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Maternal Parenting as a Mediator of the Relationship between Intimate Partner Violence and Effortful Control

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Abstract

The current study examined the relationship between intimate partner violence (IPV), maternal parenting behaviors, and child effortful control in a diverse sample of 705 families living in predominantly low-income, rural communities. Using structural equation modeling, the authors simultaneously tested whether observed sensitive parenting and/or harsh-intrusive parenting over the toddler years mediated the relationship between early IPV and later effortful control. Results suggest that parenting behaviors fully mediate this relationship. Although higher levels of IPV were associated with both higher levels of harsh-intrusive parenting and lower levels of sensitive supportive parenting, only sensitive supportive parenting was associated with later effortful control when both parenting indices were considered in the same model.

Keywords

Intimate Partner Violence; Maternal Parenting Behaviors; Sensitive Parenting; Harsh Parenting; Effortful Control

A substantial body of literature documents the deleterious effect of intimate partner violence (IPV) on a variety of child outcomes (Grych & Fincham, 2001; Kitzmann, Gaylord, Holt, & Kenny, 2003). Physical violence among parents has consistently been associated with negative consequences for children, including difficulties managing emotions and acquiring self-regulatory skills (Crockenberg & Langrock, 2001; Cummings & Davies, 2010; Raver, 2004). Emotional security theory suggests that witnessing violence is distressing and dysregulating for children, and repeated exposure to inter-parental conflict undermines their sense of security in the family (Davies & Cummings, 1994). Although past empirical and

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theoretical work has linked IPV with children's self-regulatory skills more broadly, less is known about its relationship with specific aspects of self-regulation, or the mechanisms through which it exerts its influence. The goal of the current study was to more explicitly investigate these linkages, with a focus on IPV's influence on effortful control.

Effortful Control

Effortful control, the ability to suppress a dominant response in favor of a subdominant response (Eisenberg & Spinrad, 2004; Rothbart, 1989), is an aspect of self-regulation which has garnered substantial attention in recent decades. Thought to emerge during the first year of life, this type of volitional control has been shown to become more stable during the preschool years (Kochanska, Murray, & Harlan, 2000; Rothbart & Rueda, 2005). Being able to focus attention and effectively regulate behavior is important for a successful transition to school (Blair, 2002; McClelland et al., 2007; Rimm-Kaufman, Pianta, & Cox, 2000), and self-regulatory skills at the transition to school have been shown to be predictive of both short and long-term outcomes for children (Eisenberg, Smith, Sadovsky, & Spinrad, 2004; Eisenberg, Hofer, & Vaughan, 2007). Given the integral role of effortful control in the development of various later competencies (Eisenberg, Hofer, & Vaughan; Kochanska, Murray, & Harlan, 2000), it is important to investigate factors which may foster or impede its development.

Although effortful control is believed to have a strong constitutional basis, its development has been shown to be influenced by environmental experiences (Karreman, van Tuijl, van Aken, & Dekovic, 2006; Li-Grinning, 2007; Raver, 2004). That is, although this later-developing dimension of temperamental regulation is linked to an individual's genetic endowment, its emergence and consolidation can be shaped by the child's early experiences. Although there is a growing body of research looking at more distal contextual influences on effortful control, much of the extant literature points to maternal parenting behaviors as an important predictor of emotional competence in children (Spinrad et al., 2007; Kochanska, Murray, & Harlan, 2000). Interacting with sensitive parents who consistently recognize and respond to their cues has been shown to help children acquire effortful control (Kochanska, et al.; Lengua, Honorado, & Bush, 2007). These experiences allow children to learn to regulate their emotions by providing appropriate structure, guidance, and encouragement when needed, behaviors which scaffold children's emotional development and help them successfully navigate the shift from being externally regulated by parents, to internally regulating themselves (Kochanska, Coy, & Murray, 2000; Sroufe, 1996). Experiences with harsh, intrusive parents, on the other hand, have been associated with lower levels of effortful control (Kochanska & Knaack, 2003; Olson, Bates, Sandy, & Schilling, 2002). Children of negative, controlling parents are not only denied structured opportunities to learn to regulate their emotions, but displays of parental hostility can also result in children becoming overaroused, thereby undermining their ability to regulate (Thompson & Calkins, 1996). Although both sensitive and controlling parenting behaviors have been shown to influence effortful control in isolation, few studies have tested the effect of both of these parenting dimensions simultaneously.

The importance of parental behaviors may be particularly pronounced during the toddler years, in that this is a time when effortful control undergoes substantial development (Rothbart & Rueda, 2005), and when the family system is particularly taxed (Verhoeven, Junger, Van Aken, Deković & Van Aken, 2007). Increases in child negative affectivity contributes to parenting stress, as it increases the demands placed on parents at this time (Maccoby, 2000). Although parenting has largely been the focus of research looking at environmental or family-level factors impacting effortful control, it seems reasonable that

effortful control could also be influenced by other family dynamics, including violence in the parental relationship.

Intimate Partner Violence

Although various indicators of marital distress have been shown to impact both child and family functioning, IPV has been shown to be particularly detrimental for children's development (Jouriles, Norwood, McDonald, & Peters, 2001; Margolin & Gordis, 2000). Although their reactions, the behavioral manifestations of their reactions, and their capacity for cognitive representation of physically violent conflict in parents evolves with age, past research has shown that experiencing IPV affects children of all ages (Kitzmann et al., 2003). Although much of the IPV literature deals with older children, there is some evidence that very young children (Bogat et al., 2006; McDonald et al., 2007) and even infants are affected by violence among parents (Levendosky, Leahy, Bogat, Davidson, & von Eye, 2006). Repeated exposure to IPV has been shown to lead to heightened emotional reactivity in children (as evidenced by increased sensitivity to future violence), which likely places these children at increased risk for continued difficulties managing their emotions (El-Sheik, 1994; Thompson & Calkins, 1996). Together, these findings suggest that early IPV may have immediate and long-term consequences for children's emotional development, both because early dysregulating experiences may make it more difficult for them to learn to effectively regulate their emotions, and because these early experiences may make them more sensitive and susceptible to the negative impact of subsequent conflict. Although there is some evidence linking IPV and emotional competence over the preschool years (e.g., El-Sheik; Smith & Walden, 1999), the direct and indirect effect of IPV on children's self-regulation in this age range has not received adequate attention in the extant literature. Given that children under the age of five are more likely to be exposed to IPV than older children (Fantuzzo, et al., 1997), investigating the effect of IPV during this developmental period seems particularly important.

In addition to negatively impacting children, IPV has been shown to negatively impact parents and their parenting behaviors (Cox, Paley, & Harter, 2001; Cummings & Davies, 2002). Domestic violence has been associated with lower levels of warm, sensitive, and supportive parenting, as well as higher levels of parental aggression (Levendosky & Graham-Bermann, 2000; Levendosky, Huth-Bocks, Shapiro, & Semel, 2003). Given the aforementioned role of parenting in the development of effortful control, it seems important to simultaneously consider violence and parenting in investigations of the development of effortful control.

Parenting as a Mediator

Although there is reason to believe that there is a direct link between IPV and effortful control (and establishing this link in an ethnically and economically diverse sample is an important task on its own), investigating the mechanisms through which conflict influences effortful control is arguably more important. Past research has identified parenting behaviors as one of the mechanisms through which inter-parental conflict influences child outcomes (Cox, Paley, & Harter, 2001; Crockenberg & Langrock, 2001), however less is known about physical violence and parenting as a mediator with respect to effortful control. According to the *spillover hypothesis*, the stress of IPV would carry over into the parent-child relationship, and it is at least in part through disturbances in the parent-child relationships that violence would influences child outcomes (Cox & Paley, 1997; Cummings & Davies, 2002; Krishnakumar & Buehler, 2000). Given that IPV has been associated with children's self-regulatory skills, that parenting behaviors have been shown to scaffold or undermine the development of self-regulation (Grolnick & Farkas, 2002; Kochanska & Knaack, 2003), and

that IPV likely affects parenting practices (Cox & Harter, 2003), further investigating the nature of the relationships between these multiple systems seems an important extension of this previous work.

Although the *spillover hypothesis* is the mechanism of focus in the current study, there are other theorized ways in which IPV and parenting are linked. For example, stressful life events and circumstances may trigger aggression among both intimate partners and parents and children (Jouriles, et al., 2008). Among said factors are maternal depression, maternal stress, and family income. In order to rule out the possibility that it is these factors which are exclusively driving the relationships between IPV and parenting behaviors, we have incorporated these variables as covariates in our investigation. In order to rule out the possibility that the couple's conflict, rather than IPV, explains the relations between these variables, the couple's verbal aggression was also included as a covariate in all analyses.

The Current Study

The present study sought to examine the relationship between IPV, parenting behaviors, and effortful control in a population-based sample of families living in rural communities. Guided by family systems theory (Cox & Paley, 1997) which emphasizes the importance of considering the dynamic interplay between the multiple relationships in the family to better understand development, the goal of the current study was to test the following questions: (a) Does IPV early in children's lives predict their effortful control when they are 58 months old? (b) Is this relationship mediated by sensitive and/or harsh-intrusive parenting behaviors over the toddler years? We hypothesized that early physical violence would have a lasting impact on later effortful control, but that this relationship would be partially mediated by both lower levels of sensitive parenting and higher levels of harsh-intrusive parenting.

Method

Participants

The participants in this study were a subsample of The Family Life Project, an ongoing longitudinal study of 1,292 families living in predominantly low-income, nonmetropolitan communities in eastern North Carolina and central Pennsylvania. Families were recruited in local hospitals shortly after the birth of the target child, and were visited in their home beginning when the child was 2 months old. African American and low-income families were oversampled. Please see Burchinal, Vernon-Feagans, Cox, and the Family Life Project Investigators (2008) for additional information about the recruitment and sampling procedures.

Our subsample consisted of families in which both biological parents lived in the home with the target child when he or she was 6 months old, and who remained living in the home until the child was 24 month old (n = 705). Of these children, 367 (52.1%) were male, 176 (25%) were African American, and 541 (72.6%) of the parents were married at the 6 month timepoint. The mean household income-to-needs ratio was 2.35 (with a range from 0 to 13.40). Our subsample was less racially diverse, more economically advantaged, and included more married couples than the complete sample. Mothers with non-residential or transient partners were not included in these analyses because we felt that violence in these types of relationships would impact children's developing effortful control differently than physical violence occurring in their home, among adults who consistently lived with the child.

Procedure

Data used in these analyses come from a series of home visits, when the target child was 2, 6, 15, 24, 36, and 58 months old. At each of these timepoints, two research assistants visited children and families in their homes, where they administered interviews and questionnaires to the parents (via laptop computer), conducted child assessments, and videotaped parent-child interactions for later coding. Visits lasted between two and three hours each.

Measures

Parenting behaviors—Parenting behaviors were assessed during a series of parent-child interactions when the target child was 15, 24, and 36 months old. When the child was 15 months old, mothers and children completed a free-play activity in which they were presented with a standard set of toys. Mothers were instructed to interact with their children as they typically would if given some free time during the day. When the child was 24 and 36 months old, the same mother-child dyads completed a puzzle task, in which they were presented with three developmentally appropriate puzzles of increasing difficulty. Parents were told that this was a task for the child to complete, but that they could provide any assistance that they deemed necessary. All interactions lasted 10 minutes, and were videotaped for later coding by an ethnically diverse team of coders who were blind to other information about the families. Using seven global rating scales (Cox & Crnic, 2002; Sensitivity/Supportive Presence, Detachment/Disengagement, Intrusiveness, Stimulation of Cognitive Development, Positive Regard, Negative Regard, and Animation) adapted from those used by the NICHD Study of Early Child Care (NICHD ECCRN, 1999), coders rated parenting behaviors on a 5 point scale (where 1 = *not at all characteristic* and 5 = *very characteristic*). Informed by an exploratory factor analysis with an oblique rotation (i.e., promax), the individual subscales were composited in order to obtain overall Sensitive Parenting (the mean of Sensitivity, Stimulation, Positive Regard, Animation, and reverse scored Detachment) and Harsh-Intrusive Parenting scores (the mean of Intrusiveness and Negative Regard). Inter-rater reliability for the composites, assessed using Intraclass Correlations (ICCs) across each pair of coders at each timepoint, were .89, .91, and .90 for sensitive parenting, and .79, .86, and .85 for harsh-intrusive parenting, for the 15, 24, and 36 month timepoints, respectively. At each timepoint, coders underwent training until acceptable reliability (ICC > .80) was achieved and maintained for each coder on every scale. Once acceptable reliability was established, coders began coding in pairs while continuing to code at least 20% of their weekly cases with a criterion coder. Each coding pair met biweekly to reconcile scoring discrepancies; the final scores that they arrived at by consensus were used in all analyses. 100% of the 15 month cases, 53.21% of 24 month cases, and 65.37% of 36 month cases were coded by two coders. The three timepoints of sensitive parenting were used as indicators of the latent variable, *Sensitive Parenting*, and the three timepoints of harsh-intrusive parenting were used as indicators of the latent variable, *Harsh-Intrusive Parenting*.

Intimate partner violence—IPV was assed using the Conflict Tactics Scale – Couple Form R (CTS-R; Straus & Gelles, 1990), a 19 item self-report measure completed by the mothers when their child was 6, 15, and 24 months old. Each of these items lists a possible response to conflict; respondents were asked to rate on a seven point likert-type scale (where 0 = *Never*, 1 = *Once*, 2 = *Twice*, 3 = *3-5 times*, 4 = *6-10 times*, 5 = *11-20 times*, 6 = *More than 20*) how often in the past 12 months they completed the particular behavior in response to an argument with their partner. They were also asked to rate how often in the past 12 months their partner completed each behavior. The 9-item physical violence subscale of this measure from each of the three timepoints was used as the measure of IPV in this study. An example item reads “[how often have you/your partner] kicked, bit, or hit him/her/you with a fist.” Cronbach’s alpha for the 9 item subscales were .74, .77, and .81 for mothers’

violence and .76, .78, and .80 for fathers' violence for the 6, 15, and 24 month timepoints, respectively. For the majority of items, the full range of the scale (0 - 6) was observed for both mother and father perpetrated violence. Exceptions include beat up, choked, and used a knife/fired a gun (whose range was 0 - 5), and threatened with a knife/gun (whose range was 0 - 4). Subscale scores for mothers ranged from 0 to 4.22 and 0 to 3.67 for fathers. Sixty-three percent of mothers in our subsample did not report any physical violence. This figure is consistent with other prevalence estimates of IPV (Straus & Gelles, 1995). When we looked at CTS scores over time, the majority of physically violent couples in our sample were classified as dual perpetrators, a fact which is consistent with previous work with community samples, which suggests that physical violence in community samples is more commonly mutual (Archer, 2000; Caetano, Vaeth, & Ramisetty-Mikler, 2008). As such, mother's report of her own IPV and her report of her partner's IPV were summed, to create a total score which represents the total amount of physical violence experienced by the mother. Cronbach's alphas for the 18 item total scores were .84, .87, and .88 for the 6, 15, and 24 month timepoints, respectively. The physical violence subscales from each of the three timepoints served as indicators of the latent variable, *IPV*.

It is important to note that the CTS was also administered to fathers participating in each of the visits, however there were a number of residential fathers who were either unable or unwilling to complete questionnaires. Because we believe that paternal responses were not missing at random, we could not use a missing data technique if we also included father report. Because maternal and paternal report were moderately correlated (r = .45, .36, and .38 for the 6, 15, and 24 month timepoints, respectively), only maternal report was used in the analyses presented below, in order to maximize the number of families included in the analyses.

Effortful control—Two subscales of the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadi, Hershey, & Fisher, 2001), inhibitory control and attentional focusing, were used as indicators of the latent variable, *Effortful Control*. When their child was 58 months old, mothers completed this questionnaire, indicating on a 7 point scale (where 1 = *extremely untrue of your child* and 7 = *extremely true of your child*) how characteristic a number of statements were of the target child's behavior over the past 6 months. Example items include "[my child] can wait before entering into new activities if s/he is asked to" (inhibitory control; α = .60 for our sample) and "when drawing or coloring in a book, [my child] shows strong concentration" (attentional focusing α = .72 for our sample). Each subscale consists of 6 items; items were averaged to create subscale scores.

Demographic information—At each visit, mothers reported information about a variety of demographic variables, including the total household income from all possible sources, the number of individuals living in the home, the couple's marital status (0 = *unmarried*, 1 = *married*), the mother's highest level of completed education (in years), and the race (0 = *White*, 1 = *Black*) and sex (0 = *Female*, 1 = *Male*) of the target child. Income-to-needs ratios were calculated at each assessment timepoint by dividing the total household income from all possible sources by the federally determined poverty threshold for the number of people living in the household for that year. Income-to-needs ratios above 1.0 indicate that a family is able to provide for basic needs, whereas values below 1.0 indicate that they are not. Income-to-needs ratios were quite stable over time (correlations between ratios at the different timepoints ranged from .71 to .81 in our subsample); the family's income-to-needs ratio at the 58 month assessment was used in all analyses.

Maternal depressive symptoms—When their child was two months old, mothers completed the Brief Symptom Inventory (BSI; Derogatis, 2000), a 23 item self-report questionnaire of psychological distress. Respondents are asked to rate on a five point likert-

type scale (where 0 = *not at all* and 4 = *extremely*) how distressed they were by each symptom over the past 7 days. The measure's six-item Depression subscale was used in the current study. An example item reads "[how much were you distressed by] feeling blue" (α for our sample = .80).

Maternal stress—Maternal stress was assessed using the Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978) when the target child was two months old. This 49 item questionnaire presents mothers with a list of major life events, and asks them to indicate whether or not this event had happened in the last six months, and if so, whether this was a positive or negative event in their life. An example item asks whether there has been a "Major change in living conditions of family." The number of mother-reported negative events that occurred in the previous six months were summed (α = .77), as was used as a covariate in all analyses.

Verbal aggression—The couple's verbal aggression was assessed using the verbal aggression subscale of the Conflict Tactics Scale – Couple Form R (CTS-R; Straus & Gelles, 1990), whose administration and scoring is described above. Mother's report of her own and her partners' verbal aggression were summed in order to create a score meant to capture the total verbal aggression in the relationship. This 12-item verbal aggression score from the 6, 15, and 24 month assessments were used as three indicators of a latent variable that mirrors the one constructed for IPV. An example item reads "[how often in the past 12 months have you/your partner] insulted or swore at him/her/you." Cronbach's alpha for the 12-item total scores for our sample was .74, .76, and .79 for the 6, 15, and 24 month assessments, respectively.

Analytic Strategy

Structural equation modeling (SEM) was used to test the proposed models (Schumacker & Lomax, 1996). Models were parameterized using the M*plus* 6.0 software package (Muthén & Muthén, 1998-2010), using the robust maximum likelihood estimator. This estimator accommodates non-normal data by adjusting standard errors using the Huber-White sandwich estimator. Full information maximum likelihood (FIML) was used as the missing data technique (Arbuckle, 1996). Model fit was examined using a number of fit indices, including the comparative fit index (CFI; Bentler, 1990), the Tucker-Lewis index (TLI; Tucker & Lewis, 1973), and the root mean squared error of approximation (RMSEA; Browne & Cudeck, 1993). CFI and TLI values above .95 and RMSEA values below .05 indicate excellent model fit.

In order to test our first hypothesis, the latent variable *Effortful Control* was regressed upon the *IPV* latent variable. After establishing this link, the latent variables *Sensitive Parenting* and *Harsh-Intrusive Parenting* were added to the model as mediators of this relationship. Poverty status, ethnic minority status, and child gender have each been identified as important correlates of effortful control (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006; Li-Grinning, 2007; Raver, 2004), and thus the family's income-to-needs ratio and the race and gender of the target child were included as covariates in this model. The data collection site (Pennsylvania versus North Carolina) was also included as a control variable. In order to rule out alternative explanations of the proposed associations, maternal depressive symptoms, maternal stress, maternal education, the couple's marital status, and the couple's verbal aggression were also included as control variables. Specifically, paths were estimated from all control variables to each of the three endogenous latent variables. Non-significant paths from the control variables to the three endogenous latent variables were removed from the final model in order to preserve model parsimony.

Results

Descriptive Statistics and Measurement Model

Means, standard deviations, and bivariate correlations between study variables are presented in Table 1. The associations between the variables were largely as expected, such that higher sensitive maternal parenting was associated with higher inhibitory control and attentional focusing, whereas higher harsh-intrusive maternal parenting was correlated with lower inhibitory control and attentional focusing. Higher levels of physical violence were associated with lower levels of sensitive parenting, higher levels of harsh-intrusive parenting, and lower levels of inhibitory control. The relationship between IPV when the child was 6 months and attentional focusing was the only non-significant correlation, however the direction of the association was as predicted. Sensitive and harsh-intrusive parenting were moderately negatively correlated with one another, and showed moderate stability over time. Prior to parameterizing the structural model, a measurement model was tested. This model fit the data well, χ^2 (55, N = 705) = 1672.41, p =.00, CFI = .97, TLI = .95, RMSEA = 0.05. The variances of the 11 indicators and the four latent variables all had significant variances, and all latent variables were significantly correlated with one another in the expected directions.

Model One: Regressing Effortful Control on IPV

The model in which *Effortful Control* was regressed on *IPV* fit the data well, χ^2 (4, N = 705) = 2.19, p =.70, CFI = 1.00, TLI = 1.02, RMSEA = 0.00. All estimated paths were significant, indicating that IPV was a significant predictor of effortful control (β = -.15, p < .01). That is, higher reported levels of IPV across the first two years of life were associated with lower levels of children's effortful control when they were 58 months old.

Model Two: Sensitive and Harsh-Intrusive Maternal Parenting as Mediators

The latent variables, *Sensitive Parenting* and *Harsh-Intrusive Parenting*, were added to the previous model as potential mediators of the relationship between *IPV* and *Effortful Control*. This model also fit the data well, χ^2 (77, N = 705) = 78.62, p =.43, CFI = 1.00, TLI = 1.00, RMSEA = 0.01. As can be seen in Figure 1 (where all depicted paths are significant, p < .05), when considered in a model with maternal parenting behaviors, the relationship between *IPV* and *Effortful Control* is not significant. Following procedures outlined by Holmbeck (1997), a second, nested, model was estimated, in which the path from *IPV* to *Effortful Control* was set to zero. A chi-squared difference test revealed that constraining this path to zero did not result in a significant decrement to model fit. This finding, in addition to a significant indirect effect (p = .03), confirms full mediation, indicating that, even after controlling for the family's income-to-needs ratio, the child's race and gender, the data collection site, maternal stress, education, and depressive symptoms, the couple's marital status, and their verbal aggression, maternal parenting behaviors over the toddler years fully mediated the relationship between early IPV and later effortful control. Higher levels of physical violence were associated with both higher levels of harsh-intrusive parenting and lower levels of sensitive parenting, however only sensitive parenting was associated with later effortful control. This model accounted for 31% of the variance in effortful control scores.

Although a model which also included fathers' report would not produce unbiased parameter estimates (due to non-random missing data, as discussed above), in order to strengthen our confidence in the findings produced with maternal report of violence, we re-ran all analyses including data from the available fathers. All of the relationships described in the methods section remained when both maternal and paternal report were included as six separate indicators of *IPV*. Of the paths estimated from control variables to each of the

three endogenous variables, the following were statistically significant, and thus retained in the final model. The family's income-to-needs ratio was positively associated with *Sensitive Parenting* (β = .12, $p < .01$), the child's race was negatively associated with *Sensitive Parenting* (β = -.19, $p < .01$), and positively associated with *Harsh-Intrusive Parenting* (β = .28, $p < .01$), maternal education was positively associated with *Sensitive Parenting* (β = .42, $p < .01$), and negatively associated with *Harsh-Intrusive Parenting* (β = -.37, $p < .01$), the child's sex was negatively associated with *Effortful Control* (β = -.15, $p < .01$), and positively associated with *Harsh-Intrusive Parenting* (β = .11, $p < .01$) and maternal stress was negatively associated with *Effortful Control* (β = -.10, $p < .05$).

Discussion

Consistent with theoretical expectation, the results of this study suggest that early IPV among co-residential, biological parents was linked with their child's effortful control when they were 58 months old. This relationship, however, was fully mediated by parenting behaviors over the toddler years, such that once parenting was taken into consideration, the relationship between IPV and effortful control was not significant. The lack of a direct effect of IPV on effortful control was unexpected, but not inconsistent with previous findings, which have also indicated that parenting fully mediates the relationship between inter-parental discord and child outcomes in older children (Krishnakumar & Buehler, 2000). Although physical violence in the adult-adult relationship appears to spill over into multiple dimensions of the parent-child relationship (as evidenced by both higher levels of harsh-intrusive parenting and lower levels of sensitive, supportive parenting), only sensitive, supportive parenting was associated with later effortful control in the model where both indices of parenting were considered. These results suggest that early IPV affects effortful control through its influence on mothers' behaviors, specifically by limiting children's exposure to sensitive, guided opportunities to learn to regulate their emotions. Although higher levels of IPV were also associated with higher levels of hostile, controlling parenting behaviors, neither of these types of potentially dysregulating experiences were significantly associated with children's effortful control, when considered in a model with sensitive behavior. Underscoring the importance of considering multiple relationships in the family (and multiple dimensions of these relationships), these findings suggest that interventions designed to help children living in violent homes may want to target maternal behaviors, and specifically sensitive, supportive behaviors, as a means of bolstering children's self-regulatory skills. These findings may additionally suggest that in order to be most effective, clinicians and agencies serving families referred for treatment for either IPV or because of disturbances in the parent-child relationship should assess and target both areas of family functioning.

This study adds to the literature in a number of ways. Using data from an ethnically and economically diverse sample of families living in rural communities, we were able to expand our understanding of the impact of family-level factors on children's emotional functioning in an understudied population. As much of the extant literature investigating the impact of IPV on child development has used samples of children living in women's shelters with their mothers (Jouriles, et al., 2001), this study adds important insight into how these relationships operate in a community sample. Although past research has provided piecewise support for our model, this study is to the best of our knowledge the first to explicitly test the relationship between IPV and effortful control. Although both sensitive and harsh-intrusive parenting behaviors have been linked with effortful control in the past, few studies have looked at both types of parenting in the same model. By simultaneously considering the influence of each, our study gave a more refined look at the nature of the relationship between these variables. Although our study design did not allow us to manipulate the variables in our model (and thus no causal inferences can be made), the

temporal ordering of our measurement, in addition to allowing us to capture our phenomena of interest at developmentally appropriate times, allowed us to rule out alternative explanations or characterizations of the directionality of these relationships (e.g. parenting later in the child's life can not contribute to earlier IPV). The longitudinal nature of the data allowed us to look at these relationships over a relatively large span of time (across the first five years of the child's life), giving us a better understanding of the long-term effects of earlier experiences.

Despite its contributions, this study had a number of limitations. In spite of the relatively diverse nature of our sample, the findings of this study only generalize to co-residential biological parents living in rural communities. Future research should examine these relationships among non-residential partners and among partners whose relationships dissolve over time. Although the temporal ordering of our measures allows us to eliminate some alternative explanations of these relationships, it does not allow us to give consideration to effortful control at earlier ages (and how earlier effortful control may have influenced mother-child behavioral patterns), or to look at changes in effortful control over time. Although we cannot rule out the possibility that the directionality of the relationship between parenting and effortful control is not reversed, given that this age period is characterized by a shift from children being externally regulated by parents to internally regulating themselves (Sroufe, 1996), we believe that it is reasonable to think that the effect is in the proposed direction.

Also important to note is the fact that the relationship between IPV and effortful control, although statistically significant, was modest. Perhaps an artifact of the amount of time elapsing between the measurement of physical violence and effortful control, this could also reflect the fact that our measurement of IPV does not capture the amount of the physical violence that the child is exposed to. Although we were able to capture the physical violence experienced by the mother, we do not have information about how much of this physical violence children experienced themselves. Although limiting our sample to co-residential parents likely ameliorated this issue to some extent (in that we at least know that the physical violence was among people living in the home) measurement aimed at capturing the amount of IPV children are exposed to may yield different results. Although we believe that this linkage is still meaningful, (particularly given that this is an understudied relationship, investigated using data from an understudied age range and population), the finding does warrant replication, as the association being accounted for by our mediators is modest in magnitude. Additionally concerning is the possibility that the relative infrequency of IPV in our sample may have resulted in a floor effect, which resulted in parenting being the stronger predictor of effortful control.

Another limitation of this study is that IPV was measured using maternal report. Although mothers may inaccurately or intentionally underreport IPV (Jouriles, McDonald, Norwood, & Ezell, 2001), physical violence is not a dimension of conflict that can easily be induced in a laboratory setting, for ethical among other reasons. Other methods for assessing physical violence are available, however a recent meta-analysis found that studies that used the CTS produced stronger association between physical violence and child outcomes than other methods of assessing physical violence (Kitzmann et al., 2003). This finding, in addition to the fact that maternal and paternal reports were significantly correlated in our sample, and the fact that all of the relationships described in the methods section held when also including fathers' report of IPV, strengthened our confidence in the accuracy of our measurement.

Similarly, effortful control was assessed via maternal report. Although parental perceptions of children's behaviors can certainly be biased, past research has shown that observational

and parental report of effortful control converge (Kochanska, Murray, & Harlan, 2000). Because parents observe their children's behavior in a variety of situations and contexts, we felt that maternal report would be more representative of children's behaviors, and thus would be appropriate for our purposes. A lack of an observational measure of this construct, however, is certainly a limitation of this study, particularly given the fact that parent-child interaction patterns potentially could influence maternal ratings of effortful control in a systematic manner. It is additionally concerning that both our focal predictor and our outcome are assessed using ratings from the same reporter. The fact that our findings remain when paternal report of IPV is also included in the model, and that close to three years elapsed between the mothers' last report of IPV and her report of her child's effortful control, strengthens our confidence in our findings, despite this limitation.

Another important consideration is that for use in our analyses, we summed mothers' report of her and her partner's physical violence, without consideration of the person committing the IPV, a distinction which likely is important. Because of the large number of couples in our sample for whom the IPV was mutual, we were unable to make this distinction in the current study. Future research, however, should make this distinction. Given that mothers are affected by the overall climate of their romantic relationship (regardless of the identity of the violent partner), we felt that this compositing was appropriate for testing our questions, however this remains an area of concern.

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References

Arbuckle, JL. Full information estimation in the presence of incomplete data. In: Marcoulides, GA.; Schumacker, RE., editors. Advanced structural equation modeling. Mahwah, NJ: Erlbaum; 1996. p. 243-277.

Archer J. Sex differences in aggression between heterosexual partners: a meta-analytic review. Psychological Bulletin. 2000; 126(5):651–680.10.1037/0033-2909.126.5.651 [PubMed: 10989615]

Bentler PM. Comparative fit indexes in structural models. Psychological Bulletin. 1990; 107(2):238–246.10.1037/0033-2909.107.2.238 [PubMed: 2320703]

Blair C. School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. American Psychologist. 2002; 57(2):111–127.10.1037/0003-066X.57.2.111 [PubMed: 11899554]

Bogat GA, DeJonghe E, Levendosky AA, Davidson WS, von Eye A. Trauma symptoms among infants exposed to intimate partner physical violence. Child Abuse & Neglect. 2006; 30:109–125.10.1016/j.chiabu.2005.09.002 [PubMed: 16466789]

Burchinal M, Vernon-Feagans L, Cox M. the Family Life Project Investigators. Cumulative Social Risk, Parenting, and Infant Development in Rural Low-Income Communities. Parenting. 2008; 8(1):41–69.10.1080/15295190701830672 [PubMed: 19920877]

Browne, MW.; Cudeck, R. Alternative ways of assessing model fit. In: Bollen, KA.; Long, JS., editors. Testing structural equation models. Newbury Park, CA: Sage; 1993. p. 136-162.

Caetano R, Vaeth PAC, Ramisetty-Mikler S. Intimate partner violence victim and perpetrator characteristics among couples in the United States. Journal of Family Violence. 2008; 23:507–518.10.1007/s10896-008-9178-3

Cox, MJ.; Crnic, K. Qualitative ratings for parent–child interaction at 3-12 months of age. University of North Carolina; Chapel Hill: 2002. Unpublished manuscript

Cox, MJ.; Harter, KSM. Parent-child relationships. In: Bornstein, MH.; Davidson, L.; Keyes, CLM.; Moore, KA., editors. Well-being: Positive development across the life course. Mahwah, NJ: Erlbaum; 2003. p. 191-204.

Cox MJ, Paley B. Families as systems. Annual Review of Psychology. 1997; 48:243–267.10.1146/annurev.psych.48.1.243

Cox, MJ.; Paley, B.; Harter, K. Inter-parental conflict and parent-child relationships. In: Grych, J.; Fincham, F., editors. Child development and inter-parental conflict. New York: Cambridge University Press; 2001. p. 249-272.

Crockenberg, S.; Langrock, AM. The role of emotion and emotional regulation in children's response to inter-parental conflict. In: Grych, JH.; Fincham, FD., editors. Child Development and inter-parental conflict. New York: Cambridge University Press; 2001. p. 129-156.

Cummings, EM.; Davies, PT. Children and marital conflict: The impact of family dispute and resolution. New York: Guilford Press; 1994.

Cummings EM, Davies PT. Effects of marital conflict on children: recent advances and emerging themes in process-oriented research. Journal of Child Psychology and Psychiatry. 2002; 43:31–63.10.1111/1469-7610.00003 [PubMed: 11848336]

Cummings, EM.; Davies, PT. Marital conflict and children: An emotional security perspective. New York, NY: Guilford Press; 2010.

Davies PT, Cummings EM. Marital conflict and child adjustment: An emotional security hypothesis. Psychological Bulletin. 1994; 116:387–411.10.1037/0033-2909.116.3.387 [PubMed: 7809306]

Else-Quest NM, Hyde JS, Goldsmith HH, Van Hulle CA. Gender differences in temperament: A meta-analysis. Psychological Bulletin. 2006; 132:33–72.10.1037/0033-2909.132.1.33 [PubMed: 16435957]

Derogatis, L. Brief Symptom Inventory 18. Minneapolis, MN: NCS Pearson, Inc; 2000.

Eisenberg, N.; Hofer, C.; Vaughan, J. Effortful control and its socioemotional consequences. In: Gross, JJ., editor. Handbook of emotion regulation. New York: Guilford Press; 2007. p. 287-306.

Eisenberg, N.; Smith, CL.; Sadovsky, A.; Spinrad, TL. Effortful control: Relations with emotion regulation, adjustment, and socialization in childhood. In: Baumeister, RF.; Vols, KD., editors. Handbook of self regulation: Research, theory, and applications. New York: Guilford Press; 2004. p. 259-282.

Eisenberg N, Spinrad TL. Emotion-Related Regulation: Sharpening the Definition. Child Development. 2004; 75(2):334–339.10.1111/j.1467-8624.2004.00674.x [PubMed: 15056187]

El-Sheikh M. Children's emotional and physiological responses to interadult angry behavior: The role of history of inter-parental hostility. Journal of Abnormal Child Psychology. 1994; 22(6):661–78.10.1037/0893-3200.11.2.165 [PubMed: 7876455]

Fantuzzo J, Boruch R, Berima A, Atkins M, Marcus S. Domestic physical violence and children: Prevalence and risk in five major cities. Journal of the American Academy of Child and Adolescent Psychiatry. 1997; 36(1):116–122.10.1097/00004583-199701000-00025 [PubMed: 9000789]

Grolnick, WS.; Farkas, M. Parenting and the development of children's self-regulation. In: Bornstein, MH., editor. Handbook of Parenting: Vol 5 Practical Issues in Parenting. Mahwah, NJ: Erlbaum; 2002. p. 89-110.

Grych, JH.; Fincham, FD., editors. Inter-parental Conflict and Child Development: Theory, Research, and Applications. Cambridge, England: Cambridge University Press; 2001.

Holmbeck GN. Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literature. Journal of Consulting and Clinical Psychology. 1997; 65(4):599–610.10.1037/0022-006X.65.4.599 [PubMed: 9256561]

Jouriles, EN.; McDonald, R.; Norwood, WD.; Ezell, E. Issues and controversies in documenting the prevalence of children's exposure to domestic physical violence. In: Graham-Bermann, SA.; Edleson, JL., editors. Domestic physical violence in the lives of children: The future of research, intervention, and social policy. Washington, DC: American Psychological Association; 2001. p. 12-34.

Jouriles EN, McDonald E, Smith Slep AM, Heyman RE, Garrido E. Child abuse in the context of domestic violence: Prevalence, explanations, and practice implications. Violence and Victims. 2008; 23(2):221–235.10.1891/0886-6708.23.2.221 [PubMed: 18624091]

Jouriles, EN.; Norwood, WD.; McDonald, R.; Peters, B. Inter-parental conflict and child development: Theory, research, and applications. Grych, JH.; Fincham, FD., editors. New York, NY: Cambridge University Press; 2001. p. 315-336.

Karreman A, van Tuijl C, van Aken MAG, Dekovic M. Parenting and self-regulation in preschoolers: A meta-analysis. Infant and Child Development. 2006; 15:561–579.10.1002/icd.478

Kitzmann KM, Gaylord NK, Holt AR, Kenny ED. Child witnesses to domestic physical violence: A meta-analytic review. Journal of Consulting and Clinical Psychology. 2003; 71(2):339–352.10.1037/0022-006X.71.2.339 [PubMed: 12699028]

Kochanska G, Coy KC, Murray KT. The development of self-regulation in the first four years of life. Child Development. 2001; 72(4):1091–1111.10.1111/1467-8624.00336 [PubMed: 11480936]

Kochanska G, Murray K, Harlan E. Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. Developmental Psychology. 2000; 36(2): 220–232.10.1037/0012-1649.36.2.220 [PubMed: 10749079]

Kochanska G, Knaack A. Effortful control as a personality characteristic of young children: Antecedents, correlates, and consequences. Journal of Personality. 2003; 71:1087–1112.10.1111/1467-6494.7106008 [PubMed: 14633059]

Krishnakumar A, Buehler C. Inter-parental conflict and parenting behaviors: A meta-analytic review. Family Relations. 2000; 49(1):25–44.10.1111/j.1741-3729.2000.00025.x

Lengua LJ, Honorado E, Bush NR. Contextual risk and parenting as predictors of effortful control and social competence in preschool children. Journal of Applied Developmental Psychology. 2007; 28:40–55.10.1016/j.appdev.2006.10.001 [PubMed: 21687825]

Levendosky AA, Graham-Bermann SA. Behavioral observations of parenting in battered women. Journal of Family Psychology. 2000; 14(1):80–94.10.1037/0893-3200.14.1.80 [PubMed: 10740684]

Levendosky A, Huth-Bocks A, Shapiro D, Semel M. The impact of domestic physical violence on the maternal-child relationship and preschool-age children's functioning. Journal of Family Psychology. 2003; 17(3):275–287.10.1037/0893-3200.17.3.275 [PubMed: 14562453]

Levendosky AA, Leahy KL, Bogat GA, Davidson WS, von Eye A. Domestic violence, maternal parenting, maternal mental health, and infant externalizing behavior. Journal of Family Psychology. 2006; 20(3):544–552.10.1037/0893-3200.20.4.544 [PubMed: 17176188]

Li-Grining CP. Effortful control among low-income preschoolers in three cities: Stability, change, and individual differences. Developmental Psychology. 2007; 43:208–221.10.1037/0012-1649.43.1.208 [PubMed: 17201520]

Maccoby EE. Parenting and its effects on children: On reading and misreading behavior genetics. Annual Review of Psychology. 2000; 51:1–29.10.1146/annurev.psych.51.1.1

Margolin G, Gordis EB. The effects of family and community physical violence on children. Annual Review of Psychology. 2000; 51:445–479.10.1146/annurev.psych.51.1.445

McClelland MM, Cameron CE, Connor CM, Farris CL, Jewkes AM, Morrison FJ. Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. Developmental Psychology. 2007; 43(4):947–959.10.1037/0012-1649.43.4.947 [PubMed: 17605527]

McDonald R, Jouriles EN, Briggs-Gowan MJ, Rosenfield D, Carter AS. Physical violence toward a family member, angry adult conflict, and child adjustment difficulties: Relations in families with 1- to 3-year-old children. Journal of Family Psychology. 2007; 21(2):176–184.10.1037/0893-3200.21.2.176 [PubMed: 17605540]

Muthén, LK.; Muthén, BO. Mplus User's Guide. Sixth Edition. Los Angeles, CA: Muthén & Muthén; 1998-2010.

NICHD Early Child Care Research Network. Child care and mother–child interaction in the first 3 years of life. Developmental Psychology. 1999; 35:1399–1413.10.1016/S0163-6383(03)00035-3 [PubMed: 10563730]

Olson SL, Bates JE, Sandy JM, Schilling EM. Early developmental precursors of impulsive and inattentive behavior: From infancy to middle childhood. Journal of Child Psychology and Psychiatry. 2002; 43:435–447.10.1111/1469-7610.00035 [PubMed: 12030590]

Raver CC. Placing emotional self-regulation in sociocultural and socioeconomic contexts. Child Development. 2004; 75(2):346–353.10.1111/j.1467-8624.2004.00676.x [PubMed: 15056189]

Rimm-Kaufman SE, Pianta R, Cox M. Teachers' judgments of problems in the transition to kindergarten. Early Childhood Research Quarterly. 2000; 15:147–166.10.1016/S0885-2006(00)00049-1

Rothbart, MK. Temperament and development. In: Kohnstamm, GA.; Bates, JE.; Rothbart, MK., editors. Temperament in childhood. New York: Wiley; 1989. p. 187-247.

Rothbart MK, Ahadi SA, Hershey KL, Fisher P. Investigations of temperament at 3-7 years: The Children's Behavior Questionnaire. Child Development. 2001; 72:1394–1408.10.1111/1467-8624.00355 [PubMed: 11699677]

Rothbart, MK.; Rueda, MR. The development of effortful control. In: Mayr, U.; Awh, E.; Keele, S., editors. Developing individuality in the human brain: A tribute to Michael I Posner. Washington, D.C: American Psychological Association; 2005. p. 167-188.

Sarason I, Johnson J, Siegel J. Assessing the impact of life changes: Development of the Life Experiences Survey. Journal of Consulting and Clinical Psychology. 1978; 46:932–946.10.1037/0022-006X.46.5.932 [PubMed: 701572]

Schumacker, RE.; Lomax, RG. A beginner's guide to structural equation modeling. Mahwah, NJ: Erlbaum; 1996.

Spinrad NE, Eisenberg TL, Gaertner B, Popp T, Smith CL, Kupter A, Greving K, Liew J, Hofer C. Relations of maternal socialization and toddlers' effortful control to children's adjustment and social competence. Developmental Psychology. 2007; 43(5):1170–1186.10.1037/0012-1649.43.5.1170 [PubMed: 17723043]

Sroufe, AL. Emotional development: The organization of emotional life in the early years. New York: Cambridge University Press; 1996.

Straus, MA.; Gelles, RJ. Physical violence in American families: Risk factors and adaptations to physical violence in 8,145 families. New Bruswick, NJ: Transaction; 1990.

Thompson RA, Calkins SD. The double-edged sword: Emotion regulation in high risk children. Development and Psychopathology. 1996; 8:163–182.10.1017/S0954579400007021

Tucker LR, Lewis C. A reliability coefficient for maximum likelihood factor analysis. Psychometrika. 1973; 38:1–10.10.1007/BF02291170

Verhoeven M, Junger M, Van Aken C, Deković M, Van Aken MAG. Parenting during toddlerhood: Contributions of parental, contextual, and child characteristics. Journal of Family Issues. 2007; 28(12):1663–169.10.1177/0192513X07302098

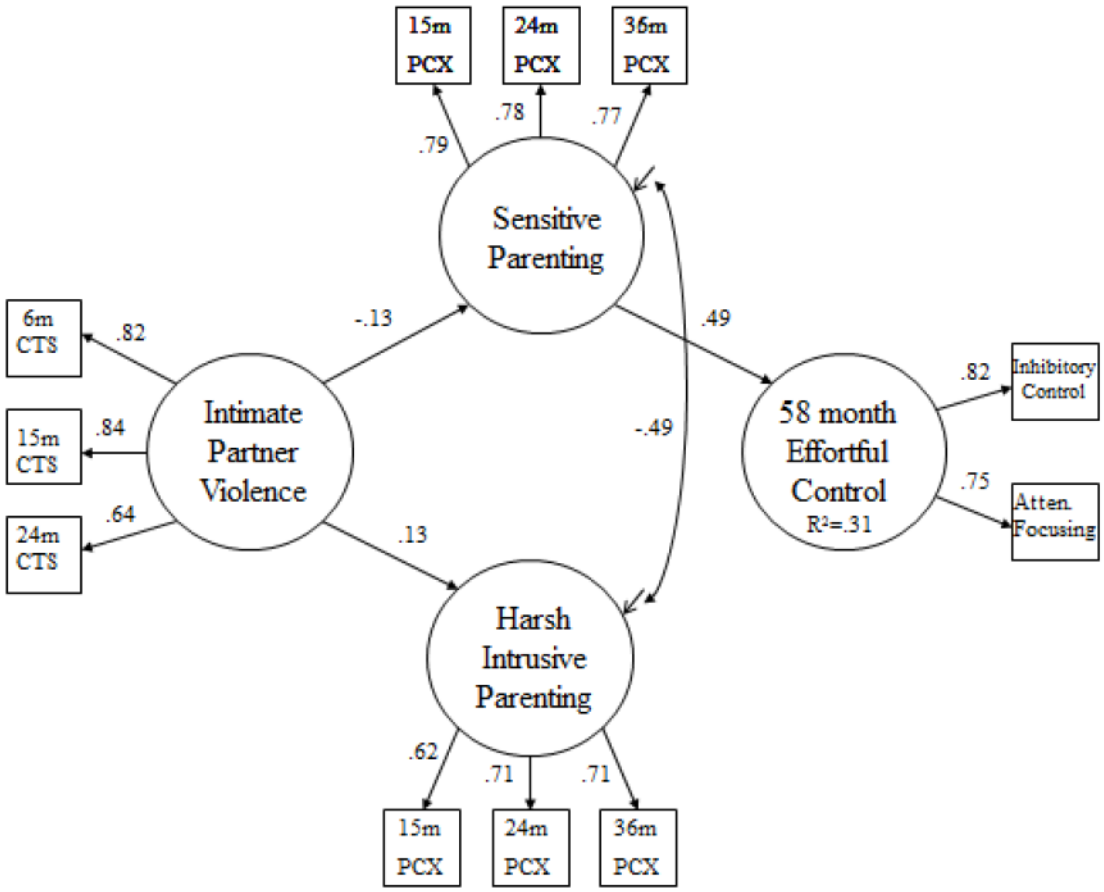

Figure 1.

Final Model in which Parenting is Included as a Mediator

Note: χ^2 (77, N = 705) = 78.62, p =.43, CFI = 1.00, TLI = 1.00, RMSEA = 0.01. CTS = Physical violence subscale of the Conflict Tactics Scale, PCX = Observational codes from the parent-child Interaction, Inhibitory Control = Inhibitory control subscale of the Children's behavior questionnaire (CBQ), Atten. Focusing = Attentional focusing subscale of the CBQ. All paths depicted are significant, $p < .05$. All parameter estimates are standardized.

Table 1

Descriptive Statistics and Bivariate Correlations Between IPV, Sensitive Parenting, and Harsh-Intrusive Parenting (N = 705)

	Physical Violence			Sensitive Parenting			Harsh-Intrusive Parenting			Effortful Control	
	6 months	15 months	24 months	15 months	24 months	36 months	15 months	24 months	36 months	Attentional Focusing	Inhibitory Control
Means	0.22	0.18	0.17	3.03	3.16	3.11	2.13	2.20	2.09	5.07	4.88
Standard Deviations	0.55	0.59	0.58	0.77	0.78	0.69	0.67	0.79	0.76	1.02	0.95
Physical violence											
6 months											
15 months	0.68**										
24 months	0.49**	0.47**									
Sensitive Parenting											
15 months	-0.16**	-0.17**	-0.19**								
24 months	-0.20**	-0.18**	-0.21**	0.62**							
36 months	-0.18**	-0.25**	-0.21**	0.61**	0.61**						
Harsh-Intrusive Parenting											
15 months	0.12**	0.11**	0.08*	-0.36**	-0.34**	-0.30**	--				
24 months	0.23**	0.20**	0.15**	-0.37**	-0.52**	-0.36**	0.46**	--			
36 months	0.18**	0.14**	0.15**	-0.38**	-0.40**	-0.48**	0.44**	0.51**	--		
Effortful Control											
Attentional Focusing	-0.10	-0.10*	-0.08*	0.29**	0.30**	0.30**	-0.15**	-0.22**	-0.20**	--	
Inhibitory Control	-0.10*	-0.13**	-0.16**	0.30**	0.34**	0.33**	-0.20**	-0.21**	-0.24**	0.60**	--

Note:

* $p < .05$

** $p < .01$