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Impact of Positive Parenting Behaviors and Children's Self-Control on Levels of Externalizing Behavior Problems during Early Childhood

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Impact of Positive Parenting Behaviors and Children's Self-Control on Levels of Externalizing Behavior
Problems during Early Childhood

A Thesis

Submitted to the Graduate Faculty of the
University of New Orleans
in partial fulfillment of the
requirements for the degree of

Master of Science
In
Psychology
Applied Developmental Psychology

by

Virginia I. Hatch

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Abstract

This study investigated the impact of parenting and children's self-control on children's externalizing behavior problems among 167 predominantly African-American mothers and their 2-year-old children. Two hypotheses were considered based on two distinct theoretical origins of self-control. First, consistent with a behavioral perspective, exposure to positive parenting was hypothesized to indirectly affect externalizing behaviors through children's self-control; that is, children's self-control was expected to mediate the association between positive parenting and externalizing behaviors. Second, consistent with a temperamental perspective, self-control was expected to moderate the impact of positive parenting on levels of children's externalizing behaviors such that only children with a propensity towards low self-control benefited from positive parenting. Results were not consistent with the mediational hypothesis and provided limited support for the moderational hypothesis. That is, only for children with characteristically low self-control was exposure to more positive parenting associated with fewer externalizing behavior problems, as rated by teachers, one year later.

Key Words: Positive Parenting, Self-Control, Effortful Control, Externalizing Behavior, Early Childhood

Introduction

Children experiencing elevated levels of externalizing behavior problems during early childhood seem to increase risk of developing peer rejection and juvenile delinquency during middle childhood and adolescence as well as psychopathology and antisocial behaviors into adulthood. Externalizing behaviors are defined as disruptive and non-compliant and are considered to be a normative part of early childhood (Campbell, 1990). Externalizing behaviors often include temper tantrums, fighting, or problems controlling impulsive behaviors (Campbell, Shaw, & Gilliom, 2000). The frequency and intensity of externalizing behaviors peaks during the toddler years, declining steadily into the middle childhood period (Gilliom & Shaw, 2004; Miner & Clarke-Stewart, 2008). By the time children enter kindergarten or first grade, most children are able to control their impulsive and disruptive behavior when the situation demands such control. Some children, however, experience elevated levels of externalizing problems during the toddler period followed by little if any decline in externalizing problems across the early childhood period (Shaw, Gilliom, Ingoldsby, & Nagin, 2003). When children demonstrate elevated and sustained problem behaviors during early childhood their risk for more severe behavior problems during later developmental periods increases substantially (Campbell et al., 2000).

Repeatedly, the quality of parenting children receive has been associated with variations in children's externalizing behavior (see Bornstein, 2002 for a review). During early childhood, positive parenting, or parenting that involves explanations, suggestions, and reasons for decisions (Kochanska, 1993) has been linked to fewer externalizing problems (e.g., Miner & Clarke-Stewart, 2008). In contrast, parenting that is emotionally negative, intrusive and lacks warmth has been associated with elevated or increasing levels of problem behaviors (e.g., Deater-Deckard, Ivy, & Petrill, 2006). Positive parenting may reduce risk for conduct problems because such parenting teaches children consequences to misbehavior and provides children with assistance in regulating their own behavior (e.g., Scaramella & Leve, 2004). Such active coaching and encouragement may reduce children's risk for developing problem

behaviors in large part because involved parenting also has been linked to children's emerging self-control (Gottfredson & Hirschi, 1990; Maccoby & Martin, 1983).

The ability to regulate behaviors and emotions autonomously is a critical task of early childhood and children with less self-control may be at greater risk for externalizing behavior problems. Self-control is generally defined as the capacity to inhibit responses to match situational demands (de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012; Duckworth & Kern, 2011). Self-control is often operationalized as the ability to delay immediate gratification or to voluntarily inhibit a dominant response for a subdominant response (Duckworth & Kern, 2011; Mischel, Shoda, & Rodriguez, 1989; Rothbart, Ellis, Rosario Rueda, & Posner, 2003). Self-control provides children with the tools to control impulsivity and disruptive behavior. Theoretically, children who exhibit more self-control should also demonstrate less externalizing behavior problems, since externalizing problems often involve temper tantrums or problems controlling impulsive behaviors (Krueger, Caspi, Moffitt, White, & Stouthamer-Loeber, 1996).

Interestingly, disagreement of the origins of self-control exist, with some arguing that self-control is a learned behavior while others suggest self-control reflects temperamental characteristics of children. Regardless of the origin, self-control (sometimes called effortful control) involves the ability to delay gratification upon request in the face of a more preferred response (Mischel et al., 1989; Rothbart et al., 2003). Children entering kindergarten without the ability to delay immediate gratification seem to be at greater risk for developing academic and social problems (Bridgett et al., 2011; Kochanska & Knaack, 2003; Kochanska, Murray, & Coy, 1997; Mischel, 1974) as well as externalizing problems throughout childhood, adolescence and into adulthood (Bridgett, Burt, Edwards, & Deater-Deckard, 2015; Gottfredson & Hirschi, 1990; Olson, Bates, Sandy, & Schilling, 2002; Rothbart & Gartstein, 2008; Rothbaum & Weisz, 1994).

The current study examined how positive parenting and children's self-control influence children's levels of externalizing behaviors both concurrently and across time. Two hypotheses were tested based on different theoretical origins of self-control. First, children's self-control was expected to explain or mediate the direct association between positive parenting and externalizing problems both concurrently, at child age 3, and change in externalizing problems from child age 3 to 4 (see Figure 1). This hypothesis assumes that self-control is a learned skill. Children who received more positive parenting will learn self-control and better self-control skills should predict fewer externalizing behaviors both within and across time. Second, conceptualizing self-control as a temperamental propensity (e.g., effortful control), the expectation that children would differentially benefit from parenting depending on their propensity towards self-control was tested. Children who are characteristically low in self-control were expected to benefit more from exposure to positive parenting than children high in self-control (see Figure 2). Consistent with this approach, self-control was expected to moderate the association between positive parenting and children's externalizing problems such that a negative association between positive parenting and externalizing problems will only emerge for children rated lowest in self-control.

The following section discusses the conceptualization and operationalization of self-control and expectations for change during early childhood. Then, the relationship between self-control and externalizing problems will be discussed. Next, the importance of positive parenting in reducing externalizing behavior problems during early childhood will be reviewed. Finally, theoretical and empirical evidence supporting both the mediational and moderational hypotheses of self-control will be described.

Self-control during early childhood: Definitions and expectations for change

Self-control is goal-directed behavior that facilitates the delay of immediate gratification by inhibiting a dominant response (Ainslie, 1975; Gottfredson & Hirschi, 1990; Mischel et al., 1989; Rothbart & Bates, 1998). Self-control emerges during early childhood and is essential for developing

adaptive social and coping skills. For instance, upon entry into school, children must be able to focus on classroom instruction over the likely preferred choice of playing. According to Kopp (1982) and Putnam and Stifter (2002), children begin to develop the ability to delay immediate gratification around 24 months of age. Dramatic improvements in self-control abilities occur from 2 to 4 years of age, improvements that coincide with a shift from primarily an external, maternal, locus of control to an internal, child-driven, locus of control (Kochanska, Murray, & Harlan, 2000; Posner & Rothbart, 2000). That is, as children become increasingly able to delay immediate gratification, parents increasingly expect children to demonstrate self-control (Atance & Jackson, 2009; Hongwanishkul, Happaney, Lee, & Zelazo, 2005; Imuta, Hayne, & Scarf, 2014).

While children's self-control tends to improve with maturation, debates as to the origins of self-control exist. On one end of the spectrum is the expectation that self-control is purely socialized skill, learned from parents and teachers. On the other end of the spectrum is the expectation that self-control reflects the broader temperamental propensity of effortful control. Mischel (1974) first defined self-control as the ability to delay gratification. Mischel and colleagues (1976) conceptualized self-control as a learned, acquired skill that develops from exposure to high quality social interactions and that emerges across childhood and into adolescence (e.g., Gottfredson & Hirschi, 1990; Mischel & Mischel, 1976; Vazsonyi & Huang, 2010). High quality parental socialization promotes self-control by teaching children consequences to their actions (Scaramella & Leve, 2004). That is, high quality socialization involves repeated positive reinforcement, rewarding children for delaying a preferred choice to comply with a parental command or request (Gottfredson & Hirschi, 1990). For instance, when asking children to clean up toys, a task that is generally unpleasant for children, positive parents will use positive reinforcement, encouragement, and praise to keep children engaged in the task. In terms of self-control, children learn to anticipate the outcomes of parental requests and develop an array of cognitive and behavior strategies that facilitate completing a task that they may not wish to do (Maccoby & Martin, 1983).

In contrast to the development of self-control as a purely socialized skill, temperament theorists integrated components of self-control into a broader construct known as effortful control (Rothbart et al., 2003). From a temperament perspective, effortful control has biological and genetic origins and demonstrates modest stability beginning during early childhood (Kochanska & Knaack, 2003; Kochanska et al., 1997). Effortful control includes not only inhibiting a dominant response for a subdominant response, but also the ability to focus and shift attention (Spinrad et al., 2007). As compared to other dimensions of temperament, effortful control is more dependent on children's development of cognitive skill. Consequently, effortful control emerges later than other dimensions of temperament, like emotional reactivity, and the propensity towards control develops relatively independent of socialization (e.g., Kochanska, 1993; Rothbart, Ahadi, & Evans, 2000). Despite differences in expectations of the origins of self-control or effortful control, common to both theoretical perspectives is the focus on children's ability to voluntarily control a dominant behavioral response.

Given the conceptual similarity between self-control and effortful control, it is not surprising that both self-control and effortful control are measured similarly. Consistent with the idea of self-control as a learned characteristic, Mischel and colleagues (1974) developed the delay of gratification paradigm which measures children's ability to wait in the face of temptation. The paradigm begins with children selecting their favorite treat from a variety of different snacks. Children are presented with their desirable treat and a less desirable snack. Children are told that they can have the less desired treat now or they can wait until the experimenter comes back for the more desirable treat. Regardless of their choice, children must wait for their treat. Experimenters then record how long children are able to delay before eating the treat. This task involved children having to use cognitive control strategies to delay and resist eating the very tempting treat.

Kochanska and colleagues later developed a similar delay task to measure one component of temperamental effortful control (Kochanska, Coy, & Murray, 2001). The experimenter placed a M&M candy under a cup in front of the children. Children were told that when the experimenter rang the bell,

they could lift the cup and eat the M&M candy. Experimenters recorded children's delay behavior and how long children waited before eating the candy. Kochanska and colleagues (2001) argued that delay behavior is one component of effortful control because waiting for the tempting treat requires inhibitory control or children to suppress a dominant response and initiate a subdominant response. In an attempt to measure the cognitive and behavioral strategies children used to comply with a difficult request, Kochanska and colleagues (2000) also developed a gift delay task. With the gift delay task experimenters loosely tie a blindfold over children's eyes and instruct children not to peek while the experimenter wraps their present. Experimenters are instructed to talk about the present and very noisily wrap the gift; once wrapped, experimenters leave the room in "search" of their bow to finish the present instructing children not to peek or touch the present. Frequency and duration of children's peeking and compliance behaviors are recorded. The similarities across both approaches in how the construct of self-control or effortful control are measured is striking.

Although both self-control and effortful control tend to be measured using delay ability, critical distinctions between self-control and effortful control rests in the fundamental assumptions of the constructs. Theoretically, self-control emerges from socialization efforts, while effortful control primarily reflects individual differences in children's propensity towards control. These distinctions are not trivial but help to shape hypotheses regarding the process by which self-control, operationalized as delay ability, influences the impact of parenting on externalizing behavior. The process by which self-control influences externalizing behaviors will be evaluated from both a behavioral and temperamental perspective. Consistent with a behavioral approach, ability to delay immediate gratification is expected to mediate any association between positive parenting and externalizing behavior. Consistent with a temperamental perspective, children's ability to delay is expected to interact with parenting such that children with low ability to delay will benefit more from positive parenting, as indicated in a negative association between positive parenting and externalizing problems, than children with high ability to delay.

Disentangling low self-control from externalizing behavior problems during early childhood

Before discussing the process by which self-control influences externalizing behaviors, it is important to clarify the extent to which problem behavior represent a normative phase of early childhood. Toddlerhood is often characterized by bouts of unregulated anger, frequently disobeying rules and difficulty managing and controlling behavior (Campbell, 1990). The term “terrible twos” describes normative increases in toddler-aged children’s unregulated negative affect and frequent noncompliance (Shaw & Bell, 1993). Typically, rates of child non-compliance and disruptive behavior increase during early childhood, peaking around age 3, and then decline steadily into middle childhood (Gilliom & Shaw, 2004; Miner & Clarke-Stewart, 2008). Risk for maladaptation increases when children’s levels of problem behavior do not decrease as children leave the early childhood period (Campbell, 1990).

A lack of self-control may be one mechanism that increases children’s risk for developing externalizing behavior problems. For example, inadequate control skills are one criterion of the definition of childhood externalizing problems (e.g., Bridgett et al., 2015; Mischel et al., 1989; Olson et al., 2002; Olson, Sameroff, Kerr, Lopez, & Wellman, 2005; Rothbaum & Weisz, 1994; Woltering, Lishak, Hodgson, Granic, & Zelazo, 2016). Inadequate control skills also are identified in major behavior disorders, such as ADHD and oppositional defiant and/or conduct disorder (e.g., August, Realmuto, MacDonald, Nugent, & Crosby, 1996; Campbell et al., 2000; Martel & Nigg, 2006; Raaijmakers et al., 2008). Aggressive, noncompliant and impulsive children tend to show early deficits controlling their negative behavior during challenging situations and tend to be rated higher on externalizing scales such as the Child Behavioral Checklist (CBCL; Achenbach, 1991; Calkins & Fox, 2002).

The substantial overlap between self-control and externalizing problems may be due, in part, to the fact that both self-control and externalizing behaviors are developing at the same time. The rapid increase in autonomy seeking behaviors during the second and third year of life is difficult for most children, leading to increases in externalizing problems and problems with self-control (de Ridder et al.,

2012). Increases in self-control that begin to emerge during the second year of life are associated with corresponding decreases in externalizing problems (Shaw et al., 2003). In addition, changes in self-control and externalizing problems have been linked to the natural pruning of cognitive neural systems during early childhood (Gilliom & Shaw, 2004; Moffitt et al., 2011; Posner & Rothbart, 2000; Zelazo & Carlson, 2012). Pruning is the process of removing non-essential neurons to further improve cognitive capacities within specific brain regions (Berger, Kofman, Livneh, & Henik, 2007; Damon, Lerner, Kuhn, Siegler, & Eisenberg, 2012). That is, the emerging maturation of neural systems occurring from 3 to 5 years of age coincides with considerable improvements in self-control and reductions in externalizing problems.

Theoretically, self-control may be a requisite skill that facilitates children's ability to anticipate outcomes from non-compliance. Quite possibly, toddlers with low self-control may have more externalizing problems because they are less able to anticipate outcomes from non-compliance making it easier to misbehave (de Ridder et al., 2012). Consistent with this expectation, early deficits in self-control abilities at approximately 2 to 4 years of age have been found to predict concurrent and later externalizing problem behaviors (e.g., Gilliom & Shaw, 2004; Olson et al., 2005; Raaijmakers et al., 2008; Rubin, Burgess, Dwyer, & Hastings, 2003; Vazsonyi & Huang, 2010). Since early childhood is a period of rapid growth, socializing agents have a number of opportunities to influence children's positive development or to influence the development of problem behaviors (Lupien, McEwen, Gunnar, & Heim, 2009). For example, toddlers with low self-control may benefit more from positive parenting influences, such that the impact of parenting on children's externalizing problems may be more effective for children with low self-control. The goal of the current study was to evaluate the mechanisms by which self-control may influence children's level of externalizing problems during the toddler period.

Positive parenting during early childhood facilitates reductions in externalizing behaviors

Identifying mechanisms that may reduce externalizing behavior problems during the preschool years may prevent the development of later, more serious, externalizing problems or psychopathology. Notably, exposure to positive parent behaviors during early childhood is linked consistently to more positive social and behavioral adjustment (see Rothbaum & Weisz, 1994). Positive parenting is defined as the ability to appropriately respond to children's needs with warmth, positive reinforcement and affection (Eisenberg et al., 2005; Kochanska, 1997). During play situations, mothers who follow toddler's cues by letting children set the parameters of the play rather than setting rules to play are characterized as more positive, or child-centered. During distress situations, positive parenting occurs when mothers' quickly identify the source of their children's distress and respond in ways to help children recover from distress (e.g., comforting, redirecting attention away from the source, or explaining consequences to misbehavior). While positive parenting generally involves warmth, sensitivity, and support with clear and consistent limits (Kochanska, 1993), positive parenting has the added benefit of providing higher quality cognitive experiences (Barnett & Scaramella, 2013). Characteristically, positive parenting includes clear explanations, scaffolding expectations, and directions that preserve children's autonomy (e.g., choices). Such rich parent-child interactions also provide children with opportunities to make choices and to practice effective social and behavioral skills.

Positive parenting has been associated with fewer and less serious externalizing problems during early childhood (e.g., Barnett & Scaramella, 2013; Eisenberg et al., 2010; Kochanska & Kim, 2013; Miner & Clarke-Stewart, 2008; Spinrad et al., 2007). For example, Spinrad and colleagues (2007) found that more supportive parenting at 18 months old was associated with lower levels of externalizing problems a year later. Similarly, Eisenberg and colleagues (2010) reported that higher levels of observed parental warmth and sensitivity, measured when children were 18 months of age, predicted less aggression and fewer defiant behaviors at 30 months. More compliance and fewer externalizing problems at 40 months of age also have been associated with more responsive parenting when children were 30 to

33 months of age (Kochanska & Kim, 2013). Although positive parenting has been linked to lower levels of noncompliance and externalizing problems during the toddler period, few studies have considered why positive parenting is associated with fewer problem behaviors. Quite possibly, children's self-control is a mechanism by which positive parenting affects the emergence and maintenance of problem behaviors.

Positive parenting and externalizing problems: The role of children's self-control

Self-control may influence the association between positive parenting and externalizing problems in two different ways. Consistent with a mediational hypothesis, positive parenting was hypothesized to more effectively teach children self-control strategies, or strategies that are necessary to control externalizing behavioral tendencies. For instance, Gottfredson and Hirschi (1990)'s theory of low self-control proposes that self-control is most effectively acquired when parents both punish and correct non-compliance while respond positively to children's socially appropriate and desired behavior. That is, the goal of socialization is for children to behave in accordance with parents' wishes even in the absence of parents (e.g., Gottfredson & Hirshi, 1990). Conceptualizing delay of gratification as a skill acquired during early childhood, exposure to more positive parenting should be associated with decreases in externalizing behavior by way of child self-control. That is, any direct association between positive parenting and externalizing behavior should be explained by gains in self-control.

The current study considered the extent to which self-control mediates the direct association between positive parenting and externalizing problems. Consistent with empirical research linking more positive parenting with gains in self-control during early and middle childhood (e.g., Bridgett et al., 2009; Eisenberg et al., 2001; Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002; Kochanska et al., 2000; Lengua, Honorado, & Bush, 2007; Olson et al., 2002; Putnam, Spritz, & Stifter, 2002; Spinrad et al., 2007; Valiente et al., 2006), positive parenting was expected to correlated with concurrent levels of self-control at age 3. Since preschool-aged children with more sophisticated self-control abilities have been found to evidence fewer externalizing behavior problems both within time and over a one-year period (e.g., Moran,

Lengua, & Zalewski, 2013; Rubin et al., 2003; Spinrad et al., 2007), self-control was hypothesized to explain direct associations between positive parenting and externalizing behavior problems during early childhood.

Alternatively, conceptualizing self-control as a temperamental characteristic that is more resistant to environmental influences suggests that self-control may moderate the relationship between positive parenting and externalizing behavior during early and middle childhood (Karreman, Van Tuijl, Van Aken, & Dekovic, 2009; Kochanska & Kim, 2013; Reuben et al., 2015). Children with a propensity towards better self-control may be influenced less by parental behaviors that socialize self-control (Kochanska & Kim, 2013). Children with a propensity towards control may have an easier time regulating their behavior and anticipating outcomes from non-compliance. In contrast, children who lack the intrinsic skills needed to regulate behavior may be more reliant on parents to teach consequences to behavior. Positive parenting and children's ability to delay immediate gratification was expected to interact such that positive parenting at age 3 would predict fewer externalizing behavior problems both within and across time, particularly for children with poor ability to delay.

Goals of the current study

The current study considered two processes by which positive parenting and children's self-control may influence externalizing problems, both concurrently and across time, during the toddler years. Specifically, the following hypotheses were tested:

Hypothesis 1: Positive parenting measured when children are 3 years of age will be negatively correlated with levels of externalizing problem behaviors at age 3 and 4.

Hypothesis 2: Children's delay ability will mediate the direct association between positive parenting and externalizing problems, both concurrently and across time (*see Figure 1, paths b and c*). Specifically, the negative association between positive parenting and externalizing

behaviors will no longer be statistically significant once children's ability to delay gratification is considered.

Hypothesis 3: Children's delay of gratification ability will moderate the association between positive parenting and externalizing problems such that positive parenting will be associated with fewer externalizing behaviors, both concurrently and across time only among children who have poor ability to delay immediate gratification but not among children who are able to delay immediate gratification (see Figure 2).

Figure 1. *Direct and indirect effects of positive parenting behavior on externalizing behavior problems through self-control at age 3.*

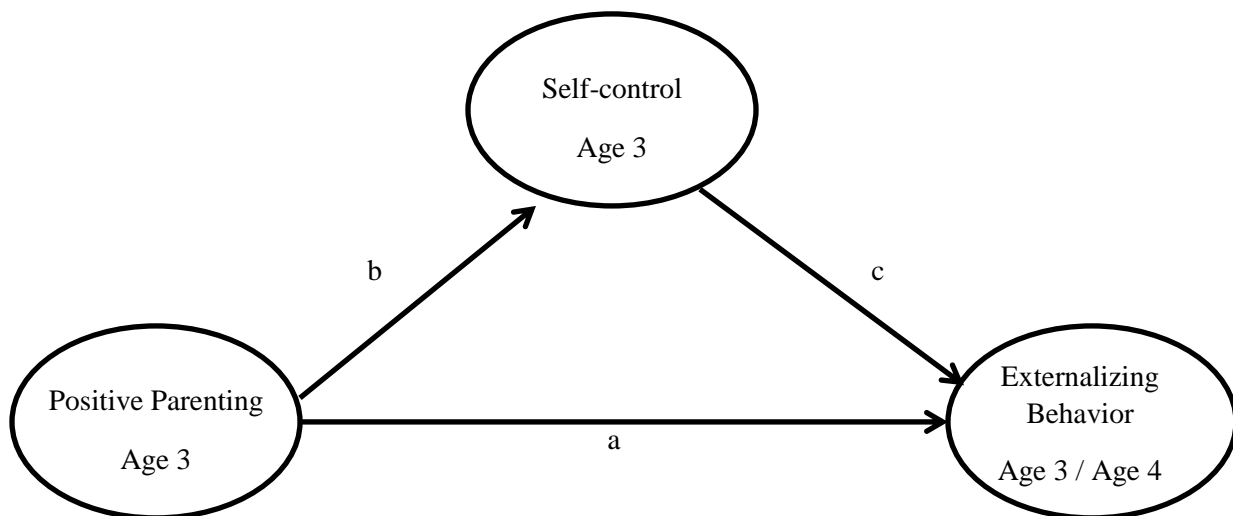
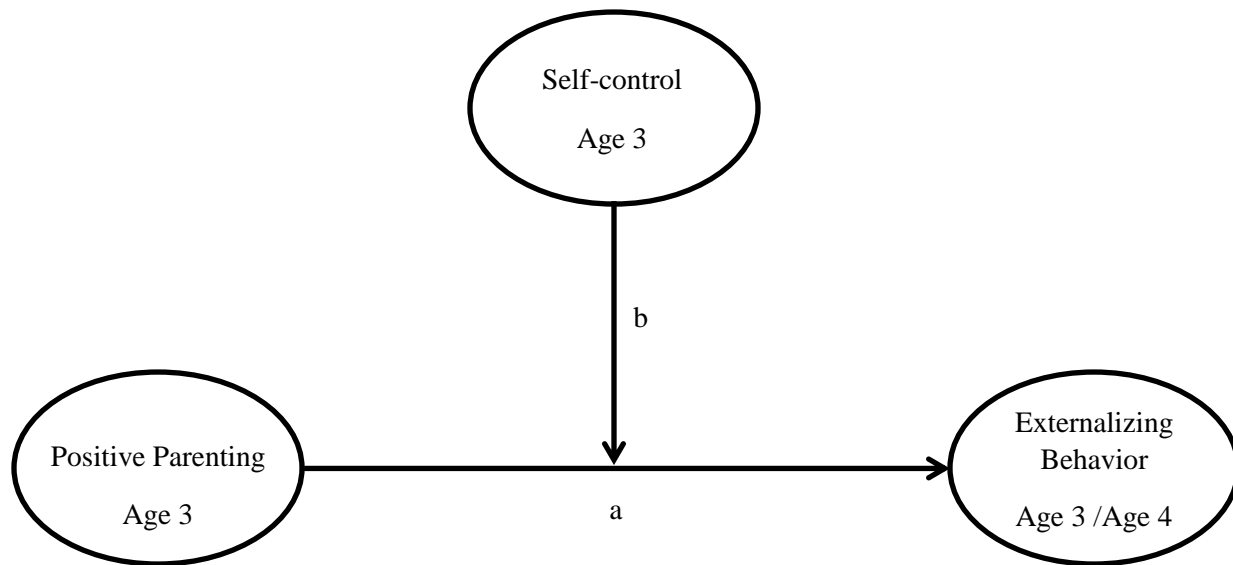


Figure 2. *Children's self-control moderates the concurrent and longitudinal associations between positive parenting and levels of externalizing behavior during the preschool period.*



Methods

Participants

Participants came from a longitudinal study of Head Start eligible families. Mothers with children eligible for Head Start were recruited from Head Start centers when their Head Start eligible children were 3 to 5 years-old. Families were eligible to participate if they also had a younger child who would turn 2-years of age during the study recruitment period. The younger child was the target child for the study. All families resided in the greater New Orleans area. Of the 306 families who were eligible, 168 families were recruited. One family was removed from the study because the younger sibling was severely developmentally disabled, leaving a total of 167 families.

Participation involved completing annual in-home assessments within 2 weeks of target children's second, third, and fourth birthdays. In-home assessments included completing a series of interactional tasks, questionnaires, and standardized assessments. All interactional tasks were videotaped and included a temperamental assessment of the target children, sibling interactional tasks, parenting interactional tasks, and play periods. The age 4 assessment also included reports from teachers if children were attending a daycare, preschool, or Head Start center. This study considers only observer ratings of mothers' parenting and children's delay ability collected at age 3, and mothers' and teachers' reports of target children's externalizing problems collected at age 3 and age 4.

At the age 3 assessment, participating mothers averaged 26 years old (mean = 26.08 years, $SD = 3.38$), and 64.7 percent earned a high school diploma. Of the target children, the sample included 86 girls (56.2%) and 67 boys (43.8%), and children averaged 35.55 months of age at the age 3 assessment ($SD = 3.63$). Families were African-American (89.4%), White (5.3%), and Middle Eastern American (1.3%). Families were predominately low income (mean income-to-needs ratio = .94, $SD = .63$), with an average per capita income of \$5,082.

The sample for the age 3 assessment included 96 percent of the participants from the age 2 assessment ($n = 153$). Missing data was deleted pairwise, thus resulting in a variable N . At age 3, one family had incomplete questionnaire data (but did have observational data), resulting in missing externalizing behavior scores ($n = 152$). At age 3, three different families had videotapes that were not codable either because of equipment problems, mothers' voices were not audible, or because mothers and children did not speak English during the interaction ($n = 150$). In addition, two different families had snack delay data ($n = 148$) that was not codable due to procedural errors. Four different families had pop up snake data ($n = 146$) that was not codable due to procedural errors. This resulted in a total of 148 and 146 families with complete observational data at age 3, respectively. The longitudinal analyses included both mother and teacher-reported externalizing problems. At age 4, the total number of families with complete data ranged from 132 (teacher report) to 148 (mother report). Children were missing teacher data for the following reasons: (a) the target children had not yet attended school at the age 4 assessment, (b) mothers refused the teacher report, (c) children were too old, or (d) the families did not participate at the age 4 assessment.

Procedure

The University of New Orleans Institutional Review Board approved all measures and procedures. Recruitment for the study took place at Head Start parent orientation meetings and when parents registered their children for Head Start. All interested mothers completed a brief recruitment screener in order to determine eligibility for the study. Project staff contacted mothers with eligible children. Mothers who agreed to participate had the study explained to them in greater detail by trained staff. Interviews were scheduled for interested mothers. All age 3 and 4 interviews took place in the families' homes. Interviews lasted approximately 2.5 hours and informed consent was reviewed prior to the start of each interview. Interviews consisted of three parts: a videotaped structured interview, a questionnaire completed by mothers, and a language assessment of the preschool-aged child. Mothers received \$100 for participating and children received a small toy worth about \$5.

The structured interview included multiple observational tasks, but only four tasks observed during the age 3 assessment were used in the current study. Two activities that involved mothers and the target children were used to measure positive parenting behaviors: a matching game and a puzzle completion task. In the matching game, mothers were first instructed how to play the game and then were given 3 minutes to teach the target children how to play the game. If dyads completed the activity before 3 minutes were up, mothers were told to play the game with their children. Interviewer returned after 3 minutes. In the puzzle completion task, target children were given a puzzle that was too difficult to complete alone. Mothers were instructed to let children complete as much of the puzzle on their own as possible, but to offer any assistance they felt was necessary. The task lasted 5 minutes.

The target children's delay of gratification was measured using two different waiting style tasks. Specifically, children completed a snack delay task and a "Surprise! It's a Pop-Up Snake" task. The snack delay task was derived from Mischel and colleagues (1974) delay of immediate gratification task. In the snack delay task, target children were offered two snacks and asked to pick one to share with their mothers and siblings. Once children chose their preferred snack, interviewers placed the snack (was this in the bag or on a plate) in front of children and told children not to eat the snack until the interviewer returned with their siblings. Children were left alone with mothers and the snack for 6 minutes. After 6 minutes, the interviewer returned with their siblings and mothers, children, and siblings ate the snack together. Children's ability to wait to eat the snack until the interviewer returned was used to measure delay of gratification.

Surprise! It's a Pop-up Snake is derived from the preschool version of the Laboratory Temperament Assessment Battery (Lab-TAB; Goldsmith, Reilly, Lemery, Longley, & Prescott) and includes multiple segments designed to measure children's temperamental exuberance. First, the interviewer approached children with a can of "jelly beans." The can of jelly beans is actually a play can that is filled with springs covered in fabric ("snakes"). Interviewers first pretended to struggle to open the can and then asked children to open the can. Children opened the can of pretend jelly beans and two

pretend snakes popped out of the can. The second half of the task was most relevant to the current study. Interviewers then asked children if they wanted to surprise their mothers with the snakes. Children were told to sit on the mat while the interviewer went and retrieved their mothers. Most importantly, children were told not to open the can until the interviewer returned with their mothers. Mothers were told what children were going to do and to act surprised when their children opened the can. Then, mothers entered the room and children surprised mothers by either opening the can or offering the can to their mothers to open. Children's ability to wait to open the can until the interviewer returned was used to measure delay of gratification.

After completing all of the interactional activities, interviewers helped mothers complete a series of questionnaires. In addition to providing family demographic characteristics and relevant to the current study, mothers completed questionnaires of children's externalizing behaviors when children were 3 and 4 years of age. At age 4, permission was obtained from mothers for children attending preschool or day care to contact children's lead teachers and teacher aides. Relevant to the current study, lead teachers and teachers' aides completed questionnaires about children's externalizing behaviors at school. If the lead teacher questionnaire was missing, the teacher aides' questionnaire were used ($n = 2$).

Later, trained undergraduate and graduate observational coders rated the observational assessments for parenting (i.e., matching and puzzle tasks) or delay ability (i.e., snack delay or Surprise! It's a Pop Up Snake). Regarding the positive parenting coding, each observational coder received a minimum of 20 hours of training and had to demonstrate excellent reliability on training interactions. The threshold for excellent reliability was an average intra-class correlation (*ICC*) greater than .80. Once reliability goals were met, coders began rating family interactions. A random selection of 25 percent of all interactions was double coded to ensure adequate inter-rater reliability. To monitor ongoing adherence to coding procedures, coders attended weekly reliability meetings, and disagreements in coding were resolved. If reliability dropped below .75 on any single code, additional training on that code occurred.

Procedures for coding the delay tasks were similar. A team of coders that did not include any of the parenting coders were trained to rate children's delay of gratification as observed during the snack delay task and the Surprise! It's a Pop-up Snake task. Coding involved recording the start time of the task and then recording the duration of time that passed for a specific behavior to occur. Inter-rater reliability was evaluated using ICC estimates. To monitor ongoing adherence to coding procedures, coders attended weekly reliability meetings, and disagreements in coding were resolved. While an ICC of .80 was established as the criterion for excellence, if ICC scores dropped below .75 on any single code, additional training on that code occurred.

Measures

Positive Parenting: Child age 3. Positive parenting was defined as parenting which involved supportiveness, positivity and clear guidance. Such parenting supports children's efforts while providing constructive direction. Positive parenting was measured using both the matching and puzzle tasks completed at age 3. Each task was rated by separately trained groups of coders. The rating scales were derived from the NICHD Study of Early Child Care and Youth Development (NICHD, 1999) coding system. Specifically, coders viewed the entire segment (either the matching or puzzle task) and then rated mothers' behavior on 7 different behavioral indices, 3 of which included sensitivity/responsiveness, positive regard, and cognitive stimulation. Behaviors were rated on a 7-point Likert-type scale ranging from 1 (*not at all characteristic*) to 7 (*very highly characteristic*).

Relevant to the current study were the 3 codes used to measure positive parenting. First, the sensitivity/supportive presence code measured mothers' behaviors that were child-centered rather than mother-centered. The code includes evidence of mothers' awareness of their children's needs, moods, interests, and capabilities as well as mothers' contingent responses to children's distress and non-distress. Second, the positive regard code measured mothers' expression of positive feelings toward their children, including affection, appreciation, care, praise, concern, or support. Finally, the stimulates cognitive

development code measured the degree to which mothers' fostered children's cognitive and language development by labeling, encouraging children to speak, offering explanations, asking children questions, and responding to children's vocalizations.

Mothers received a score on each code for both of the two interactional tasks. A positive parenting score was computed by averaging 6 ratings, three ratings measured mothers' positivity during the matching task and three codes measured mothers' positivity during the puzzle task. Inter-rater reliability for each code was very good, with intra-class correlation coefficients of .78/.87 for sensitivity/supportive presence, .89/.85 for positive regard, and .77/.80 for stimulation of cognitive development for the puzzle and matching tasks, respectively. In addition to intra-class correlation coefficients, Pearson correlation coefficients were computed to evaluate the extent to which codes were correlated across the two tasks. Results of the correlational analyses are described in Appendix A. Importantly, sensitivity, positive regard and stimulates cognitive development ratings from the matching and puzzle tasks were positively and statistically significantly correlated. One exception occurred; stimulates cognitive development rated during the puzzle task was unrelated to mothers' positive regard rated during the matching task.

Delay of gratification: Child age 3. Delay of gratification was defined as children's ability to wait for the desired activity, namely the snack (i.e., snack delay task) or mothers' to return (i.e., Surprise! It's a Pop-up Snake task). The snack delay score was based on the total number of seconds children waited before eating the snack. The total possible wait time for the snack delay task was 6 minutes, or 360 seconds. If children waited the entire length of the task without eating the snack, children received a score of 360. If children ate the snack before the interviewer returned, the total number of seconds from the time the interviewer left until the child placed the snack in his/her mouth was recorded. On average, children waited 308.49 seconds or 5.14 minutes ($SD = 115.24$). Interestingly, 81.8 percent of the participating children waited the entire time ($n = 121$) and only 18.2 percent of the children ate the snack

($n = 27$). Of the children who did not wait, the average wait time was 77.67 seconds ($SD = 86.04$) and wait times ranged from 0 to 340 seconds.

Scores for the Surprise! It's a Pop Snake task also reflected the total duration children waited. The task began the moment in which interviewers were no longer visible on the screen and ended when mothers entered the room or when children opened the can, whichever occurred first. On average children waited 11.92 seconds ($SD = 6.71$). Interestingly, 93.8 percent of the children delayed the entire time. These children waited an average of 11.96 seconds ($SD = 6.62$) and wait times ranged from 1 to 39 seconds. Only 6.2 percent of children opened the can and did not wait for their mothers. Of the children who did not wait, the average wait time was 9.33 seconds ($SD = 5.15$) and wait times ranged from 1 to 16 seconds.

Intra-class correlation coefficients were computed to measure inter-rater reliability for each task. Inter-rater reliability for snack delay scores and pop-up snake delay scores was excellent, with inter-class correlation coefficients of .89 and 1, respectively. To evaluate the construct validity of the delay scores, the two delay scores were correlated with a score derived from a separate clean up task. Specifically, the proportion of time in which children were off-task during a clean up activity was recorded. The clean up tasks involved mothers and occurred at the end of the age 3 and 4 assessments. During the clean up task, children were asked to stop playing with toys and to put the toys away. Children who waited longer for the snack also were less likely to be off task during the clean up task at age 3 ($r = -.33$, $p < .001$) and at age 4 ($r = -.28$, $p < .01$). In contrast, the pop-up snake scores were unrelated to the time children spent off task.

As compared to the snack delay scores, the pop-up snake scores demonstrated very little variability and efforts to validate the measure were largely unsuccessful. One challenge with the delay tasks was that the length of the wait time varied across the two tasks. The snack delay task had a standard duration where the Surprise! It's a Pop up Snake task did not. Moreover, the Surprise! It's a Pop up Snake

task also required children to inhibit excitement, but the snack delay task lacked any interesting distraction or anticipation. Not surprisingly, wait times for the two tasks were not statistically or significantly correlated ($r = .07$). Upon review of the means and standard deviations, the snack delay task demonstrated considerably more variability in the wait times and evidenced more construct validity. The pop-up snake scores were dropped from further analysis and only the snack delay scores were used in the analyses. Consequently, delay ability scores are reflected as the total amount of seconds children were able to delay eating the snack upon request.

Externalizing behaviors: Child age 3 and 4. Children's externalizing behaviors were defined as children's actions that were generally destructive and aggressive towards others (Campbell, 1990). Mothers completed questionnaires regarding children's externalizing behaviors at the age 3 and 4 assessments. In addition, for children who were attending preschool during the spring semester of their age 4 assessment, lead teachers and teachers' aides completed questionnaires about the target children's behaviors observed in the classroom. Both mothers and preschool teachers completed the Child Behavior Checklist for ages 18 months to 5 years old (Achenbach, 1991) when children were 4 years of age, but only mothers completed the questionnaire when children also were 3 years of age. Mothers and teachers rated the 26 externalizing behavior items regarding target children's behaviors during the past 2 months on a 3-point scale ranging from 0 (not at all true) to 2 (always or often true). Sample items included: "Is defiant" and "Destroys his/her own things".

Items were averaged separately for mothers' and teachers' reports. Mothers' reports of externalizing behaviors declined over time (age 3: mean = .67, $SD = .34$; age 4: mean = .60, $SD = .33$) and were generally much higher than teachers' reports when children were 4 years of age (mean = .28, $SD = .23$). Although mothers and teachers reported on the same behaviors, discrepancies in mothers' and teachers' reports could occur for two reasons. First, mothers' and teachers' did not complete the questionnaires at the same point in time. That is, all mothers completed questionnaires during the in-home assessments at age 3 and 4. In contrast, all teachers completed the questionnaires during the spring

semester closest to the target children's age 4 in-home assessment. In most instances teachers completed questionnaires after the in-home assessment, but in some instances the reports occurred before the in-home assessment. Second, mothers and teachers are reporting on behaviors that they witness and children may behave differently at home and at school.

Data Analytic Plan

Prior to hypothesis testing, all constructs were screened to ensure each construct met normality assumptions. Next, child sex was correlated with study constructs. Previous work using data from the current sample has demonstrated sex differences in the association between parenting and child externalizing problems at child age 2. Specifically, in previous analyses, less positive parenting was associated with higher externalizing behavior scores for girls only (Barnett & Scaramella 2013). Should child sex be statistically and significantly correlated with study constructs, then child sex will be statistically controlled in all analyses.

The final step was to test study hypotheses using multiple regression analyses. First, the mediational hypothesis was evaluated. Baron and Kenny (1986), suggest that four conditions must be met for mediation to be supported. The first three conditions can be tested with correlational analyses. First, the independent and dependent variables must be statistically and significantly correlated. Second, the independent variables and the mediator variables must be statistically and significantly correlated. Finally, the mediator and dependent variable must be significantly correlated. Correlations among the independent, mediator, and dependent variables will be computed and examined. Should the correlational analyses provide initial support the mediational hypothesis, then the final step in testing for mediation will be to compute a regression equation in which the mediator (i.e., delay score) is entered, followed by the entry of positive parenting behavior. Three regression equations were computed. The first considered the extent to which delay ability mediates the association between positive parenting and concurrent levels of externalizing behavior at age 3. The second two models statistically controlled for externalizing

behavior at age 3 and evaluated changes in the magnitude of the association between positive parenting and externalizing behavior at age 4 once delay ability was controlled. Mother and teacher-reported externalizing behavior at age 4 were evaluated separately.

Finally, the moderational hypothesis was tested using multiple regression procedures. Independent variables were grand mean centered by subtracting the mean from the respective scores to decrease the possibility of multi-collinearity among constructs. For instance, positive parenting was grand mean centered by subtracting the mean of positive parenting from the positive parenting score. This procedure was replicated for delay ability scores. An interaction term was computed by multiplying the centered parenting score with the centered delay ability score. Three equations were computed to evaluate the concurrent and longitudinal associations of positive parenting and delay ability on children's externalizing behavior. The first model considered positive parenting and delay ability for age 3 externalizing problems. The second two models controlled for age 3 levels of externalizing problems and considered the impact of positive parenting and delay ability on externalizing behaviors at age 4. Mother and teacher-reported externalizing behavior at age 4 were evaluated separately.

Since so few children actually ate the snack ($n = 27$), the regression equations were re-estimated using dichotomized delay ability comparison groups: did not wait (1 = eats the snack before 360 seconds) or waited (0 = does not eat the snack and delays the entire 360 seconds). The interaction term was computed by multiplying the centered positive parenting score with the dichotomous delay score. The three moderational models were re-computed using the dichotomous indicator of delay and the new interaction term.

Results

Descriptive Analyses

First, the range and skew for positive parenting, delay ability, and externalizing behaviors were consistent with normality assumptions. That is, none of the study constructs had skew values larger than

3.0. On average, mothers were observed to use low to moderate levels of positive parenting but there was some variability around the mean (see Table 1, $M = 3.17$, $SD = .78$). Although a large proportion of the children were able to delay, the delay ability scores among children who did not delay demonstrated considerable variability (see Table 1), ranging from 1 to 340 seconds. On average, mother-reported externalizing behaviors significantly declined across time ($t [144] = 3.09$, $p < .01$). In addition, all externalizing behavior scores were related (see Table 1), indicating stability across reporters and time. Interestingly, mothers reported statistically significantly higher levels of externalizing behavior than teachers reported at the same age (see Table 1; $t [134] = 10.45$, $p < .001$).

Next, child sex was correlated with all study constructs to justify inclusion of child sex as a study control (females = 0; males = 1). Only two statistically significant correlations with child sex emerged. First, child sex was correlated with delay ability scores such that girls waited longer for the snack than boys (see Table 1). In addition, child sex was statistically significantly correlated with mothers' reports of externalizing behavior at age 3, indicating that boys were rated higher on externalizing behaviors than girls. Since the pattern of associations varied for boys and girls regarding both the mediator and moderator (delay ability) and mother-reported externalizing problems, child sex was statistically controlled in all of the regression analyses.

Hypothesis 1: Positive parenting at 3 years of age will be positively correlated with levels of externalizing problem behaviors at age 3 and 4

Correlational analyses were computed to evaluate the extent to which positive parenting was related to both concurrent and future externalizing problems. Consistent with expectations, more positive parenting was statistically and significantly correlated with fewer externalizing behavior problems concurrently ($r = -.23$ $p < .01$; see Table 1) and with teachers' reports at age 4 ($r = -.19$, $p < .05$; see Table 1), but only at the trend level for mother-reported externalizing behavior at child age 4 ($r = -.16$ $p = .06$; see Table 1). The next step was to consider whether delay ability explained this statistical association.

Hypothesis 2: Delay ability will mediate the direct association between positive parenting and externalizing problems, both concurrently and over time.

Pearson correlations coefficients were computed to test conditions needed to support mediation as suggested by Baron and Kenny (1986). The first condition was met with hypothesis 1. That is, positive parenting (independent variable) was statistically and significantly correlated with externalizing behavior concurrently (at age 3) and longitudinally, although the magnitude was only at the trend level for mothers' reports at age 4. Contrary to expectations, the second condition was not met. The delay ability score, as measured with the total wait time observed during the snack delay task, was not statistically and significantly correlated with positive parenting (see Table 1). Consistent with expectations, the third condition was met. The delay ability score was only associated with the dependent variable, teacher-reported externalizing behavior at age 4 ($r = -.32, p < .001$). Since the conditions for mediation were not met, no additional analyses were computed. That is, no empirical evidence emerged indicating that delay ability mediates the direct link between positive parenting and children's externalizing behaviors.

Table 1. Means, standard deviations and bivariate correlations among the delay ability score, positive parenting and externalizing behavior at age 3 and 4.

<i>Measure</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>M</i>	<i>SD</i>
1. Child Sex	—					.43	.50
2. Positive Parenting: Age 3	-.16					3.18	.77
3. Delay Ability Score: Age 3	-.19*	.09				308.49	115.24
4. Mother-Reported Externalizing Behavior: Age 3	.19*	-.23**	-.10			.68	.34
5. Mother-Reported Externalizing Behavior: Age 4	.05	-.16	-.14	.53**		.60	.32
6. Teacher-Reported Externalizing Behavior: Age 4	.12	-.20*	-.32**	.23**	.21*	.28	.23

Note. N ranged from 132 to 153.

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

Hypothesis 3: The association between positive parenting and externalizing problems is moderated by children's delay ability

Multiple regression equations were computed to test whether delay ability moderated the association between positive parenting and externalizing behaviors. All equations statistically controlled for child sex in the first step of the equation. Positive parenting and delay ability were entered in the second step of the equation. In the third step, the interaction term was entered. Support for the hypothesis would emerge with a statistically significant beta coefficient for the interaction term and a statistically significant change in the amount of variance explained by the interaction term.

Considering age 3 externalizing behavior, the main effects of positive parenting and delay ability were considered first. Only the beta coefficient associated with the main effect of positive parenting was statistically significant ($\beta = -.21, p < .05$; see Table 2, panel A), suggesting that less positive parenting was related to higher levels of externalizing behaviors, regardless of children's delay ability. Contrary to expectations, the positive parenting x delay interaction term was not statistically significant for mother-reported externalizing behavior at age 3 (see Table 2, panel A).

Next, the model predicting mother-reported externalizing behavior at age 4 was estimated. After controlling for mother-reported externalizing at age 3 and child sex, positive parenting and delay ability were entered. Neither the positive parenting nor the delay ability beta coefficients were statistically significant nor did either explain statistically significant portions of variance associated with externalizing behaviors (see Table 2, panel A). Contrary to expectations, the positive parenting x delay interaction term was not statistically significant for mother-reported externalizing behavior at age 4 (see Table 2, panel A).

Finally, the model predicting teacher-reported externalizing behavior at age 4 was estimated. Again, after controlling for mothers' reported externalizing behavior at age 3 and child sex, the main effects of positive parenting and delay ability were estimated. Only the beta coefficient associated with the main effect of delay ability was statistically significant ($\beta = -.29, p < .01$; see Table 2, panel A).

Results indicated longer wait times (better delay ability) was associated with less externalizing behavior problems. Contrary to expectations, the positive parenting x delay interaction term was not statistically significant for teacher-reported externalizing behavior at age 4 (see Table 2, panel A).

Finally, all three of the models were re-estimated, this time recoding delay ability into two comparison groups: did not wait (1) or waited (0). Regarding mother-reported externalizing behavior at age 3 and 4, the results of the regression analyses using the dichotomized delay score were consistent with the models in which delay was a continuous indicator (see Table 2, panel B). That is, only positive parenting accounted for statistically significant portions of the variance associated with mother-reported externalizing behaviors at age 3.

Considering teacher-reported externalizing behaviors, after controlling for mother reports of child externalizing problems at age 3 and child sex and after considering the direct effects of positive parenting and children's delay group, the positive parenting x delay group interaction term was marginally statistically significant ($\beta = -.16, p = .08$; see Table 2, panel B). The overall model accounted for statistically significant portions of the variance associated with teacher-reported externalizing behavior ($R^2 = .17, F(5, 122) = 4.98, p < .001$). As suggested by Holmbeck (2002), the interaction term was decomposed and is depicted in Figure 3. Consistent with expectations, the association between positive parenting and teacher-reported externalizing behavior was statistically significant only for children who demonstrated an inability to delay gratification. That is, the parenting slope was statistically significant and negative for children who did not delay ($\beta = -.45, p < .05$), indicating that more positive parenting was related to fewer externalizing behavior problems for this group. The parenting slope was not statistically significant for children who were able to wait the entire time for the snack ($\beta = -.05, p = .62$). Thus, empirical evidence provided support consistent with the expectations that delay ability moderates the relationship between positive parenting and externalizing behaviors.

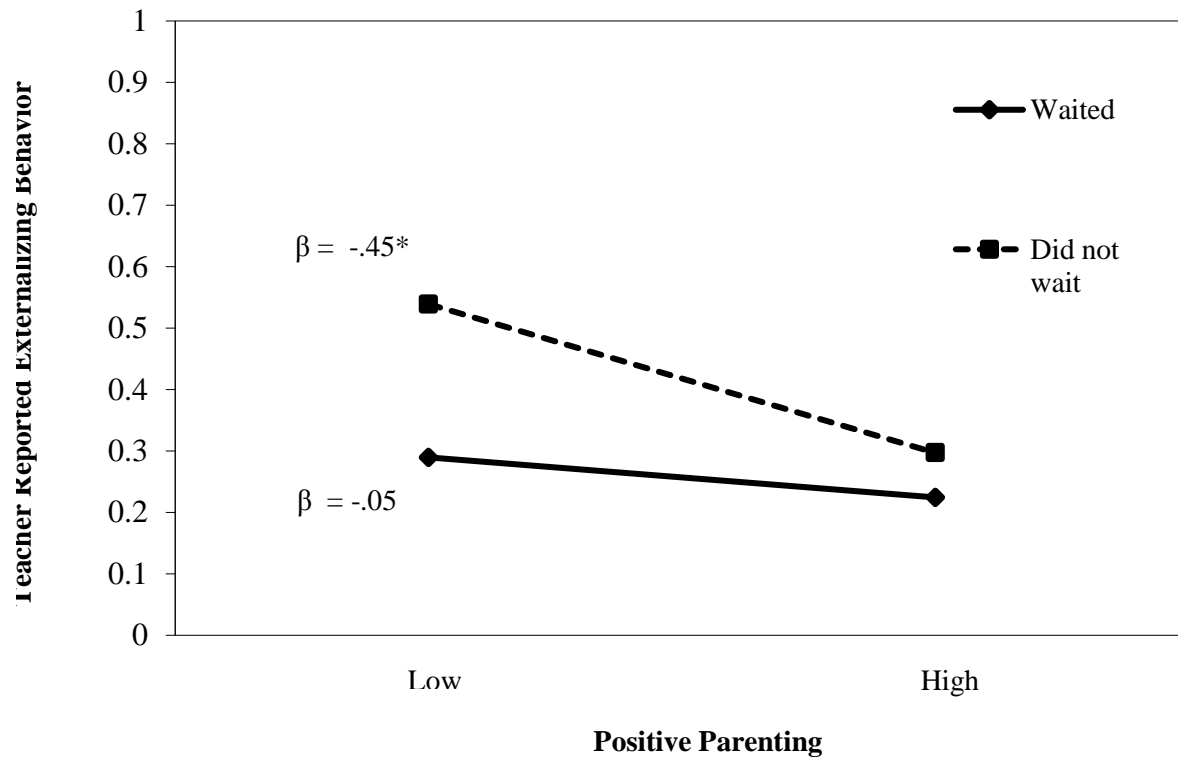
Table 2. *Results of the regression analyses estimating interactive effects of children's delay ability at age 3 and positive parenting at age 3 on externalizing behaviors at age 3 and 4.*

Predictor	Children's Externalizing Behavior					
	Mother Report: Age 3		Mother Report: Age 4		Teacher Report: Age 4	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
A						
Continuous delay ability						
Step 1	.04*		.28**		.06*	
Child Sex		.19*		-.06		.08
Mother-Reported Externalizing Behavior: Age 3		—		.54**		.22*
Step 2	.05*		.01		.10**	
Positive Parenting		-.21*		-.04		-.13
Delay Ability Score		-.05		-.10		-.29**
Step 3	.00		.00		.01	
Positive Parenting x Delay Ability		-.03		-.07		.10
Overall R^2	.08*		.30**		.17***	
B						
Dichotomous delay ability						
Step 1	.04*		.28**		.06*	
Child Sex		.19*		-.06		.08
Mother-Reported Externalizing Behavior: Age 3		—		.54**		.22*
Step 2	.05*		.02		.09**	
Positive Parenting		-.21*		-.04		-.14
Delay Ability		.08		.13		.27**
Step 3	.00		.00		.02	
Positive Parenting x Delay Ability		.02		.07		-.16 ⁺
Overall R^2	.09*		.30**		.17**	

Note. N ranged from 132 to 153.

⁺p < .10. * p < .05. ** p < .01.

Figure 3. Children's delay ability at age 3 moderates the effect of mothers' positive parenting at age 3 on children's externalizing behavior problems at age 4.



Note. * $p < .05$.

Discussion

Children's risk for behavior problems during middle childhood and adolescence significantly increases when children demonstrate persistently elevated levels of externalizing behaviors during the early childhood period (Campbell et al., 2000). Interestingly, positive parenting has been found to reduce children's risk for behavior problems (Bornstein, 2002). Theoretically, positive parenting teaches children consequences to their behavior and helps them learn the skills needed for compliance. One of the skills children acquire during early childhood is self-control, namely the ability to inhibit a dominant response for a subdominant response. Debates exist as to whether self-control is learned (i.e., behavioral approach) or whether self-control is a temperamental characteristic of individuals (i.e., effortful control). Importantly, both approaches operationalize self-control similarly making it possible to empirically pit each approach against each other. If self-control is an acquired skill, then self-control should explain any association between parenting and later problem behavior (i.e., mediational hypothesis). If self-control reflects individual differences in the propensity to inhibit behavior, then self-control may moderate any association between parenting and externalizing behavior. Specifically, children low on self-control (conceptualized as effortful control) may need positive parenting more; consequently, positive parenting may be associated with less problem behavior for children who are low in self-control.

Results of the current study provided no support for expectation that self-control mediated the link between parenting and externalizing problems and limited support that self-control moderated the association between parenting and externalizing problems. That is, only when self-control was dichotomized into waiting versus non-waiting groups did differences in the association between positive parenting and externalizing problems emerge. For children who did not wait the entire time before eating the snack, exposure to more positive parenting was associated with fewer problem behaviors, as rated by teachers, one year later. The following sections will first describe the findings as they relate to theoretical models of self-control, then the study limitations, strengths, and suggested future directions will be discussed.

Positive parenting and child externalizing problems: Clarifying the role of child self-control

Conceptualizing children's self-control as an acquired skill means that all children should benefit from positive parenting. That is, positive parenting should enhance children's understanding of consequences to their behavior and better assist children in inhibiting dominant responses. Empirical research supports this perspective, demonstrating that self-control mediates associations between parenting and externalizing behavior problems (Chang, Olson, Sameroff, & Sexton, 2011; Choe, Olson, & Sameroff, 2013; Eiden, Edwards, & Leonard, 2007; Eisenberg et al., 2001; Spinrad et al., 2007). In contrast, if self-control is conceptualized as an individual propensity, children should differentially benefit from parenting depending on their propensity towards self-control. Empirical research also supports the temperamental perspective, demonstrating that self-control moderates associations between parenting and externalizing behavior during early childhood (Karreman et al., 2009; Kochanska & Kim, 2013; Reuben et al., 2015). Results were somewhat more consistent with the individual propensity, or temperamental, approach towards self-control rather than the mediational approach. That is, some evidence emerged to suggest that delay ability may moderate the links between positive parenting and externalizing problems but only at the trend level.

The lack of strong empirical support for either the mediational or moderational model may be due, in part, to how self-control was measured. In the current study, self-control was based on one indicator of delay ability derived from only one delay task. Other studies measuring self-control typically include multiple delay tasks. For instance, Chang and colleagues (2011) measured children's delay ability using two different delay tasks. The amount of time children delayed, global ratings of children's ability to delay, and frequency counts of children's delay behavior were combined to create one delay ability construct. The construct was then summed into an effortful control index along with other observational measures of behavioral control and behavioral report components. When operationalized as effortful control, investigators augment delay tasks with mother self reports (e.g., Kochanska, et al., 1996). Increasing the number of tasks and increasing the level of challenge for the delay tasks may have resulted

in increased variability in children's ability to inhibit a dominant response, thereby improving the capacity to detect statistical associations consistent with expectations.

Second, the delay ability task may not have sufficiently challenged children, resulting in a less powerful test of delay ability. In addition, mothers were present during the task and the presence of mothers may have inhibited children's impulsivity. Children were told to wait for the task, but mothers were given no instructions on what to do during the task. Many mothers did not prohibit their children from eating the snack, but others did. Future work should either exclude mothers from the task or, if mothers are included, structure the task to capture mothers' socialization efforts. For instance, Kochanska and colleagues (2001) measured parents' socialization of inhibitory control behaviors and children's internalization of socialization efforts within a prohibition task. The mothers were specifically instructed to keep children away from toys that were easily accessible and very attractive to children. Thus, the task specifically elicits parenting behaviors related to teaching children self-control, a necessary skill for compliance. Although the current delay task may have captured some delay of gratification behavior and some efforts to socialize self-control, neither components were measured well. Using delay tasks that eliminate external control over children could be a more valid way to measure children's delay of gratification. Despite the fact that the current procedures used to measure self-control were not ideal, children who did not delay may represent children who have the most difficulty inhibiting a dominant response.

For children who ate the snack in their mothers' presence, exposure to more positive parenting was associated with less externalizing behavior in preschool only. That is, more positive parenting was associated with fewer externalizing problems at school for those children who did not wait for the snack. For children who were able to wait for the snack, positive parenting was unrelated to externalizing behavior at school. It is possible that children who waited the entire time also were better at controlling their behavior in a school context. Interestingly, no evidence of moderation using mothers' reports of children's externalizing problems at home emerged. In all likelihood all children demonstrate more

impulsive behavior at home than at school. Kochanska and colleagues (2001) suggest that toddlers most likely have acquired effective strategies to control misbehavior when they are able to delay upon request and act in accordance with parental standards in the absence of parents such as in the classroom. In fact, although there was no effect on mother-reported externalizing behaviors, children with characteristically low self-control did learn effective strategies from positive parenting to reduce misbehavior at school. Consequently, examining teachers' reports of behavior problems during early childhood may be a better test of how children learn to reduce externalizing behavioral tendencies through parenting efforts. In conclusion, exposure to positive parenting may be a crucial opportunity for children who lack intrinsic self-control skills to learn strategies that reduce misbehavior at school and other contexts outside of the home.

Limitations, strengths, and future directions

The study includes several limitations in addition to the problems of the self-control measure already noted. First, as compared to mothers' reports, considerably less data was available for teachers. Although most of these children who were missing data were not enrolled in school and teacher data was not possible, it did reduce the sample size for the longitudinal analyses and decreased the power. Second, the observed parenting construct had somewhat low variability. That is, the amount of positive parenting observed was rather low. The tasks used were designed to elicit more instruction rather than positivity. Increasing the variety of tasks used may have increased the level of positivity. Third, the sample is somewhat homogeneous. While previous research studying self-control often relies on more affluent samples, it is possible that the way in which self-control is socialized varies across socioeconomic groups. Fourth, repeatedly harsh parenting has been linked to more externalizing behaviors. Expanding measures of parenting and testing alternative models with different parenting behaviors may provide a more comprehensive assessment of how self-control influences the impact of parenting on externalizing behavior. Finally, the sample size was rather small and a larger sample may have strengthened the findings.

Despite these limitations, this study has a number of strengths. First, independent observers rated measures of parenting and children's delay ability. Thus, measures did not rely on mother's perceptual bias of parenting or children's control ability. The inclusion of observational ratings also limited the influence of shared method variance on findings. Also, non-maternal reports of children's problem behaviors by children's teachers limited shared method variance and extended examination of behavior problems in different settings. Second, child sex was statistically controlled in all of the models. Child sex was correlated with delay ability and externalizing behavior at age 3, demonstrating girls waited longer for the snack and were rated lower on externalizing behaviors than boys. Third, this study is one of the first to consider the role of self-control using a sample of predominately ethnic minority families who were socioeconomically disadvantaged. Most research considering self-control relies on White, middle and upper-class families (e.g., Chang et al., 2011, Reuben et al., 2015, Spinrad et al., 2007). These results may indicate that self-control functions differently across varied economic and ethnic groups.

Taken together, the results of this study were most consistent with a temperamental approach of effortful control. Future research may want to consider both the behavioral and attentional components of self-control (i.e., effortful control). Using multiple control indicators should more fully capture mechanisms associated with effortful control.

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Appendix A

Table 1

Pearson Correlations Among Positive Parenting Behaviors with Means and Standard Deviations

	1	2	3	4	5	M	SD
Matching Task							
1. Sensitivity						3.34	1.10
2. Positive Regard	.47**					2.33	1.25
3. Stimulates Cognitive	.43**	.23**				2.81	.89
Puzzle Task							
4. Sensitivity	.36**	.18*	.32**			4.06	1.19
5. Positive Regard	.27**	.28**	.25**	.53**		3.04	1.45
6. Stimulates Cognitive	.19*	.02	.33**	.55**	.32**	3.47	1.16

Note. N = 150.

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

Vita

The author was born in Auburn, Alabama. She obtained her Bachelor's degree in psychology from Tulane University in 2011. She joined the University of New Orleans psychology graduate program to pursue a PhD in applied developmental psychology, and became a member of Professor Laura Scaramella's research group in 2014. Her research interests focus on how parenting and environmental contexts influence children's social-emotional development.