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Low-income minority fathers' control strategies and children's regulatory skills

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Abstract

The current study explored the bidirectional association of children's individual characteristics, fathers' control strategies at 24-months and children's regulatory skills at pre-kindergarten (pre-K). Using a sample of low-income minority families with 2-year-olds from the Early Head Start Evaluation Research Program (n = 71) we assessed the association between child gender and vocabulary skills, fathers' control strategies at 24-months (e.g., regulatory behavior and regulatory language), and children's sustained attention and emotion regulation at pre-kindergarten. There were three main findings. First, fathers' overwhelmingly use commands (e.g., do that) to promote compliance in their 24-month old children. Second, children's vocabulary skills predict fathers' regulatory behaviors during a father-child interaction, whereas children's gender predicts fathers' regulatory language during an interaction. Third, controlling for maternal supportiveness, fathers' regulatory behaviors at 24-months predict children's sustained attention at pre-kindergarten whereas fathers' regulatory language at 24-months predicts children's emotion regulation at pre-kindergarten. Our findings highlight the importance of examining paternal contributions to children's regulatory skills.

Keywords

fathers; parental control; self-regulation

Research over the last decade has consistently shown that fathers' contributions to child development are unique and independent from mothers' (Lamb & Lewis, 2010; Martin, Ryan, & Brooks-Gunn, 2010; Tamis-LeMonda, Shannon, Cabrera & Lamb, 2004). In particular, the quality of father-child interactions has been linked to children's cognitive and social skills across developmental periods (Kochanska, Askan, Prisco, & Adams, 2008; Tamis-LeMonda et al., 2004). A domain of child development that has received less attention in fatherhood research is children's self-regulation. This is an important area of research because children's regulatory skills during the early years are critical for school readiness and later school achievement (Blair & Diamond, 2008). Although children follow a clear pattern in their development of regulatory skills, individual differences appear from

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an early age (Calkins & Howse, 2004). Much literature has suggested that children's regulatory skills may be influenced by the strategies their parents, mostly mothers, use to promote compliance with their children (i.e. control strategies; Bindman, Hindman, Bowles, & Morrison, 2013; Kochanska & Askan, 1995; Sethi, Mischel, Aber, Shoda, & Rodriguez, 2000).

Although limited in scope, research has also shown that children's regulatory behaviors are influenced by the quality of father-child interactions (Kochanska, Aksan, Prisco, & Adams, 2008; Owen et al., 2013; Peterson & Flanders, 2005; Vogel et al., 2006). A study of European American middle-class 2-year-olds and their mothers and fathers found that highly cooperative father-child interactions directly predicted children's effortful control at 52-months; this was not the case or mothers (Kochanska et al., 2013). Similarly, Flanders and colleagues (2010) found that in a sample of middle-class fathers and their 3-year-olds, when fathers were dominant during rough-and-tumble play interactions, children were rated higher on an emotion regulation checklist 5 years later than when fathers were low-dominant in play. We know of no study that has examined these associations among low-income fathers. Low-income families, in general, are at risk for low-quality parenting due to economic hardship and thus it is plausible that parents' regulatory behaviors might be different from those of middle class families. However, there is also tremendous variability among low-income fathers, with many engaging with children in high quality interactions (Cabrera et al., 2007). Thus we cannot be certain of the direction of the hypothesis. We add to this small body of research by examining whether low-income minority fathers' control strategies during structured interactions with their toddlers promote their children's regulatory skills. We focus on toddlerhood because it is a critical developmental period for children's regulatory and attentional control systems (Blair, 2006; Diamond, Barnett, Thomas, & Munro, 2007). We also examine whether children themselves influence fathers' control strategies. In particular we focus on child gender and vocabulary skills because these have been identified as individual characteristics of children that influence parenting (Stansbury & Zimmerman, 1999; Tamis-LeMonda, Briggs, McClowry, & Snow, 2009). We use a sample of low-income minority children and their fathers enrolled in the Early Head Start Research and Evaluation Project (EHSREP) to ask the following research questions: (1) What types of control strategies do low-income minority fathers use during interactions with their toddlers? (2) Are fathers' control strategies associated with children's regulatory behaviors at pre-kindergarten? And, (3) are toddler's vocabulary skills and gender associated with fathers' use of control strategies?

Theoretical framework

We draw from a bioecological model of human development which posits that children's proximal influences in the home environment such as direct interactions that children have with their parents and other caregivers influence children's development (Bronfenbrenner & Morris, 2006). Parents use a variety of control strategies, such as prohibitions (e.g. don't do that), commands (e.g., go there), modeling (i.e. demonstrate how to do something), and physical control (i.e. physically guide them through a situation) to help children comply with parental demands (Livas-Dlott et al., 2010). Over time, through the use of such control strategies, children learn to control their emotions, pay attention, and stay focused on tasks

and thus move from externally regulated behavior to internally regulated behavior (Kopp, 1982).

Within a bioecological framework, children contribute to their own development by eliciting different behaviors or responses from their parents (Bronfenbrenner & Morris, 2006). A growing body of research suggests that children's gender might be particularly influential in eliciting certain control strategies from their caregivers (Stansbury & Zimmerman, 1999). A study of Israeli fathers and their two-year-olds found that fathers exhibited more warm control strategies with their daughters than their sons (Feldman & Klein, 2003), suggesting boys may elicit different control strategies from their fathers than girls. Children's language skills have also been linked to differential parenting (Tamis-LeMonda, Briggs, McClowry, & Snow, 2009). For example, a study of mothers and their preschool aged children found that children with lower verbal comprehension had mothers who used more unexplained compliance demands with their toddlers (Stansbury & Zimmerman, 1999). Additional findings suggest that children's early language skills are linked with their regulatory skill development (Vallotton & Ayoub, 2011).

Regulatory skills of low-income toddlers

The development of self-regulation, the ability to regulate our own arousal, emotion, and behavior is one of the major achievements of early childhood (Shonkoff & Phillips, 2000). It is during this period that children transition from being primarily regulated by external sources (e.g. parents) to increasingly being able to self-regulate their emotions, behaviors, and cognition (Calkins & Fox, 2002). Self-regulation enables children to voluntarily control their attention and emotional arousal to meet a desire goal (Blair, 2010; Blair & Ursache, 2011). Although there is much inconsistency in the field regarding the conceptualization and measurement of self-regulation, there is agreement that it is composed of interrelated top-down processes referred to as executive functioning (i.e., working memory, inhibitory control, and cognitive flexibility) and bottom-up components (i.e., automatic, less effortful processes associated with stress physiology and emotional arousal (Blair & Ursache, 2011).

As a broad construct, self-regulation underlies many of the social and cognitive processes associated with positive school adjustment and academic achievement (Blair, 2002; Hughes & Ensor, 2007). Studies have shown that differences in self-regulatory skills, broadly speaking, may account for a substantial portion of the income-achievement gap (Blair & Diamond, 2008; Howse et al., 2003). Mounting evidence shows that children from low SES families are at risk for low self-regulatory skills (Blair et al., 2011; Gershoff, 2003; Evans & English, 2002). Although studies have established a correlational link between SES and children's regulatory behaviors, there is less information on the sources of variability among low-income children's regulatory behaviors (Blair & Diamond, 2008, Evans & Rosenbaum, 2008). Understanding variability in this group is important because children's regulatory skills may promote resilience among children growing up in low SES environments and may even protect them from the harmful effects of poverty on cognitive capacities (Buckner, Mezzacappa & Beardslee, 2003; Evans, 2013; Li-Grining, 2007).

Fathers' control strategies: Links to regulatory skills

Parents use a variety of control strategies in efforts to promote compliance among their children and these strategies have been linked with children's later regulatory skills (Feldman & Klein, 2003). The literature on parental control, primarily conducted with mothers, suggests that some control strategies (e.g. limit setting) are associated with positive children's outcomes whereas other control strategies (e.g. coerciveness or power assertion) are negatively associated with children's outcomes (Karreman, van Tuijl, van Aken, & Dekovic, 2006). Moreover, the literature has identified various forms of regulatory language (e.g. commands) and regulatory behaviors (e.g. modeling) that parents use with their children to teach children to regulate themselves (Kochanska & Askan, 2006; Kopp, 1982).

Research on how fathers promote their children's regulatory skills is limited. Most studies have not specifically examined the types of strategies that fathers use to help their toddlers regulate their emotions or pay attention. Instead, studies have looked at broad or global measures of father involvement such as residential status or intrusiveness and have reported associations with higher levels of self-regulation or socioemotional development (i.e. Stevenson & Crnic, 2013; Vogel et al., 2006). In a study of father-child interactions in an ethnic minority sample, researchers measured father-child interaction quality with a 5-point global rating scale and found that sensitive and stimulating fathering was a unique contributor to children's emerging response inhibition skills (Owens et al., 2013). Similarly, a study of middle class two-parent families found that positive and cooperative father-child play interactions were linked to children's effortful control at 52-months (Kochanska, Aksan, Prisco & Adams, 2008). Others have examined how fathers help children regulate their impulses in the context of play, specifically rough-and-tumble play (RTP), which is characterized by aggressive behaviors that are also playful like wrestling, jumping, tumbling (Paquette, 2004; Peterson & Flanders, 2005; Flanders, Leo, Paquette, Pihl, & Seguin, 2009). These studies have found that during play fathers are able to help children regulate their impulses, and create boundaries.

We add to this growing literature by examining the specific strategies fathers use to help toddlers comply with requests during everyday interactions. We expect that father who use more control strategies will have children with higher emotion regulation and sustained attention skills.

Fathers' use of control strategies: Variation by children's characteristics

Research has shown that girls demonstrate higher levels of self-regulation than boys as early as the first year of life and throughout toddlerhood (Raikes, Robinson, Bradley, Raikes, & Ayoub, 2007; Weinberg, Tronick, Cohn & Olson, 1999). While it is difficult to determine direction of causality, studies have also shown that parents differentially socialize their boys and girls. For example, on average, fathers exhibit more control with their daughters than with their sons (Chen, Liu, & Li, 2000; Feldman & Klein, 2003). Based on these findings, we examine whether child gender is associated with fathers' control strategies. We expect that fathers will use more control strategies with their daughters than with their sons.

Children's language skills have also been linked to parenting behaviors. Children who are able to understand and produce more language to understand what is required of them and to express their feelings may be more likely to elicit verbal control strategies from their parents than children who are not as skillful (Vallotton & Ayoub, 2011). We therefore expect that children with more limited vocabulary skills will have fathers who employ more control strategies.

Current study

The current study seeks to extend the limited literature on how fathers contribute to their children's regulatory skills by examining the associations among children's individual characteristics (i.e. gender, vocabulary skills), fathers' control strategies with their 24-month old children, and children's self-regulatory skills at pre-kindergarten. In particular, we focus on children's emotion regulation and sustained attention skills because they are most predictive of children's later academic achievement (Blair & Diamond, 2008; Duncan et al., 2007). Based on the bioecological framework that children develop through direct interactions with their parents, we hypothesize that fathers' control strategies will be associated with children's regulatory skills. We also hypothesize fathers will use more control strategies with their daughters than their sons and with children with less advanced vocabulary skills than children with more advanced vocabulary skills.

Method

Data source

This study utilized data from the Father Involvement with Toddlers Substudy (FITS) of the Early Head Start Research and Evaluation Project (EHSREP), a randomized and controlled evaluation of the Early Head Start (EHS) program in the United States (U.S.; Love et al., 2005). EHS is a federal program that provides services for low-income (i.e. at or below the federal poverty level) families with infants and toddlers (Administration for Children and Families, 2002). Families participating in EHSREP were recruited from seventeen EHS sites participating in the evaluation. Fathers participating in FITS were recruited from twelve of the seventeen EHSREP sites participating in the sub study (see Boller et al., 2006 for additional information on FITS recruitment and study characteristics). On average, fathers participating in FITS were more likely to be employed and have higher levels of education than fathers who did not participate in FITS (see Cabrera et al., 2004; Tamis-LeMonda et al., 2004 for more detailed analysis of selection bias). Because we were interested in understanding how fathers encourage compliance from their toddlers, we selected a random subsample of children enrolled in EHSREP who had a resident father, demographic and father-child interaction data from the 24-month wave, and emotion regulation and sustained attention assessment data at pre-kindergarten. Our sample was drawn from sites serving mostly Latino and African American families. Participants in the final analytic sample (n=71) represent two-parent low-income minority families where fathers (i.e. biological) or father figures (i.e. non-biological) resided with their children from child's birth to pre-kindergarten (Boller et al., 2006).

Participants

Participants were 71 resident fathers or father figures, biological mothers, and their toddlers. The sample comprised of *n*=35 African American and *n*=36 Latino fathers. Nearly 82% of families (*n*=58) identified English as the primary home language and 18.3% (*n*=13) identified Spanish as the primary home language. Mothers and fathers ranged in years of education from 6 to 17 years (*M*=11.88, *SD*=1.82) and from 4 to 20 years (*M*=12.10, *SD*=2.41), respectively. Approximately half of the children (56.3%) were female and ranged in age from 23 to 35 months (*M*=27.88, *SD*=2.83). There were no differences in all study measures between families with fathers (*n*=54) or families with father figures (*n*=17). Means and standard deviations for all demographic variables are presented in Table 1.

Procedure

Data collection for the EHSREP included child assessments, mother interviews and home visits during which videotaped observations of mother-child interactions were obtained. For families participating in FITS, father interviews and videotaped observations of father-child interactions were also obtained. All components of FITS, and EHSREP more broadly, were completed in the family's primary language. Data collection waves occurred when the child was 14 months old, 24 months old, 36 months old, at pre-kindergarten (i.e. the spring prior to kindergarten entry), and in the spring of the child's sixth year of formal schooling (i.e. 5th grade for most children). This study utilizes demographic data from the 24-month mother and father interviews, publicly available global ratings of maternal and paternal supportiveness from the 24-month mother-child and father-child interactions (e.g., Administration for Children and Families, 2002), our own coding of fathers' control strategies from the 24 month father-child interactions, maternal report of child vocabulary skills at 24 months, and the children's pre-kindergarten assessments. The father-child interactions included ten minutes of semi-structured play and shared book reading. Fathers were given three bags, the first containing a book entitled, “The Very Busy Spider” by Eric Carle and the second two containing toys. The contents of all three bags were designed to be age appropriate and stimulate talk and play between parent and child. Data collectors instructed fathers to sit with their child on a mat, to ignore the camera, and act as they naturally would while interacting with their children. They were directed to share the contents of the three bags with their child for ten minutes; to start with bag #1, move on to bag #2, and finish with bag #3. Fathers were allowed to divide up the 10-minutes as they liked. These videotapes were subsequently transcribed at the utterance unit level using the standardized format of the Codes for the Analysis of Human Language (CHILDES; MacWhinney, 2000). The native language of the transcriber matched the primary language used by fathers throughout the interaction. After transcription, a second individual verified each transcript for accuracy and ran the transcript through an automatic “check” in the CHAT program. Next, two individuals separately coded the transcripts for fathers' control strategies (as described in detail below) and automatic analyses tabulated counts of each type of strategy evidenced in the transcripts. In the spring prior to kindergarten entry (*M*=60.15, *SD*=2.51), trained EHSREP data collectors assessed the child for sustained attention and emotion regulation skills.

Measures

Fathers' control strategies—A coding scheme was adapted from the work of Livas-Dlott and colleagues (2010) to assess observationally the various control strategies employed by fathers while interacting with their children. We coded for twelve types of control strategies: 1. negotiation or compromise (e.g., letting the child do something with conditions), 2. modeling (e.g., father demonstrates how to hold the book), 3. physical support (e.g., father holds child's hand and together they cut the toy pizza), 4. permitting misbehavior (e.g., father doesn't follow through after a command has been given), 5. physical discipline (e.g., father enforces a command with physical action), 6. praise compliance (e.g., father bestows positive feedback on child for their compliance), 7. shame/guilt (e.g., father verbally demeans or puts down a child to curb particular behavior), 8. threat/consequence (e.g., reference to an authority or a negative consequence), 9. commands (e.g., spoken directive), 10. indirect command (e.g., spoken directive without infinitive), 11. prohibitions (e.g., forbidding child), and 12. indirect prohibitions (e.g., forbidding without infinitive). Inter-coder reliabilities were established following standard methods. The kappa coefficient was .89. We next computed a ratio that divided the sum of each type of control strategy by the total number of control strategies employed by each father.

Children's Pre-K regulatory skills: emotion regulation and sustained attention —Children completed a series of protocol-defined tasks using the Leiter International Performance Scale, Revised (Leiter-R; Roid & Miller, 1997). The Leiter-R was developed to assess cross-cultural intellectual function in children with limited verbal abilities and includes two subtests that tap on to important aspects of children's self-regulation, control of attention and emotion regulation. The former was assessed using a sustained attention task, in which children were asked to find and cross out pictures with a determined target. Higher sustained attention scores indicated greater numbers of correct answers with fewer errors and reflect focused attention and greater vigilance. The latter (emotion regulation) was assessed by trained EHSREP. At the end of the child assessment, the EHSREP assessors rated children's energy and feelings, mood and regulation, and sensory reactivity. Individual items were rated on a 4-point scale reflecting how often the child exhibited the relevant behavior. These subscales were combined and scaled to form a measure of emotion regulation. Higher emotion regulation scores indicated greater levels of energy, lack of anxiety, positive emotion, appropriate self-regulation and indistractability.

Children's vocabulary skills—Children's vocabulary skills were assessed at the 24-month data collection wave using the productive vocabulary component of the MacArthur Communicative Development Inventory (CDI; Fenson et al., 1994; Fenson, Pethick, Renda, Cox, Dale & Reznick, 2000). Mothers were provided with a list of 100 vocabulary words and reported the words that they had heard their child say aloud. A sum score of words was then created to represent the total number of words out of 100 in the child's productive vocabulary.

Maternal and paternal supportiveness—Trained teams of EHSREP researchers coded the semi-structured mother-child and father-child reading and play interactions for sensitivity (i.e. responsiveness to the and adjustment to the child's cues), cognitive

stimulation (i.e. scaffolding of child's activities and contingent verbal responding to child's engagement attempts), and positive regard (i.e. verbal and physical warmth toward child) on a 7-point scale (1=*low incidence of behavior*, 7=*high incidence of behavior*). All coders were trained to an 85% agreement criterion level (i.e. within 1-point on the scale). This level of reliability was maintained for at least 15% of the videotaped observations (Brady-Smith, O'Brian, Berlin, & Ware, 1999; Love et al., 2005). A composite score of maternal supportiveness and paternal supportiveness was created that averaged the sensitivity, cognitive stimulation, and positive regard scores.

Demographic variables—Demographic variables included father's biological relationship to the focal child, child's age at the time of the father-child interaction, mothers' and fathers' average years of schooling, child's gender, and the primary home language of the child.

Results

Analytic plan

All variables had no missing data and were normally distributed. To address our research questions, we first conducted descriptive analyses of the control strategies that fathers used with their 24-month old children. Next, we conducted an exploratory factor analysis to explore the underlying factor structure of the various control strategies. We then examined bivariate correlations to determine associations between our variables of interest (i.e. demographic variables, children's individual characteristics, maternal and paternal supportiveness, compliance factors, children's emotion regulation, and children's sustained attention). Next, we conducted two sets of multiple regression analyses, to determine: (1) how fathers' types of control strategies (i.e., regulatory language and regulatory behaviors) predicted children's sustained attention and emotion regulation, controlling for maternal supportiveness; and (2) how children's individual characteristics (i.e. gender, vocabulary skills) predict fathers' type of control strategies, controlling for child age.

Fathers' control strategies

Our first research question sought to describe the control strategies that fathers used with their 24-month old children. Approximately, 30% of fathers' utterances were classified as verbal compliance strategies. Overwhelmingly, commands accounted for the majority of fathers' control strategies. Direct commands were the most common strategy and accounted for nearly 60% of all control strategies (M=45.07, SD=25.67) while indirect commands accounted for nearly 22% of control strategies (M=16.24, SD=10.79). Next, fathers' prohibitions accounted for just over 6% of control strategies (M=4.94, SD=5.35), fathers' modeling accounted for nearly 4% of control strategies (M=2.49, SD=2.19), fathers' physical support accounted for nearly 3% of control strategies (M=2.01, SD=2.72), and fathers' physical discipline accounted for nearly 2% of control strategies (M=1.37, SD=2.13). The remaining strategies that we coded for (i.e. permitting misbehavior, shame/guilt, threat/consequence and negotiation/compromise) were observed in less than 50% of the father-child interactions. As a result, we did not include these strategies in further analyses.

Factor analysis

We next conducted an exploratory factor analysis using principal axis factoring and varimax rotation to explore the dimensionality of the various types of control strategies. The goal of the analysis was to identify a small number of underlying latent factors representing associations among the control strategies. The overall Kaiser-Meyer-Olkin measure of sampling adequacy was .62 indicating that the factor analysis was appropriate for our data. Examination of the scree plot and eigenvalues greater than one suggested that two factors should be retained. These two factors accounted for approximately 37% and 19% of the variance respectively. To aid in the interpretation of the factor solution, we examined which strategies had high loadings (greater than .4) on each factor (see Table 2 for loadings of all strategies on each of the two factors). Factor 1 had high loadings for physical discipline, physical support, and modeling and factor 2 had high loadings for direct commands, indirect commands, and prohibitions. We labeled these factors as fathers' regulatory behavior (factor 1) and fathers' regulatory language (factor 2).

Bivariate correlations

Bivariate correlations among study variables are presented in Table 3. Bivariate correlations showed that children's vocabulary skills were negatively associated with fathers' regulatory behaviors (r=-.30, p=.021) and children's gender (female=1) was negatively associated with fathers' regulatory language (r=-.29, p=.004). Fathers' regulatory language was positively associated with children's emotion regulation (r=.36, p=.003) and fathers' regulatory behavior was associated with children's sustained attention (r=.36, p=.003). Control variables (child is African American, home language is English, paternal supportiveness, paternal education, maternal education, and father is biological father) were not significantly associated with fathers' regulatory language, regulatory behavior, children's emotion regulation, or sustained attention and thus were not included in the multiple regression analyses. Maternal supportiveness was significantly, negatively correlated with children's age whereas paternal supportiveness was positively associated with children's age. Maternal education was positively correlated with English home language and paternal education. As a result, we used maternal supportiveness and children's age as control variables in subsequent analyses.

Multiple regression analysis predicting children's regulatory skills

To address our main research question, we conducted two step-wise multiple regression analyses to determine if fathers' behavioral and regulatory language predicted first, children's emotion regulation and second, children's sustained attention after controlling for maternal supportiveness, children's gender, age, and vocabulary skills. The results of these analyses are presented in Table 4 and Table 5. Of our control variables, only maternal supportiveness significantly predicted children's emotion regulation (β*= .31, t (65) = 2.58, p = .012) and this model accounted for nearly 10% of the variance. When we added fathers' regulatory behavior and language to the model, we found that fathers' regulatory language significantly predicted children's emotion regulation (β*= .36, t (63) = 2.79, p = .007), over and above maternal supportiveness. Overall, the full model accounted for 23% of the variance in children's emotion regulation. In our second regression predicting children's

sustained attention, maternal supportiveness was the only control variable that significantly predicted children's sustained attention, (β*= .25, t (65) = 2.04, p = .045) and this control model accounted for just over 6% of the variance. When we added fathers' regulatory behavior and language to the model, we found that fathers' regulatory behavior significantly predicted children's sustained attention (β*= .275, t (63) = 2.47, p = .016), above maternal supportiveness. Overall, the full model accounted for just over 24% of the variance in children's sustained attention.

Multiple regression analysis predicting fathers' control strategies

To address our third research question we next conducted two step-wise multiple regression analyses to determine if children's gender and vocabulary skills predicted fathers' use of regulatory behavior and regulatory language, controlling for children's age. The results of these analyses are presented in Table 6 and Table 7. Children's age did not predict fathers' use of regulatory behaviors (p>.05) and accounted for just over 4% of the variance in fathers' regulatory behavior. When we added children's vocabulary skills and gender to the regression model, we found that children with more advanced vocabulary skills had fathers that used fewer regulatory behaviors (β*= .29, t (3) = -2.61, p = .011). Gender was not significantly associated with fathers' regulatory behavior (p>.05). This model accounted for just over 12% of the variance in fathers' regulatory behavior (p=.019). Children's age also did not predict fathers' use of verbal compliance strategies (p>.05) and accounted for just over 4% of the variance in fathers' regulatory language. When we added children's vocabulary skills and gender to the regression model, we found that male children had fathers that used more regulatory language (β*= -.28, t (3) = -2.58, p = .012). Children's vocabulary skills were not significantly associated with fathers' use of regulatory language (p>.05). This model accounted for nearly 12% of the variance in fathers' regulatory behavior (p=.028). Additional posthoc analyses investigating whether gender and vocabulary skills moderated the association between fathers' control strategies and children's regulatory skills were not significant.

Discussion

The primary goal of this study was to explore how father-toddler interactions contribute to children's regulatory skills by examining the associations among children's individual characteristics, fathers' control strategies, and children's emotion regulation and sustained attention skills. Overall, we found support for our hypotheses.

The first goal of this study was to describe the control strategies that low-income fathers used with their children. We found fathers' verbal commands or regulatory language accounted for the considerable majority of all of fathers' control strategies. Fathers also commonly utilized behavioral control strategies, including prohibitions, modeling, physical support, and physical discipline to promote compliance with their children. Strategies such as shaming the child or negotiating with the child were rarely used by the fathers in our sample. These findings are consistent with Livas-Dlott and colleagues' work with mothers (2010) that mothers primarily used direct verbal commands to promote compliance with

their toddlers. Additional research should be conducted to explore whether mothers and fathers differentially utilize control strategies with their toddlers.

We also examined the conceptual coherence underlying fathers' control strategies and found that fathers' strategies can be conceptualized into two factors: regulatory language (i.e. directives and prohibitions) and regulatory behavior (modeling, physical support, physical discipline), which contrasts with the common positive control and negative control classifications in the parenting literature (e.g., Karreman et al., 2006). Our finding suggests that conceptualizing fathers' control strategies into regulatory language and regulatory behaviors might be a better way to link these behaviors to children's outcomes (Ispa et al., 2004; Smetana & Daddis, 2002). Because paternal supportiveness and children's regulatory skills were not significantly correlated, it is possible that control strategies represent a unique construct from paternal supportiveness. Future research should continue to explore how best to conceptualize and measure fathers' control strategies.

Our finding that fathers of boys used more regulatory language than fathers of girls does not support existing research conducted with international middle-class samples that fathers use higher levels of control (i.e., verbal) with female children than male children (Chen, Liu, & Li, 2000; Feldman & Klein, 2003). We need further studies that explore how fathers' socialization strategies with their sons and daughters vary across cultural and socioeconomic contexts.

Another noteworthy finding is that fathers used more regulatory behaviors with their children who had less advanced vocabulary skills. It is possible that children with limited vocabulary may not respond readily to regulatory language and thus fathers may be more inclined to use regulatory behaviors that are easier to understand. This supports previous findings linking children's vocabulary skills to their regulatory skills (Vallotton & Ayoub, 2011), and highlights the fact that both cognitive and social-emotional skills should be considered together to get a complete picture of children's early development. Consistent with a bioecological model of human development, these findings lend additional support to the view that children influence the way they are parented. Future research should include mutuality coding to account for the reciprocal relationship between parent and child.

Finally, we found that *fathers' regulatory behaviors* predicted children's sustained attention whereas *fathers' regulatory language* predicted children's emotion regulation. These findings were evident while controlling for maternal supportiveness. It is important to note that our findings are consistent with research conducted with middle class European American samples (e.g., Kochanska, Coy, & Murray, 2001), indicating that the link between fathers and children's regulatory-skills in low-income and minority populations may be similar to middle class and European American populations. It was not possible in our study to control for maternal control strategies thus we cannot ascertain whether father's control strategies uniquely explain the variance in children's regulatory behaviors. Examining mothers and fathers control strategies would be a good direction for future research. Overall, our finding suggest that promoting quality father-child interactions may help low-income children, who are at risk for dysregulation, develop strong self-regulatory skills. Further research should focus on better understanding the mechanism by which fathers promote

their children's regulatory skills and *both* mothers and fathers to understand unique, additive and multiplicative impacts on children's regulatory skills.

It is also noteworthy that fathers' regulatory language and behaviors were each associated with a unique dimension of children's regulatory skills. While this differential association was not originally hypothesized it corresponds with existing theoretical models of the development of emotion regulation and sustained attention. On the one hand, using regulatory language (e.g., commands, prohibitions) may teach children to use language to regulate their own emotions (Cole, Armstrong, & Pemberton, 2010). On the other hand, using behaviors (e.g., modeling, physical support) may help children to redirect their attention from what they are doing to what their fathers want them to do, encouraging joint and sustained attention. Future research should consider using an event-based coding scheme to investigate if parents' use of regulatory behaviors co-occurs with children's attention. In addition, research should test these differential pathways to children's sustained attention and emotion regulation with mothers.

There are also a couple of limitations that should be considered when interpreting the findings of this study. First, this study focused on a small convenience sample of low-income, minority fathers and their children thus its generalizability is limited. Second, although we control for maternal supportiveness, we did not control for mothers' compliance strategies, which would have allowed us to parse out the effects of maternal compliance strategies on children's regulatory behaviors.

Despite these limitations, this study offers important insights into how low-income minority fathers contribute to their children's regulatory skills. As with middle-class fathers, low-income fathers' use of regulatory and verbal language is important to help children learn to sustain attention, critical for task completion and learning, and regulate their emotions. This is particularly important for low-income children who may have difficulty regulating their behaviors (Blair & Diamond, 2008; Evans, 2013). Our findings also demonstrate the importance of examining maternal and paternal contributions separately to better understand the unique contributions of each parent to children's regulatory behaviors. Lastly, these findings suggest that father-child interactions may be an important point of intervention to promote children's regulatory skills among low-income minority families.

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Table 1

Descriptive Statistics (N = *71*)

Variable	*n*	*%*	*M(SD)*
Child gender			
Male	31	43.7	
Female	41	56.3	
Child age T1 (months)	64	100	27.89 (2.83)
Mother years of school	71	100	11.89 (1.81)
Father years of school	71	100	12.10 (2.41)
Child Ethnicity			
African-American	36	56.3	
Latino	28	43.8	
Father relationship to child			
Biological father	54	76.1	
Non-biological father	17	23.9	
Household language			
English	58	81.7	
Spanish	13	18.3	
MacArthur CDI	71	100	59.34(19.57)
Maternal supportiveness	71	100	3.75(1.05)
Paternal supportiveness	71	100	3.95(.89)
Emotion regulation	71	100	93.55(6.56)
Sustained Attention	71	100	11.20(3.21)

Table 2

Rotated factor loadings and communalities from exploratory factor analysis of control strategies (*N* =71)

	Verbal Strategies	Behavioral Strategies	Communality
Direct directives	.29	.73	.61
Indirect directives	.12	.48	.24
Prohibitions	.26	.43	.26
Physical Discipline	.63	.16	.43
Physical Support	.64	.01	.41
Modeling	.49	.11	.25
Negotiation/compromise	-.15	.50	.27

Table 3

Bivariate Intercorrelations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Child age	1													
2. CDI	.07	1												
3. Female	.09	.12	1											
4. Afric. Amer.	-.33**	-.15	.00	1										
5. English lang.	-.08	.13	-.02	.47**	1									
6. Dad supp.	.28*	.01	.18	-.06	-.10	1								
7. Dad educ.	.06	.06	-.10	-.20	.02	.20	1							
8. Bio. dad	-.07	.06	-.08	-.30**	-.21	.11	.06	1						
9. Mom supp.	-.28*	.21	.23*	.03	.08	-.09	.04	-.07	1					
10. Mom educ.	.07	-.03	-.02	-.15	.30**	.12	.25*	.11	.16	1				
11. Behaviors	-.21	-.30*	.01	.19	-.17	-.15	-.03	-.24*	.08	-.05	1			
12. Language	-.12	-.16	-.29**	.14	-.08	-.21	-.13	-.18	-.20	-.11	.37**	1		
13. Emot. reg.	.02	.10	-.03	.20	.00	.06	.05	-.01	-.09	-.08	.17	.36**	1	
14. Attention	-.01	.01	-.03	.13	-.15	.13	.13	.01	.02	.14	.36**	.12	.25*	1

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Table 4

Multiple regression model predicting children's emotion regulation (n = *71*)

	Model 1			Model 2		
	B	***SE***	***β***	***B***	***SE***	***β***
Children's age	.04	.33	.01	.32	.32	.12
Child is female	-.46	1.86	-.03	.82	1.81	.05
Children's language skills	.01	.05	.03	.05	.05	.12
Maternal support.	2.28	.88	.31*	1.67	.85	.22
Regulatory Language				3.29	1.18	.36*
Regulatory Behavior				.91	1.09	.10

* $p < .05$

1. $R^2 = .10$ $F(4, 67) = 1.82$, $p = .135$.

2. $R^2 = .23$, $F(6, 65) = 3.29$, $p = .007$.

Table 5

Multiple regression model predicting children's sustained attention (n = *71*)

	Model 1			Model 2		
	B	***SE***	***β***	***B***	***SE***	***β***
Children's age	.08	.14	.07	.16	.13	.14
Child is female	-.20	.78	-.03	-.34.	.74	-.05
Children's language skills	-.01	.02	-.06	.02	.02	.10
Maternal support.	.83	.40	.25*	.92	.37	.28*
Regulatory Language				.03	.48	.01
Regulatory Behavior				1.62	.45	.46*

* $p < .05$

1. $R^2 = .06$ $F(4, 67) = 1.10$, $p = .364$.

2. $R^2 = .24$, $F(6, 65) = 3.39$, $p = .006$

Table 6

Multiple regression model predicting fathers' regulatory behavior (n = *71*)

	Model 1			Model 2		
	B	***SE***	***β***	***B***	***SE***	***β***
Children's age.	-.06	.03	-2.1	-.06	.03	-.19
Child is female				-.07	.19	.73
Children's vocabulary skills				-.01	.01	-.29*

* $p < .05$

1. $R^2 = .04$ $F(1, 70) = 3.53$, $p = .064$.

2. $R^2 = .13$, $F(3, 68) = 3.52$, $p = .019$.

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Table 7

Multiple regression model predicting fathers' regulatory language (n = *71*)

	Model 1			Model 2		
	B	***SE***	***β***	***B***	***SE***	***β***
Children's age.	-.03	.03	-1.1	-.03	.03	-.09
Child is female				-.51	.20	-.28*
Children's vocabulary skills				-.01	.01	-.12

* $p < .05$

1. $R^2 = .01$ $F(1, 70) = 1.06$, $p = .307$.

2. $R^2 = .12$, $F(3, 68) = 3.20$, $p = .028$.