DC: APA; 1995. p. 423-466.
- Thompson RA. Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*. 1994; 59:25–52. [PubMed: 7984164]

Biographies

Kristin L. Moilanen is an Assistant Professor of Child Development and Family Studies in the Department of Technology, Learning, and Culture at West Virginia University. Dr. Moilanen received her Ph.D. in Developmental Psychology from the University of Nebraska, and prepared this manuscript during postdoctoral training at the University of Pittsburgh. Her major research interests include self-regulation, parent–child relationships, and adolescent risk behaviors.

Daniel S. Shaw is a Professor and Chair of the Department of Psychology, and the Director of the Pitt Parents and Children Laboratory at the University of Pittsburgh. Dr. Shaw received his Ph.D. in Clinical Psychology from the University of Virginia. His research focuses on factors associated with the development and prevention of conduct and emotional problems, particularly during early childhood.

Amber Fitzpatrick is a roving instructor with United Technical Center in Clarksburg, West Virginia. She received her M.A. in Educational Psychology with an emphasis in Child Development and Family Studies from West Virginia University. Her major research interests include spiritual and moral development, and the development of self-regulation in childhood.

Table 1

Study variable descriptive statistics and correlations ($N = 263$)

	<i>M</i>	<i>SD</i>	<i>Correlations</i>			
			1	2	3	4
1. Self-regulation (age 10)	12.09	3.03				
2. Self-regulation (age 11)	12.44	3.21	.69**			
3. Regulatory support	5.85	.93	.23**	.20**		
4. Antagonism	2.72	.83	-.25**	-.28**	-.14*	
5. Relationship quality	3.68	.64	.34**	.36**	.10	-.09

* $p < .05$,** $p < .01$ (two-tailed)

Table 2

Results of hierarchical regression analysis predicting self-regulation at age 10

	Step		
	1	2	3
Ethnicity	.04	.01	.03
Per capita income	.28***	.24***	.19**
Regulatory support		.14*	.13*
Antagonism		-.22***	-.20**
Relationship quality			.27***
R^2	.09	.16	.23
ΔR^2		.07	.07

All weights are standardized (β s).*
 $p < .05$;**
 $p < .01$;***
 $p < .001$

Table 3

Results of hierarchical regression analysis predicting self-regulation at age 11

	Step			
	1	2	3	4
Self-regulation (age 10)	.69***	.66***	.63***	.59***
Ethnicity		.03	.02	.02
Per capita income		.09 ⁺	.10 [*]	.08
Regulatory support			.01	.01
Antagonism			-.11 [*]	-.11 [*]
Relationship quality				.14**
<i>R</i> ²	.47	.48	.50	.51
ΔR^2		.01	.01	.01

All weights are standardized (β s).⁺
 $p < .10$;^{*}
 $p < .05$;^{**}
 $p < .01$;^{***}
 $p < .001$