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Title: Child Emotion Regulation and Attentional Control in Pre-Kindergarten: Associations with Parental Stress, Parenting Practices, and Parent-Child Interaction Quality

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Abstract Body

Background / Context: Readiness for school depends, in large part, on the child's developing ability to regulate emotions and control attention (Blair, 2002). These two aspects of self-regulation demonstrate remarkable growth during the preschool years, and prepare children for the behavioral, social, and academic demands of school (Cole, Martin & Dennis, 2004; Hughes, 2011). Although inter-twined developmentally, existing research suggests that emotion regulation and attentional control each contribute in unique ways to children's capacities to engage effectively in the classroom, as they promote flexible problem-solving skills and goal-oriented learning, and allow children to form positive relationships with teachers and peers (Blair, 2002; Raver et al., 2011). Children who enter school with significant delays in either of these important areas of regulatory control are at considerable risk for academic and behavioral adjustment difficulties (Raver & Knitzer, 2002; Shonkoff & Phillips, 2000).

Parenting represents an important and understudied influence on the development of emotion regulation and attentional control among preschool children (Lengua, 2002). Existing research suggests that children growing up in poverty are often delayed in the development of these regulatory skills, possibly due to the stressful conditions that depress and demoralize their parents (Liaw & Brooks-Gunn, 1994), the reduced levels of warm support and availability in the parent-child relationship (Eccles & Harold, 1996), and the reduced levels of book-reading, conversation, and language use (Hart & Risley, 1995) that often accompany low socio-economic status. Given the importance of self-regulation skill development to school readiness, more research is needed to explore and understand how aspects of parenting that are associated with poverty may also affect the developmental of these skills.

Purpose / Objective / Research Question / Focus of Study: This study focuses on three aspects of parenting that have been linked theoretically and empirically with the development of child emotion regulation and attention control skills in early childhood: 1) parental stress and distress, 2) the degree of warmth and sensitivity evident in the parent-child relationship, and 3) parental support for the child's language development and learning. Existing research documents the importance of parental negative emotional reactivity and warm-sensitivity for the development of child emotion regulation skills in early childhood (0-3) (Cole, Martin, & Dennis, 2004). Less is known about the association of these aspects of parenting with child emotion regulation at home and school during the pre-kindergarten year, or their association with the preschool child's developing attentional control (Hughes, 2011). Research on the development of learning behaviors and attentional control skills suggests that parental support for learning may play a key role, particularly in terms of supporting joint attention and learning engagement (Lengua, 2002). However, rarely are these three aspects of parenting examined concurrently to evaluate their shared vs. unique contributions to child self-regulatory skill development. In addition, child emotion regulation and attention control skills are often examined in separate studies. This leaves open the question of how inter-related the regulation of attention and emotion are as children prepare to enter kindergarten, and whether the qualities of parenting and parent-child relationships that support these two areas of regulatory control are similar or different.

To address these issues, the current study focuses on three aspects of parenting that may affect the development of both emotion regulation and attentional control skills. These include: 1) the parent's stress levels, 2) the quality of the parent-child relationship, and 3) the degree of

cognitive challenge and language support available in parent-child interactions. In addition, the current study utilized multiple methods to assess the two domains of child skill development – attentional control and emotion regulation.

It was hypothesized that the warmth and sensitivity evident in parent-child interactions would show associations with the development of both emotion regulation and attention control skills. In addition, it was predicted that parent's emotional stress and negative emotional reactivity would be most strongly associated with the children's emotion regulation skills, whereas the parent's support for the child's learning and language development would be most strongly associated with the child's attention regulation skills.

Setting: Children and their parents were recruited from Head Start Programs in three counties of Pennsylvania. These programs served a range of small urban, suburban, and rural communities.

Population / Participants / Subjects: Participants included two cohorts of four-year-old children (total N = 210, 55 percent girls; 20 percent Hispanic, 25 percent African-American, 55 percent European American) recruited from 26 Head Start classrooms in three counties in Pennsylvania**.** At the time of assessment, children were, on average 4.80 years old (SD = .29, range = 4.26–5.36). Children and caregivers were recruited for an intervention study evaluating a home visiting program. The current study uses pre-test data collected during the pre-kindergarten year before the intervention began.

Research Design: After caregivers and children were recruited for the study and completed the pre-intervention assessments, they were randomly assigned to receive the home visiting intervention or to receive mail-home learning materials (the control group). The current study utilizes baseline data (pre-kindergarten) from children who were later assigned to either the intervention or control groups.

Data Collection and Analysis: Recruitment letters were distributed to caregivers of children attending Head Start. Parents who indicated an interest in the study were visited in their homes, where informed consent was collected and pre-assessment parent ratings were collected via a structured interview with a trained interviewer. At this time, the interviewer also video-taped a structured parent-child interaction, in which parents engaged in a book-reading and teaching task with their child. Parents were compensated $50 for participating in the assessment.

About two months into the school year, a research assistant met with each teacher to explain the teacher-rating measures and obtained the teacher's informed consent. All teachers agreed to participate. Teachers completed the ratings on their own time, and were collected by a research assistant two weeks later. Teachers were compensated $10 per student to complete student rating forms. Child assessments were conducted at school by trained interviewers during two individual 'pull-out' sessions (30-45 minutes each), scheduled in coordination with the teacher.

Parenting Stress and Negative Reactivity. Parent's depressive symptoms were assessed using the *Center for Epidemiologic Studies Depression Scale* (CES-D, Radloff, 1977). Parents indicate the frequency with which they experienced 20 symptoms during the past week, using a 4-point scale that ranged from *rarely* to *almost all the time* (e.g. "How often have you felt like you couldn't shake the blues, even with the help of family and friends?"). The level of stress the

parent experiences on a daily basis, associated with their parenting activities and family responsibilities was assessed using the *Parenting Daily Hassles* measure (Crnic & Greenberg, 1990). Parents indicate the degree of stress felt about 12 daily events using a 4-point scale ranging from *rarely* to *almost always* (e.g., cleaning up messes; trouble getting children ready for school or leaving on time). Negative feelings that the parent has about their relationship with their child was assessed using nine items from the *Parenting Stress Index* (Abidin, 1983; Loyd & Abidin, 1985). The measure uses a 5-point scale ranging from *agree* to *disagree* and has items such as, "When I do things for my child I get the feeling that my efforts are not appreciated very much."

Parent-Child Relationship Quality. Immediately following the home visit interview with the parent and administration of the video-taped parent-child interaction task, the research team interviewer completes the *Post-Visit Inventory* (Dodge, Bates & Pettit, 1990). Based upon observations of the caregiver's behavior toward the child and responses to questions about parenting practices and discipline, and based also on the child's behavior toward the parent during the visit, the research assistant rates the parent's warmth (4-items, e.g. "spoke to child with a positive tone" and "gave attention when child talked", each rated on a 4-point scale). The research assistant also rates the parent's responsiveness and sensitivity to the child (e.g. "Parent follows child's interests and foci of attention, and responds promptly and sensitively to child's initiations with related comments") using a 5-point scale. These ratings were combined to assess warmth and sensitivity in the parent-child relationship. On the *Post-Visit Inventory*, research assistants also rate 5-items describing the level of hostility toward the child observed (e.g. "parent shouted at child" and "parent expressed anger toward child"), using a 4-point scale (didn't occur, occurred once, occurred more than once, cant rate). This measure was used to assess negativity in the parent-child relationship.

Parent's Learning Support. Three measures assessed the degree to which the parent provides support for the child's language and learning development. Parent's report the degree to which they talk with their child on the *Parent-Child Conversations* (Bierman et al., 2008) measure, rating 4-items with a 6-point scale (e.g. "How often does your child volunteer to tell you about something that happened when you were not around?"). In addition, the videotaped interactions of parents and children engaging in book reading and a teaching task (tangram puzzles) were coded using a system developed for this project. All child-directed utterances were classified as being either directives (which function to control children's behavior) or conversation (e.g., questions or comment/statements). This study examined directives as an impediment to learning support. Finally, after coding the utterances on the parent-child interaction videotapes, observers completed a set of five-point ratings regarding parent-child interaction quality. Ratings assessing the parent's support for the child's learning and parent's teaching style were used in this study.

Child attentional control. The *Peg Tapping* Task (Diamond & Taylor, 1996) was used as a direct measure of the child's ability to regulate and shift attention during an executive function task. Children were asked to tap a peg twice when the interviewer tapped once, and vice versa. Scores represented the number of trials (out of 16) that the child did correctly. In addition, teachers rated child attentional control in the classroom using the *ADHD Rating Scale* (DuPaul, 1991; $\alpha = .94$; inter-rater $r = .76$). Five items drawn from this scale specifically assess problems with inattention (e.g. "Is easily distracted" and "Blurts out answers inappropriately"). These ratings were combined with three additional items reflecting attentional control, drawn from an inventory developed for this study (e.g., "Is careful with his or her work") and reverse-scored to

make a total inattention score. After completing each child assessment session, in which the child was asked to do a number of structured tasks and tests, research assistants rated the child's attention control using the *Interviewer Checklist* (Roid & Miller, 1997; Smith-Donald, Raver, Hayes & Richardson, 2007). The 13 items focus on the child's attention, sustained concentration, conscientiousness, and compliance in the testing situation; each item was rated on a 4-point scale. Items were scored or reverse scored, such that higher numbers indicated that the child had a higher level of attentional control.

Emotion regulation. The Locked Box task was adapted from the preschool version of the Laboratory Temperament Assessment Battery (Lab-TAB; Goldsmith, Reilly, Lemery, Longley, & Prescott, 1993) and provided a direct assessment of the child's capacity to regulate emotion during a frustration task. The child was asked to pick their favorite toy among a number of options. That toy was put in a locked box and the child was given a set of incorrect keys to try to open the box for a three-minute period. The observing research assistant then completes a set of items, describing the child's distress, positive affect, disruptive/destructive behavior, and persistence/interest during the task, using 5-point rating scales. Disruptive/destructive behavior and distress were reverse scored and the average of the four ratings was taken to compute the total score.

Findings / Results: Correlations were computed to examine relations between parental stress and the child's emotion regulation and attentional control (see Table 1). All three measures of parental stress (e.g., maternal depression, daily hassles, and distress in the parental role) were significantly associated with child emotion regulation in the home context (range of *r* from -.36 to -.50). In addition, parent's reported distress in their parenting role showed "spill over" effects into the school context, correlating significantly and inversely with the teacher ratings of the child's emotion regulation skills. In addition, distress in the parenting role was significantly correlated (inversely) with interviewer ratings of the child's attentional control in the testing session, and daily hassles were significantly associated with lower peg tapping scores and elevated teacher ratings of inattention. Next, correlations were computed to examine relations between the quality of the parent-child relationship, as indexed by home interviewer ratings, and child regulatory skills (see Table 2). High levels of warmth-sensitivity were significantly correlated with 4 of the 6 measures of child regulatory skill (all except for parent ratings of emotion regulation and Peg Tapping). Low levels of parent-child negativity were also significantly correlated with 4 of the 6 measures (all except Locked Box and Peg Tapping). Finally, correlations were computed to examine the relationship between parent's support for learning and the child's emotion and attention regulation (see Table 3). A clear pattern of association with child attentional control emerged, as parent-child conversations, parent teaching style, and (inversely) parent directives were significantly correlated with Peg Tapping, interviewer checklist ratings of the child's attention control, and (with the exception of teaching style) with teacher-rated inattention. Parent-child conversations and observed parent teaching style were also significantly associated with parent-rated emotion regulation.

Conclusions: Overall, these findings suggest that the three aspects of parenting studied here (parental stress, parent-child relationship quality, parent support for learning) are each associated significantly with the development of emotion regulation and attentional control during the pre-kindergarten year. Specific patterns of association varied across measure and domain. The next step in this study will be to conduct additional analyses (multiple regressions, structural equation modeling) to examine these multiple influences of parenting simultaneously.

Appendices

Appendix A. References

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Appendix B. Tables and Figures

Table 1
Correlations between Parenting Stress and Child Attentional Control and Emotion Regulation

Child Skills	Parental Stress		
	Depression	Daily Hassles	Parenting Stress
Emotion Regulation			
Parent Ratings	-.36**	-.47**	-.50**
Teacher Ratings	-.10	-.11	-.21**
Locked Box	-.00	-.03	.04
Attentional Control			
Teacher Ratings	.13	.15*	.13
Interviewer Ratings	-.08	-.05	-.14*
Peg Tapping	-.10	-.14*	-.10

** $p < .001$; **$p < .01$; *$p < .05$

Table 2
Correlations between Parent-child Relationship Quality and Child Attentional Control and Emotion Regulation

Child Skills	Parent-Child Relationship Quality	
	Warm-Sensitivity	Negativity
Emotion Regulation		
Parent Ratings	.11	-.19**
Teacher Ratings	.14*	-.24**
Locked Box	-.20**	-.04
Attentional Control		
Teacher Ratings	-.14*	.29**
Interviewer Ratings	.16*	-.36**
Peg Tapping	.09	-.13

** $p < .001$; **$p < .01$; *$p < .05$

Table 3

Correlations between Parent Support for Learning and Child Attentional Control and Emotion Regulation

Child Skills	Parent Support for Learning		
	Conversations	Teaching Style	Directives
Emotion Regulation			
Parent Ratings	.34**	.20**	-.09
Teacher Ratings	.08	-.01	-.06
Locked Box	-.03	-.09	-.05
Attentional Control			
Teacher Ratings	-.21**	-.10	.30**
Interviewer Ratings	.14*	.17*	-.36**
Peg Tapping	.22**	.16*	-.25**

** $p < .001$; **$p < .01$; *$p < .05$