

## ABSTRACT

NICE, RACHEL LAUREN. The Relation between Parenting Behavior and Self-Regulation among Physically Abused Children. (Under the direction of Dr. Mary Haskett).

Children who are physically abused are likely to display negative social, academic, and mental health outcomes; however, some children are resilient despite a history of maltreatment. One process that may lead to positive outcomes for some physically maltreated children compared to others is appropriate self-regulation of behavior and emotion. Studies of non-physically maltreated samples indicate that parents who display sensitive, positive parenting have children who develop better self-regulation, but it is unclear whether this association also exists in children who have been physically maltreated. This study investigated the relation between parenting behaviors and child self-regulation in a sample of eighty-five 4 to 7 year-old physically maltreated children and their parents. Parenting measures included parent-child interactions coded for sensitivity, intrusiveness, positive regard for the child, and negative regard for the child. Child self-regulation was measured using relevant scales on the teacher report form of the Behavior Rating Inventory of Executive Function. Overall parenting quality was significantly related to teacher ratings of children's ability to inhibit inappropriate behavior and successfully shift between situations, but it was not significantly related to emotion-related self-regulation. Although further research is necessary to investigate the causal nature of these links, results suggest that parenting behaviors in abusive families may play a role in the development of differential outcomes for children's self-regulatory behavior in the early school setting. These results, along with further study, may enhance understanding about the mechanisms behind effective intervention for this population.

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The Relation between Parenting Behavior and Self-Regulation among  
Physically Abused Children

by  
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## **BIOGRAPHY**

Rachel Nice grew up in Derry, New Hampshire. After graduating from Pinkerton Academy in 2002, she attended Wake Forest University. In 2006 she graduated cum laude with her Bachelor of Arts in Psychology. After graduating, she took time away from academia to work in London, England for some time before entering the School Psychology graduate program at North Carolina State University. There she was a part of the Family Studies research team, studying child maltreatment and parenting. In the future she wishes to pursue interests related to parenting interventions for military families and academic interventions for children of military families.

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## **THE RELATION BETWEEN PARENTING BEHAVIOR AND SELF-REGULATION AMONG PHYSICALLY ABUSED CHILDREN**

Despite advances by researchers and policymakers in understanding and preventing child abuse, it remains a significant problem in scope as well as severity. The US Department of Health and Human Services estimated 681,000 victims of substantiated child abuse or neglect in 2011 in the United States. Of those children, 1,570 died as a result of the abuse or neglect. In the United States, the Child Abuse Prevention and Treatment Act defines child abuse and neglect as: “any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to act which presents an imminent risk of serious harm.” Beyond the immediate physical and emotional harm inherent in the definition of child abuse, there is substantial evidence that child abuse is associated with a host of short-term and long-term negative developmental outcomes. Negative outcomes associated with child abuse include internalizing symptoms such as depression, anxiety, and withdrawal (Bolger & Patterson, 2001a; Toth, Manly, & Cicchetti, 1992; Mills, Scott, Alati, O’Callaghan, Najman, & Strathearn, 2013); cognitive and academic difficulties such as poor grades in school and on standardized tests (Eckenrode, Laird, & Doris, 1993); and social problems such as aggression and peer rejection (Bolger & Patterson, 2001b; Salzinger, Feldman, Hammer, & Rosario, 1993). Because of the prevalence of this problem and the potential negative effects of abuse, investigation into the processes and contextual variables surrounding abuse is imperative.

Although the deleterious outcomes of maltreatment are wide-ranging and pervasive, some children do not display these negative outcomes (see Haskett, Nears, Sabourin Ward &

McPherson, 2006, for a review). Within a developmental context, this phenomenon is referred to as resilience and can be defined as “meeting age-salient developmental tasks in spite of serious threats to development,” (Masten & Reed, 2002, p. 76). It is important to examine individual differences among physically maltreated children to better understand resilience, specifically to better understand the protective factors or processes that may qualify the pathway to good outcomes for some victims of physical child abuse.

One important process within the child that has received increased attention in the developmental literature as a source of individual differences is the broad concept of self-regulation, the process by which a child monitors and controls his or her behavior according to the demands of a situation (Posner & Rothbart, 2000) across many levels, including the emotional, attentional, social, and cognitive levels (Calkins & Fox, 2002). Children must develop the capacity to regulate their emotions, behaviors, and thoughts so they can function appropriately as they encounter an increasingly wide range of socially and cognitively demanding environments during the progression from early childhood into the school years and beyond. Children who are able to self-regulate their behaviors and emotions display better social and academic adjustment than those who display poor self-regulation (Eisenberg et al., 2001; Maughan & Cicchetti, 2002). Although many physically maltreated children are poor regulators of their emotions and behaviors (Rieder & Cicchetti, 1989; Shields & Cicchetti, 1998), there is variability across physically maltreated children in this domain of functioning. Given the strong association between self-regulation and other positive outcomes for the child, and given the variability of self-regulatory ability among physically maltreated children, it may be useful to investigate factors that may influence the

development of poor self-regulation in some physically maltreated children and effective self-regulation in others. Such was the purpose of the current study.

Although many variables in a child's environment, and the interactions among these variables, are likely to influence the development of self-regulation in physically maltreated children, one especially important variable to examine is parenting. The literature on self-regulation of typically developing children illuminates the role of parenting in the socialization of emotion and behavioral regulation in children – warm, sensitive, responsive parenting is associated with the development of effective regulatory skills within children (e.g., Colman, Hardy, Albert, Raffaelli & Crockett, 2006; Eisenberg, et al., 2005) and harsh, controlling, negative parenting is associated with poor self-regulation (e.g., Berlin & Cassidy, 2003; Chang, Schwartz & Dodge, 2003; Morris, et al., 2002). In infancy, it is the caregiver that first has the responsibility of regulating the child's environment and reactivity on behalf of the child. As cognitive and motor skills develop through the first year of life and beyond, the child becomes his or her own regulatory agent for increasingly complex tasks, and this develops in the context of a caregiver's scaffolding of these tasks within the context of a warm and supportive environment.

Given this link between parenting and children's self-regulation, it follows that as a group, parents of abused children – who tend to employ harsher, more insensitive parenting practices than parents of non-abused children – have children with poor self-regulation (Shipman & Zeman, 2001; Thompson & Calkins, 1996). However, not all parents of abused children are the same; there is variability in the parenting styles and behaviors of these parents (Haskett, Smith Scott, & Sabourin Ward, 2004). Documented links between

parenting and self-regulation that are present in the literature on normative populations, then, also might be present in abusive children and may serve to explain variability in self-regulation of abused children.

The current study, therefore, attempts to explain this variability in abused children's self-regulation by investigating parenting as a predicting variable. Purposes for studying this link in the present study were to develop a better understanding of the pathways from maltreatment to social and academic outcomes and to gain a clearer picture of parenting and self-regulation in the general population through the study of this unique, at-risk population (Cicchetti, Ganiban & Barnett, 1991).

To provide a richer context for the current study, a review of the literature on maltreatment, self-regulation, and parenting follows. First, there will be a review of the literature on maltreatment and its relation to children's social development. Next, there will be a review of the literature on self-regulation and the role of regulation in serving as a pathway to positive social outcomes. Parenting in typical populations and links between parenting and development of self-regulation in children will then be addressed, followed by parenting in maltreating samples. The literature review will conclude with a discussion of the limitations of the current research on parenting and self-regulation in physically maltreated children.

## **Literature Review**

### **Child Maltreatment and Children's Functioning**

Children with a history of being physically abused are typically reared in chaotic, stressful settings with parenting that is not bolstered by a secure attachment between

caregiver and child. These children are exposed to inconsistent, absent, or harsh parenting that fails to scaffold appropriate early social and cognitive development in the child, setting them on a trajectory for later negative outcomes. There is a vast body of literature that documents these negative effects of child abuse in many domains of functioning. In the academic domain, for example, physically maltreated children tend to score lower than their peers on reading, spelling, and math achievement tests (Kinard, 2001). In a study of kindergarten through 12th grade students, physically maltreated children scored lower than their non-physically maltreated peers on class grades and standardized tests, and they were more likely to be retained (Eckenrode, Laird, & Doris, 1993).

Child abuse is associated with negative psychological adjustment as well. For example, physically abused 6 to 13 year olds had lower self-esteem, greater levels of depression, and more feelings of hopelessness about the future than their non-abused counterparts (Kazdin, et al., 1985). There is evidence that these consequences are often maintained over time. A long-term longitudinal study by Silverman, Reinherz, and Giaconia (1996), for example, revealed that physically maltreated children displayed more symptoms of depression, anxiety, psychiatric disorders, emotional problems, and suicidal ideation in late adolescence than their non-physically maltreated peers.

In the social domain, children who are physically maltreated are more likely to be rejected by peers, and aggression toward peers has been shown to account for much of this link (Bolger & Patterson, 2001b). The same study showed that chronic maltreatment was associated with peer rejection not just at one period of development, but over several years from childhood to early adolescence. In a study by Salzinger and her colleagues (1993),

abused children displayed low levels of reciprocity in their peer relationships, were rated by their peers as more aggressive and less cooperative, and held lower status in peer groups. Further, children who were physically abused in early childhood had significantly more social problems, aggression, and social withdrawal in 11th grade than did non-physically maltreated students in the same prospective study (Lansford, et al., 2002).

When this literature is considered together, it is clear that many physically maltreated children display maladaptive social, cognitive, and psychological outcomes when compared to their non-physically maltreated peers. However, a vast amount of the literature documenting outcomes for physically maltreated children focuses on the overall group differences in development between physically maltreated children and non-physically maltreated children, and a comparatively smaller portion of the literature examines differences within the physically maltreated population. Some physically maltreated children are resilient (Haskett, et al., 2006), and our understanding of this group is limited until we identify the processes that lead to differential outcomes.

A growing body of literature highlights the factors associated with resilient functioning in physically abused children. Cognitive functioning (Herrenkohl, Herrenkohl, & Egolf, 1994), internal locus of control (Bolger & Patterson, 2001a; Moran & Eckenrode, 1992), and self-esteem (Cicchetti & Rogosch, 2009; Moran & Eckenrode, 1992) are related to positive outcomes (e.g., lower school drop-out, fewer internalizing and externalizing symptoms) among physically maltreated children. Looking beyond within-child characteristics, there are several parent and family factors related to resilient functioning in physically maltreated children. For example, maternal sensitivity (Farber & Egeland, 1987),

maternal affection and low hostility (Herrenkohl et al. 1994), low family conflict (Brown & Kolko, 1999), and coherence of the family environment (Sagy & Dotan, 2001) are related to positive outcomes in physically maltreated children. Finally, there are some factors beyond the immediate family context that also play a role in predicting resilient functioning in physically maltreated children. For example, having friends who engage in positive behaviors rather than risky behaviors, being in a positive school climate (Perkins & Jones, 2004), and having a strong sense of school membership (Sagy & Dotan, 2001) are associated with more positive outcomes.

Many of the factors that lead to positive outcomes for abused children are conceptualized as manifestations of the underlying ability of self-regulation. The following section includes a discussion of the process of self-regulation and some definitional issues, followed by its relation to child outcomes in the normative and physically maltreated populations.

### **Self-Regulation**

Early in life, infants and young children are dependent on their primary caregiver to manage their surroundings and meet their needs. As they progress through early childhood, this regulatory role is gradually transferred from the caregiver to the child as the individual becomes increasingly able to regulate her own emotions and behaviors. This regulation happens by shifting attention away from a distressing stimulus, inhibiting dominant responses to make way for a more effective but possibly more effortful response, and managing physiological responses to stimuli. If children develop these self-regulatory skills successfully, they will be able to monitor and adjust their experience of and reaction to other

challenging situations. These regulatory skills become increasingly important as the child encounters new situations independent of the caregiver and beyond the home, into the school setting. As the school years commence, the child must apply these self-regulatory abilities to complex social situations and effortful cognitive situations to avoid frustration, isolation from peers, and academic failure.

There is a large theoretical and empirical literature on this developmental task of self-regulation, and this concept has been conceptualized in many ways. Self-regulation has been understood to be the part of temperament that modulates a person's reactivity to the environment (Rothbart & Derryberry, 1981). Posner and Rothbart (2000) specify that self-regulation modulates reactivity according to the demands of the situation. One area of discussion within the self-regulation literature has been the various levels, modalities, or manifestations of self-regulation. While there has been a focus on emotion components of self-regulation (Gross, 1998; Cole, Martin, & Dennis, 2004; Calkins, 1994), others have taken a multidimensional approach to self-regulation, understanding it as an individual's ability to monitor and control responses to the environment at the emotional, cognitive, social, and attentional levels (Calkins & Fox, 2002). Although any one of these areas alone may be a legitimate focus of study in the investigation of self-regulation, there is growing consensus that these domains are related and must be understood together.

For example, Shields, Cicchetti, and Ryan (1994) contend that it is particularly important to study affective and behavioral aspects of self-regulation together because of empirically demonstrated overlap between these two aspects of self-regulation. Many investigators have followed with a similar approach of studying the behavioral and emotional

aspects of self-regulation in relation to each other (e.g., Calkins, Smith, Gill, Johnson, 1998; Carlson & Wang, 2007; Cole, Dennis, Smith-Simon, & Cohen, 2009; Feng, et al., 2008). Investigators generally agree that although the use of emotion regulation versus other types of cognitive regulation can appear very different, they represent an underlying self-regulation process likely rooted in attentional networks in the brain (Posner & Rothbart, 2000). For example, a child with poor emotion regulation may cry or throw a tantrum when it is time to be left at preschool without a parent because he does not have the ability to comfort himself to alleviate the anxiety of the unknown situation. The same child may have a difficult time waiting his turn when playing a game with peers because he does not know how to follow the rules during the low-arousal situation of waiting his turn. He must inhibit his desire to play the game in order to give way to his peers. Then, he must shift his attention between cognitive tasks required in the classroom. These distinct behaviors – some requiring suppression of emotion, some requiring shifting of attention, and others requiring inhibition of responses – are different types of executive functions that may represent a similar underlying deficit in the ability to regulate states that are different from what the child normally experiences or from what is normally regulated for him by an adult.

Because of the interrelated nature of various types of self-regulation, the current study uses an executive functioning model to examine and understand developmentally salient behavioral manifestations of an underlying self-regulatory ability, rather than attempting to understand these as completely separate processes, as is often attempted in current literature. There is a lack of consensus on the definition and measurement of self-regulation; thus, the following review of the literature will clarify, when necessary, the way in which self-

regulation has been operationalized in the past, in order to gain a clearer understanding of this construct and how researchers communicate about it.

**Self-regulation and children's functioning.** This section includes highlights from a substantial body of literature that shows that (a) there is a well-documented link between self-regulation and children's functioning in a variety of domains, (b) this link exists for both emotion and cognitive/attentional regulation, and (c) this link is documented in longitudinal studies, showing the importance of self-regulation across development.

First, we see support for the link between *emotion* self-regulation and a variety of outcomes over time. Hill, Degnan, Calkins, and Keane (2006) identified several profiles of externalizing behavior typically displayed by children across the ages 2, 4, and 5, and showed that emotion regulation at age 2 was a significant predictor of a chronically clinical profile for girls. Specifically, emotion regulation (measured through observations of reactivity to a frustrating event and behavioral regulation of this frustration) differentiated girls who had clinical levels of externalizing behavior across all time points from girls who started with nearly clinical externalizing behavior and showed reductions in externalizing from age 4 to 5. These findings suggest that emotion regulatory skills in very early childhood are particularly important in predicting whether children at-risk for later externalizing problems will continue on a clinical trajectory or if they will show fewer problems over time. A similar pattern of findings has emerged in other studies. To illustrate, Cole, Zahn-Waxler, Fox, Usher, and Welsh (1996) measured emotion regulation in preschoolers by coding facial expressions during an induced negative mood. Preschoolers who were highly expressive or not expressive at all (indicating emotion dysregulation) had more externalizing symptoms in

preschool and in first grade. Additionally, preschoolers who were not expressive had more symptoms of anxiety and depression in first grade.

Next, we see support for the link between self-regulation and a variety of outcomes over time. Eisenberg and members of her lab are leaders in the field and have shown evidence for the link between behavioral self-regulation and a variety of outcomes in children over time. For example, in a sample of preschoolers followed over four years, self-regulation measured by parent and teacher report of attention control, attention shifting, and inhibitory control predicted social functioning measured by parent report, teacher report, and child self-report (using a puppet procedure) concurrently and longitudinally (Eisenberg et al., 1997). In 2001, Eisenberg and colleagues found that children categorized as high on externalizing problems (parent and teacher report) had poorer behavioral self-regulation as measured by persistence on a behavioral task, reaction to a disappointing gift, and a sitting still task than controls or those with internalizing problems only. In sum, self-regulation of emotion and attention are associated with a variety of child outcomes, and these links exist across early to late childhood, suggesting it is an important process that underpins the development of children's social, academic, and psychological adjustment.

**Self-regulation and functioning of physically maltreated children.** Not only is the link between self-regulation and children's functioning well-established in the normative population, this link has also been established for samples of physically maltreated children. For children at risk of maltreatment, observed and maternally reported behavior and emotion regulation predicted behavior problems in 3-year-olds (Schatz, Smith, Borkowski, Whitman, & Keogh, 2008). Maughan and Cicchetti (2002) observed more undercontrolled and

overcontrolled emotion regulation patterns in physically maltreated children than non-physically maltreated children in response to a simulated angry exchange between a parent and a research assistant; these patterns of dysregulated emotion were associated with behavior problems and symptoms of anxiety and depression. Teisl and Cicchetti (2008) found that physically maltreated and non-maltreated children with poorer emotion regulation were more likely than their peers to be peer-nominated for behavior problems, and emotion regulation partially mediated the association between maltreatment and behavior problems. Shields and colleagues also studied links among emotion regulation, maltreatment, and adjustment, consistently finding that both maltreated and non-maltreated children with poor behavioral and emotion regulation were more socially maladjusted. Specifically, they displayed more aggression (Shields & Cicchetti, 1998), peer rejection (Shields, Ryan, & Cicchetti, 2001), bullying and victimization (Shields & Cicchetti, 2001), and social incompetence (Shields & Cicchetti, 1994). Additionally, two studies investigating self-regulation and children's outcomes using the larger dataset that the present study used found that among physically maltreated children, parents' and teachers' reports of children's self-regulation were significantly related to teachers' reports of internalizing, externalizing, and adaptive behavior in the classroom setting (Kim-Spoon, Haskett, Longo, & Nice, 2012; Haskett, Stelter, Proffit & Nice, 2012).

Not only is there a documented link between self-regulation and children's functioning in the physically maltreated population, there is also evidence that self-regulation is one mechanism through which maltreatment status is associated with negative child outcomes. In each of the studies by Shields and her colleagues mentioned in the previous

paragraph (Shields & Cicchetti, 1998; Shields, Ryan, & Cicchetti, 2001; Shields & Cicchetti, 2001; Shields & Cicchetti, 1994) the relation between maltreatment and social maladjustment was explained (completely or partially) by self-regulation of behavior. In sum, self-regulation broadly manifested plays a central role in organizing early socio-emotional development for children with and without a history of maltreatment.

Despite the increase in the attention given to this concept of self-regulation and its role in explaining adjustment in abused children, gaps remain in our understanding of factors that are associated with individual differences in self-regulation in this unique population. Most research on self-regulation in abused children has focused on group differences between abused and non-abused children. As demonstrated by the studies described above and others, abused children tend to have less well-developed self-regulation skills than their non-abused counterparts (e.g., Rieder & Cicchetti, 1989; Shields & Cicchetti, 1998, 2001) and poorer understanding of negative emotion (e.g., Smith & Walden, 1999). However, not all physically maltreated children display poor self-regulation in every setting, and very little research investigates factors that predict variations in self-regulatory abilities within physically maltreated samples and across contexts in each maltreated child. Examining factors that predict self-regulation of abused children may contribute to understanding the process by which some physically maltreated children display poor social-emotional outcomes and others do not – thus informing efforts to decrease these negative outcomes in abused children.

**The role of parenting in the development of self-regulation.** Certainly, there is no single influence that drives the development of self-regulation. As Calkins (1994) argues, a

multitude of factors both within the child and external to the child likely interact with one another along developmental pathways to shape a child's self-regulatory skills. It is generally agreed, however, that parents (or other primary caregivers) have the opportunity to play a particularly important role in these pathways in early childhood. It is thought that because the parent-child relationship is the most salient social relationship in the early years, and parents mediate much of children's experience of the world, children's initial emotion and behavior regulation skills develop within the context of this relationship (Thompson, 1994). Early primary caregivers are responsible for meeting the needs of their children and soothing their children when the children are experiencing distress; thus, this relationship can create the structure – or lack of structure – in which children learn about modulating their behaviors and emotions on their own (Kopp, 1989). Furthermore, parents often have the ability to control their children's access to situations in which self-regulation can be practiced, they can assist their children in regulating their emotions or behaviors, and they can explicitly teach regulatory strategies. For example, in one study of emotion regulation in parent-child dyads, parents who were observed using appropriate regulation strategies with their children had children who were better regulators of their own emotion and behavior later on (Spinrad, Stifter, Donelan-McCall & Turner, 2004). Mothers in that study used fewer emotion-regulation strategies across the three time points with their children as the children became more capable of performing these tasks on their own.

Not only is there evidence that children acquire self-regulation skills in part by learning from parents' specific and direct use of regulation strategies with them, there is empirical support for the association between parents' general pattern of caretaking and their

children's self-regulation. Specifically, sensitive, responsive, positive parenting is associated with effective self-regulation in children; harsh, controlling, and negative parenting predicts poor self-regulation in children. Research to support these links is provided below.

Calkins, Smith, Gill, and Johnson (1998) found that toddlers whose mothers displayed more negative control during parent-child observations were less likely to use the self-regulation strategy of distraction when faced with a situation designed to elicit negative emotion. Inhibition of inappropriate behavior in a "stop-play" task as well as compliance in a "clean-up" task also were related to negative parental control. Negative control included parental behaviors such as frequent scolding, derogatory remarks, anger, physical control, and verbal direction of their children's activity. In a study of first and second grade students, children's perceptions of their mothers' hostility, measured by a puppet interview, were related to mothers' ratings of their children's self-regulation, as assessed by rating scales of inhibitory control and attention (Morris, et al., 2002). Additionally, inconsistent discipline has been shown to be associated with low self-regulation of anger and sadness (Garner & Spears, 2000). These studies provide evidence that parents who are hostile, controlling, and negatively expressive have children with poor inhibition of inappropriate behavior and poor regulation of attention and emotion. Controlling, hostile, and negative parenting are thought to teach the child to suppress emotions in the face of negative reactions from parents toward emotion and behavior expressions instead of learning appropriate ways to regulate them.

Other studies indicate a link between positive parenting factors and strong self-regulation skills. For example, a study of 6 to 8 year olds showed that maternal and paternal responsiveness to children's distress predicted observed and maternally-reported negative

affect regulation of the children (Davidov & Grusec, 2006). A longitudinal study indicated that high levels of observed parental positive support when children were 2 years old were associated with greater increases in children's self-regulation between the ages of 2 and 4 years than for children with parents who displayed lower levels of positive support (Moilanen, Shaw, Dishion, Gardner & Wilson, 2009). Positive support included observations of engagement with the child, positive reinforcement, and providing developmentally appropriate structure for the child. These and other studies (e.g., Calkins & Johnson, 1998; Smith & Walden, 2001) indicate that positive parenting, which includes characteristics such as responsiveness, reciprocal behavior, positive expression, appropriate structure, and sensitivity, is related to effective self-regulation in young children. These parenting qualities indicate an awareness of the child's needs that allows the parent to help regulate the emotions and behaviors of the child when appropriate and assist the child in using self-regulation strategies that allow for more autonomous emotion and behavior regulation later on, and it also may allow the child to express emotions appropriately without being criticized or punished.

Though the relation between parenting and self-regulation in young children is supported by many studies, as discussed above, one meta-analysis of 41 studies of parenting and self-regulation in 2 to 5 year-old children suggests that this link is weak and varies depending on how self-regulation is defined (Karreman, Tuijl, Aken, & Dekovic, 2006). Specifically, the link between parents' positive control (e.g., appropriate direction, teaching, and guiding of the child's behavior) and children's compliance (one conceptualization of self-regulation) was positive and significant and the link between parents' negative control

(e.g., intrusiveness, criticism, anger) and children's compliance was negative and significant. However, these associations were weak in magnitude. Also, positive and negative parental control were not related to two other types of self-regulation – inhibition and emotion regulation. Further, parental responsiveness (e.g., positive affect, sensitivity, warmth, responsiveness to child's cues) was not significantly related to children's compliance, inhibition, or emotion. Moderating factors could explain overall insignificant and weak effect sizes in this meta-analysis despite stronger and significant associations in individual studies; unfortunately, the meta-analysis study did not include a sufficiently large number of studies to examine many of the potential moderating factors of interest. This meta-analysis, considered together with the rest of the literature in this area, indicates that there are associations between positive and negative parenting behaviors and children's self-regulation, but these associations are likely complex and deserve further study. This area of research is especially lacking in studies investigating the relation between parenting and self-regulation in physically maltreated children, who might be at particular risk for poor self-regulation given their parents' approach to caretaking.

### **Parenting Behaviors of Abusive Parents**

Abusive parents tend to use harsher, less responsive and less sensitive parenting practices than non-abusive parents. An early publication by Crittenden (1981) identified specific parenting behaviors that distinguished abusive and neglecting mothers from adequate mothers. Subsequent research (e.g., Lyons-Ruth, Connell, & Zoll, 1989) including a meta-analysis (Wilson, Rack, Shi, & Norris, 2008) supports Crittenden's conclusions that abusive mothers tend to display hostility toward their children, interfere with the goals of their

children's behavior, and display contradictory emotional signals to their children. Neglecting parents tend to interact infrequently with the child, exhibit a lack of emotional expression toward the child, engage in little eye contact, and maintain physical distance from the child. On the other hand, mothers who were neither abusive nor neglecting displayed responsive behavior that was consistent with the goals of the child, responsiveness to the child's cues, and affectionate.

As would be expected given these parenting behaviors, children of abusive parents on the whole have worse self-regulation than non-abused children (e.g., Maughn & Cicchetti, 2002; Rieder & Cicchetti, 1989; Shields & Cicchetti, 1998, 2001). Some empirical literature suggests that the relation between maltreatment history and self-regulation is accounted for – at least in part – by parenting behaviors (e.g., Shipman & Zeman, 2001). That is, the history of maltreatment predicts differences in self-regulation through the pathway of unsupportive, insensitive parenting behaviors. More specifically, physically maltreated children tend to have parents who use patterns of insensitive parenting, which in turn affects children's self-regulation, rather than the event of maltreatment directly influencing self-regulation.

Although there are group differences between abusive and non-abusive parents, there is documented variability in the type of parenting exhibited by abusive parents. Based on cluster analyses, Oldershaw, Walters and Hall (1989) identified distinct subgroups of physically abusive parents who differed in observed responsiveness, discipline, affect, and controlling behavior during interactions with their children. Haskett and colleagues (2004) also used cluster analysis to identify subgroups of parents within a sample of physically abused parents based on observed parenting. In this sample, two sub-groups emerged within

the abusive group – one that was characteristic of warm, sensitive, engaged parenting and one characteristic of negative, insensitive parenting. It may seem dissonant that a subgroup of abusive parents may exhibit sensitive parenting. However, it is important to remember that the etiology and sequelae of maltreatment varies among abusive parents, with some abuse incidents representing a pervasive pattern of insensitive parenting, and other abuse incidents being an isolated aberration in an otherwise well-functioning parent-child relationship. Such differences in parenting may place physically maltreated children on very different developmental pathways. Indeed, the subgroups of abusive parents identified by both Haskett and colleagues (2004) and Oldershaw and colleagues (1989) were differentially predictive of various child outcomes, suggesting differential developmental trajectories for children whose parents belonged to the different subgroups. Thus, abusive parents – a group that has often been regarded in the literature as homogeneous – may parent their children more differently from one another than previously acknowledged.

The literature summarized in the paragraph above, though not conclusive on typology of abusive parents, does show that there is variability in observed parenting behaviors and styles employed by abusive parents, and understanding this variability could clarify some of the differences in child behavioral outcomes among abused children. It is possible that differences in parenting behaviors among abusive parents may also be predictive of individual differences in children's self-regulation; this is a question that has not been adequately addressed. The small body of literature related to parenting and physically maltreated children's self-regulation is reviewed below.

### **Parenting and Physically Maltreated Children's Self-Regulation.**

Very little research investigates the link between parenting and self-regulation among physically maltreated children. Robinson and her colleagues (2009) investigated the link between parenting behaviors and emotion regulation in 1 to 4 year-old physically maltreated children and found that parents who displayed more hostile behavior during a parent-child interaction had children who displayed more hostile behavior, less effortful control, and less positive affect in the same parent-child interaction. Also among these dyads, parents who displayed more positive affect had children who likewise displayed more positive affect. One limitation of this study is the authors' operational definition of emotion regulation. They used three measures of children's emotion regulation: hostility (frequency and intensity of irritability, angry withdrawal, and hostility); positive affect (frequency and intensity of laughter, smiles, and joyful expression); and effortful control (persistence and duration of on-task behavior). This is problematic in that the first two indicators simply assess displays of positive and negative emotion, not necessarily emotion regulation. Further, using effortful control as a measure of *emotion* regulation assumes that the child is staying on task because of an ability to internally regulate the experience of emotion that he or she would otherwise cope with by acting out or being off task. Another limitation is the measurement of self-regulation within the parent-child interaction only. Although understanding the association between parenting and self-regulation as they occur in the same parent-child interaction is useful in many ways, it is not necessarily useful in understanding self-regulation as it occurs in other contexts independent of the parent. Lastly, all of the physically maltreated children were living outside of the original home due to the severity of maltreatment. This is only one

subset of physically maltreated children and it is possible the findings do not generalize to less extreme cases of maltreatment, which may constitute the majority of cases.

In an unpublished dissertation, Schatz (2007) examined parenting across time and its relation to regulation in a sample of children from 4 months to 2 years old whose mothers were at risk for maltreatment. Multiple indicators of parenting were used and three aspects of self-regulation were measured (behavioral, physiological, and emotional). Parenting across the children's first two years of life predicted children's self-regulation at 2 years of age. Further, declines in good parenting over time were associated with poorer children's self-regulation at 2 years of age. This study is important in its pursuit to understand parenting and regulation processes in the earliest years of a child's life; however, it is limited by measurement of a very early form of self-regulation when the child is only 2 years old, a time when a child has not yet experienced the developmental stages in which self-regulation independent from parents and other adults is required. Another limitation is the use of a sample at-risk for maltreatment, rather than a sample of children with substantiated histories of abuse. Lastly, the parent was the only rater for the self-regulation measure and no information on the validity of the scale was given.

Shipman and Zeman (2001) demonstrated that the relation between maltreatment history and emotion self-regulation in 6 to 12 year old physically maltreated and non-physically maltreated children was mediated by mothers' supportiveness of their children's emotional displays and by mothers' ability to generate effective strategies for their children to cope with their emotions. These results indicate that maternal supportiveness and problem solving partly account for the differences in self-regulation between physically maltreated

and non-physically maltreated children. However, it is not clear whether these parenting behaviors are predictive of self-regulation in the maltreatment group alone. Further, the authors did not report whether they conducted a significance test to determine whether the portion of the effect of maltreatment on self-regulation mediated by parenting was significantly different from zero.

Furthermore, no study investigates the relation between parenting behavior and self-regulation in abused children specifically during the developmentally important time of preschool, kindergarten, and first grade, when children are faced with the new social and cognitive demands of entering into formal schooling. During this time period, parenting by abusive parents tends to get worse rather than better, though there is much variability from parent to parent (Haskett, Neupert & Okado, 2013). Stress tends to accumulate over time, and for parents under high stress this may translate into degrading parenting behavior. Knowing whether the association between this decline in parenting quality and children's self-regulation is the same at preschool, kindergarten, and first grade, would begin to shape a picture of how closely related these two processes are through this developmentally important time. It may be that as children become immersed in the social world of school, and their teachers and peers become influential in shaping their self-regulatory abilities, their parents' interactions with them at home may become less important. Or, the relation between parenting and self-regulation may emerge as the child moves from preschool to kindergarten to first grade because of the increasing social and cognitive demands of these developmental periods.

### Statement of the Problem

As described in the preceding literature review, a large body of research has documented the negative effects of child maltreatment. Emotion and behavior self-regulation are important processes that may account for the relatively poorer adjustment of physically maltreated children compared to non-physically maltreated children. However, comparatively little research examines predictors of differences in self-regulation among physically maltreated children. One important influence on self-regulation in the general population is parenting behavior, but this variable has not been adequately examined as a predictor of self-regulation among physically maltreated children despite the empirical support that exists for differences in parenting behavior among abusive parents. Within the small body of research that does examine parenting and self-regulation among physically maltreated children, several limitations are present: (a) lack of generalizability of the sample (e.g., risk-of-maltreatment sample rather than substantiated abuse cases; out of home placement), (b) inadequate operational definition of emotion or behavioral self-regulation, or (c) reliance on only parent ratings of self-regulation.

Much is already known about how physically maltreated children and their parents differ from the normative population; it is now necessary to examine parent and child characteristics – as well as characteristics of the parent-child interaction – *within* this population. Doing so will allow for a clearer understanding of individuals within the physically maltreated population. Because self-regulation is associated with later adjustment, investigating possible parenting influences on self-regulation in physically maltreated children will aid in a better understanding of pathways through which physically maltreated

children progress to positive or negative outcomes. Understanding these pathways may inform the development of targeted intervention techniques that focus on the parenting behaviors that matter the most for children's development. Further, understanding this unique group will also allow for a better grasp of the role of parenting in the normative population.

It is also necessary to investigate the variations in parenting of maltreating parents – rather than simply comparing these parents to matched control groups – because of the ambiguous methods used to identify and classify physically maltreated children and the lack of information about the characteristics of the abuse history of these children. Examining other important variables (such as parenting) within groups of physically maltreated children may be a less error-laden method for understanding individual differences that will yield a clearer picture of the maltreatment context. Finally, reliance on parent reports for measures of parenting and children's regulation is a limitation of prior research. The current study used observations of parenting and teacher reports of children's self-regulatory processes to avoid problems associated with shared method variance and to determine the degree to which parenting predicted children's regulation outside the family context. Hypotheses are outlined below.

### **Hypotheses and Research Questions**

The first research question was whether, among parents and their children with a history of physical child abuse, parents who display higher quality parenting have children who display better emotion control, inhibition of inappropriate behaviors, and attention shifting in the school setting. There were three hypotheses related to this research question. Parenting quality will be positively and significantly related to children's emotion control

(Hypothesis 1), children's ability to inhibit inappropriate behavior (Hypothesis 2), and children's ability to appropriately shift attention (Hypothesis 3). An additional research question investigated was whether the relation between parenting behavior and abused children's self-regulation in the school setting varied depending on the child's current grade; there was no directional hypothesis put forth.

## **Method**

### **Participants**

Participants were 85 physically abused children and their parents who were participants in a larger study of 93 physically maltreated children's social and academic adjustment from preschool to first grade. The larger study was a longitudinal study for which data were collected at three time points: preschool (time 1), kindergarten (time 2), and first grade (time 3). For purposes of the current study, one time point was selected at random for each parent-child dyad for cross-sectional analyses. Eight dyads were excluded because there was not a single time point for which all study measures were available.

Children were 51-89 months old ( $M = 69$  months;  $SD = 9.4$  months) and were in preschool ( $n = 29$ ), kindergarten ( $n = 27$ ), or first grade ( $n = 29$ ). The majority of the children were African American (73%) and male (61%). Ten of the children had one or more siblings in the study, but each parent-child dyad was unique so sibling pairs were retained in the dataset. Parents and caregivers ranged from 19 to 58 years of age and all were the mother or grandmother of the child. The Hollingshead (1975) measure of socioeconomic status indicated that there were families from all levels of socioeconomic status, with the majority (62%) from the highest two levels (representing the lowest socioeconomic status).

## **Instrumentation**

**Children's self-regulation.** The Behavior Rating Inventory of Executive Function (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000) and the Behavior Rating Inventory of Executive Function-Preschool Version (BRIEF-P; Gioia, Espy, & Isquith, 2003) were used as the measure of self-regulation. The BRIEF was administered to teachers of the children when they were in kindergarten and first grade, and the BRIEF-P was administered to teachers of the children when they were in preschool. The BRIEF will be described first, followed by the BRIEF-P.

The BRIEF teacher form is an 86-item rating scale of behaviors indicative of executive dysfunction in children 5 to 18 years old. Teachers respond to each item using a three-point scale with the anchors "never," "sometimes," and "often." Items measure a range of everyday school behaviors that theoretically and empirically form eight subscales that indicate distinct but related areas of executive functioning. Three of the eight subscales are behaviors that pertain to children's self-regulation, and these three factors load onto a separate factor from the other five scales. They were used for the study as measures of self-regulation: Inhibit, Shift, and Emotion Control. Items on the Inhibit scale measure behaviors pertaining to inhibitory control, or children's inhibition of impulses and ability to stop or refrain from inappropriate behavior. The Shift scale measures the ability to adapt to new situations and shift attention when appropriate. The Emotion Control subscale measures the ability to appropriately modulate one's emotions. Raw scores are calculated for each subscale by summing the score of all items on a scale (each item is scored one point for "never," two points for "sometimes," and three points for "often"). Raw scores are translated into T-scores

using conversion tables for gender and age group, based on the normative samples of 720 children. Psychometric properties of the BRIEF are strong. For Emotion Control, Shift, and Inhibit, Cronbach's alphas range from .91 to .96 in a clinical sample and normative sample (Gioia, et al., 2000). Test-retest correlations (average of 3.5 weeks between test administrations) are good at .91 for Inhibit, .83 for Shift, and .92 for Emotion Control. Most scales on the BRIEF teacher form have good content validity, assessed by agreement of expert raters. Convergent and divergent validity are shown with scales on the Child Behavior Checklist, the Behavior Assessment System for Children, and the Conner's Rating Scale (Gioia, et al., 2000).

The BRIEF-P (Gioia, et al., 2003) is a parallel form of the BRIEF, with items that are theoretically appropriate for preschool-age children (2 years through 5 years, 11 months) and empirically validated on a preschool normative sample. It contains 63 items that comprise 5 subscales, including Inhibit, Shift, and Emotion Control scales, which are very similar to the scales on the BRIEF with the same name. Items are similar or identical to the items on the BRIEF scales and they theoretically measure the same underlying self-regulatory processes. Reliability and validity are very similar to that of the BRIEF. For the scales used in this study, internal consistency ranges from .90 to .94, test-retest reliability over an average period of 4.2 weeks ranges from .65 to .94, and there is evidence for content and construct validity (Gioia, et al., 2003).

**Parenting behavior.** Parent-child interactions were coded for six global parenting characteristics using a coding system based on the Qualitative Ratings of Parent-Child Interactions (Cox, 1997): (a) positive regard for the child, (b) negative regard for the child,

(c) sensitivity, (d) intrusiveness, (e) detachment, and (f) flatness of affect. For each of the three segments of the parent-child interaction (described below), a coder rated the parent's behavior on a 7-point rating scale (1= not at all characteristic of this category; 7 = highly characteristic of this category). The categories positive regard, negative regard, sensitivity, and intrusiveness were used in the present study because of the research supporting links with these parenting characteristics and children's self-regulation. Positive regard for the child is frequency and intensity of verbal or physical warmth and positive expression (e.g. smiles, hugs) toward the child; negative regard is frequency and intensity of verbal or physical hostile, negative behaviors (e.g., name-calling, pushing away); sensitivity is the degree to which parent behavior is responsive and reciprocal, according to the child's needs; and intrusiveness is the degree to which parents' behavior dominates the interaction in such a way that the child is not allowed to follow his or her own interests, needs, and desires. This coding system and other similar coding systems have been used widely in parenting research and have demonstrated reliability and validity (e.g., Haskett, Ahern, Ward, & Allaire, 2006; Haskett, et al., 2004).

### **Procedures**

Parent-child dyads were referred from the Department of Social Services on the basis of a substantiated report of physical abuse or neglect involving inappropriate discipline within the previous 6 months of entry into the study. Most children were recruited in their last year of preschool, but some were recruited during kindergarten or first grade. Children were excluded if they (a) had a history of sexual abuse, (b) were not living in the same home as their parent, or (c) had a parent with untreated substance abuse. To recruit parents and

children who met these criteria, social service staff conducted a review of the child protection registry and mailed descriptions of the study to those parents who were eligible. The letters informed parents they would receive \$70 for time 1, \$80 for time 2, \$90 for time 3, transportation reimbursement, and child care if they qualified for the study. Parents who were interested voluntarily contacted the project office and completed a psychosocial interview. After the interview, data collection was scheduled for those who met the criteria. To further encourage participation, parents were entered into a drawing for a \$50 bonus when they scheduled each data collection appointment.

For each data collection session, families were provided with taxi transportation to the data collection site, and parents were offered child-care during the three-hour session for any children who did not participate. Before data collection, parents gave their informed consent and children gave their assent for their participation. They were given the option to decline participation in any part of the data collection. Parents also were given a Certificate of Confidentiality from the federal Department of Health and Human Services, protecting them from research data being used in court. Data were labeled with parent and child identification numbers that were not associated with their identities, and all materials were stored in locked file cabinets. The university Institutional Review Board approved these procedures.

Teams of undergraduate research assistants, who were not informed of the children's abuse history or the hypotheses of the study, were trained and supervised by a graduate student to administer all parent and child measures. Data were collected from parents and

children separately in adjacent rooms, after which parents and children were reunited and participated together in the videotaped parent-child interaction.

For the parent-child interaction, each parent-child dyad was observed and videotaped through a camera disguised as a clock for three eight-minute segments. The parent-child dyads were told that they were going to film a movie together doing things that are fun for families. For the first segment, the parent was instructed to play with her child in a room with toys. For the second segment, the parent was instructed to ask their child to clean up the toys, draw a picture of a person, then sit quietly while the parent read a magazine. For the last segment, the child was given two puzzles to complete and the parent was told to help the child without touching the puzzle pieces. The research assistant set a timer in front of the parent and child to show them how much time remained to complete the puzzles. After parent-child data collection at the university clinic, parents were given compensation and parenting support materials; children were given a toy.

Videotaped parent-child interactions were coded by trained undergraduate and graduate student research assistants who were not involved in data collection. Research assistants were trained on the coding system until each trait in each segment was scored reliably (i.e., 80% interrater agreement with the trainer). After reliability was reached, research assistants coded videotapes independently, and 25% of tapes were coded to document inter-rater agreement. Inter-rater reliability was found to be adequate, as indicated by intra-class correlations of  $r = .75$  for Positive Regard,  $r = .65$  for Negative Regard,  $r = .72$  for Sensitivity, and  $r = .64$  for Intrusiveness.

No more than two weeks after parent-child data collection, teachers were contacted and asked to assist in the study by completing several measures and allowing observers to conduct observations during recess on the playground. Measures were mailed to teachers at their schools and collected in person when research assistants conducted the playground observations, at which time teachers were given compensation of \$15.

## **Results**

### **Data Reduction for Parenting Behavior**

Across the three parent-child interaction tasks, ratings within each parenting variable (positive regard for the child, negative regard for the child, sensitivity, intrusiveness) were moderately and significantly correlated (Table 1). Therefore, one score for each parenting variable was created by computing the mean of the ratings from the three tasks. Combining scores across segments in this way was conceptually appropriate because the objective was not to measure parenting behavior in a specific context, but rather to measure typical parenting behavior across settings. Table 2 displays the means, standard deviations, and intercorrelations of the four parenting variables across segments.

A principal component analysis of the four parenting variables was performed. Based on past studies of parent-child interactions providing evidence that warm, sensitive parenting and harsh, intrusive parenting are not necessarily two ends of one dimension, but rather can be understood as distinct factors (Haskett, Smith Scott, & Sabourin Ward, 2004) a two-factor solution was expected to emerge. However, the data suggested that a one-factor solution best accounted for the shared variance among the variables. A forced two-factor solution was not possible due to the communality of one of the variables exceeding zero. The one-factor

solution explained 66% of the total variance and factor loadings were strong (Table 3), with negative regard and intrusiveness loading negatively onto the factor. One global parenting score was created by taking the mean of positive regard, sensitivity, negative regard (reverse coded) and intrusiveness (reverse coded). This composite parenting variable was labeled “parenting quality,” with higher values indicating more sensitivity and positive regard and less negative regard and intrusiveness.

### **Descriptive Statistics and Check for Covariates**

Mean, standard deviation, range, kurtosis, and skew statistics were computed for each independent and dependent variable (Table 4). Variables were checked for normality by performing significance testing to determine if the skewness or kurtosis statistics were significantly greater than zero. The skewness statistic was divided by the standard error of skewness to obtain the z-score of the skewness statistic, which was then compared to the cutoff of 1.96; the same was done for kurtosis (Field, 2009). Parenting Quality was not significantly skewed or kurtotic according to the 1.96 z-score cutoff. Emotion control, shifting, and inhibition were all significantly skewed in the positive direction, and emotion control was significantly kurtotic. Boxplots for the three self-regulation variables indicated there were seven significant outliers across the three measures, two of which were extreme outliers. To reduce skewness, lessen the influence of outliers, and (in the case of emotion control) reduce kurtosis, each of these variables was transformed using a natural log transformation. The descriptive statistics for the transformed variables (Table 4) indicate that transformation reduced the skew and kurtosis statistics and for the inhibit variable, the

skewness was reduced to non-significance. Additionally, the transformation eliminated the most extreme outliers.

To determine the appropriateness of including key demographic variables in the regression models to account for potential confounding effects, correlation analyses were performed among child's IQ, age, gender, socioeconomic status, ethnicity (dichotomized into African American and non-African American) and the three regulation variables (inhibit, shift, and emotion control) (Table 5). None of the demographic variables were significantly correlated with any of the self-regulation variables. Although it is well documented that age and gender are strongly associated with self-regulation and executive function, the use of age- and gender-specific norming information when translating raw scores on the BRIEF to T-scores probably removed some of the effects of these variables on T-scores.

Intercorrelations of the three BRIEF subscales were calculated to understand the relatedness of the dependent variables. All correlations were significant and positive. The correlation between inhibition and emotion control had the highest magnitude, and the correlation between shifting and inhibition had the lowest magnitude. The values for these correlations can be viewed in Table 6.

### **Hypothesis Testing**

**Parenting quality and self-regulation.** To determine whether parenting quality was related to self-regulation, Pearson's correlations were performed. All reported significance tests are one-tailed. Analyses indicated that parents who displayed higher parenting quality had children with lower scores (lower scores indicate better self-regulation) on teacher-reported shifting  $r(84) = -.27, p = .007$  and inhibition  $r(84) = -.18, p = .045$ . Thus, parenting

quality accounted for 7.3% of the variability in shifting and 3.2% of the variability in inhibition. There was no significant correlation between parenting quality and emotion control, though the correlation approached significance  $r(84) = -.17, p = .057$ .

**Grade as a moderator of the relation between parenting and self-regulation.** A series of multiple regressions was conducted to explore whether the relation between parenting and children's self-regulation depended on the child's grade in school (Howell, 2010). First, parenting quality was centered to minimize multi-collinearity between the independent variable and the interaction terms. Dummy variables were created for the grade variable (preschool, kindergarten, first grade) so children could be compared categorically. Kindergarten was used as the reference grade. Next, regression analyses were performed with parenting quality and grade (dummy variables) entered as predictors into the model first, followed by the interaction term for grade and parenting. This was done with each self-regulation variable (inhibit, shift, emotion control) as the dependent variable. Diagnostic statistics were then calculated to determine if there were any problems with the model (violations of assumptions, outliers, or overly influential cases).

**Emotion control.** A moderation analysis (Table 7) indicated there was a significant moderating effect of grade on the association between parenting quality and emotion control. The slope of parenting quality and emotion control was significantly larger for children in preschool than for children in kindergarten ( $t = -1.93, p = .05$ ), but there was no significant difference in this slope between first graders and kindergarteners ( $t = -1.60, p = .11$ ). A simple slopes analysis indicated the relationship between parenting quality and emotion control was

significantly negative for children in preschool ( $t = -2.50, p = .02$ ) and first grade ( $t = -2.12, p = .04$ ), but it was non-significant for children in kindergarten ( $t = .50, p = .63$ ; see Figure 1).

There was no evidence of substantial multicollinearity among the predictors, as indicated by variance inflation factor (VIF) and tolerance values within the expected range (i.e., no VIF greater than 10 and average VIF not substantially greater than 1, per Bowerman & O'Connell, 1990). The residuals appeared to be normally distributed upon visual inspection of the histogram and normal probability plots. Further evidence for normal distribution of the residuals was found when only four cases (5% of the total number of cases) had a standardized residual with an absolute value greater than 1.96, and only two cases had absolute values greater than 2.5. Two leverage values greater than three times the average leverage (Stevens, 1992) suggested these could be overly influential cases to the model; however, Cook's distance was less than 1 for all cases (Cook & Weisberg, 1982), and only one Mahalanobis distance was above the 5% cutoff for five predictors and a sample size of approximately 100 (Barnett & Lewis, 1978). A visual inspection of the plot of the residuals against the predicted values indicated some heteroscedasticity in the data, with residuals becoming more dispersed at higher levels of the predicted values. The Durbin-Watson statistic of 1.53 shows that the assumption of independence of errors was not violated.

**Shifting.** The next moderation analysis, which tested for an effect of grade on the link between parenting quality and shifting, showed the slopes for the three grades were not significantly different from each other (Table 8), as indicated by the non-significant interaction terms comparing the slopes of parenting quality and shifting for preschoolers to

kindergarteners ( $t = -1.59, p = .12$ ) and kindergarteners to first graders ( $t = -.62, p = .53$ ).

Although there was no significant interaction effect, a simple slopes analysis indicated the relation between parenting quality and shifting was significantly negative for children in preschool ( $t = -2.76, p = .01$ ), but for children in kindergarten ( $t = -.35, p = .73$ ) and first grade ( $t = -1.40, p = .17$ ) there was no significant relationship (Figure 2).

As with the previous regression model, there was no evidence of substantial multicollinearity among the predictors, as indicated by VIF and tolerance values within the expected range, and the residuals appeared to be normally distributed upon visual inspection of the histogram and normal probability plots. Only one standardized residual was above the 1.96 cutoff. Also similar to the pattern found in the previous model, two cases had leverage values higher than three times the average expected leverage value given the sample size, but Cook's distance was less than 1 for all cases and only one Mahalanobis distance above the 5% cutoff. The plot of the residuals against the predicted values indicates some heteroscedasticity in the data, with residuals becoming more dispersed at higher levels of the predicted values. The Durbin-Watson statistic was 1.92; thus, there was no autocorrelation of errors.

**Inhibition.** The moderation analysis to test for the effect of grade on the link between parenting quality and inhibition also did not indicate a significant interaction effect (see Table 9). The slope of parenting and inhibition for kindergarteners was not significantly different from the slope of parenting and inhibition for preschoolers ( $t = -.47, p = .64$ ) nor for first graders ( $t = -.65, p = .52$ ). Additionally, the simple slope was not significant for parenting quality and inhibition at preschool ( $t = -1.20, p = .24$ ), kindergarten ( $t = -.53, p$

=.60), or first grade ( $t = -1.53, p = .14$ ). Although there were no significant slopes or interactions, Figure 3 displays the trend of these slopes.

As with the other two models, VIF and tolerance values indicated no excessive multicollinearity among the predictors. Histogram and normal probability plots of the residuals showed that the residuals were roughly normally distributed. Only two cases (less than 5% of the total number of cases) had a standardized residual with an absolute value greater than 1.96. Unlike the other models, there was only one leverage value greater than three times the average leverage. Cook's distance was less than 1 for all cases, and only one Mahalanobis distance was above the 5% cutoff suggested by Barnett and Lewis (1978). As with the other models, the plot of the residuals against the predicted values indicated some heteroscedasticity in the data, with residuals becoming more dispersed at higher levels of the predicted values. The Durbin-Watson statistic of 1.85 suggested independence of errors.

Table 1

*Correlations Among Parenting Scores across Timepoints*

Positive Regard	Time 1	Time 2	Time 3
Time 1	—		
Time 2	.530**	—	
Time 3	.591**	.504**	—
Negative Regard	Time 1	Time 2	Time 3
Time 1	--		
Time 2	.593**	--	
Time 3	.566**	.625**	--
Sensitivity	Time 1	Time 2	Time 3
Time 1	--		
Time 2	.603**	--	
Time 3	.553**	.446**	--
Intrusiveness	Time 1	Time 2	Time 3
Time 1	--		
Time 2	.365**	--	
Time 3	.401**	.598**	--

*Note.* \*\*Correlation is significant at the  $p < 0.01$  level (2-tailed).

Table 2

*Descriptive Statistics for Parent Behavior Variables*

	Range	Mean	Std. Deviation	Skew	Std. Error	Kurtosis	Std. Error
Positive Regard	1–6.33	3.51	1.21	-.034	.261	-.360	.517
Sensitivity	2–6.67	3.95	1.12	.369	.261	-.462	.517
Negative Regard	1–5	2.12	.84	1.23	.261	1.49	.517
Intrusiveness	1.33–6	3.55	1.11	.171	.261	-.367	.517

*Note.* N = 85

Table 3

*Principal Component Analysis of Parenting Variables*

	Component
Positive Regard	.832
Negative Regard	-.859
Sensitivity	.901
Intrusiveness	-.650

Table 4

*Descriptive Statistics for Self-regulation Variables*

Original Scale	Range	Mean	Std. Deviation	Skew	Std. Error	Kurtosis	Std. Error
Inhibit	39 - 109	59.10	15.08	.885	.260	.407	.514
Shift	41 - 83	52.84	10.97	.835	.260	-.305	.514
Emotion	38- 130	55.33	16.18	2.131	.260	5.833	.514

Log Transformed	Range	Mean	Std. Deviation	Skew	Std. Error	Kurtosis	Std. Error
Inhibit	3.66 – 4.69	4.0494	.24243	.433	.260	-.721	.514
Shift	3.71 – 4.42	3.9474	.19717	.576	.260	-.849	.514
Emotion	3.64 – 4.87	3.9800	.24634	1.281	.260	1.633	.514

Table 5

*Correlations among Dependent Variables and Potential Covariates*

	Inhibit	Shift	Emotion Control
Gender	.188	.032	.155
Age	-.096	.146	-.035
IQ	-.041	.095	-.102
Ethnicity	-.112	-.041	-.006
SES	.040	.111	-.047

*Note.* Pearson correlations for age, IQ, and SES. Point-biserial correlations

for gender and ethnicity. None of the correlations were statistically significant at  $p < .05$ .

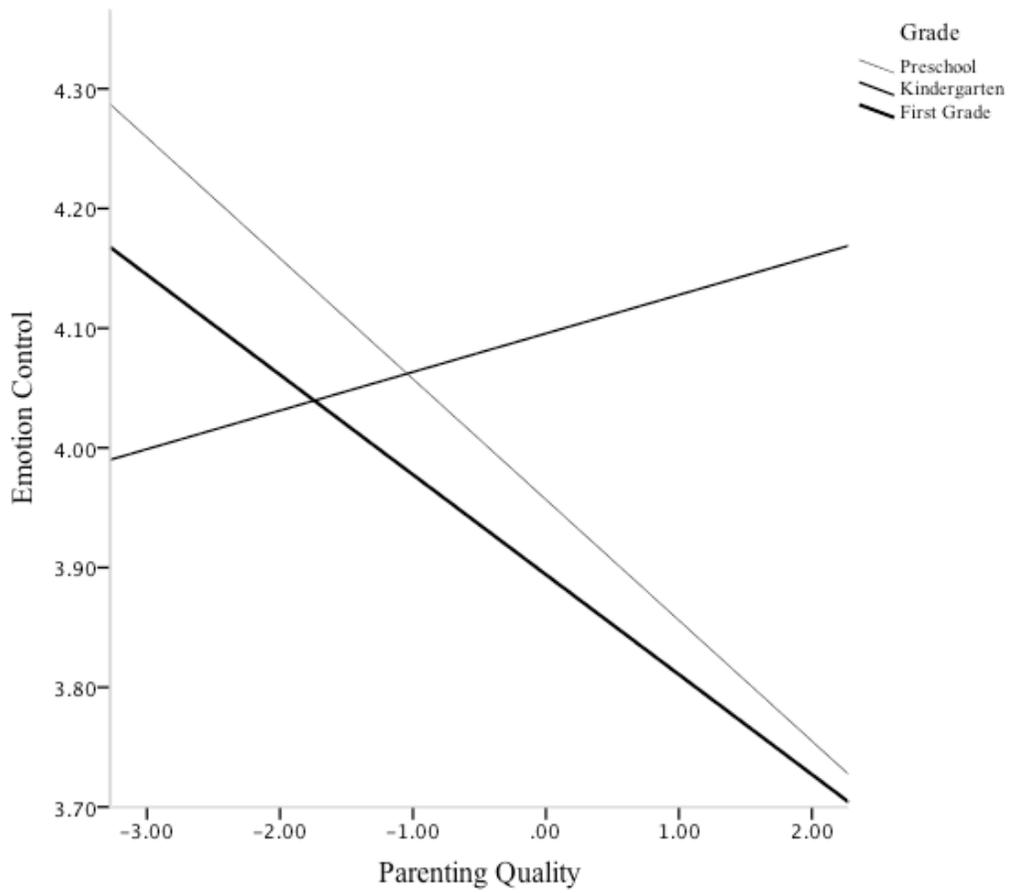
Table 6

*Correlations among BRIEF Subscales*

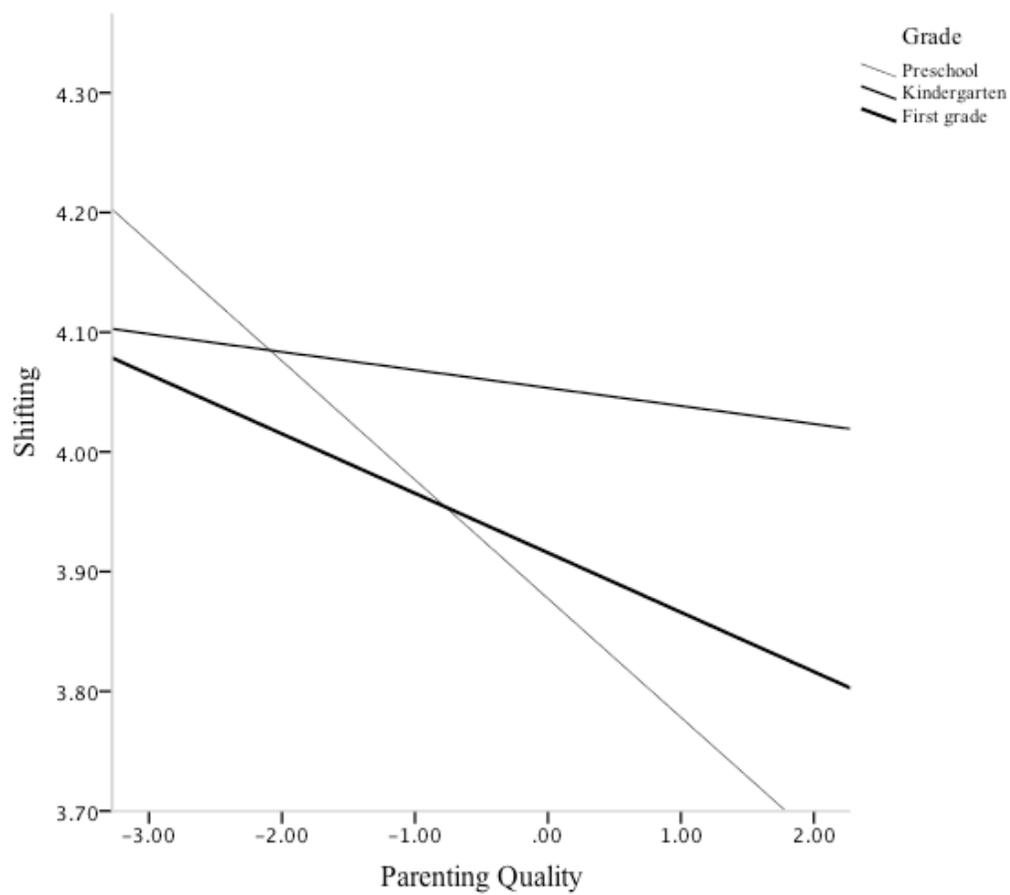
	Inhibit	Shift
Inhibit	---	
Shift	.441**	---
Emotion Control	.671**	.592**

*Note.* \*\*Correlation is significant at the  $p < 0.01$  level (2-tailed).

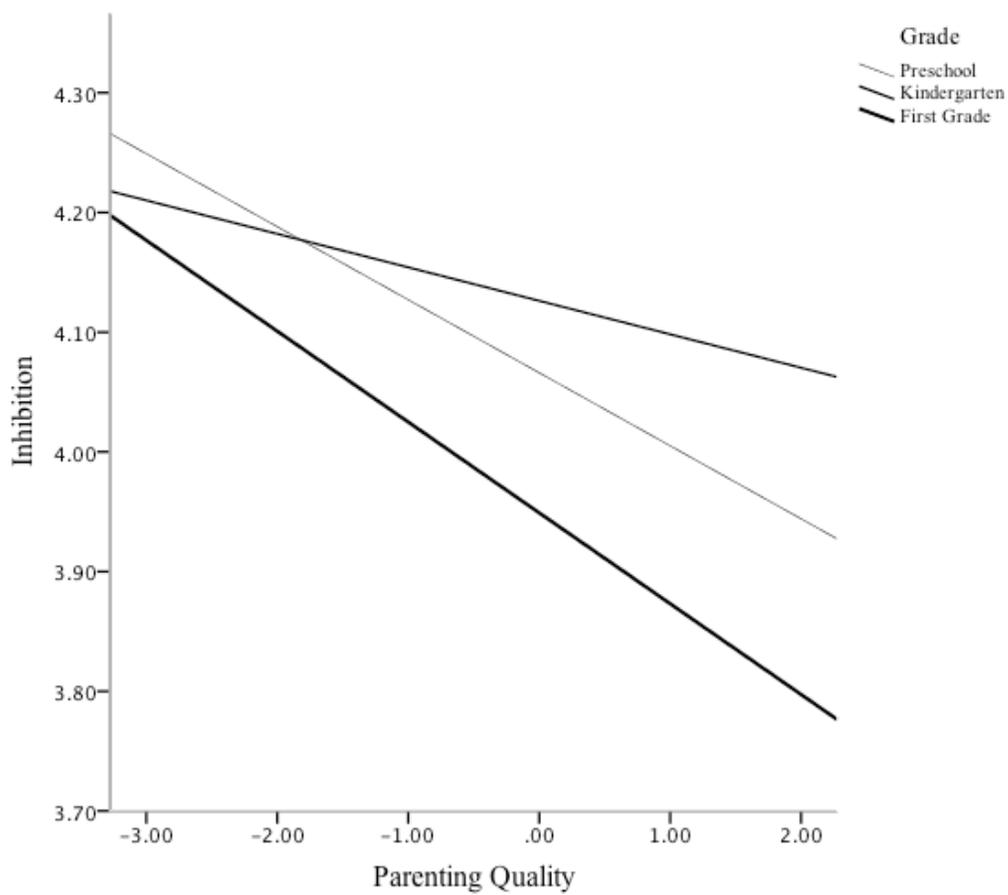
Correlations are among the log-transformed BRIEF variables.



*Figure 1.* The Moderating Effect of Grade on the Relation between Parenting Quality and Emotion Control.



*Figure 2.* The Moderating Effect of Grade on the Relation between Parenting Quality and Shifting



*Figure 3.* The Moderating Effect of Grade on the Relation between Parenting Quality and Inhibition.

Table 7

*Regression Analysis of the Effect of Grade on the Relation between Emotion Control and Parenting Quality*

	B	Std. Error	$\beta$	t
Constant	4.10	.04		93.75**
Parenting Quality	.03	.05	.11	.68
Preschool-Kindergarten	-.14	.06	-.27	-2.26*
1 <sup>st</sup> grade-Kindergarten	-.20	.06	-.39	-3.26**
Parent Quality x Preschool	-.13	.07	-.27	-1.93*
Parent Quality x 1 <sup>st</sup> grade	-.12	.07	-.22	-1.60

*Notes.*  $R^2 = .$   $N = 85$ . Emotion control variable was log transformed.

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

Table 8

*Regression Analysis of the Effect of Grade on the Relation between Shifting and Parenting Quality*

	B	Std. Error	$\beta$	t
Constant	4.05	.033		121.04**
Parenting Quality	-.015	.037	-.07	-.41
Preschool-Kindergarten	-.176	.047	-.43	-3.73**
1 <sup>st</sup> grade-Kindergarten	-.138	.047	-.33	-2.91**
Parent Quality x Preschool	-.084	.053	-.22	-1.59
Parent Quality x 1 <sup>st</sup> Grade	-.035	.056	-.08	-.62

Notes.  $R^2 = .$   $N=85$ . Shifting variable was log transformed.

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

Table 9

*Regression Analysis of the Effect of Grade on the Relation between Inhibition and Parenting Quality*

	B	Std. Error	$\beta$	t
Constant	4.13	.044		93.11**
Parenting Quality	-.028	.048	-.100	-.58
Preschool-Kindergarten	-.060	.062	-.118	-.96
1 <sup>st</sup> grade-Kindergarten	-.177	.063	-.345	-2.82**
Parent Quality x Preschool	-.033	.070	-.069	-.47
Parent Quality x 1 <sup>st</sup> Grade	-.048	.073	-.091	-.65

Notes.  $R^2 = .$   $N=85$ . Inhibition variable was log transformed.

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

## Discussion

As noted in the introduction to this study, children who have been physically abused are more likely than children who were never abused to develop social and emotional problems and perform poorly in school (e.g., Bolger & Patterson, 2001a; Bolger & Patterson, 2001b; Cicchetti & Toth, 2005; Eckenrode, et al., 1993; Mills et al, 2013; Salzinger, et al., 1993; Toth, Manly, & Cicchetti, 1992). The failure to develop appropriate self-regulation may be one important part of understanding the pathways to negative outcomes later in life for these children. However, some children with a history of physical abuse *do* successfully develop appropriate self-regulation skills and, in turn, demonstrate typical social, emotional, and academic adjustment (Cicchetti & Rogosch, 2009). Thus, learning more about the experiences of these resilient children and understanding the conditions in which they develop successful regulation will aid in determining the most effective ways to prevent negative outcomes for other physically abused children.

Multiple factors interacting with one another comprise the possible pathways to resilience (e.g., temperament, neighborhood factors, school teachers, peers), including quality of parenting (Calkins, 1994; Thompson, 1994). Even among caregivers who have physically abused their children in the past, there may be important differences in the quality of their current parenting and their relationships with their children that differentiate children who are resilient from those who are not. Thus, the current study investigated the link between these differences in parenting behavior *among parents with a history of abuse* and their children's self-regulation during the developmentally important time of preschool, kindergarten, and first grade, a period during which it is important for children to begin using their own

strategies for regulating affective and cognitive experiences. Among all children, more sensitive, positive interactions with the child and less intrusiveness and harsh interactions are associated with better self-regulation, which creates a pathway toward a host of positive developmental outcomes. In the current study, I investigated whether the same was true among abusive caregivers and their children – that is, whether children with a history of physical abuse whose parents were warmer, more sensitive, and less hostile and intrusive toward their children showed better self-regulation with regard to their emotions, attention shifting, and inhibition of inappropriate behavior in the school setting.

One assumption central to the purpose of this study was that despite displaying overall poorer self-regulation than the normative population (i.e., mean T-scores on all BRIEF scales exceeded 50), physically abused children, as a group, have a wide range of self-regulatory abilities in the preschool to first grade years. In the current sample, average self-regulation was nearly one standard deviation above the non-clinical norming sample, and there was a range of self-regulatory skill, from one to two standard deviations below the norming group mean to several standard deviations above (lower scores indicate better self-regulation). In sum, although physically abused children showed poorer self-regulation in the classroom as a group in relation to their non-abused peers, many of these children displayed self-regulatory functioning well within the range considered normal by the test makers of the BRIEF. This confirms that there is a range of developmental outcomes among abused children, and it is appropriate to investigate what factors account for this range. Likewise, a second assumption of this study's hypotheses was that behavior among abusive parents encompasses a wide range on each parenting dimension. Indeed, the range in parenting

behavior was not restricted; rather, there was a distribution along the range of possible parenting scores representing poor parenting among some parents and higher quality parenting among others. These descriptive findings support the underlying assumptions of the investigation.

### **Hypothesis Testing: Parenting quality and self-regulation**

The primary hypothesis of this study was that abusive parents who displayed higher quality parenting (fewer negative interactions, more positive interactions, more sensitivity, and less intrusiveness) would have children who displayed better ability to control their emotions, inhibit inappropriate behaviors, and appropriately shift their attention when necessary in the school setting. Consistent with the hypothesis, children of parents who demonstrated greater parenting quality were better at refraining from impulsive, out of control behavior and they more easily adapted to changes in the classroom. Contrary to the hypothesis, however, there was no association between parenting quality and children's ability to regulation their emotions at school, though this link approached significance.

This link between parenting quality and some aspects of self-regulation among children with a history of abuse is supported by past research that demonstrated this link for typically developing populations (Berlin & Cassidy, 2003; Colman, et al., 2006; Chang, et al., 2003; Davidov & Grusec, 2006; Eisenberg, et al., 2005; Morris, et al., 2002; Spinrad, et al., 2004). The current findings suggest that similar parenting processes that foster the development of self-regulation skills in children who were never abused may play a similar role for children who have been abused by their parents. Quality parenting matters for all children, at least with respect to the ability to self-regulate by inhibiting inappropriate

behavior and shifting attention. A history of physical child abuse does not necessarily negate the importance of sensitive and positive parenting.

The link between quality parenting and *emotion* self-regulation was not supported by the current study, however. There are several potential explanations for the failure to find a significant correlation between these constructs. First, although regulation of emotion is frequently understood as stemming from the same roots as other types of self-regulation, some theoretical and empirical literature addresses it as a qualitatively different process. Karreman and colleagues' meta-analysis (2006) of 41 studies examining parenting and self-regulation in 2 to 5 year olds failed to find significant links between parenting quality and children's emotion regulation, though there were significant associations between parenting and other forms of self-regulating behaviors. Among the associations that did exist, the effect sizes were small. This may suggest there are other important moderating factors that would clarify this link for emotion regulation even in the normative populations – perhaps the understanding of self-regulation of *emotion* and parenting link requires a more nuanced approach due to the complexities of how emotion is regulated in young children.

When investigating this link in the maltreated population, the picture might become even muddier given the failure to find a significant link between parenting and emotion regulation in the current study. It is also possible that the ability to control emotions does not share the same association with parenting quality as do other aspects of self-regulation (i.e., inhibiting and shifting) due to the way in which abuse might affect children's ability to control emotions. That is, the developmental trajectory of emotion control might be altered during early child abuse and cannot be overcome by general positive parenting.

Also important to note is the possibility that the scaling of the T scores and the characteristics of the normative sample on the BRIEF for the emotion control subscale might be at fault for the failure to find a significant link between parenting and emotion self-regulation. Specifically, the norming groups for the teacher-report BRIEF for 5- and 6-year-old boys and girls are quite small, and there are very few 5 year olds included (eight 5-year-old and twenty-four 6-year-old boys in the boys' norming group; twelve 5-year-old and seventeen 6-year-old girls in the girls' norming group). The T score conversion tables for the 5-and 6-year-old girls shows that it is possible to score a T score of 130 on the emotion control subscale, and a difference in the teacher's response to just a question or two could mean a large increase in T score, a characteristic that is not as dramatic in the other subscales. It is understandable that a sample of only 29 5- and 6-year-old girls is unlikely to produce a T-score scale distribution that accurately represents the population, especially for a construct as complex as emotion control.

**Research Question: Grade as a moderator of the link between parenting and self-regulation**

Early childhood is an important time for the development of the ability to self-regulate behavior and emotions. During this time, caregivers play a critical role in scaffolding a child's learning about the world and their development of social and cognitive skills. Early school years are a time during which children develop rapidly as they face increasing demands for self-regulation both socially and cognitively in the school setting. The parent-child relationship undergoes many changes to accommodate this rapid development, so it is possible that the nature of the link between parenting and children's

self-regulation may change with age. To better understand the link between parenting and self-regulation from this developmental perspective, I investigated whether this link was moderated by the child's developmental stage, as measured by his or her current grade (preschool, kindergarten, or first grade).

Moderation analyses indicated that among abused children, the relation between parenting quality and children's self-regulation of emotion in the school setting varied significantly by grade, but grade did not moderate the link between parenting and inhibition or attention shifting. As discussed earlier, for the full sample across the three grades, children with parents who displayed higher quality parenting did not have significantly better emotion regulation in the classroom; however, when grade was taken into account as a moderating variable, a significant interaction emerged such that the link between parenting quality and emotion regulation was significantly stronger for preschoolers than it was for kindergarteners. This suggests that the quality of parenting in preschool is more relevant to children's ability to regulate their emotions than it is in subsequent grades; other factors in children's lives are likely more relevant than parenting in those later grades. At the preschool age, the scaffolding and support provided by their parents plays a more important role than it does at later ages, when the child spends more time at school completing increasingly difficult academic and social tasks. In kindergarten and first grade, relationships with peers and teachers might become more important in children's ability to regulate their emotions and behavior.

It is important to note that testing for a moderation effect has low power when one or more of the predictor variables are continuous (McClelland & Judd, 1993). In addition, with

a sample size of only 85 children in the current study, there may not have been sufficient power to detect effects that might exist. Therefore, it is important to view the null results from these analyses as a failure to find an effect rather than a definitive ruling-out of the existence of this moderation effect.

### **Limitations and Future Directions**

The current study makes an important contribution to a limited research base that investigates within-group differences of physically abused children and their parents. Strengths of the study include use of direct observational measures of parenting and teacher reports of child regulatory skills. Further, the sample included participants with a substantiated abuse history rather than children simply at-risk for abuse. This study is not without limitations, however, and there are several important directions for future research to build on our understanding of this vulnerable population.

A multimethod assessment of children's self-regulation should be used in future studies. A teacher's ratings likely are influenced by the self-regulatory abilities of the class to which the teacher is comparing the child, and expectations for self-regulatory behaviors may vary widely from teacher to teacher. A child may be rated by a teacher as highly competent in self-regulation by a teacher who is used to children of the same age who are poorly self-regulated, whereas the same child may be rated as a poor self-regulator by a teacher who is used to children who are highly competent in this area. For these reasons, which are present with the use of any rating scale, observational measures of self-regulation in combination with teacher reports could create a richer and perhaps more valid picture of this variable and would be an important step for future study.

One limitation to the measurement of parenting quality in the present study is that brief observations in the laboratory setting might not fully capture important differences in parenting between parent-child dyads. Further, conclusions cannot be made about the link between children's regulation and low-incidence harsh parenting behaviors that are unlikely to be observed in the clinic and could have a different effect on self-regulation than simply high levels of negative regard that was observed in the clinic. Despite this limitation, however, there were significant findings, so it appears that these clinical observations are measuring meaningful aspects of parenting with respect to children's regulation.

Another limitation of this study is its cross-sectional design. Parenting may be rated the same for two parent-child dyads, but for one dyad this may be an improvement from past parenting and for another it may be a decline in parenting, and these two situations may have very different effects on child adjustment. Any significant findings present in the cross-sectional design show us that this link exists based on concurrent parenting, but conclusions cannot be made about the influence of parenting over time. Further, the cross-sectional design does not allow for investigation into the direction of the relation between parenting and children's self-regulation. A significant association between these variables does not indicate that parenting causes self-regulatory abilities or vice versa. It may simply be the case that poor parenting and child dysregulation are both caused by another variable, such as stressful living conditions. Ultimately, the direction of this association is likely bidirectional and transactional over time, and this possibility warrants further investigation.

Additionally, care must be taken when communicating about the population to which these results generalize. As with many other studies that rely on referrals from Child

Protective Services for participant recruitment, information about the type of abuse is limited and lacking in details related to chronicity and severity. We can only say with confidence that these results generalize to children who have a history of at least one instance of substantiated physical abuse and no history of substantiated sexual abuse. Further, the abuse was likely mild to moderate in severity because the children had not been removed from their parent's care at the time of entry into the study. Cases involving more severe abuse might have produced different findings.

It should be noted that, although there were significant links between parenting quality and inhibition and parenting quality and attention shifting, the effect sizes were only weak to moderate. Because each of these children has very different experiences surrounding their abuse history, and some may be much more susceptible to stress and trauma than others, this link between subsequent parenting quality and regulation may differ widely from child to child. It will be worthwhile to understand this main effect in the context of the constellation of variables that potentially moderate this link. Belsky (2005) explains this concept in terms of "differential susceptibility to rearing." Some children may benefit more from quality parenting practices than others do, and other children may be harmed more by poor parenting than are others. For example, children who have a greater tendency to be highly emotionally reactive may benefit more from sensitive parenting than less emotionally reactive children. As it pertains to this study, it is possible that the links between parenting and self-regulation in the classroom are weak because there is a subset of children who may be less likely to develop good regulation strategies even with highly sensitive parents, whereas others are greatly affected by this. Likewise, some children may have been more seriously affected in a

negative way by past harsh parenting experiences, thus making current positive parenting less helpful.

Another way to think about differential susceptibility to parenting quality is through the lens of attachment theory. Children who have experienced abuse are more likely to develop an insecure or disorganized attachment than those who were never abused (see Cyr, Euser, Bakermans-Kranenburg & Van Ijzendoorn, 2010 for a meta-analysis). Disorganized attachment, which places a child at particularly increased risk of poor outcomes, can result from very *inconsistent* parenting. Thus, if many of the children in this sample have disorganized attachments with their caregivers, a single observation of parenting may be less predictive of functioning in the school setting than would multiple observations over time and across settings, which would better capture the existence of inconsistent versus consistent parenting. Two parents can display positive parenting practices to their respective children in the moment, but one of these two might be much more variable over time and across situations. This could explain weak and non-significant links in the current study, and more theoretical and empirical work is necessary to further understand potential differential susceptibility to parenting.

### **Implications and Conclusions**

Just as we see significant links between parenting and self-regulation in children without a history of child abuse, the present study shows evidence for significant links between parenting and self-regulation within the physically abused population during the preschool to first grade period (albeit links are somewhat weak and variable across aspects of regulation). Thus, even with a history of being physically abused, positive, sensitive,

nonintrusive parenting practices are associated with better self-regulatory outcomes in school. These findings suggest a hopeful situation in which abuse that occurred in the context of these positive parenting behaviors might be associated with better self-regulation. If we continue to develop and promote parenting interventions that focus on bolstering positive, sensitive parent interactions with the child (e.g., The Incredible Years Parent Training Program; Triple P: Positive Parenting Program), it could be possible to change the current tendency for the quality of abusive parents' parenting to deteriorate over time (Haskett, Neupert & Okado, 2013), which may in turn play a role in enhancing children's self-regulation skills. The current study adds to the increasing evidence upon which these parenting programs are founded; that is, positive parenting interactions with children are important among a wide variety of families with diverse histories. These parenting interventions should be the ones promoted by those who have influence in the lives of families with a history of abuse, such as educators, healthcare providers, social workers, and those in our judicial system. Additionally, future research should focus on unraveling more about the parenting quality that follows a history of child abuse and how this influences the important process of self-regulation in children who have been abused so that even better and more targeted interventions might be developed that will improve the outcomes for these families.

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