Preschoolers and Disruptive Behavior: Using Multiple Measures to Examine Intervention Processes

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A Dissertation Presented to

The Faculty of the Curry School of Education

University of Virginia

In Partial Fulfillment of the Requirements for the Degree

Doctor of Philosophy

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by

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August 2016

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August 2016

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APPROVAL OF THE DISSERTATION

This dissertation, “Preschoolers and Disruptive Behavior: Using Multiple Measures to Examine Intervention Processes,” has been approved by the Graduate Faculty of the Curry School of Education in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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DEDICATION

This work is dedicated to my former second grade students. Thank you for giving me the joy of a strong teacher-student relationship, showing me the frustrations of disruptive behavior, and instilling in me the commitment to use learning for positive change.

ACKNOWLEDGEMENTS

This work would not have been possible without the guidance of my adviser and dissertation chair, Amanda Williford. Your mentorship and patience as I learned the ropes have been invaluable to my development as a researcher and a clinician. I feel grateful to have had the opportunity to learn from you.

Thank you to my dissertation committee, Ronald Reeve, Robert Pianta, and Daphna Bassok. I am greatly appreciative of your thoughtful recommendations and your contributions to this work.

I am grateful to the Curry School of Education and the grants that funded my time at the University of Virginia. I could not have asked for a more rewarding experience.

This work was made possible by the generous programs, teachers, children, parents, and project staff who contributed to the PREP study.

To my colleagues at CASTL: thank you for giving me the chance to learn about and contribute to excellent research. I gratefully acknowledge the research assistants who helped code the narrative data: Blake Potts, Alex Le, and Lindsey Porter. Elise Rubenstein, your mastery of all things data related was integral to this work. Jamie Decoster, I am appreciative of the statistical guidance you offered throughout my four years at Curry. Lauren Carter and Karyn Hartz: thank you for your support as we navigated MPlus and two CASTL moves together. Karyn, I am indebted to you for sharing the data that you collected.

I am also appreciative for the support of my family. To my husband, Andrew: thank you for being my secure base. I could not have done this without your support, patience, and humor. To my parents, Clare and Marius, and my siblings, Justine and Matthew: Thank you for investing in my education and believing in me.

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Overview of Three Manuscript Dissertation

By examining intervention processes, this dissertation seeks to better understand the links between children's disruptive behaviors and the quality of teacher-child interactions. Using multiple reporters and multiple measurements, this research investigates intervention selection, intervention implementation, and the teacher-child relationship as assessed from the child's perspective. The proposal follows the Curry School of Education Guidelines for Manuscript Style Dissertations and includes the theoretical and empirical justification for the three studies, followed by a description of each study. The three studies are reviewed in the following order: Study 1 is titled Teacher and TA Ratings of Preschoolers Externalizing Behavior: Agreement and Associations with Observed Classroom Behavior (published in *Topics in Early Childhood Special Education*); Study 2 is titled Program and Teacher Characteristics Predicting the Implementation of *Banking Time* with Preschoolers who Display Disruptive Behaviors (in press at *Prevention Science);* and Study 3 is titled Internal Working Models and Secure Base Behavior: Preschool Children's Representations of the Teacher-Child Relationship.

Conceptual Link

Preschoolers and Disruptive Behavior: Using Multiple Measures to Examine Intervention Processes

Disruptive behavior disorders, characterized by impulsivity, hyperactivity, temper-loss, non-compliance, aggression, and low-concern for others (Axelrad, Butler, Dempsey, & Chapman, 2013; Wakschlag, Tolan, & Leventhal, 2010), are the precursors to up to 60% of later mental disorder across the lifespan (Kim-Cohen et al., 2003). On the one hand, the report of problem behaviors among preschoolers is common in the general population, and these behaviors frequently dissipate as children develop (Hill, Degnan, Calkins & Keane, 2006). However, there is a group for whom these behaviors continue during the early childhood period and beyond (Bufferd, Dougherty, Carlson, & Klein, 2011; Bufferd, Dougherty, Carlson, Rose, & Klein, 2012; Lavigne et al., 1998). In fact, of all emotional disorders diagnosed during preschool, disruptive behavior diagnoses are the most stable (Lavigne et al., 1998). Thus, while early disruptive behaviors are fairly common, many children who demonstrate these behaviors will continue to exhibit them into later school years.

Disruptive behavior disorders have significant negative impacts on children's early experiences, in particular their interactions in preschool. In the 2011 school year, the number of three- to five-year-old children involved in some type of preprimary childcare was 64% (USDE NCES, 2013), highlighting that preschool is a critical

developmental context for a majority of children. Children who display disruptive behaviors in the classroom often enter into conflictual relationships with teachers (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008), interact negatively with peers (Ramani, Brownell, & Campbell, 2010), tend to be less engaged in classroom activities (Bulotsky-Shearer, Fernandez, Dominguez, & Rouse, 2011), and frequently experience subsequent learning difficulties (Spira & Fischel, 2005). Preschoolers are three-times more likely to be expelled than their school-age counterparts (Gilliam, 2005), and teachers report that they feel ill-equipped to handle the challenging behaviors of these students (Perry, Dunne, McFadden, & Campbell, 2008). Together, these negative outcomes and statistics provide clear evidence that the early display of disruptive behaviors is likely to compromise children's later school success (Gilliam, 2005; Raver et al., 2009).

Importance of Teacher-Child Relationships

Given that disruptive behaviors are defined in part based on conflictual interactions with others, focusing on relationships between adults and children offers promise for improving children's outcomes (Howes, Phillipsen, & Peisner-Feinberg, 2000; Hamre & Pianta, 2006). One area that is of particular importance for young children with disruptive behavior problems is the teacher-child relationship, which has been shown to be a contributor to children's successful school adjustment (Hamre & Pianta, 2001; Pianta & Stuhlman, 2004). A close teacher-child relationship in the early school years has been shown to relate to a variety of academic, behavioral, and

motivational outcomes (Liew, Chen, & Hughes, 2010; O'Connor, Dearing, & Collins, 2011; Palermo et al., 2007; Roorda, Koomen, Spilt, & Oort, 2011). Unfortunately, children with disruptive behavior problems are more likely to enter into less positive, more conflictual interactions with their teachers (Mantzicopoulous, 2005; Henricsson & Rydell, 2004; Hamre & Pianta, 2001). This conflict is likely to continue to have negative consequences for children's subsequent interpersonal behaviors over time (Birch & Ladd, 1998; Hamre & Pianta, 2001). However, when children at-risk due to behavioral difficulties are able to form a close teacher-child relationship, they show improved outcomes relative to their peers without this support (Baker, 2006). Moreover, a close teacher-child relationship has been associated with decreases in the escalation of externalizing behavior across the elementary school years, especially for those children with the most severe levels of disruptive behavior (Silver, Measelle, Armstrong, & Essex, 2005).

Attachment and Transactional Theories of Development

When attempting to understand the importance of the teacher-child relationship for children with disruptive behaviors, both an attachment framework and the transactional model of development are helpful to consider. Although attachment is primarily a construct that is associated with parent-child interactions, recent research also views the teacher as an attachment figure, a role is likely to be more important for young and vulnerable children (Verschueren & Koomen, 2012). Attachment theory posits that children's early relational interaction patterns with caregivers are critical for children's

development, and these patterns eventually become internalized in the child (Bowlby, 1988). When teachers are able to provide emotionally responsive interactions and a safe, consistent environment, children are more likely to use the teacher as a secure base to stay actively engaged in the classroom (Pianta, Hamre, & Allen, 2012; Verschueren & Koomen, 2012; Hamre & Pianta, 2006). Ultimately, the internalization of these interaction patterns, either supportive or not, guides children's expectations of self and others, thereby influencing motivation, trust, and self-worth (Pianta & Steinberg, 1992). This work implies that when children form close relationships with their teachers, they are more likely to develop positive perceptions that they carry with them into future relationships.

The transactional model of development is also helpful in explaining how a strong teacher-child relationship can be especially protective for at-risk children. According to the transactional model, development is bi-directional and is a product of the interaction between a child's experience and his or her social setting over time (Sameroff, 2010). This means that children's behaviors and the resulting responses to them exert continual influences over each other (Sameroff & MacKenzie, 2003). This model has been shown to provide a useful explanation for aggressive behavior in particular—coercive discipline by caregivers in response to children's oppositional behavior combine to form a mutually reinforcing pattern (Sameroff, 2010). Applying the transactional model to the classroom, children with disruptive behavior are likely to enter into conflict with their teachers, who are then likely to respond negatively, serving to exacerbate children's disruptive

behaviors. Conversely, if children's disruptive behavior is responded to in the context of a relationship that conveys warmth and sensitivity, aggressive behaviors are likely to deescalate over time, in turn leading to improved interactions and outcomes.

Importance of Early Intervention

Given that both attachment and transactional models emphasize the importance of early patterns and their development over time, early intervention for children with disruptive behavior is critical. A meta-analytic investigation of the overall effect of 36 psychosocial treatments for early disruptive behavior problems suggests that these treatments have a large effect (Comer, Chow, Chan, Cooper-Vince, & Wilson, 2013). Moreover, school-based interventions that focus on reducing children's disruptive behavior by changing classroom practices have demonstrated significant and positive impacts on children's behavioral and academic outcomes during the preschool year (e.g., Raver et al., 2009; Webster-Stratton, 2011). This suggests that these interventions hold promise for changing the trajectories of children with disruptive behavior. Still, research is needed to better understand the mechanisms by which these programs are effective and how effective interventions can be brought to scale.

Measurement and Interventions with Young Children

Uncovering mechanisms behind successful interventions and disseminating knowledge relies on accurately measuring intervention processes (Knoche, Sheridan, Edwards, & Osborn, 2010). Measurement is a particularly salient issue in studies of young children given the challenges inherent in assessing behaviors in this age group

(Carter, Briggs-Gowan, & Davis, 2004; Wakschlag et al., 2010). First, caregivers are often the reporters of young children's behaviors and outcomes, meaning that rater characteristics become intertwined with evaluations of the severity of problem behaviors (Kraemer et al., 2003). This is significant because others' endorsements of preschoolers' difficulties have far-reaching impacts for referrals and identification for services (Abidin & Robinson, 2002; Berg-Nielsen, Solheim, Belsky, & Wichstrom, 2011). Moreover, even when observational measures are used, young children's behavior is typically highly variable across time and contexts (Egger & Angold, 2006; Winsler & Wallace, 2002) and often behaviors such as aggression are low frequency events (Pelham & Fabiano, 2005). This makes gaining an accurate estimate of a child's impairment challenging, as reporters' ratings may reflect their own biases, whereas observational measures may fail to capture low base-rate but clinically significant behaviors.

Three Study Approach

Disseminating interventions for young children with disruptive behavior relies on understanding intervention processes and their effectiveness, yet measuring important constructs in interventions with young children can be particularly challenging. This research uses a three-study approach to investigate various stages of interventions using multiple measures. Study 1 carefully examined the selection of children for a school-based intervention by examining teacher reports of disruptive behaviors and their relation to teacher assistant (TA) reports and observational measures. Given that interventions

with young children rarely assess children's own perceptions, Study 3 examined how to measure young children's representations of the teacher-child relationship.

In addition to measuring young children's behaviors and perceptions in the context of intervention efforts, it is critical to accurately measure factors related to successful intervention implementation. To do so, it is imperative to understand teacher and setting characteristics that relate to various aspects of implementation, including fidelity, dosage, and quality of delivery, all of which should be measured using multiple indicators (Domitrovich et al., 2008; Knoche et al., 2010). Given this need, Study 2 examined teacher and setting characteristics that are related to various types of implementation as assessed through multiple measurements. This allows for a deeper knowledge of the characteristics of teachers and preschool programs that relate to how well, how often, and how accurately a particular intervention is practiced. The following section provides additional detail on each study.

Study 1. Study 1 examined the agreement among lead teacher, TA, and observational assessments of disruptive behavior for children who were selected to participate in a teacher-child intervention. The study investigated these associations across the domains of hyperactivity/impulsivity, inattention, oppositional defiance, and total disruptive behavior and examined the links between teacher-rated severity of disruptive behavior and teacher-TA agreement. The study also examined whether using the TA's report, the teacher's report, or both reports provided a better estimate of children's classroom behavior. Results indicated that teachers' and TAs' reports were

modestly correlated with observational measures, and using both reporters did not provide additional, meaningful information when compared to a single informant's report alone. These results highlighted the different perspective that various measures provide within the same setting, emphasizing the importance of conducting a multi-method, multi-informant assessment of young children's externalizing behavior in the classroom.

Study 2. Study 2 used multiple measures of implementation, including consultant report, teacher report, and observed variables to investigate the classroom, demographic and teacher psychological beliefs that predicted various dimensions of implementation, including dosage, quality, and generalized practice. Results showed that type of preschool program was linked with both dosage and quality, teacher demographics related to all three aspects of implementation, and teacher beliefs predicted dosage and generalized practice. This work implies that when attempting to scale up interventions, it is particularly important to consider setting and teacher characteristics, as these factors play a role in the frequency, quality, and generalizability with which teachers implement interventions. Exploring possible mechanisms behind these associations will be an important next step in furthering this work.

Study 3. Study 3 focused on understanding how young children internalize their relationship with their teacher. Previous research has primarily relied on teacher-report of the relationship or used observations of interactions to understand how children relate with their teachers. This study adapted a coding scheme used in the parent-child attachment literature and applied it to a newly developed narrative procedure that

required children to draw a picture of them and their teacher and then tell a story about their drawing. Results indicated that children's representations of their teacher as assessed through their narratives were reliable and valid. Moreover, children's representations were shown to affect the relation between children's observed positive interactions with teachers and their observed task orientation, such that the relation between positive interactions with teachers and task orientation was stronger for children with less positive representations. This suggested that children with relatively less positive representations of the teacher-child relationship differentially benefited from interactions with their teacher to stay engaged in classroom tasks. Thus, this work allowed for a better understanding of how to measure children's internalizations of the teacher-child relationship while also shedding light on the processes that underlie the importance of the teacher-child relationship for young children's school success.

Together, these three studies add to the literature related to conducting interventions with young children by examining critical intervention processes from multiple angles. This allows for a deeper understanding of how to help young children and also points out factors to consider when scaling up interventions. Although examining these issues from multiple angles is complex, exploring intervention processes with multiple measures is particularly important in applied settings, where a variety of individual, relational, and environmental factors contribute to the success of an intervention. As such, failing to measure and consider multiple perspectives using a variety of measures is likely to lead to lead to an incomplete understanding of complex

processes. This work aims to further knowledge that will help ensure that children with disruptive behaviors who are most in need are selected for services, critical issues are taken into consideration when scaling up interventions, and the impacts of these programs can be measured from the perspectives of the children who are receiving treatment.

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Teacher and TA Ratings of Preschoolers' Externalizing Behavior: Agreement and Associations with Observed Classroom Behavior

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(Published in *Topics in Early Childhood Special Education,* 2015)

Wolcott, C. S., & Williford, A. P. (2015). Teacher and TA ratings of preschoolers' externalizing behavior: Agreement and associations with observed classroom behavior. *Topics in Early Childhood Special Education*, *34*(4), 211-222.

Abstract

The present study investigated teachers' and teacher aides' (TAs) agreement in their ratings of preschoolers' externalizing behavior and their associations with observed classroom behavior for a sample of children at risk of developing a disruptive behavior disorder. One hundred twenty-two teachers rated 360 students' externalizing behavior in the first month of school, and within the next 6 weeks, children were observed in their classroom. Results indicated that teacher and TA reports were moderately correlated, teacher-rated severity of oppositional defiant disorder behaviors was related to agreement, and teacher/TA agreement did not predict observed externalizing behavior. In general, using teacher and TA ratings together versus a single informant's rating did not provide a better estimate of information gathered from observational measures. Results demonstrate the importance of gathering observations and rating scales when evaluating preschoolers' externalizing problems. Future work should explore factors that contribute to teachers', TAs', and observational methods' differential evaluations of externalizing behavior.

Teacher and TA Ratings of Preschoolers' Externalizing Behavior: Agreement and Associations with Observed Classroom Behavior

Children who display externalizing behaviors in the preschool classroom are at risk for a variety of negative outcomes, making it critical to identify these children early in development (Dunlap et al., 2006). Externalizing behaviors are characterized by over-activity, impulsivity, aggression, and noncompliance/defiance (Hinshaw, 1992). High levels of these problem behaviors are often the precursors of later, more serious developmental disorders such as Attention-Deficit/Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) (Calkins, Gill, & Williford, 1999). Preschoolers displaying problem behaviors are three-times as likely to be expelled from early childhood programs compared to their school age peers (Gilliam, 2005), a reality that is especially concerning, as the majority of children spend substantial time in preschool prior to kindergarten entry (Adams, Tout, & Zaslow, 2007). Importantly, high-quality preschool programs can serve as a protective factor for children at risk of developing later behavioral problems (Frede & Barnett, 1992).

Due to the negative outcomes associated with the display of externalizing problems during early childhood, it is critical to accurately identify these children in order to change developmental trajectories through early intervention and prevention efforts (Campbell 2002; Querido and Eyberg, 2004). Assessment plays a key role in this

process, and information from the preschool classroom is especially important, as school is often a setting in which maladjustment related to externalizing problems is likely to occur due to heightened social and academic demands (Wolraich et al., 2004).

Assessment in the Preschool Classroom

The assessment of preschool externalizing problems should gather information from the child's school or daycare setting and should use multiple informants and multiple methods, such as rating scales and direct observations (Carter, Briggs-Gowan, & Davis, 2004; Egger & Angold, 2006). Direct observations in naturalistic settings are useful because they are considered an unbiased way of capturing a child's environmental functioning (Carter et al., 2004). These observations take place in-context, evaluate actions at the time of their occurrence, and are assumed to be representative of a child's usual behavior in these settings (Qi & Kaiser, 2004; Thomas, Shapiro, DuPaul, Lutz, & Kern, 2011). However, direct observations are timely and costly, frequently making them impractical for everyday use (Thomas et al., 2011; Pelham, Fabiano, & Massetti, 2005). Another major concern is that these observations use a time sampling approach, which can lead to the failure to detect behaviors that have a low base rate but are clinically significant, such as conflict and aggression (Pelham et al., 2005).

Due to the limitations of direct observations, indirect measurements, such as rating scales, are often used to assess externalizing problems (Thomas et al., 2011). Teacher rating scales are considered an important source of information because teachers interact with children in the school context, where problem behaviors often manifest

themselves (Wolraich et al., 2004). Additionally, teachers are in a position to assess children's irregular patterns of externalizing behavior, a tendency that is attributed to their ability to compare children's behaviors to typical patterns of development and to their experience interacting with a variety of students (Atkins & Pelham, 1991). Finally, teachers are frequently involved in the expulsion of preschool children (Gilliam, 2005), highlighting that teachers' perceptions of children's behavior is associated with important child outcomes. Despite these strengths, teachers may artificially inflate their report of children's externalizing behavior; for example, studies have shown that teacher ratings of hyperactivity spuriously increase when children display behaviors characteristic of ODD (Abikoff, Courtney, Pelham, & Koplewicz, 1993; Jackson & King, 2004). This suggests that teachers may be influenced by halo effects, which can lead to bias in their reports.

Gathering ratings from two teachers, both of whom interact with and observe children in the same classroom, may help us better understand the extent to which important adults with the same role view children's externalizing behavior. Although work has investigated multiple teachers' ratings from different classrooms and found that teachers' ratings are more highly correlated than teacher and parent ratings (Achenbach, McConaughy, & Howell, 1987), few studies have examined ratings from teachers within the same classroom. In many preschool classrooms, a teacher aide (TA) works with the teacher during the school day, helping with classroom responsibilities and providing extra support to children (Essa, 2010). However, relatively little work has examined the utility of the TA's perspective in understanding preschool externalizing behavior, and few

studies have investigated how TA and teacher perspectives align. In a study that examined TAs' reports of elementary school students with an intellectual disability (ages 5-12, *M*=9.0), TAs' reports were more highly correlated with observed classroom behavior than lead teacher reports (Miller, Fee, & Jones, 2003). This suggests that although TAs interact with children in the same classroom, they may have different perspectives than teachers. However, given the particular population and wide age range of the sample used in the Miller et al. (2003) study, the extent to which TA ratings align with other measures of preschoolers' behavior remains relatively unexplored.

Challenges of Integrating Discrepant Reports

Given the strengths and limitations of various raters and methods, using information from multiple methods is most likely to result in a fair and accurate assessment of a child (Carter et al., 2004). However, the results produced from various sources are likely to be discrepant, thereby making it challenging to integrate conflicting reports (Achenbach, 2006; De los Reyes et al., 2009). Although discrepancy among raters has often been conceptualized as measurement error, recent work has examined the correlates and meaning of informant differences and has focused on context as a contributor to rater disagreement (De los Reyes, 2011). De Los Reyes et al. (2009) examined if parent and teacher discrepancies were associated with preschoolers' observed behavior in different contexts and found that the variability among parent and teacher reports of externalizing behavior was related to how children behaved in an observed lab task with a parent versus an unfamiliar adult (De Los Reyes et al., 2009).

Similarly, Strickland, Hopkins, & Keenan (2012) demonstrated that the agreement between parent and teacher ratings of preschoolers' externalizing behaviors was higher when raters were instructed to report on children's behaviors in the same context.

In addition to relating to context, disagreement among informants has been hypothesized to relate to the severity of dysfunction (De los Reyes et al., 2009). In cases in which impairing behavior is severe, informant agreement is likely to be stronger because raters might be more apt to notice the manifestations of severe behaviors across contexts and situations (De los Reyes et al., 2009). Conversely, agreement would be expected to be lower when behaviors occur at moderate levels (De los Reyes et al., 2009). Although this hypothesis makes sense conceptually (Wakschlag, Tolan, & Leventhal, 2010), we found no studies that explicitly tested this theory within the preschool population.

Present Study

The present study attempted to better understand the assessment of preschool externalizing problems by investigating rater agreement and examining the relation among multiple assessment methods. This study adds to the literature and explores the role of context in behavioral assessment by utilizing the TA report and observational measures in combination with lead teacher ratings. First, we asked to what extent teachers and TAs agreed in their ratings of preschoolers' externalizing behaviors. We hypothesized that teacher ratings would be associated with TA ratings at similar levels to those cited in previous studies that have investigated rater agreement between individuals

in similar contexts (average r=.60; Achenbach, 2006). Second, we asked whether agreement between teachers and TAs was related to the severity of behavior as evaluated by the lead teacher. We hypothesized that agreement between teachers and TAs would be greatest for children who were rated as evidencing either low or high levels of externalizing behaviors, as these children would either display few symptoms of externalizing behaviors, or their behavior would be severe and would occur consistently across contexts and caregivers, leading the teacher and TA to rate these behaviors similarly. Third, we asked whether teacher-TA agreement predicted observed externalizing behavior over and above a single teacher's rating. Although one would not expect teachers and TAs to rate children identically, we hypothesized that agreement would be associated with observed externalizing behavior in the classroom over and above a single informant's report.

We also investigated associations among teacher ratings, TA ratings, and observational measures. Because little work has examined TA report and because a previous study explored this issue with a sample of children with an intellectual disability (Miller et al., 2004), we were interested in whether teacher and TA ratings would be differentially related to observed externalizing behavior for children in preschool. Given that the Miller et al. (2004) study used a sample of teachers and TAs who likely have different roles and responsibilities than teachers in general education preschool classrooms, we were unsure if TAs' reports would be more aligned with observational measures. In addition, we investigated whether including two teachers' ratings, rather

than using a single teacher's rating, would be more highly associated with observed externalizing behavior. Here, we speculated that teachers and TAs may observe children in different contexts within the preschool classroom (e.g., a teacher may observe all children's behavior as she leads circle time, whereas the TA may be getting materials ready for the next activity or may be attending to a single challenging child during this period), and therefore using both their ratings together would be more aligned with an independent observers' rating of a child's behavior across classroom activities. Given the limited information about the relation between teacher ratings, TA ratings, and observed externalizing behavior, examining agreement and associations among different types of assessment approaches allows greater understanding of how various methods may be combined to gather a more complete picture of the externalizing behaviors children display in the classroom.

Method

Participants

The participants for the present study were drawn from a sample of teachers and children who participated in an efficacy trial testing an early intervention to improve behavioral outcomes for preschool children displaying elevated levels of externalizing behavior. The intervention was not of interest and all data used in the current study were collected at baseline before the intervention took place. The larger one-year intervention occurred with 471 children across three different cohorts in two mid-Atlantic states in a total of 173 classrooms with 183 lead teachers (n=37 from cohort 1, n=103 from cohort

2, and n=43 from cohort 3; the replacement procedure for the study meant that some lead teachers were replaced throughout the year, which is why there are slightly more lead teachers than total number of classrooms). The larger trial included teachers and children residing in mostly urban and surburban areas. A variety of preschool programs participated with the following composition of classrooms: 27% Head Start, 26% state-funded public, and 47% private (not-for-profit and for-profit) programs that served 3,4, and/or 5-year-old children for five days a week. Of the initial 173 classrooms selected for the larger intervention trial, 122 classrooms had both a participating teacher and TA and are included in the present study. Of the classrooms that had both teacher and TA ratings, 25 participated from cohort 1, 51 participated from cohort 2, and 46 participated from cohort 3. Classrooms with participating TAs (N=122) were compared to the classrooms of teachers who did not participate, either because the TA did not fill out rating scales or the classroom did not have a TA (*N=51)*. No significant differences were found among the percentage of students who were African American, Hispanic, or white, or the percentage of children who were 3, 4, or 5 years old Participating classrooms had a lower percentage of Asian students (M=.02; t(148)=-2.77, p=.006) than non-participating classrooms (M=.06). Non-participating classrooms were significantly more likely to have fewer students (M=12.84; t(154)=4.975, p<.001) than participating classrooms (M=15.96). In addition, non-participating classrooms had a significantly lower percentage of boys (M=.48; t(152)=2.09, p=.038) than participating classrooms

(*M*=.53). Note that missing data on classroom demographic survey questions ranged from 11-17%.

Teachers. The 122 lead teachers were mostly female (97.5%) and were on average 42 years of age (Range=22-67). The sample was fairly ethnically diverse, with 53% of lead teachers identifying themselves as White, 42% as Black, and 5% as Hispanic, Native American, Asian, Multiracial, or another ethnicity. The average education of teachers was 15.6 years (Range=13-18). The average experience teaching preschool was 10 years (Range=0-38).

The 122 TAs who completed demographic data were 97.8% female and on average 35 years old (Range=18-68). They were also ethnically diverse, with 50.0% of TAs identifying themselves as Black, 39% as White, 4.5% as Hispanic, and 6.5% as Native American, Asian, Multiracial, or another ethnicity. The average years of education was 14.22 years (Range=12-18), and the average years of experience teaching preschool was 8 years (Range= 0-33).

Children. The children in the study were part of the sample selected for a larger efficacy trial designed to improve behavioral outcomes for children. Of the 471 children selected for the larger intervention (2 children selected per classroom in Year 1; 3 children selected per classroom in Years 2 and 3), 360 children had TA ratings in addition to teacher ratings. Of note, there are more total children in the sample than would be expected given the 122 participating classrooms due to the replacement procedure used in the study (if the child withdrew or moved classrooms, the next highest

ranked child in the classroom was substituted and selected for the intervention). Children were 68% male and the average age was 48 months, ranging from 30 to 66 months. Participants were racially diverse, with 39% of children identified by caregivers as White, 41% as Black, 9% as Hispanic, 9% as multi-racial, and 2% as Native American, Asian, or another ethnicity. The average years of maternal education was 14 (Range=11-20) and the average income to needs ratio was 1.86 (*SD*=1.56, Range=0.20-6.07).

Procedures

Recruitment. Recruitment of preschool classrooms was consistent across the three sites. Program directors were contacted through paper mailings, emails, and physical visits and were asked permission to recruit their teachers for participation. Once a program agreed, teachers and TAs were invited to participate in the study. Teachers who agreed to participate gave their informed consent for classroom observations, completed personal and classroom demographic surveys, and assisted with obtaining consent from parents regarding their children's participation. TAs who agreed to participate sent in ratings of children's behavior and completed a personal demographic survey. Once full informed consent was secured from lead teachers, they facilitated in obtaining parental consent from all children in the classroom. The parental consent rate for the study averaged 76%.

Selection of children. Teachers and TAs completed the ADHD Rating Scale (ADHD-RS IV; DuPaul, Power, & Anastopoulos, 1998) and ODD Rating Scale (ODDRS; Anastopoulos, 1998—see measures section for additional details) on all

children in their classroom. The participating teachers filled out a total of 2,379 behavior rating scales on all students in their classrooms, and ultimately 471 children were selected to participate for the larger intervention. The three children (2 of those selected were boys, and 1 was a girl) with the highest levels of lead teacher-reported disruptive behaviors were selected to be in the study (For site 1, only 2 children were selected per classroom). Children selected to participate in the intervention demonstrated significantly more externalizing behavior (M=28.48) than children who were not selected for the intervention (M=10.82) based on lead teachers' summed scores of all items from the ADHD RS-IV and the ODDRS (t(2369)=24.831, p<.001)). Only those children who were selected for the intervention were observed in the classroom, and thus this group of children comprises the sample for the current study. As stated previously, children in the current study's sample had both teacher and TA ratings (N=360) and are thus a subsample of the children selected for the larger intervention.

Direct Observation Training. Data collectors were required to complete an extensive two-day training from a certified trainer on the observation measure used in the study (Individualized Classroom Assessment Scoring System; inCLASS, Downer, Booren, Hamre, Pianta, & Williford, 2011) prior to data collection. The training included a review of the content of the measures and required data collectors to code, watch, and discuss training clips. At the end of the training, data collectors were required to reliably code five clips by scoring within 1 point of a mastercode on 80% of the scheme's dimensions. Across the sites, 43 data collectors conducted the observations. Data

collectors' initial reliability scores ranged from 80-94%. Following successful training but before data collection began, data collectors practiced the coding scheme on children in preschool classrooms that were not part of the study with a master trainer. In addition, data collectors watched and coded practice videos to ensure that they had not drifted from initial reliability. Inter-rater reliability was estimated by double coding 20% of all field observations; these estimates are provided in the description of the inCLASS measure below.

Observation Protocol. Observations were scheduled during the first six weeks of school within two weeks of receiving the lead teachers' rating scales. During this time, teachers and children were observed in the classroom setting. Each observation day lasted approximately four hours from the start of the day until mid-day and occurred over multiple days. Data collectors observed the selected children in a series of alternating cycles starting at the beginning of the school day; each cycle consisted of observing a child for ten minutes and then coding the observation for five minutes. Data collectors shifted their observation across the two or three selected children (i.e., they observed child 1, child 2, then child 3, and began again with child 1; on the next day children were observed in a different repeating order, such as child 2, child 3, then child 1), with the goal of collecting at least eight cycles per child across two days. The participants in the current study were observed for approximately 9 cycles (M=8.66, SD=1.79*)* across three days (M=3.11, SD=0.84*)*.

Measures

Teacher and TA Ratings of Externalizing Behavior. Teachers and TAs completed a survey that contained all items from the Attention-Deficit/Hyperactivity Disorder Rating Scale – IV (ADHD RS-IV; DuPaul, Power, Anastopoulos, & Reid, 1998) as well as the Oppositional Defiant Disorder Rating Scale (ODDRS; Anastopoulos, 1998; Hommersen, Murray, Ohan, & Johnston, 2006) in order to screen for externalizing behavior to select children for the larger intervention. Both are psychometrically sound behavior rating scales often used in clinical research with preschool-aged children (DuPaul, McGoey, Eckert, & Vanbrankle, 2001; Johnston, Hommersen, & Seipp, 2009; Barkley et al., 2000) and have been shown to be valid and reliable in the preschool population (McGoey, DuPaul, Haley, & Shelton, 2007). The ADHD RS-IV is an 18-item scale based upon the DSM-IV symptoms of ADHD. Nine items correspond to symptoms of inattention and nine items measure hyperactivity/impulsivity. Modeled after the ADHD RS-IV, the ODDRS contains eight items corresponding to the DSM-IV criteria for ODD. Scores were summed for each individual dimension of externalizing behavior, resulting in a score for Hyperactivity/Impulsivity (HI, α=.93) Inattention (IA, α=.92), and Oppositional Defiant behavior (ODD, α=.93). In addition, scores across all dimensions were summed to create a Total Externalizing score (α=.96). To demonstrate concurrent construct validity for this measure in the current project, correlations between the ADHD RS-IV and ODDRS rating scales and the Sutter-Eyberg Student Behavior Inventory-Revised (SESBI-R; Querido & Eyberg, 2004) were examined. The SESBI-R is a widely-used, comprehensive, behaviorally specific rating scale that assesses disruptive behaviors

in the school settings. The correlations of the ADHD-RS and ODDRS summary scores with the intensity score of the SESBI-R were all significant at the $p < .001$ level (HI, $r = .58$; IN, $r = .46$, ODD, $r = .55$; Total Externalizing, $r = .65$) and were comparable in strength to those found in other research (McGoey et al., 2007). Children were selected for the larger intervention study based on lead teachers' Total Externalizing score.

Observed externalizing behavior. The Individualized Classroom Assessment Scoring System (inCLASS; Downer, Booren, Hamre, Pianta, & Williford, 2011) is an observational assessment of young children's behavior during everyday interactions with teachers, peers, and tasks in preschool classrooms. The inCLASS measures ten dimensions of children's behavior on a 7-point scale, including: (a) positive engagement with teacher, (b) teacher conflict, (c) teacher communication, (d) peer sociability, (e) peer conflict, (f) peer assertiveness, (g) peer communication, (h) engagement within tasks, (i) self-reliance, and (j) behavior control. Trained observers watch children for 10 minutes, and immediately following this period, they rate children's positive or negative patterns of behavior based upon the child's display of clearly defined behavioral indicators that categorize each dimension. Children are observed over multiple cycles (in this case an average of 9 cycles across 3 days) to estimate a child's typical behavior pattern displayed in the classroom. In validation studies, the inCLASS has shown construct and criterion validity (Downer, Booren, Lima, Luckner, & Pianta, 2010) in addition to predicting children's self-regulation and language and literacy skills (Williford, Maier, Downer, Pianta, & Howes, 2013; Williford, Whittaker, Vitiello, & Downer, 2013).

Only the dimensions that were conceptually linked to teacher-rated externalizing behaviors were used for the present analyses. Behavior control was reverse scored and labeled observed impulsivity. Behavioral indicators for low behavior control/ high observed impulsivity include interrupting, going out of turn, shouting out, speaking loudly, engaging in extra movement, intruding on the personal space of others, and often bumping into objects or other children. Engagement within tasks was reverse scored and labeled observed inattention. Behavioral indicators for low engagement/high observed inattention include engaging in activities that are not assigned, receiving frequent redirections from the teacher related to the activity, changing activities often, wandering around the room, spending time watching others rather than engaging in the activity, and engaging in activities lethargically or repetitively. Conflict with teachers and conflict with peers were averaged together and labeled observed conflict. Children with high conflict scores engage in verbal or physical aggression, such as hitting, kicking, pushing, yelling, and name calling; exhibit non-compliance, such as defying request and provoking arguments; show negative affect, such as frowning, grimacing, or folding hands across the chest; and engage in attention seeking behaviors, such as whining, complaining, or pouting. Observed impulsivity, observed inattention, and observed conflict were averaged together to create an observed total externalizing score.

Inter-rater reliability was calculated across 20% of all observations with two data collectors independently observing and rating the same children. Intraclass correlations (ICCs), exact agreement, and agreement within 1 point (the measure developer's

benchmark for reliability during the training) were as follows: behavior control = .75, 52%, 91%; engagement within tasks = .69, 41%, 85%; teacher conflict= .63, 84%, 98%; and peer conflict = .72, 81%, 97%. Note that the ICCs for teacher and peer conflict were low due to the skewness of the data (conflict is a low occurring event). In addition, internal consistencies for dimensions across observation periods were calculated. Internal consistencies were as follows: Observed Impulsivity (α=.84), Observed Inattention (α=.71), Observed Conflict (α=.75) and Observed Total Externalizing (α=.81).

Data Analysis and Missing Data

To test the relation between teacher and TA ratings and their associations with direct observations, hierarchical linear models were used to account for the organizational nature of the data where children (level 1) were nested in classrooms (level 2). We used the Type=Complex Command in MPlus, which adjusts standard errors to take into account the fact that children were clustered within classrooms. In addition, we examined intra class correlations, which for TA ratings ranged from .14 (ODD) to .25 (IA), and for teacher ratings ranged from .24 (ODD) to .37 (Total Externalizing). Descriptive statistics and pairwise correlations were examined in SPSS Version 21, and all other models were analyzed in Mplus Version 6 (Muthén & Muthén, 2012). Absolute difference scores between teacher and TA ratings of HI, IA, ODD, and Total Externalizing scales were calculated to estimate teacher and TA agreement. There are multiple ways of calculating rater agreement including using raw difference scores, standardized difference scores, and residual difference scores (De los Reyes & Kazdin,

2004); we used absolute raw difference scores because we did not have hypotheses related to the direction of differences, and the distributions for the teacher and TA variables were similar.

Missing data in the current analyses included those children who did not have baseline inCLASS observational outcome data (*N*=22*)* and two children for whom survey data was incomplete (*N*=2*)* due to a teacher omitting more than two items on the inattention subscale and a TA omitting more than two items on the ODD subscale. We used full information maximum likelihood estimation with robust standard errors in order to make use of all available data for each case (Enders & Bandalos, 2001).

Results

Descriptive Statistics and Teacher and TA Agreement

Descriptive statistics are presented in Table 1 and Correlations are presented in Table 2. As Table 1 shows, on average across all scales, teachers rated children's externalizing behavior slightly higher than TAs, although the distributions of teacher and TA ratings were similar. Pairwise correlations between teacher and TA ratings of externalizing behavior dimensions indicated that teacher and TA ratings were moderately correlated between 0.52 (HI) - 0.57 (ODD) (See Table 2).

Severity of Externalizing Behavior and Agreement

To test whether teacher-TA agreement was greatest at low and high ends of externalizing behavior, we created a squared term for teacher ratings of HI, IA, ODD, and Total Externalizing behavior. We then ran four separate regressions and regressed

teacher ratings of externalizing behavior and the corresponding squared term onto teacher/TA absolute difference scores of HI, IA, ODD, and Total Externalizing scores. The squared term for ODD was significant (□=-0.53, SE=0.23, *p*=.025) indicating that teacher-TA agreement was higher at the tails (when lead teachers rated children as displaying either low or high oppositional behavior) compared to when lead teachers rated children as displaying more moderate levels of oppositional behaviors. The coefficient for the squared terms of HI (□=0.07, SE= .24, *p*= ns*)* IA (□=-0.03, SE=.17, *p*=ns*)* and Total Externalizing scores (□=-0.04, SE=0.09, *p*=ns) were all non-significant.

Agreement and its Relation to Observed Externalizing Behavior

To assess whether teacher/TA agreement was associated with observed externalizing behavior over and above the lead teacher's ratings, teacher ratings and teacher/TA absolute difference scores were regressed onto corresponding observed externalizing behavior dimensions. Lead teachers' ratings, rather than the TAs', were used in models because lead teacher ratings are commonly used during the assessment process. Four separate models assessing teacher/TA agreement of HI (□=0.039, *p*=ns), IA (□=-0.069; *p* =ns), ODD (□=-0.036, *p* =ns), and Total Externalizing Scores (□=-0.035, *p* =ns) were run separately. Analyses demonstrated that teacher/TA agreement did not significantly predict observed externalizing behavior for any dimensions; however, teacher ratings alone continued to significantly predict observed externalizing behavior (See Table 3).

Using Teacher and TA Ratings Together

To examine if teacher and TA ratings entered into a model together were more associated with observed externalizing behavior than using a single informant's report alone, we investigated models that included teacher ratings alone, TA ratings alone, or their ratings entered into a model together to predict each externalizing behavior outcome. We examined the significance of the coefficients in each of these models to better understand whether estimates of children's externalizing behavior using two raters would be more strongly associated with observed ratings as compared to using a single rater's estimate. We also examined R^2 statistics, which were generated in MPlus, to understand how much variance in observed externalizing behavior could be accounted for by teacher and TA ratings alone and in combination. We found that teacher and TA ratings significantly predicted observed externalizing behavior independently, but when entered in the model together, both ratings were significant only for observed impulsivity (see Table 4). Across all models, teachers alone, TAs alone, and their ratings in combination accounted for small amounts of variance in observed externalizing behavior (R^2=.019-.103).

Although the standardized coefficient (β) was stronger for the teacher's ratings entered alone when compared to the TA's rating entered alone across all models, we used Wald tests to determine whether teachers' ratings were significantly more associated with observed externalizing behavior than TAs' ratings. The Wald test for ODD was significant (Wald=3.781, p=.05) indicating a difference in teachers' and TAs' β coefficients such that lead teachers' ratings of children's oppositionality were more

closely aligned with observed ratings of conflict in the classroom compared to TAs' ratings of oppositionality. Wald tests of coefficient equivalence were non-significant for ratings of HI (Wald= 0.051, p = ns), IA (Wald=0.06, p= ns), and Total Externalizing behavior (Wald=0.159, p= ns).

Discussion

The present study sought to better understand rater agreement and investigated how to integrate assessment information gathered from multiple informants and methods. First, we examined teacher and TA ratings of externalizing behavior to see if two adults—both of whom have comparable roles, interact with children in the same context, and do so for the same amount of time each day—evaluate children's classroom behavior similarly. We also examined whether teacher/TA agreement was greater when lead teachers rated children as evidencing low or high levels of externalizing behavior. We then tested whether agreement between teachers and TAs predicted observed externalizing behavior over and above lead teachers' ratings alone. We further examined how teacher and TA ratings were associated with children's observed classroom behavior by investigating whether teacher, TA, or both of their ratings were better predictors of observed externalizing behavior.

We found that teacher and TA reports of preschoolers' externalizing behavior were moderately correlated between .52 (HI) and .57 (ODD). This is slightly lower but comparable to associations reported by other studies that have investigated agreement between adults with similar roles (average r=.60; Achenbach, 2006). Although the

correlations that we found are higher than those between adults with different roles (e.g., parents and teachers; average *r*=.28; Achenbach et al., 1987), the correlations from our study are still too low to ensure that a similar picture of a child was obtained from each teacher (Achenbach, 2006)—at the most, 32% of the variance in teacher and TA ratings were shared. The differences in teachers and TAs ratings may exist as a function of the context and relationships with which individual teachers interact with children (De los Reyes, et al., 2009). For example, teachers may typically observe all children's behavior during circle time and whole group activities, whereas the TA may be preparing materials for the next activity or working individually with a single challenging child during this period. An alternate explanation could be that rater characteristics, such as expectations for behavior, or psychological and demographic variables, contribute to teachers' differential assessments of children's behavior (Mashburn, Hamre, Downer, & Pianta, 2006). Ultimately, these results highlight that while one teacher may find a child's behavior particularly problematic, another teacher in the same classroom may perceive a child's behavior quite differently. This reflects the importance of gathering input from multiple individuals within the preschool setting when assessing the severity of a child's behavior.

Our tests of whether teacher/TA agreement was greater when children were rated as evidencing low or high levels of externalizing behavior by the lead teacher were significant only for ratings of ODD. Our findings regarding the relation between the severity of teacher ratings and agreement for inattention, hyperactivity/impulsivity, and

total externalizing behavior ran counter to hypotheses proposed in the literature around the severity of behavior and rater agreement (e.g., De los Reyes et al., 2011). At the same time, given that ratings of ODD followed the pattern we expected, it may be that elevated levels of defiance and aggression are more salient and less normative in preschool children when compared with hyperactivity/impulsivity or inattention, which are prevalent in this age group (Campbell, 2002). As such, teachers' definitions of acceptable or typical levels of hyperactivity and inattention may be quite variable. On the other hand, demonstrations of oppositionality and aggression are more likely to be noticed and identified as problematic by multiple individuals; although displays of aggression are not unusual during this period, it is rare for a child to demonstrate these behaviors consistently (Wakschlag, Tolan, & Leventhal, 2010).

We found that after controlling for lead teachers' ratings of externalizing behavior, teacher/TA agreement did not predict observed externalizing behavior. This finding was contrary to our expectations, as we had hypothesized that agreement would be indicative of a more objective evaluation of what was occurring in the classroom. There may be several explanations for these null findings. First, we found low associations between observed externalizing behavior and teacher and TA ratings in general. It may be that these measures are tapping different constructs (Thomas et al., 2011), and therefore agreement between two teachers would not necessarily relate to observational measures. Second, as stated previously, agreement may be a product of similarities between raters (e.g., expectations for acceptable behavior, interaction styles;

De los Reyes et al., 2009) rather than being indicative of what is captured by in independent observer.

The finding that agreement does not relate to observational measures points to the importance of gathering both observational assessments and using teacher report, as even when raters agree about the severity of children's behavior, this does not appear to be indicative of the information captured by an independent observer. While agreement in this study was not concurrently predictive of observational measures, future research should examine whether agreement between multiple teachers is related to important outcomes, similar to the work that has been done with parent and self-report (for a review, see De los Reyes, 2011). As an example, if teacher/TA disagreement does in fact reflect teachers' differing views of preschoolers' externalizing behavior, these differences may impact the consistency with which adults in the classrooms implement interventions aimed to improve externalizing behaviors. This may ultimately affect the extent to which preschoolers' externalizing classroom behavior improves or worsens over time.

In examining whether using both teacher and TA ratings provided a better estimate of observed externalizing behavior compared to using the teacher or TA alone, we found that for all dimensions except HI, using both informants was not a better estimate than using a single informant's report only. We also found that the amount of variance accounted for in observed behavior by both raters individually and in combination was small. Furthermore, even though both teacher and TA ratings were significant when entered into the same model for HI, practically speaking, their reports

still accounted for little variance in observed impulsivity. These results were consistent with the literature (e.g., Carter et al., 2004; Thomas et al., 2011) and suggest that indirect ratings appear to be tapping into a different construct than observational measures. Finally, we found no significant differences in the relation between teachers' ratings and observed externalizing behavior and TAs' ratings and observed externalizing behavior, except for ODD. The relation between teacher ratings of ODD and observed conflict was significantly stronger compared to the relation between TA ratings and observed conflict. This difference may be a product of the varying roles that teachers and TAs play in the classroom. Studies of TAs in primary and secondary school classrooms indicate that TAs are increasingly interacting with children in small group settings, as well as supporting children who have special needs (Rubie-Davies, Blatchford, Webster, Koutsoubou, & Bassett, 2010). If TAs are in fact working with children in smaller, more individualized settings in preschool, and lead teachers tend to be involved in directing whole group instruction and transitions, children may be more likely to display difficult behaviors given the high attentional and behavioral demands of whole group and transition activities. More research will be important in understanding and testing this hypothesis.

The present study has several limitations. First, rating scales were collected at the beginning of the school year, and therefore teachers were still becoming familiar with children as they adjusted to the classroom environment. Second, rating scales were clinical in nature and corresponded to DSM-IV symptoms of ADHD and ODD, and the applicability of these disorders for preschool children has been debated (e.g. Carter et al.,

2004). However, the ADHD RS-IV has been shown to provide useful diagnostic information for preschool age children (Purpura, Wilson, & Lonigan, 2010) and the stability of externalizing behaviors has been documented in this population (e.g. Egger & Angold, 2006). Still, because rating scales were designed for clinical purposes, they may have been less appropriate for use in a community sample with preschool teachers. One could also argue that the small amounts of variance explained by our ratings could have been related to the observational approach used in this study. However, a strength of our study was the amount of time each child was observed (~90 minutes) across multiple days and a variety of activity settings. Even so, it should be noted that some of the behaviors assessed in this study are low base rate behaviors (noncompliance, aggression, oppositionality) even for children who are identified as challenging to manage in the classroom (Pelham et al., 2005). Finally, the selection of children for the study—which was based on teacher reports of externalizing behavior only—may have influenced levels of agreement between teachers and TAs. Selecting children using alternative criteria could have led to greater agreement between teachers and TAs and a stronger relation between teacher/TA agreement and observed behavior. Despite this limitation in our selection, the fact remains that using lead teachers' reports of problematic behavior is practically meaningful. Lead teachers are often involved in the expulsion of preschool children and their referral for services (Gilliam, 2005), highlighting the critical associations between lead teachers' perceptions and important child outcomes. Thus, gaining multiple perspectives on the externalizing behavior of children who are identified

by the lead teacher has important implications in understanding how assessments and agreement align for these children.

In conclusion, our study furthered the work that focuses on understanding multi-informant and multi-method assessment by investigating this phenomenon in an early childhood sample with adult raters who have the same role and interact with children in the same setting. These results have implications both for future research and for early childhood educators. This work highlights that much remains unknown about why discrepancies among teacher, TA, and observational measures occur. For example, are discrepancies measure-specific, such that a different measure might provide more consistent estimates of a child's functioning? Or, in line with other work (e.g., De los Reyes, 2009), does the context of interactions contribute to disagreement, such that each individual teacher and activity setting represents a unique context? Or finally, is agreement linked to rater characteristics, such that teachers with similar beliefs, psychological characteristics, and/or demographic characteristics are likely to evaluate children more uniformly? Although studies have examined factors associated with differences in parents' and teachers' reports of preschoolers externalizing behavior (e.g. Dinnebeil et al., 2013; De los Reyes, 2009), future work should investigate classroom and teacher factors (e.g. demographics, psychological characteristics) that are associated with these differences. Observational classroom measures that explicitly track behaviors that occur with a teacher versus a TA will be helpful in uncovering whether meaningful

variations occur in children's classroom behavior depending on whether the child is interacting with a teacher versus a TA.

For early childhood educators, this work shows that it is important for teachers and TAs to refrain from assuming that they view children's externalizing behavior similarly. Even when teachers and TAs do agree about behavior, an independent, impartial observer is likely to provide additional information that may not be captured by teachers' and TAs' reports. Rather than assuming that one teacher's report or a direct observation's results represent "the truth," it may be helpful to gather more information about the underlying reasons for discrepancies from teachers and observers themselves. This, in turn, might illuminate the type of situations and relationships that evoke particular child behaviors. If children's externalizing behavior is less severe in particular contexts or with particular teachers, providing children with linked supports could be helpful in reducing problematic behavior in the classroom. Because children who exhibit externalizing behavior in the preschool classroom are at risk for a variety of negative outcomes, gaining a better understanding of how multiple individuals and methods evaluate children's behavior will be critical for assessment, and in turn, effective early intervention systems for young children.

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Table 1

Descriptive Statistics: Teacher and TA Ratings, Disagreement, and Observed Disruptive Behavior

Variables	*N*	Minimum	Maximum	Mean	SD
Teacher and TA Ratings					
Teacher HI	360	0.00	27.00	11.75	6.99
TA HI	360	0.00	27.00	10.58	7.26
Teacher IA	359	0.00	27.00	10.11	6.49
TA IA	360	0.00	27.00	8.41	6.97
Teacher ODD	360	0.00	24.00	6.77	6.20
TA ODD	359	0.00	24.00	5.87	6.40
Teacher Total	360	0.00	78.00	28.57	16.39
TA Total	359	0.00	75.00	24.86	17.95
Agreement					
HA Absolute Difference	360	0.00	19.00	5.57	4.41
IA Absolute Difference	359	0.00	20.00	5.08	4.28
ODD Absolute Difference	359	0.00	22.00	4.18	4.11
Total Absolute Difference	359	0.00	46.00	13.03	10.79
Obs. Externalizing Behavior					
Observed Impulsivity	338	1.00	5.88	2.57	0.88
Observed Inattention	338	1.33	6.00	3.30	0.82
Observed Conflict	338	1.00	3.42	1.31	0.36
Obs. Total Externalizing	338	1.34	4.54	2.39	0.57

Table 2

Correlations among Teacher Ratings, TA ratings, and Observed Externalizing Behavior

Variables	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Teacher HI	.516**	.665**	.343**	.556**	.401**	.900***	.486**	.248**	.104	.205**	.218**
2. TA HI		.386**	.732**	.335**	.665**	.500**	.927***	.258**	.106	.209**	.225**
3. Teacher IA			.546**	.383**	.239**	.824**	.453**	.132*	.151**	.140**	.168**
4. TA IA				.172**	.487**	.428**	.859***	.151**	.176*	.121*	.185**
5. Teacher ODD					.574**	.767**	.406**	.221**	.074	.313**	.213**
6. TA ODD						.482**	.815**	.207**	.104	.203**	.197**
7. Teacher Total							.540**	.243**	.133*	.263**	.241**
8. TA Total								.238**	.149**	.205**	.235**
9. Obs, Impulsivity									.533**	.660**	.898***
10. Obs, Inattention										.395**	.826**
11. Obs. Conflict											.730**
12. Obs. Externalizing											1.00

*Note: *p < .05, **p <.01, *** p <.001*

Table 3

Teacher Ratings and Teacher/TA Agreement Predicting Observed Externalizing Behavior

Regressions	**β**	**SE**
Observed Impulsivity		
Teacher HI	.243***	.057
Absolute Difference HI	.039	.060
Observed Inattention		
Teacher IA	.181*	.067
Absolute Difference IA	-.069	.062
Observed Conflict		
Teacher ODD	.326***	.057
Absolute Difference ODD	-.036	.055
Obs. Total Externalizing		
Teacher Total	.256***	.060
Absolute Difference Total	-.035	.060

*Note: *p < .05, ***p <.001*

Table 4

Results Of Separate Regressions Examining Teacher Ratings, TA Ratings, and Teacher and TAs Together Predicting Observed Externalizing Behavior.

	Teacher Ratings Only			**TA Ratings Only**			**Teacher and TA ratings**		
Variables	**β**	**SE**	R^2	**β**	**SE**	R^2	**β**	**SE**	R^2
Obs. Impulsivity									
Teacher HI	0.232***	0.060	0.053	--	--	--	0.161*	0.072	
TA HI	--	--		0.219***	0.058	0.048	0.137*	0.048	
									0.068*
Obs. Inattention									
Teacher IA	0.147*	0.060	0.022	--	--	--	0.107	0.074	
TA IA	--	--		0.137*	0.063	0.019	0.081	0.076	
									0.027
Obs. Conflict[a]									
Teacher ODD	0.318***	0.052	0.101**	---	--	--	0.289***	0.067	
TA ODD	--	--		0.217***	0.054	0.045*	0.050	0.068	
									0.103**
Obs Total Ext.									
Teacher Total	0.207**	0.066	0.043	--	--	--	0.148	0.076	
TA Total	--	--		0.189**	0.059	0.036	0.109	0.067	
									0.052

Note: R-squared values were calculated in M plus.

[a]*Teacher and TA coefficients were significantly different based on Wald Tests.*

**p < .05, **p < .01 ***p <.001*

Study 2: Program and Teacher Characteristics Predicting the Implementation of *Banking Time* with Preschoolers who Display Disruptive Behaviors

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(In Press at *Prevention Science*, 2015)

Abstract

This study examined the relationship among baseline program and teacher characteristics and subsequent implementation of *Banking Time*. *Banking Time* is a dyadic intervention intended to improve a teacher's interaction quality with a specific child. *Banking Time* implementation was examined in the current study using a sample of 59 teachers and preschool children displaying disruptive behaviors in the classroom (~ three children per classroom). Predictors included preschool program type, teacher demographic characteristics (personal and professional) and teacher beliefs (self-efficacy, authoritarian beliefs, and negative attributions about child disruptive behavior). Multiple measures and methods (i.e., teacher report, consultant report, independent observations) were used to assess implementation. We created three implementation composite measures (dosage, quality, and generalized practice) that had high internal consistencies within each composite but were only modestly associated with one another, suggesting unique constructs of implementation. We found that type of preschool program was associated with dosage and quality. Aspects of teacher demographics related to all three implementation composites. Teacher beliefs predicted dosage and generalized practice. Results suggest that the factors that predict the implementation of *Banking Time* vary as a function of the type of implementation being assessed.

Program and Teacher Characteristics Predicting the Implementation of *Banking Time* with Preschoolers who Display Disruptive Behaviors

Children who display early disruptive behaviors (e.g., hyperactivity, impulsivity, low frustration tolerance, non-compliance, anger) are at risk for both short- and long-term negative outcomes. Preschool children with these types of behavior problems are expelled from classrooms three times more often than K-12 students exhibiting similar behavioral problems (Gilliam, 2005). Children who display high levels of disruptive behaviors exhibit less close and often conflictual relationships with teachers (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008), more negative interactions with their peers (Ramani, Brownell, & Campbell, 2010), and less engagement with learning tasks and activities (Bulotsky-Shearer, Fernandez, Dominguez, & Rouse, 2011). This lack of positive engagement in the classroom context is linked with an escalation of behavior problems, less social competence, and greater academic difficulty as children enter into elementary and secondary grades (e.g., Ladd, Birch, & Buhs, 1999).

Developmental theory and prevention science indicate that early treatments for emerging problems, compared with later interventions, are more likely to interrupt the stabilization of behavioral, emotional, and social problems, thereby increasing children's likelihood of positive school success (Kazdin & Weisz, 2003). And yet, even though well validated approaches to support children's social-emotional competence are available, teachers continue to indicate that addressing challenging behaviors is the area in which they most need additional training

(Hemmeter, Corso, & Cheatham, 2006). Thus, the fields of early education and prevention science need additional focus and research to address factors that are supports or barriers to implementing effective preschool/childcare-based intervention and prevention programs. In the current study, we examined whether a set of classroom and teacher factors predicted the implementation of a teacher-child, relationship-based intervention designed to improve young children's emotional and behavioral outcomes.

Interventions Focused on Teacher-Student Relationship Quality

The quality of relationships that students form with their teachers has been repeatedly linked with students' academic and social-emotional outcomes (Sabol & Pianta, 2012). High quality teacher-student relationships are most often characterized by high levels of warmth, sensitivity, and responsiveness and low levels of dependency, negativity and conflict (Sabol & Pianta, 2012). The teacher-student relationship is protective for children who display behavior problems (Baker, Grant, & Morlock, 2008). Because children who display behavior problems often engage in conflictual interactions with their teachers, a positive relationship with a teacher can help prevent coercive cycles, thereby decreasing children's negative behavior and increasing prosocial behavior and achievement (Doumen et al., 2008).

Banking Time is a dyadic intervention intended to improve a teacher's relationship with a specific child. *Banking Time* is directly adapted from parent training interventions that focus extensively on increasing parents' sensitivity and responsiveness (e.g., Brinkmeyer & Eyberg, 2003). The intervention is called *Banking Time* because when a teacher invests in a relationship with a child, that relationship can become a resource in the classroom for both the child and the

teacher during times of challenge (e.g., when the child is struggling within a learning or social activity). The links between teachers' implementation of *Banking Time* and children's outcomes have been examined in two studies of preschool teachers serving low-income preschool children. First, in the context of a larger intervention study, all participating preschool teachers (N=252) within a diverse sample of state-funded preschool programs in an eastern state were provided information to implement *Banking Time* with children selected for the study (N=1064 children; ~4 per classroom; Driscoll, Wang, Mashburn, & Pianta, 2011). Results indicated that voluntary implementation of *Banking Time* (24% of teachers chose to implement) was linked with higher teacher-child closeness. And, teachers implemented *Banking Time* more frequently with children who displayed disruptive behavior or who were from poor backgrounds. In a subsequent study, 29 Head Start teachers were randomly assigned to *Banking Time* or a business as usual condition. The sample included 116 children (4 per classroom). Teachers assigned to the *Banking Time* condition reported increased relationship closeness, child frustration tolerance, task orientation, and competence and decreased conduct problems (Driscoll & Pianta, 2010).

Banking Time is well-suited to be used in classrooms at scale as it is delivered by the teacher and designed to take place in short increments of time during the school day. Teachers spend 10-15 minutes of individual time with a student, two to three times a week. Integral to the *Banking Time* intervention is a consultation model providing implementation support to the teacher, which can be filled through a variety of personnel including school psychologists, guidance counselors, and supervisory or mentoring teachers. Understanding the factors that are linked with teachers' implementation of *Banking Time* can help determine how and why some

teachers are ready to uptake and benefit from interventions. This knowledge can help determine how and when to provide support to improve implementation.

Intervention Implementation

The field of prevention science has called for a better understanding of both the factors that influence intervention implementation and how implementation affects program outcomes (e.g., Damschroder et al., 2009; Domitrovich & Greenberg, 2000). Without information about implementation, it is impossible to understand the mechanisms by which interventions may impact outcomes, thereby preventing the advancement of knowledge for program replication and diffusion (Knoche, Sheridan, Edwards, Osborn, 2010). Although some progress has been made in understanding program implementation, more work that focuses on how to monitor and measure implementation is needed. For instance, implementation studies have most often only examined one aspect of implementation (Durlak & Dupre, 2008). We examined several dimensions of teachers' implementation of *Banking Time*.

Implementation quality has been defined in a variety of ways, and currently there is a lack of consensus regarding which dimensions are most important. Recent conceptual models describe implementation as the processes that need to occur for an intervention to be used within an organization (Damschroder et al., 2009; Durlak & Dupre, 2008). Frequently examined aspects of implementation include *dosage*, which refers to how much of an intervention is delivered, and *quality of delivery*, which refers to how well different intervention components are implemented (Durlak & Dupre, 2008). A less often examined but critical aspect of implementation (sometimes included as an aspect of implementation quality) is *generalization of practice*, which is defined

as the extent to which the intervention components are extended into interactions or activities that are not part of the formal intervention delivery (Domitrovich, Gest, Jones, Gill, & DeRousie, 2010). For many classroom-based interventions, improved child outcomes are expected to occur through the teacher's ability to generalize strategies outside of the training situation (e.g. Blair, Fox, & Lentini, 2010). We know very little about the factors that are related to early childhood teachers' generalization of intervention practice (Sheridan, Edwards, Marvin, & Knoche, 2009).

Previous work examining implementation of *Banking Time* indicated that with respect to dosage, teachers were able to conduct sessions at the requested frequency (i.e., 2-3 times a week). Prior work has not examined quality of teacher's *Banking Time* implementation but did explore generalized practice. Driscoll and Pianta (2011) found that *Banking Time* teachers generalized *Banking Time* techniques (e.g., following a child's lead) to structured interactions outside of *Banking Time* sessions. In order to extend this prior work, we examined multiple indicators of implementation that assessed dosage, quality of delivery, and generalized practice using a multi-method approach that included teacher and consultant report as well as independent observation. We expected that these aspects of implementation would be moderately associated with one another. As an example, even though we expected dosage to be positively related to quality, we anticipated that some teachers may have provided high dosage of *Banking Time* but with lower quality and little generalization. We then examined teacher and school factors that predicted these different aspects of implementation.

Factors Linked with Implementation

Several comprehensive reviews provide useful frameworks for understanding and

organizing the factors that may be linked with intervention implementation (Aarons, Hurlburt, & Horwitz, 2011; Damschroder et al., 2009; Durlak & Dupre, 2008). These models underscore the myriad of factors that occur at multiple levels (e.g., school, teacher) and interact to impact implementation. We selected a limited number of teacher and program factors that we hypothesized would be relevant in understanding the implementation of this intervention. In this study, we focused on the type of preschool program within which the teacher taught, key teacher demographics, and multiple aspects of teacher beliefs. Below we describe our rationale for choosing these variables to predict teachers' implementation of *Banking Time.*

Type of Preschool Program. Variability in intervention participation has been attributed to the type of center (i.e., Head Start or private child care; Baker, Kupersmidt, Voegler-Lee, Arnold, & Willoughby, 2010). In a study that examined implementation of a social-emotional and academic program targeting school readiness, Baker et al. (2010) found that Head Start teachers were less likely than teachers in community centers to implement the intervention. Researchers speculated this may have been because teachers in Head Start must fulfill multiple federal requirements, and therefore implementing a new program may have been especially difficult given teachers' competing demands. In addition, center characteristics have been tied to quality (Blau, 2000), which may be related to implementation via shared factors that are important for both implementation and classroom quality. For example, policies (e.g., regulations, state laws) have been shown to relate to implementation (Domitrovich et al., 2010), and these factors have also been associated with preschool classroom quality (Mashburn et al., 2008). In an investigation of the relation between center characteristics and program quality,

Blau (2000) found that centers that received public subsidies for maintaining certain standards of care displayed higher quality than for-profit, privately run, or non-profit preschools. We implemented *Banking Time* in classrooms that were part of Head Start, state-funded pre-k, and private programs. Given previous research on classroom quality and implementation, we predicted that teachers working in state-funded preschools would evidence better implementation compared to teachers working in Head Start or privately run preschool programs.

Teacher demographics. Teacher socio-demographics, such as years of experience, specialization in early childhood, and race/ethnicity were hypothesized to possibly relate to uptake of the *Banking Time* intervention. Existing research examining the association between teacher experience and implementation has shown inconsistent findings (e.g., Baker et al., 2010 vs. Morris et al., 2013). However, we hypothesized that less experienced teachers may be more willing to uptake a new strategy in their classroom (Morris et al., 2013). Because *Banking Time* is a child-centered intervention, we expected teachers whose education did not include a focus on early childhood might be less likely to uptake the intervention. We found little research examining the extent to which teacher race/ethnicity was linked with intervention implementation in early childhood. However, because *Banking Time* is directly adapted from parent training interventions where research has indicated that parents of minority ethnicity show lower levels of engagement in parent training (Lau, 2006) we wanted to examine whether teacher ethnicity was related to implementation of *Banking Time*.

Teacher beliefs. Teachers' perceptions of teacher-child relationships are influenced by their own personal characteristics (e.g. Doumen et al., 2012; Mashburn et al., 2006; Spilt,

Koomen, Thijs, van der Leij, 2012). Given the explicit focus on *Banking Time* to improve child disruptive behavior through strengthening the teacher-child relationship, we expected that teachers' existing belief systems (i.e., authoritarian beliefs, efficacy, attributions) might be associated with their implementation of *Banking Time*. We expected that teachers who were more child-centered in their beliefs would be more responsive to *Banking Time,* which is consistent with other research examining interventions focused on improving teacher-child interactions (Downer, LoCasale-Crouch, Hamre, & Pianta, 2009). With regard to teaching self-efficacy, research suggests that higher teaching self-efficacy is related to more positive perceptions of the teacher-child relationship (Spilt et al., 2012) and high-quality program implementation (Kallestad & Olweus, 2003). Thus, we hypothesized that teachers with higher levels of teaching efficacy would be more open to implementing an intervention focused on improving the teacher-child relationship. Finally, recent research found that teacher reported negative attributions were linked with less supportive teacher interactions, lower perceptions of teacher-child relationship closeness, and more negative discipline practices (Carter, Williford, & Locasale-Crouch, 2014). Given this, we hypothesized that teachers who endorsed more negative attributions might be less likely to implement an intervention that was focused on improving the teacher-child relationship, emphasized that the child lead the session, and did not encourage traditional behavior management strategies.

In sum, the current study examined the relations among multiple program and teacher characteristics collected at baseline and subsequent implementation of *Banking Time*. We

investigated multiple predictors of implementation including the organizational setting of type of preschool program, teacher demographics and educational background, and teacher beliefs.

Method

Participants

Data were collected as part of a larger randomized control trial examining the impact of *Banking Time* to improve children's social-emotional outcomes. Teachers (N = 173) were randomly assigned to one of three treatment conditions (Intervention—*Banking Time*, Time-Control Comparison, Business-as-Usual). The current sample included the 59 teachers who were assigned to the *Banking Time* condition and who were active participants at the time when the intervention work started (about six weeks into the school year). Six teachers who were randomly assigned to the *Banking Time* condition were excluded because they attrited from the study before starting the intervention. Teachers were mostly female (94.7%) and averaged 40.38 years of age (SD = 11.91). Most teachers (67.8%) reported having a bachelor's degree or higher (M education years = 15.51, SD = 1.56) and had on average 8.54 years of experience teaching pre-kindergarten (SD = 7.15). Teachers' racial/ethnic composition was 49% White, 42% Black, 3.5% Hispanic, and 5.5% Multi-racial or another ethnicity.

Procedures

Recruitment of preschool programs (Head Start, state-funded public, and private [for- and not-for-profit]) occurred in three urban or semi-urban southeast regions. Programs were contacted by email, phone, and/or in person. If a director agreed to allow teachers to participate, research staff met with teachers, described the project, and asked them to participate. Programs

varied in size (Range = 1 – 6 preschool classrooms/building). Teachers who agreed to participate signed an informed consent form and were randomized into conditions. Teachers allowed data collectors access to their classrooms for observations, completed surveys, and assisted in obtaining parental consent. All parents or guardians of children in each participating classroom (*M* = 15 students, *SD* = 3.2) were given a letter explaining the study, an informed consent form, and a short family demographic survey, which they completed and returned to their child's teacher (76% of parents agreed to participate). Teachers rated all children in their classroom on two disruptive behavior rating scales (ADHD Rating Scale-IV, DuPaul et al., 1998; ODD Rating Scale, Hommersen, Murray, Ohan, & Johnston, 2006). The two boys and one girl who had the highest teacher ratings of disruptive behavior (ADHD and ODD combined) *and* who also had caregiver consent participated in the remainder of the study (88% of selected children were rated by their teachers as the 2 boys or 1 girl evidencing the most disruptive behavior). Children were then randomly assigned to receive the treatment during one of three, seven-week treatment windows. Data were collected at four points during the year: (a) before window 1/baseline, (b) after window 1/before window 2, (c) after window 2/before window 3, and (d) after window 3/end-of-year. Before any intervention began at baseline, classroom and teacher characteristics were collected via teacher report. Teacher implementation data was collected during or immediately after each treatment window via teacher report, consultant report, or observation.

Intervention. *Banking Time* sessions are a set of time-limited (10-15 minutes), one-on-one meetings between a teacher and a child that take place within the school setting and occur two to three times per week. For the current study, teachers implemented *Banking Time* with one

child at a time for seven consecutive weeks during his/her selected window (~ 3 children total). Teachers were instructed to find time that they could work with the child privately (e.g., have another staff member substitute for the teacher so the teacher could have an individual *Banking Time* session in a library or break room). During each *Banking Time* session, a teacher and child participated in an activity that was supposed to be chosen and led by the child. Teachers were instructed to implement critical skills designed to improve the quality of teacher-child interactions: (a) observing the child's behaviors and expressed emotions, (b) narrating the child's actions and allowing the child to lead the activity, (c) accurately labeling the child's feelings and emotions to understand the child's perspective, and (d) developing relational themes to focus on important aspects of the teacher-child relationship. Teachers were also instructed to limit questioning and refrain from teaching skills during the session.

Implementation support. Teachers were provided with a site-specific consultant to increase the likelihood that the teacher fully implemented *Banking Time*. Immediately after baseline data collection, consultants met individually with each teacher for about 1.5 hours, at which time they provided teachers with a *Banking Time* teacher manual and briefly described the intervention. Following this interaction, teachers and consultants had a face-to-face meeting once every two weeks and a brief phone meeting on the alternate weeks. The focus of in-person and phone meetings was to ensure that teachers fully implemented the *Banking Time* intervention. Initially, consultants supported teachers' implementation by helping them problem-solve how to fit *Banking Time* into their daily teaching routine so that teachers implemented at full dosage levels (3X/week). Throughout the year, teachers videotaped an individual *Banking Time* session

once a week and sent this footage to their consultant. The consultant reviewed and rated this footage (see measures section for details) and used short clips from this footage in the face-to-face meetings in order to improve the teacher's implementation and address any questions or concerns. The phone meetings were check-ins used to make sure that teachers were on-track with implementation and provided teachers with an opportunity to problem-solve with the consultant.

This study employed four *Banking Time* consultants across three sites, with one site using two consultants. All consultants had a Master's degree in education or psychology and had early childhood experience. Consultants received intensive training before starting their work with teachers that consisted of one week of on-site training and additional off-site training. In addition, consultants participated in weekly group and individual supervision throughout the year led by a supervisor who had extensive early childhood experience and prior training in *Banking Time* to ensure that consultants were providing accurate information in their support of teachers. The supervisor regularly selected teachers' tapes of *Banking Time* sessions at random from each consultant. The supervisor then independently reviewed and rated the tape using the same coding scheme as the consultant to ensure consultant accuracy. Disagreements occurred infrequently but were discussed when they arose.

Measures

Predictors of implementation.

Program Type. The type of preschool program within which each teacher worked (Head Start, state-funded, private) was collected at the time of recruitment.

Teacher professional characteristics. In the fall, teachers completed a survey asking them to report personal and professional demographics including their race, years of experience teaching pre-k, and whether they had a degree in early childhood education.

Teacher beliefs. Teachers' beliefs about teaching young children were assessed using the *Modernity Scale* (Schaefer & Edgerton, 1985). This 16-item Likert scale discriminates between "traditional" adult-centered/authoritarian perspectives on interactions with children, and more "modern or progressive" child-centered perspectives (α =0.79). Teachers' instructional self-efficacy was assessed using an abbreviated 7-item, likert scale version of the *Teacher Self-Efficacy Scale* (TSES; Bandura, 1997), which measured teachers' self-efficacy towards discipline, instruction, positive environment, and decision-making (α =.86). Teacher's negative attributions regarding child misbehavior was assessed using the *Preschool Teaching Attributions Scale* (PTA; Carter et al., 2014), which includes two subscales: causal and responsibility. The PTA asks a teacher to think about a recent time that a child in his or her classroom exhibited five scenarios of disruptive behavior (e.g., noncompliance toward teacher). For each scenario, the teacher uses a likert scale to rate statements regarding aspects of negative attributions (α =.85). The negative responsibility attribution subscale score was used (i.e., the child's behavior was purposeful rather than unintentional, done with negative intentions, motivated by selfish reasons, and deserved to be disciplined). Higher scores on the teacher beliefs variables indicate greater self-efficacy, more authoritarian beliefs, and more negative responsibility attributions about disruptive behavior.

Implementation outcomes.

Implementation was assessed at the end of each window. Table 1 provides the descriptive statistics for each of the implementation variables.

Dosage. Four variables (α=.80) were aggregated to assess the amount of total dosage each teacher received in *Banking Time*: Three variables assessed how often teachers implemented *Banking Time*: (a) Number of videos submitted (ideal number of videos = 7). Once a week, teachers were asked to submit a video of a *Banking Time* session to consultants. (b) Number of session notes submitted (ideal = 3 x 7 or 21). After each *Banking Time* session, teachers were asked to complete session notes that included information about the date and duration of intervention sessions. (c) Consultant ratings of the frequency that teachers implemented *Banking Time*. Consultants rated the frequency with which they thought each teacher engaged in *Banking Time* during each window on a five point scale ranging from 1, "Never or rarely" to 4, "Very Frequently—three times a week for most weeks". (d) Dosage was also measured by how often teachers participated in the consultancy. Consultants kept a detailed log of all teacher contacts including the number of phone meetings during each window (ideal =3 or 4). We did not use the number of face-to-face meetings in the dosage composite for two reasons. First, almost all teachers met with their consultant at least 3-or 4-times (which was ideal) during each window (M =3.91). Second, some consultants chose to meet with teachers face-to-face more frequently if they felt teachers were less engaged, and so higher face-to-face meetings indicated lower implementation for some teachers.

Quality. Two variables (r =.52) were aggregated to assess the quality of teachers' implementation of *Banking Time.* (a) Consultants reviewed each of their teachers' video-

recorded teacher-child *Banking Time* sessions and rated the teacher's overall quality of implementation of *Banking Time* on a 4-point, likert scale ranging from "very poor" to "good" (see procedures section for more details). Quality of the teacher-child session was evaluated by consultants in terms of using the *Banking Time* techniques effectively (observation, narration, labeling, and relational themes), integrating techniques, and maintaining a session that was child-led by limiting questioning, teaching, and other directive language. (b) Consultants also reported on their impressions of the quality of teachers' engagement in *Banking Time* after each window. Consultants rated the extent to which they disagreed or agreed with statements about teachers' openness to the intervention (e.g., "This teacher is open to trying new or different strategies") and teachers' involvement during consultation sessions (e.g., "This teacher takes an active role in consultancy sessions") using 12 items rated on a 5-point, likert scale that ranged from "definitely agree" to "definitely disagree" (α=.95).

Generalized practice. Teachers' generalized practice of *Banking Time* was assessed during a 3-minute clean-up portion of a standardized, teacher-child interaction task. Immediately following the treatment/assessment window, trained data collectors scheduled a time to administer and video-record this task with all teachers across conditions. This standardized task was different from a *Banking Time* session in several a ways. The task included a 7-minute play session during which the teacher and child were instructed to play with a specially selected set of toys that the data collector emptied from a bin and spread out on the floor. This was followed by a 3-minute clean-up session that began when the data collector stated that the child should clean up and sort the toys. This task was adapted from the mother-child interaction task developed by

Egeland and Hiester (1993) and similar tasks that have been used frequently in developmental research to examine the quality of mother-child interactions (e.g. Carlson, Egeland, & Sroufe, 2009; Kochanska & Aksan, 1995). We adapted the task to examine the quality of interactions across teacher-child dyads in a standardized setting. The clean-up portion was selected because it was a situation that was outside of a *Banking Time* session that was designed to induce stress upon the dyad similar to situations in classrooms where teacher-child conflict may occur (e.g., child given a directive with which he/she may not want to comply). Coders blind to condition evaluated the frequency with which teachers used *Banking Time* strategies during this structured play task. For the current study, the following items were coded on a 5-point likert scale ranging from "very poor" to "good": (a) use of observation, (b) use of imitation, (c) use of overall narration, (d) use of language to control child's behavior (reverse scored), and (e) session was child-led. Correlations among the individual *Banking Time* techniques were positive, although there was variability in teachers' use of the individual *Banking Time* techniques with positive correlations among the individual indictors ranging from low to high. We used a total score across all items which evidenced adequate reliability (α =.71). Thirty-five percent of tapes were double coded, and the intraclass correlation for the composite score was .73. Validity of the measure was supported by the total score's inverse relation to independently observed teacher-child conflict in the classroom (r=-.22; p<.05) as measured by the inCLASS (Individualized Classroom Assessment Scoring System; Downer, Booren, Hamre, Pianta, & Williford, 2011).

Data Analytic Plan

Data were analyzed using Mplus Version 6.1 (Muthén & Muthén, 1998-2010). Missing data for any one variable ranged between 0% and 27%. Analyses were run using maximum likelihood estimation with robust standard errors so that data analyses used all available data (i.e., 59 teachers and 160 cycles). The hierarchical/organizational structure of the data where windows (level 1) were nested within teachers (level 2) was taken into account by conducting two-level, hierarchical regressions (using type=two-level). This approach adjusts the standard errors to take into account that windows were clustered within teachers. Each implementation outcome variable was examined in a separate model. Full models were fit and included window, site variables, teacher demographic variables, and teacher beliefs to determine the unique explanatory variance of each between-level variable. In order to determine if implementation varied across windows, we created two dummy variables where Window 1 served as the reference group. All other predictors were between-level. Categorical variables were dummy coded as follows: for program type, Head Start = 1 and Private =1, so that State-Funded preschool served as the reference group; for teacher ethnicity, Minority Ethnicity =1 so that White, non-Hispanic served as the reference group; for teacher major, Early Childhood =1 so that teachers without this major served as the reference group. Consultants were accounted for by including a series of three dummy codes.

Results

Table 2 provides the bivariate correlations of predictor and outcome variables. The implementation measures were modestly associated with one another and the associations between the predictor variables and implementation outcome variables ranged from small to

medium. Table 3 provides the results of the hierarchical models of program and teacher factors predicting aspects of *Banking Time* implementation. There was one effect of Window/Time such that teachers tended to display lower dosage during the last Window compared to the first Window (B = -.26, SE= .11, p<.05).

Dosage

Compared to teachers in state-funded preschool programs, teachers in Head Start preschool programs (B = -.62, SE= .32, p=.05) and teachers in private preschool programs (B = -.44, SE = .18, p = .016) exhibited lower *Banking Time* dosage, as did teachers of Minority Ethnicity compared to teachers of White, non-Hispanic ethnicity (B = -.45, SE = .15, p = .003). Teachers with an Early Childhood major demonstrated greater *Banking Time* dosage (B =.29, SE =.11, p = .007). Finally, teachers reporting more authoritarian beliefs exhibited higher *Banking Time* dosage (B = .33, SE = .15, p = .022).

Quality

Teachers in Head Start or private preschool programs tended to evidence lower *Banking Time* quality (B = -1.18, SE = .38, p = .001; B = -.47, SE = .23, p = .028, respectively) as compared to teachers in state-funded preschool programs. Teachers who were of Minority Ethnicity compared to teachers of White, non-Hispanic ethnicity tended to evidence lower quality (B = -.68, SE = .22, p = .001).

Generalized Practice

Teachers' report of negative attributions was positively associated with generalized practice (B = .16, SE = .07, p = .023), such that teachers who reported more negative

responsibility attributions about children's disruptive behavior tended to display higher generalized practice.

Discussion

The purpose of the current study was to examine classroom and teacher characteristics that predicted teachers' implementation of *Banking Time*—a social-emotional intervention aimed at improving the quality of the teacher-child relationship—in a sample of early childhood teachers and preschool children. There are multiple aspects of implementation that can be measured in a variety of ways. A clear strength of this work was our examination of implementation in terms of dosage (how *often* teachers engaged in the *Banking Time* intervention), quality (how *well* teachers engaged), and generalized practice (did teachers extend what they learned). In addition, we used a multi-method approach to assessing these implementation aspects, including teacher report, consultant report, and independent observations.

An interesting descriptive result was that the implementation components were modestly or not significantly associated with one another. Dosage was positively linked with quality and quality was positively linked with generalized practice. However dosage was not significantly related to generalized practice. In addition, we found differential prediction of these implementation outcomes. Together, these results underscore the multi-dimensional nature of intervention implementation and emphasize that multiple aspects of implementation need to be examined in order to determine how to best support teachers to take-up and use interventions.

Below we discuss the implications associated with the differential pattern of results for predictors of dosage, quality, and generalized practice.

Our study tested an intervention within a range of preschool program types rather than within a single program type, which is more typical. This heterogeneity allowed us to examine how teachers working within different program types vary in their implementation of *Banking Time*. Teachers working with children in classrooms that were part of Head Start or private preschool programs were less likely to implement *Banking Time* than state-funded preschool programs in terms of dosage and quality. This result may be because state-funded classrooms reside within a larger elementary school setting. As such, teachers may have been more likely to have access to a private space for teacher-child and consultation sessions, and principals and resource teachers may have been more supportive of teachers' implementation of this intervention. Alternatively, the quality of higher order contextual characteristics (e.g., administrative leadership and organization) have been found to be important for good implementation (Durlak & Dupre, 2008), and these factors may have overlapped with program type in the current study. However, we did not collect data on these higher-level administrative and leadership characteristics in our study. At the end of the year, we asked teachers to report whether implementing *Banking Time* was feasible and/or stressful and whether they had adequate support at their school/center to support their implementation. As a post hoc analysis, we looked to see if teachers' responses differed based on program type and we found no evidence of differences. Thus, more research is needed to understand why teachers in state-

funded preschool programs may be better able to implement interventions such as *Banking Time* at greater frequency and with higher quality.

In terms of teacher demographics, we found that teachers who were of minority ethnicity tended to engage in *Banking Time* less often and with lower quality compared to White, not Hispanic teachers. Minority and White teachers did not differ in the extent to which they transferred *Banking Time* techniques into a new setting. Researchers have expressed concern about the generalizability of interventions to diverse consumer populations (e.g., Lau, 2006). These results suggest that minority teachers were less receptive to the intervention as indicated by a lower degree of dosage, perhaps indicating a lack of social validity with these teachers. Future exploration is needed to determine how to overcome barriers to engagement, including whether intervention adaptations may be needed (e.g., ethnic match with consultant; Lau, 2006) to promote better uptake and implementation of the intervention. Teachers with specialization in early childhood tended to engage in *Banking Time* more often compared to teachers without this specialization. This is consistent with research that has shown that early childhood training is linked to quality (Pianta et al., 2005) and productivity (Blau, 2000).

Our results with respect to teacher beliefs were not consistent with our hypotheses. Teachers holding more authoritarian/adult-centered beliefs tended to implement *Banking Time* with higher dosage, and teachers who had beliefs that a child's behavior is purposeful, motivated by selfish reasons, and deserves to be disciplined were more likely to extend *Banking Time* techniques outside of their sessions. Previous research has found that teachers who are most in need of an intervention may benefit the most from engagement in that intervention (Raver et al.,

2008). Along these lines, perhaps for teachers who initially held more adult-centered beliefs or negative attributions about the children with whom they were working, implementation of *Banking Time* provided opportunities to engage in teacher-child interactions that were set up to be very different from their typical day-to-day interactions with children. The interactions during *Banking Time* may have provided these teachers with a view of a child that diverged from their current personal beliefs, and this juxtaposition may have been influential for these teachers and had a greater impact on their implementation. Teacher beliefs need to be examined in future implementation research to determine if our unexpected effects will hold in other studies that assess similar belief constructs.

Our study is limited by the fact that this was an observational study that explored the associations between baseline predictors and subsequent teacher implementation within a group of teachers receiving *Banking Time*, and thus results cannot be interpreted causally. In addition, the sample size for this study was relatively small (N = 59), which limited the number of factors that we could use to predict teacher's implementation of *Banking Time*. The small sample size also limited our power, allowing us to detect only modest associations between baseline characteristics and implementation.

In conclusion, we examined program type, teacher demographics, and teacher beliefs collected at baseline that predicted implementation of *Banking Time*. This dyadic intervention was designed to improve a teacher's relationship with a specific child and was implemented by early childhood education teachers with children displaying disruptive behavior. Research focused on implementation can advance our understanding of the mechanisms by which

interventions impact outcomes and our knowledge of effective program replication and scalability (Domitrovich & Greenberg, 2000; Knoche et al., 2010). We found that the factors that predicted *Banking Time* implementation varied depending upon type of implementation. This implies that teachers may need distinct types of scaffolding and support for various implementation components. This type of individualization may be the key to the successful implementation of many SEL interventions. For young children who display disruptive behavior problems, improving the teacher-child relationship can increase their early school success, as teachers may be less likely to remove them from the early childhood classroom—a reality that the research indicates happens all too frequently (Gilliam, 2005). Perhaps, by individualizing supports during implementation, teachers may in turn be more likely to individualize their interactions to meet children's needs.

Acknowledgments

This manuscript was supported by a grant awarded to the first author by the Institute of Education Sciences, U.S. Department of Education, through Grant R324A100215 respectively to the University of Virginia. The opinions expressed are those of the authors and do not represent views of the U.S. Department of Education. The authors wish to thank the generous programs and teachers who participated in this study. In addition we are grateful to all project staff for their contributions to this work. The authors declare that they have no conflict of interest.

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Table 1

Descriptives of Implementation Variables, and Outcome Composites

Implementation Variables	Minimum	Maximum	Mean	SD
Dosage				
Phone Attendance	0.00	5.00	2.33	1.29
# Videos Submitted	0.00	8.00	4.67	2.37
# Session Notes Submitted	0.00	26.00	13.30	6.76
Frequency of BT Sessions	1.00	5.00	3.23	1.54
Quality				
Session Quality	1.00	4.00	3.12	0.65
Engagement	1.42	5.00	3.84	1.01
Banking Time Fidelity During a Structured Free Play				
Observation	1.00	5.00	2.99	0.90
Narration	1.00	5.00	2.23	0.71
Imitation	1.00	5.00	2.37	0.76
Language to Control (Rev.)	1.00	5.00	3.20	1.19
Child-Led	1.00	5.00	2.98	1.15

Table 2

Bivariate Correlations among Predictor and Outcome Variables

	Minority	Yrs. Exp. PK	EC Major	Author. Beliefs	Self-Efficacy	Attributions	Dosage	Quality	Gen. Practice
Minority	--	.04	.16	.24	.15	-.13	**-.37****	-.26	-.17
Years Exp. PK		--	.11	-.09	**.**02	.22	-.03	.01	-.23
EC Major			--	-.04	.03	-.21	.06	.07	.12
Author. Beliefs				--	-.06	.26	.06	-.08	-.05
Self-Efficacy					--	.14	.10	-.14	-.14
Attributions						--	.05	-.10	.21
Dosage							--	**.36****	.23
Quality								--	**.39****
Gen. Practice									**---**

Note: Author. Beliefs = authoritarian beliefs, EC Major = early childhood major, Gen. Practice = generalized practice.
*$p < .05$, **$p < .01$

Table 3

Predictors of implementation and their association with dosage, quality, and generalized practice.

	Dosage		**Quality**		**Generalized Practice**	
	B (β)	*SE*	B (β)	*SE*	B (β)	*SE*
Within						
Window 2	-0.14 (-0.14)	0.09	0.02 (0.02)	0.08	-0.03 (-0.02)	0.13
Window 3	**-0.26* (-0.24)**	0.11	0.23 (0.22)	0.13	-0.14 (-0.11)	0.15
Between						
Classroom Context						
Head Start	**-0.62* (-0.39)**	0.32	**-1.18** (-0.66)**	0.38	0.04 (0.08)	0.20
Private	**-0.44* (-0.32)**	0.18	**-0.47* (-0.30)**	0.23	0.22 (0.47)	0.16
Teacher Demographics						
Minority Ethnicity	**-0.45** (-0.32)**	0.15	**-0.68** (-0.44)**	0.22	0.08 (0.17)	0.19
Years Experience Pre-K	0.00 (0.02)	0.01	-0.02 (-0.19)	0.02	-0.02 (-0.49)	0.01
Early Childhood Major	**0.29** (0.36)**	0.11	-0.07 (-0.08)	0.12	0.13 (0.48)	0.10
Teacher Beliefs						
Authoritarian Beliefs	**0.33* (0.32)**	0.15	0.04 (0.04)	0.15	-0.08 (-0.24)	0.09
Self-Efficacy	0.08 (0.10)	0.10	-0.02 (-0.03)	0.11	0.03 (0.11)	0.09
Attributions	-0.01 (-0.01)	0.11	-0.21 (-0.22)	0.13	**0.16*(0.57)**	0.07

Note: Dosage, Quality, and Generalized Practice were run in separate two-level models with window controlled for at the within level using a series of dummy codes, where Window 1 is the reference group. Reference group for Classroom Context variables =state-funded preschools. Consultants were controlled for using a series of dummy codes.**p* < .05, ***p* < .01.

Internal Working Models and Secure Base Behavior: Preschool Children's Representations of the Teacher-Child Relationship

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Abstract

The importance of early teacher-child relationships is often explained using attachment theory, which asserts that children form an internal representation of the teacher-child relationship to help guide their engagement in classroom tasks. Using a sample of 157 preschool children at risk of developing a disruptive behavior disorder, the current study examined children's internal representations of the teacher-child relationship. The study used a newly developed narrative procedure and adapted a coding scheme that has been well used within the parent-child attachment literature. Children's representations as assessed through their narratives were internally consistent and were modestly associated with established measures of the teacher-child relationship. Results supported that children's perceptions of their relationships as assessed through both a drawing and a verbal narrative demonstrated qualities of internal working models: children whose representations were indicative of more positive representations of their teacher were less dependent on positive interactions with their teachers to be oriented towards tasks. Findings point to the importance of understanding preschoolers' internal representations of the teacher-child relationship to better understand how this relationship contributes to children's school success.

Internal Working Models and Secure Base Behavior: Preschool Children's Representations of the Teacher-Child Relationship

Extensive work has documented the importance of the teacher-child relationship, in particular for young children who are at risk of negative school-related outcomes due to disruptive behaviors (Baker, 2006; Hamre & Pianta, 2001; Palermo, Hanish, Martin, Fabes, & Reiser, 2007; Sabol & Pianta, 2012). Attachment theory explains these links by positing that early caregiver relationships—including those with teachers— become internalized within the child and serve as a secure base from which children explore their surroundings (Birch & Ladd, 1997; Howes, 2000; Kennedy & Kennedy, 2004; Verschueren & Koomen, 2012). This process facilitates young children's learning by giving them the confidence to engage in the classroom environment (Kennedy & Kennedy, 2004). However, although children's internalizations of the teacher-child relationship are believed to contribute to their classroom success (Howes, 2000), the majority of work has examined this relationship from the perspective of the teacher (Roorda, Koomen, Spilt, & Oort, 2011). This study adds to the literature on the teacher-child relationship by applying a coding scheme adapted from the parent-child attachment literature to a newly developed narrative storytelling procedure designed to understand children's internalization of their relationship with their preschool teacher.

Attachment Theory and the Teacher Child Relationship

The importance of the teacher-child relationship is often explained by attachment theory. Attachment theory asserts that a primary caregiver's responsive and sensitive interactions over time help young children to feel safe—children learn that caregivers will be available and ready to respond with comfort or reassurance when necessary (Bowlby, 1988). In turn, the caregiver becomes a secure base, or a resource from which children successfully explore the environment (Bowlby, 1988; Birch & Ladd, 1997; Howes, 2000). This allows for successful learning by encouraging children to confidently interact with the social and physical environment (Ainsworth & Bell, 1970; Bowlby, 1988; Kennedy & Kennedy, 2004). In the absence of danger or stress, children who experience a secure attachment with their caregivers are likely to engage in their surroundings, with periodic checks on the caregiver's location (Bowlby, 1988; Waters & Deane, 1985). During the preschool period, secure base behavior is accompanied by increasing autonomy, meaning that the balance is likely to favor independent exploration; children are expected to return to a caregiver for guidance or reassurance only when other options have been exhausted (Delius, Bovenschen, & Spangler, 2008).

Over time, caregivers' responses to children become internalized in the child. Children form an internal working model, which is a cognitive representation that governs how the child feels toward the attachment figure, the expectation that a child carries into interactions, and how a child plans his or her behavior (Bowlby, 1988; Verschueren & Koomen, 2012). These internal working models are adaptive and help children predict the caregiver's actions and formulate an appropriate response

(Bretherton, Ridgeway, & Cassidy, 1990). Because these relational patterns become internalized in the child via an internal working model, children's interactions with early caregivers persist and are replicated in their future relationships (Bowlby, 1988).

The Importance of the Teacher-Child Relationship

Although attachment theory is most commonly applied to parent-child relationships, the teacher can also be considered an attachment figure, a role that is hypothesized to be more important for younger and more vulnerable children (Howes, 1999; Verschueren & Koomen, 2012). Sensitive and responsive teacher-child relationships have been shown to be protective for children with behavioral difficulties, who demonstrate improved academic outcomes when they experience a supportive teacher-child relationship during early schooling (Baker, 2006). Conversely, early conflictual teacher-child relationships, characterized by high negativity, have been shown to predict poor outcomes through eighth grade, particularly for children with externalizing behavior (Hamre & Pianta, 2001). Additionally, preschool and elementary teacher-child relationships have demonstrated moderate stability across grade levels (Ladd & Burgess, 2001; Howes, Phillepsen & Peisner-Feinberg, 1998), suggesting that children's relationship quality is replicated with teachers across time. This body of work emphasizes the importance of the teacher-child relationship in predicting outcomes for children who demonstrate challenging behaviors, both during the year that a child spends with a particular teacher and beyond.

Assessing Internal Working Models: The Parent-Child Literature

Most studies examining the teacher-child relationship have relied on teachers' perceptions (Roorda et al., 2011), despite the fact that internal working models are frequently cited as the process by which positive teacher-child relationships reduce risk for children with externalizing behaviors within and across grade levels (Bergin & Bergin, 2009; Kennedy & Kennedy, 2004). However, the parent-child attachment literature offers information on how to assess young children's internal representations of attachment figures. Representational measures are unique in that they evaluate attachment themes ambiguously to allow children the freedom to openly express their underlying perspective and emotions (Oppenheim & Waters, 1995). Both drawings and narrative measures have demonstrated validity in assessing how preschoolers represent their attachment relationships with parents (e.g., Emde, Wolf, & Oppenheim, 2003; Fury, Carlson, & Sroufe, 1996; Goldwyn, Stanley, Smith, & Green, 2000; Madigan, Ladd, & Goldberg, 2003). Compared to drawing methods, which are reliant on children's visual-motor skills, narrative measures are unique in that they utilize children's language to communicate how they view relationships and critical events (Oppenheim & Waters, 1995; Fiese & Spagnola, 2005).

The MacArthur Story Stem Battery. The Macarthur Story Stem Battery (MSSB; Emde et al., 2003) is a reliable and validated narrative procedure that has been extensively researched in the parent-child literature and provides information on the emotional organization, attachment, and internalization of parental relationships in clinical and non-clinical preschool populations. The procedure requires a trained

examiner to provide several story stems that introduce a conflict or a problem to solve. The child is provided with dolls and props and uses them to act out a response to each of the stems. Through this process, children are hypothesized to access their emotional responses as well as their underlying representations of the parent-child relationship (Bretherton & Oppenheim, 2003).

Several MSSB coding schemes have been developed, as the procedure allows for flexibly tailoring codes and story stems to the research question of interest (Bretherton & Oppenheim, 2003). Codes borrowed from multiple coding systems have been shown to cluster into four main factors, including: anger and discipline, positive themes and representations, negative themes and representations, and coherence of the story (Von Klitzing, Kelsay, & Emde, 2003). Both the content of the stories that children tell (i.e., themes and representations) in addition to the coherence of children's stories (i.e., the logic, response to the conflict, and openness in story-telling) have been related to children's attachment status and ratings of externalizing and prosocial behavior (Bretherton et al., 1990; Emde et al., 2003). This body of work highlights the possibility of accessing preschoolers' internal working models through the use of narrative measures.

However, there are important limitations to consider related to narrative story stems. Despite the extensive evidence of reliability and validity they have shown in assessing parent-child relationships and attachment, there are challenges related to the procedure's scalability—the multiple story stems require a set of clinical skills that are

complex, and the protocol is time-intensive (Bettman & Lundahl, 2007). Thus, given the strengths and limitations of the MSSB, the current study developed a narrative procedure that required children to tell a story about a drawing that they created of them and their teacher. This procedure allowed for the possibility of gathering two representational measures: children's drawings that were previously and independently coded for relational negativity (Hartz & Williford, 2015) and a narrative measure that was coded for positive and negative themes/representations, emotions, and coherence of the story.

Extending Narratives to the Teacher-Child Relationship

Given the current study's aim to develop a valid measure of children's internal representations of the teacher-child relationship, it is important to take into account the known contributors to and measures of the teacher-child relationship. Moreover, because attachment theory asserts that the primary purpose of internal working models is to guide the balance between proximity-seeking and exploratory behaviors, new measures assessing internal working models should be related to children's use of the attachment figure as a secure base (Waters & Cummings, 2000). A review of previously established indicators of teacher-child relationship quality and research examining the teacher's role as a secure base follows.

Teacher perceptions of the teacher-child relationship. As stated previously, the majority of studies on the teacher-child relationship have been conducted from the teacher's perspective. This literature has demonstrated that teacher perceptions form a closeness and conflict dimension (Pianta, 2001). Teacher perceptions of relational

conflict are associated with a host of negative academic and behavioral outcomes for young children (Birch & Ladd, 1998; Hamre & Pianta, 2001; Palermo et al., 2007). Conversely, teacher ratings of closeness are associated with improved academic and behavioral outcomes and are protective for young children with externalizing behavior (Baker, 2006; Palermo et al., 2007; Peisner-Feinberg et al., 2001). The predictive power of teachers' perceptions within a school year and longitudinally suggests that teachers' perceptions of relationship quality are likely to relate to how children internalize their relationships with their teachers to guide their success in the classroom.

Children's perceptions of the teacher-child relationship. To a lesser extent, teacher-child relationship quality has also been assessed using young children's perceptions (Harrison, Clarke, & Ungerer, 2007; Mantzicoupoulos & Neuharth-Pritchett, 2003). Research has shown that preschool, kindergarten and first grade children can validly and reliably report on their perceptions of their relationship with their teacher through a structured interview called the Young Children's Appraisal of Teacher Support (Y-CATS; Hartz & Williford, 2015; Mantzicopoulos, 2005; Mantzicopoulos & Neuharth-Pritchett, 2003; Spilt, Koomen, & Mantzicopoulos, 2010). In addition, negativity in the teacher-child relationship as expressed in kindergarteners' drawings has been associated with teachers' ratings of closeness and conflict in the expected direction (Harrison et al., 2007) and inversely correlated with preschool children's observed positive engagement with teachers (Hartz & Williford, 2015). Although these results are promising, children's relationship perceptions as assessed through drawings and structured interview are only

modestly correlated with each other and other measures of the teacher-child relationship, (*r*s=.17-.28; Hartz & Williford, 2013; Harrison et al., 2007; Mantzicopoulos & Neuharth-Pritchett, 2003). This suggests that each measure provides unique information or measurement error and may not offer a complete picture of young children's internalizations. Finally, drawings that were specifically borrowed from the parent-child attachment literature may offer a window into children's internal working models (e.g., Fury, Carlson, & Sroufe, 1997), but the extent to which this measure is associated with secure base behavior with teachers has not yet been explored.

Observed Interactions. Measuring the quality of the interactions between adults and children is important because these exchanges are thought to directly influence children's internal working models (Bowlby, 1988). Teachers' warm and responsive interactions with children at the classroom level are critical for the development of positive teacher-student relationships (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008; Hamre & Pianta, 2005; Howes, Galinsky, & Kontos, 1998; Verschueren & Koomen, 2012). At the dyadic level, individual children's observed positive interactions with teachers are positively linked with teachers' report of relationship closeness, whereas children's observed conflict in the classroom is linked with teacher report of relational conflict (Downer, Booren, Lima, Luckner, & Pianta, 2010). This work suggests that dyadic and classroom-level interactions both contribute to and serve as indicators of teacher-child relationship quality, and thus would be expected to relate to children's internal working models of the teacher-child relationship.

Individual Child Characteristics. In addition, child characteristics have been associated with the quality of the teacher-child relationship. Children with disruptive behavior evidence lower teacher-reported relational closeness and higher teacher-reported relational conflict (Baker, 2006; Baker, Grant, & Morlock, 2008; Hamre & Pianta, 2001). Children's verbal skills have been linked with teacher-report of the relationship (Moritz, Rudasill, Rimm-Kaufman, Justice, & Pence, 2006) and associated with lower levels of conflict and negativity as assessed by children's interviews and drawings (Hartz & Williford, 2015). Gender is also related to relationship quality, such that girls tend to form closer and less conflictual relationships with their teachers (Baker, 2006; Birch & Ladd, 1997; Hamre & Pianta, 2001; Silver, Measelle, Armstrong, & Essex, 2005), a trend that is also evident when children report on relationships with their teachers (Harrison et al., 2007; Hartz & Williford, 2014; Mantzicopoulos & Neuharth-Pritchett, 2003). In addition, age has been related to the quality of children's perceptions of the teacher-child relationship, such that older children have more positive perceptions of their teachers (Harrison et al., 2007; Hartz & Williford, 2015). Finally, additional demographic characteristics, including African-American ethnicity (Hamre & Pianta, 2001; Murray & Murray, 2004), lower maternal education, and lower SES (Howes, 2000) have been tied to poorer relationship quality. This literature suggests that children with certain characteristics may be more likely to develop positive or negative internalizations of their teachers.

Secure Base Behavior. Children's positive internal working models of the teacher-child relationship are believed to relate to their use of the teacher as a resource to successfully engage in classroom tasks (Howes, 2000; Kennedy & Kennedy, 2004). However, it remains unclear from the literature whether measures of teacher-child relationship quality are indicators of internal working models as there have been few studies linking teacher-child relationship quality to secure base behavior. An observational study of children's attachment to teachers in preschool classrooms provided qualitative information on how children's observed interactions with teachers related to their exploration of tasks in the classroom. Howes and Ritchie (1999) described children who demonstrated resistant qualities as easily angered, quickly frustrated, and unsatisfied with the teacher's attempts to engage them in learning activities (Howes & Ritchie, 1999). These qualities were moderately correlated with externalizing behavior (r=.55), suggesting that children with disruptive behavior struggle to use the teacher as a resource to stay engaged in learning opportunities. Separate work with a sample of 79 kindergarten children who were socially inhibited revealed that observed interactions indicative of children's security with their teacher affected their use of the teacher to engage in tasks (Thijs & Koomen, 2008). Using observations conducted during a lab task, researchers found that for children who showed less observed emotional security with teachers, the relation between teacher support and children's persistence was stronger. This work offers preliminary evidence of the secure base hypothesis by showing that children with less security needed more teacher support to successfully persist on tasks. Based on these

findings, authors cited the importance of examining these relations in an externalizing sample and using children's own representations, as children's internal working models of their teacher are likely to underlie their observed security (Thijs & Koomen, 2008).

The Present Study

Due to the importance of better understanding the teacher-child relationship from an attachment framework, the current study examined how preschoolers at risk of developing a behavior disorder internalized their relationships with their teachers as assessed through a newly developed narrative procedure. We examined whether MacArthur Story Stem Battery codes (Emde et al., 2003) could be adapted and successfully applied to a narrative procedure that required children to tell a story about a picture that they previously drew of them and their teacher. Inter-rater reliability, internal consistency of the adapted codes, and concurrent validity with previously established measures of and contributors to the teacher-child relationship were examined. We hypothesized that coders could become reliable on the scheme and that the adapted codes would form a positive themes/representations composite, a negative themes/representations composite, and a coherence composite. Based on prior literature examining the teacher-child relationship, we hypothesized that positive and coherent relational representations would relate positively to children's and teachers' perceptions of warmth/closeness; (b) teachers' emotionally supportive classroom practice and children's observed positive teacher interactions; and (c) children's older age, female gender, verbal ability, SES, parental education, and Caucasian ethnicity. We expected

inverse associations among children's positive and coherent representations and (a) teacher perceptions of relational conflict; (b) observed classroom conflict, and (c) children's disruptive behavior, minority ethnicity, lower SES, and lower parental education. It was hypothesized that children's negative representations of their teachers would be positively associated with (a) teacher and child perceptions of negativity and conflict, (b) observed classroom conflict, and (c) children's disruptive behavior, male gender, and minority ethnicity. We expected inverse associations between negative representations and female gender, age, verbal ability, SES, and parental years of education.

As a further test of the validity of the new measures used in the study, we examined whether children's representations of their relationships with their teachers as assessed via drawings and narratives were associated with children's secure base behavior. To do so, we examined if children's internal representations affected the association between children's observed positive interactions with teachers and their observed task orientation. It was hypothesized that children with less positive and cohesive representations of their teacher would have more difficulty securely exploring their environment, thereby requiring higher levels of positive interactions with teachers to be oriented towards tasks. Conversely, we predicted that children with positive and cohesive representations would be oriented towards tasks regardless of the level of teacher interactions, effectively using the teacher as a secure base to explore the environment. We predicted that children with negative representations would

demonstrate low levels of task orientation regardless of the level of positive teacher interactions, whereas children with low negativity would independently explore the environment while also showing benefit from teacher interactions to remain oriented towards tasks.

Methods

Participants

The children in the current study were from a sample of children selected as part of a one-year intervention trial occurring with three different cohorts of children at risk of developing a disruptive behavior disorder. The data collected for the current study were added as a subcomponent of the larger study for cohorts 2 and 3 of the study. Intervention status was not related to any of the outcome measures in the study but is included as a covariate in regression analyses. Participants included 157 children (51 female) ranging from 3.45 years to 6.18 years (M=4.88, SD=0.54). Children were ethnically diverse: 43% were African American, 32% were Caucasian, 9% were Hispanic, 1% were Asian, 14% were multiracial, and 1% were another ethnicity. Children came from largely low-income backgrounds, and the average income-to-needs ratio was 1.78 (range=0.22 – 5.16, SD = 1.51). Parental years of education averaged 14 years (range=11-20; SD= 2.29). Children in the current study were nested in 81 classrooms, with 1-3 children per classroom participating in the end of the year assessments.

Teachers worked in a variety of different center types, including Head Start (34.2%), state-funded prekindergarten (16.5%), private with state prekindergarten

funding (10.1%), private for-profit (13.9%), and private not-for-profit preschool classrooms (25.3%). Teachers were 97% female and were ethnically diverse: 48% of teachers in the study were African American, 46% were white, 3% were Multi-Racial, and 3% identified as Native American, Latino, or another ethnicity. On average, teachers were 41 years old (Range= 23-62; *SD*=10.54), with 12.44 years of teaching experience (Range=0-34; *SD*=9.25) and 15.48 years of education (Range=13-18; *SD*=1.29).

Recruitment and Selection

Participation was first obtained from center directors, and teachers were subsequently invited to be in the study. Teachers who agreed to be observed throughout the year assisted in obtaining parental consent for the children in their classroom. At the start of the school year, parents and guardians were given a letter explaining the study, an informed consent form, and a demographic survey.

After children had been in their classroom for approximately three weeks, teachers completed the ADHD Rating Scale (ADHD-RS IV; DuPaul, Power, & Anastopoulos, 1998) and ODD Rating Scale (ODDRS; Anastopoulos, 1998) on all children in their classroom. Children who were typically developing and whose behavior was not accounted for by an intellectual disability or an autism spectrum disorder were eligible to participate. The three children per classroom with the highest levels of disruptive behaviors (two boys and one girl) who also had parental consent were selected to participate. The average consent rate for children in the study was 76%.

Attrition

The 157 children who completed the child assessments, including the drawing, interview, and narrative procedures, were 67% of the original sample that had consented at the beginning of the year. A large portion of attrition occurred due to the teacher or child's leaving the current school (68%). Other reasons included teachers withdrawing from the study (21%), children no longer being eligible (3%), a child withdrawing from the study (1%), or absences, refusal, or another reason (7%). Two additional children did not have data, one due to a data collection error and one because the child did not complete the task. Children participating in the child assessments were compared to children who were no longer participating, and no significant differences were found in family demographics, including maternal education and income-to-needs ratio. There were no differences in children's age, gender, IEP status, or teacher-rated disruptive symptoms at baseline. However, there was a higher percentage of ethnic minority children who completed the interview relative to the non-participating sample ($t(226)=1.14$, $p<.05$).

Procedures

Data Collection. Data for this study was collected as part of a larger efficacy trial that occurred over three years with different children and teachers participating each year. The current study includes data collected in Years 2 and 3. Teachers were assigned to one of three treatment conditions, and the three selected children in each classroom were assigned to one of three, eight-week treatment/assessment windows throughout the year. Data was collected at the beginning of the year, end of the year, and pre and post the

eight-week intervention window. Thus, for the first selected child, the beginning of the year was the same as their pre-assessment, and for the third selected child, their end of year was also their post-assessment.

At the beginning of the year, classroom and child demographic data were gathered via questionnaires, and an independent data collector directly measured children's verbal skills. At the end of the year, teachers completed ratings on children's disruptive behaviors, and teachers' emotionally supportive classroom practice and children's classroom interactions were observed. Pre-treatment window, teachers filled out information on their perceptions of their relationship with children. At the end of the year, children completed an interview, a drawing, and a narrative about their relationship with their teacher.

Observation Training and Protocol. Data collectors were required to complete an extensive two-day training from a certified trainer on the observation measures used in the study (Individualized Classroom Assessment Scoring System; inCLASS, Downer et al., 2010; Classroom Assessment Scoring System; CLASS, Pianta, LaParo & Hamre, 2008) prior to data collection. The training included a review of the content of the measures and required data collectors to code, watch, and discuss training clips. At the end of the training, data collectors were required to reliably code five clips by scoring within 1 point of a mastercode on 80% of the scheme's dimensions. Data collectors' initial reliability scores were high and ranged from 80-94%. Following successful training but before data collection began, data collectors practiced the coding scheme on

children in preschool classrooms that were not part of the study with a master trainer. In addition, data collectors watched and coded practice videos to ensure that they had not drifted from initial reliability.

Classroom observations were scheduled at the end of the year during a time that was convenient for the teacher. Children were observed in the classroom setting using the Individualized Classroom Assessment Scoring System (inCLASS, Downer et al., 2010), and teachers' emotionally supportive and responsive teaching was observed using the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008). Each observation lasted approximately four hours from the start of the day until mid-day and occurred over approximately three days. Data collectors observed the selected children in a series of alternating cycles starting at the beginning of the school day; each cycle consisted of observing a child for ten minutes and then coding the observation for five minutes. Data collectors shifted their observations across the two or three selected children and alternated between coding teacher's classroom interactions using the CLASS and individual children's interactions using the inCLASS (i.e., they observed child 1, the teacher, child 2, the teacher, child 3, and began again with child 1; on the next day children were observed in a different repeating order; e.g., child 2, the teacher, child 3, the teacher then child 1), with the goal of collecting at least eight cycles per child across two days and 4 cycles across two days for teachers. Children in the study were observed for approximately 9 cycles (M=8.66, SD=1.79*)* across three days (M=3.11, SD=0.84*)* and teachers were observed for an average of 5.55 cycles (SD = 2.19; range =3 – 14).

Child Assessments. Data collectors attended a training for administering receptive vocabulary measures, the interview, the drawing, and the narrative. To ensure fidelity to the protocol, the training included a review of a detailed manual of procedures and required data collectors to practice administering the assessments. The assessments of children's receptive language skills were conducted in a quiet location within the center, either in the hallway, an office, or a corner of the classroom. At the end of the year, children participated in an interview about their relationship with their teacher, drew a picture of their teacher, and responded to prompts about their drawing in narrative form. The order of the measures was intended to prime children to think about their relationship with their teacher through a structured interview and then express their perceptions through a drawing and a narrative. All child measures were administered in the same order and were conducted on a day when the study teacher was present so that the child was able to successfully identify his or her teacher.

Measures

Narratives.

Procedure. After the child finished a structured interview and drawing (see details below), the data collector read the following prompts: (a) "*Show me you,"* (b), *"Show me your teacher*," (c) *"What else is in your drawing?"* (d) *"Now I want you to tell me a story about your drawing. What is happening in your drawing?"* (e) *"What are you doing in your drawing?"* (f) *"What is your teacher doing in your drawing?"* (g) *"How do you feel in your drawing?"* (h) *"How does your teacher feel in your drawing?"* (i) *"Is*

there anything else that you want to tell me about your story?" Data collectors wrote down what each child said verbatim and were instructed to refrain from asking additional questions. While children were drawing their picture, data collectors recorded any spontaneous comments made by the child, which were included in the narrative coding procedure if children offered information about what was happening in their picture. If a data collector lost track of what a child was saying, he or she recorded that words were missing and recorded as complete a transcript as possible. Narratives with lost words were compared to narratives in which all words were recorded. No significant differences were found on the narrative composites used in analyses. However, the 22 narratives with verbatim lost had significantly more words ($t(1, 154)=2.29$, $p<.05$; $M=135.87$, $M=96.45$). In line with the protocol from the MacArthur coding system, if a data collector inserted an extra question ($n=4$), the child's response following the question was not taken into account when coding the response to that particular prompt.

Adaption of the coding scheme. Narrative codes were based on several coding schemes applied to the MacArthur Story Stem Battery and were tailored to the specific aims of the current study (Bretherton, Oppenheim, Buchsbaum, & Emde, 1990; Warren, Mantz-Simmons, & Emde, 1993). MacArthur codes are typically coded in a presence/ absence fashion and aggregated across multiple story stems (Bretherton & Oppenheim, 2003). As part of the adaption process, a graduate student and research assistant read through narratives and recorded the presence and absence of MacArthur codes. Codes that were pertinent to the current narratives were retained. Because the constructs

assessed by the adapted codes appeared to be continuous rather than dichotomous, codes were modified to fit a continuous five-point scale from 1 “not present/very low” to 5 “very present/high.” The coherence scale was modified to reflect that coherence is better assessed by multiple codes that separately assess logic, approach to the story, and detail (Von Klitzing et al., 2003). Finally, several codes were added to provide a global estimate of the emotional tone in the narratives, similar to the first and final content codes in the MSSB Narrative Emotion Coding Scheme (Warren, 2003).

Codes. Positive and negative content themes included empathy/helping/reassurance, sharing, affiliation, affection, aggression and personal injury (Warren, Oppenheim, & Emde, 1996); narrative emotion codes included danger, child power, emotional incoherence to positive, emotional incoherence to negative (Warren, 2003); and the coherence scale assessed children’s response to the prompt, the logic of the story, and the amount of detail children provided. Teacher positive and negative affect, child positive and negative affect, and a code for affective match were added to the scheme to account for the concordance between teacher and child expression of affect. For a description of codes included in the adapted scheme, see the coding manual in Appendix A.

After finalizing the manual, two undergraduate research assistants and a lead coder double coded all transcripts to ensure adequate inter-rater reliability. Coder reliability was maintained through weekly coding meetings during which one or more of the narratives was discussed and consensus codes were assigned.

Children's perceptions of the teacher-child relationship.

Relational negativity. Children's perceptions of their relationship with their teacher were measured with a drawing task using procedures outlined by Harrison et al. (2007). After completing a structured interview, children were instructed to do the following: "Draw a picture of you and your teacher at school." Children were given blank paper and markers to complete the drawing. They were reminded to include their teacher in their drawing but were not provided with additional directions. After the child had finished, the data collector asked the child to identify himself/herself, identify the teacher, and identify any other objects in the drawing to ensure the drawings were coded accurately. The drawings were coded following procedures outlined by Dallaire et al. (2012) and included the following codes rated from a 1 "*very low*" to 7 "*very high*": (a) Creativity/Vitality, (b) Pride/Happiness, (c) Vulnerability, (d) Emotional Distance/Isolation, (e) Tension/Anger, (f) Role Reversal, (g) Bizarreness/Dissociation, (h) Global Pathology. If a child did not draw him or herself or the teacher even after prompting, the drawing was not coded.

Consistent with the Harrison et al. (2007) study, results from a Confirmatory Factor Analysis (CFA) in the current study found that Creativity and Vitality did not fit with the other drawing codes, which were subsequently averaged to create a relational negativity composite. The CFA had good model fit after accounting for correlations between (a) Emotional Distance and Vulnerability, (b) Emotional Distance and Pride/Happiness (reversed), and (c) Bizarreness & Dissociation and Role Reversal. Fit

statistics were as follows: (χ^2 (11)=19.259, *N* = 151, *ns*; RMSEA = .071; CFI = .994; TLI = .988; Hartz & Williford, 2015). The internal consistency for the relational negativity composite was very high (α = .96).

Warmth and conflict. The Young Children's Appraisal of Teacher Support (Y-CATS; Mantzicopoulos & Neuharth-Pritchett, 2003) assesses children's perceptions of their relationship with their teacher. Children answer a series of yes-no questions that assess their perceptions of warmth and conflict in their relationship with their teacher. In previous validations of the Y-CATS, internal consistency ranged from acceptable to good for warmth (α = .80, .65) and conflict (.78, .72) (Mantzicopoulos & Neuharth-Pritchett, 2003; Spilt et al., 2010). Test-retest reliability over a 3-week interval for warmth and conflict was acceptable (*r*s = .67 and .62; Spilt et al., 2010). In the current study, 11 warmth items and 10 conflict items were used. In accordance with the use of the scale in previous studies (Mantzicopoulos & Neuharth-Pritchett, 2003; Spilt et al., 2010), items comprising both factors were averaged to create one score for each scale. The warmth and conflict factors demonstrated solid internal consistency (α = .78 and .77, respectively). The central tendency and variability in the current study were similar to distributions reported in studies that used the scale in past work with different samples of children (Mantzicopoulos & Neuharth-Pritchett, 2003; Spilt et al., 2010).

Observed Classroom Interactions.

Children's positive teacher interactions, classroom conflict, and task orientation. The *Individualized Classroom Assessment Scoring System* (inCLASS;

Downer, Booren, Hamre, Pianta, & Williford, 2011) is an observational assessment of a child's behavior during everyday interactions with teachers, peers, and tasks in preschool classrooms. The inCLASS measures ten dimensions of a particular child's behavior on a 7-point scale, including: (a) positive engagement with teacher, (b) teacher conflict, (c) teacher communication, (d) peer sociability, (e) peer conflict, (f) peer assertiveness, (g) peer communication, (h) engagement within tasks, (i) self-reliance, and (j) behavior control. Trained observers watch children for 10 minutes, and immediately following this period, they rate children's positive or negative patterns of behavior based upon the child's display of clearly defined behavioral indicators that categorize each dimension. Children are observed over multiple cycles (in this case an average of 9 cycles across 3 days) to estimate a child's typical behavior pattern displayed in the classroom. In validation studies, the inCLASS has shown construct and criterion validity (Downer et al., 2010) in addition to predicting children's self-regulation and language and literacy skills (Williford, Maier, Downer, Pianta, & Howes, 2013; Williford, Whittaker, Vitiello, & Downer, 2013).

Validation studies indicate that the ten dimensions cluster into four domains (Downer et al., 2010). The three domains of interest in the current study included children's positive interactions with teachers (positive teacher interactions, teacher communication), task orientation (engagement and self-reliance with tasks) and conflict (teacher conflict, peer conflict, and behavior control reversed). Inter-rater reliability was calculated across 20% of all observations with two data collectors independently

observing and rating the same children. Intraclass correlations (ICCs) were as follows: children's positive interactions with teachers=.798, task orientation =.714, and conflict =.753. Internal consistencies for domains across observation cycles were calculated and were as follows: positive interactions with teachers □=.826, task orientation □=.892, and conflict □=.880.

Teachers' emotionally supportive and responsive classroom practice. Teachers' classroom interactions were assessed using the Classroom Assessment Scoring System (CLASS), an observational a measure of teachers' classroom practice (Pianta et al., 2008). The class has ten dimensions that comprise three domains: (a) emotional support, consisting of positive climate, negative climate – reversed, teacher sensitivity, and regard for student perspectives (b) classroom management, consisting of behavior management, productivity, instructional learning formats, and (c) instructional support, consisting of concept development, quality of feedback, and language modeling. For the current study, the emotional support domain was used as a measure of teachers' emotionally supportive and responsive interactions. Teachers' emotional support has been linked with children's academic development and social competence (Mashburn et al., 2008).

CLASS cycles occur for 10 minutes of observation followed by five minutes of coding. Each dimension is coded on a 7-point scale, with higher scores indicating better quality, with the exception of negative climate (higher scores are indicative of lower quality). Codes across observation cycles are averaged to create a reliable estimate of teachers' practice. Approximately 20% of all observations were double coded. Inter-rater

reliability for emotional support was good (ICC=.82).

Teacher perceptions of relationship quality. Perceptions of the teacher-child relationship from the teacher's perspective were measured using the Student-Teacher Relationship Scale (STRS; Pianta, 2001). The STRS is comprised of 15 items that a teacher rates on a scale from 1 (*definitely does not apply)* to 5 (*definitely applies)* about his or her relationship with a particular child. Eight items are averaged to create a closeness scale that represents warmth and affection. Seven items are averaged to create a conflict scale, which reflects negativity in the relationship. The STRS demonstrated good internal consistency for both the closeness and conflict scale in the present study (= .82 and .88, respectively), similar to results in previous work (e.g., Silver et al., 2005; Thijs & Koomen, 2009). Closeness and conflict ratings are associated with children's academic, behavioral, and social-emotional outcomes (Hamre & Pianta, 2001; Pianta & Stuhlman, 2004).

Child characteristics.

Disruptive behavior. Teacher perceptions of children's disruptive behavior were assessed using the Sutter-Eyberg Student Behavior Inventory-Revised (SESBI-R) (Querido & Eyberg, 2004). The SESBI-R contains 38 items that ask teachers to rate the frequency of behavior problems from 1 *(never)* to 7 *(always).* Teachers also answer "*yes*" or "*no*" to whether each item is a problem for them. The frequency ratings are added to create a score for the Intensity Scale, which was used in the present study and demonstrated good internal consistency (= .96).

Verbal ability. Children's receptive language ability was measured using the Peabody Picture Vocabulary Test-Fourth Edition (PPVT-4; Dunn & Dunn, 2007). The PPVT-4 requires children to point to one of four pictures that match a word that an examiner reads aloud. Children's scores were standardized by age, such that a child's score represents their score relative to their same-aged peers. The PPVT-4 demonstrates good internal consistency for children between the ages of 3-5 years (□s = .95 - .97) and high test-retest reliability (*r*s = .91 - .94) over one month. The PPVT is associated with other measures of children's verbal ability (Dunn & Dunn, 2007).

Demographic information. Children's age, gender, income-to-needs ratio, ethnicity, and parental years of education were obtained from a demographic survey that parents and guardians completed at the beginning of the year.

Data Analysis

Missing data in regression models was accounted for using full information maximum likelihood estimation with robust standard errors to make use of all available data for each case (Enders & Bandalos, 2001). Missing data included children whose drawings were not codable (*N*=7) and a child who did not participate in the narrative procedure (*N*=1). The number of children missing demographic or teacher-report data ranged from 2-7. All children in the study had complete observation data.

Descriptive information and correlations were computed in SPSS. Regression models examining the moderation of narrative composites on the relation between observed teacher interactions and observed task engagement were run in MPlus Version 7

(Muthén & Muthén, 2013). The Type=Complex function was used to adjust standard errors to take into account that children were clustered within classrooms. Ranges, means, standard deviations, and bivariate correlations among individual codes were examined. Narrative codes displaying inadequate variability were excluded from subsequent analyses. Included codes were composited by creating an average score based on theory and prior research. Concurrent and content validity were assessed by examining bivariate correlations among children's narrative representations of their teacher and (a) children's perceptions of relational negativity, conflict, and warmth; (b) teachers' observed emotionally supportive and responsive classroom practice, children's observed positive interactions with teachers, and children's observed classroom conflict; (c) teachers' perceptions of relational conflict and relational closeness; and (d) children's disruptive behavior, gender, ethnicity, age, receptive vocabulary, parental years of education, and income-to-needs ratio. To ensure that narrative measures assessed more than children's language abilities, partial correlations controlling for children's receptive vocabulary were examined among narrative representations, children's perceptions, observed interactions, teacher perceptions, and disruptive behavior.

Construct validity was examined by testing the relation of children's representations to secure base behavior. A multiple regression model examined whether the relation between children's positive interactions with teachers and children's observed task orientation varied based on children's internal representation of their teachers (narrative representations and drawing relational negativity). Narrative

representations, relational negativity, and children's observed positive interactions with teachers were standardized. The product of children's positive interactions with teachers and children's representations of teachers was calculated to create variables representing all possible two-way interactions. All interaction terms were entered into the model simultaneously. Models controlled for gender, minority ethnicity, age, receptive vocabulary, parental years of education, income-to-needs ratio, disruptive behavior, teachers' observed emotionally supportive classroom practice, and intervention status. Nonsignificant steps of interaction terms were removed before presenting the final model. Interactions were interpreted as significant when □ =.10 because of the statistical difficulty of detecting interaction effects in field studies (Pluess & Belsky, 2009; McClelland & Judd, 1993). Interactions were graphed at one standard deviation above and below the means for the predictors and moderator (Aiken & West, 1991) and illustrate the isolated effects of the interaction terms using excel.

Results

Narrative Coding Results

Inter-rater reliability. All narratives were coded independently by two coders. Intraclass correlations for all codes indicated a high degree of inter-rater reliability (□ >.78), with the exception of Sharing and Child Power (□=.64 and .62, respectively; see Table 1).

Distribution of codes. Codes that showed limited variability, including content and emotional themes (sharing, affection, empathy/helping, aggression, personal injury,

child power, danger, incoherence to positive, and incoherence to negative) and supplemental codes (child negative affect, teacher negative affect) were excluded from subsequent analyses due to limited variability (M<1.5; 75% of scores were coded as "1/not present"; see Table 1 for descriptive information and Appendix B for distribution of codes). Based on prior theory and research, two composites with adequate internal consistency were established. Positive teacher-child affect consisted of teacher positive affect, child positive affect, and affective match (□=.86). Coherence consisted of affiliation, embellishment, logic, and response to prompt (□=.84).

Narrative codes. All descriptive statistics of variables used in analyses are presented in Table 2. Bivariate correlations among narrative representations and indicators of teacher-child relationship quality are reported in Table 3. Coherence and positive teacher-child affect were moderately correlated (r=.412, p<.001)

Narrative associations with children's perceptions. Coherence was significantly related to children's perceptions of warmth (r=.194, p=.02), and inversely related to children's perceptions of conflict (r=-.193, p=.02) and relational negativity (r= -.365, p<.001). Positive teacher-child affect was not significantly associated with drawing relational negativity (r=.157, p>.05), children's perceptions of warmth (r=.159, p>.05), or conflict (r=-.125, p>.05).

Narrative associations with observed classroom interactions. Coherence was significantly and inversely associated with children's observed classroom conflict (r= -.168, p=.04). Positive teacher-child affect was significantly associated with teachers'

observed emotionally supportive and responsive classroom practice (r=.192, p=.02). There were no significant associations between coherence and children's positive interactions with teachers (r=.119, p>.05) or teachers' emotionally supportive and responsive classroom interactions (r=.017, p>.05). Positive teacher-child affect was not significantly associated with children's observed positive interactions with teachers (r=.145, p>.05) or observed conflict (r= -.083, p>.05).

Narrative associations with teacher perceptions of relationship quality. Positive teacher-child affect was significantly and inversely associated with teacher perceptions of conflict (r= -.19, p=.02) but not significantly associated with closeness (r=.09, p>.05). Coherence was not significantly associated with teacher perceptions of closeness (r=.12, p>.05) or conflict (r= -.030, p>.05).

Narrative associations with child characteristics. Coherence was inversely related with teacher-reported disruptive behavior (r= -.18, p=.03). Older child age was positively associated with coherence (r=.228, p<.01), while male gender was inversely related to coherence (r= -.176, p=.03). Verbal ability was associated with narrative coherence (r=.307, p<.01) and positive teacher-child affect (r=.184, p=.03). Minority ethnicity was negatively associated with coherence (r=-.178, p=.03) and positive teacher-child affect (r=.203, p=.01). Parental years of education was associated with positive teacher-child affect (r=.235, p<.01) and coherence (r=.184, p=.02). A higher income-to-needs ratio was positively associated with coherence (r=.207, p=.01) and positive

teacher-child affect (r=.247, p<.01). Positive teacher-child affect was not significantly associated with male gender (r=.02, p>.05) or age (r=.01, p>.05).

Partial correlations. Given that narrative measures were dependent on children's verbal skills, partial correlations examined the associations of expressed positive teacher-child affect and narrative coherence with children's perceptions, teacher perceptions, observed interactions, and disruptive behavior after controlling for children's receptive verbal ability (see Table 3). Associations were largely similar to the bivariate correlations. However, associations between coherence and children's perceptions of warmth (r=.159, p=.05) children's perceptions of conflict (r=-.125, p=.13), and observed classroom conflict (r=-.149, p=.07) were weakened.

Internal Working Models and Secure-Base Behavior

Regression models tested the hypothesis that the strength of the relation between children's observed positive interactions with teachers and their observed task orientation would depend on their positive and negative internalizations of the teacher-child relationship. The final interaction model is presented in Table 4. The effect of children's coherent stories on their observed positive interactions with teachers was not significant and was therefore removed from the model. The relation between children's observed positive interactions with teachers and their task orientation was moderated by their expression of positive teacher-child affect (B=-.149, *SE*=.078, p=.06). Figure 1 demonstrates that as children's expression of positive teacher-child affect increased, the association between children's observed positive interactions with teachers and their task

orientation weakened. Thus, for children with high expressed positive teacher-child affect, their orientation to classroom tasks was relatively less contingent upon their level of observed positive interactions with teachers, whereas for children with low expressions of positive teacher-child affect, children's observed positive interactions with teachers was associated with higher task orientation.

The association between children's positive interactions with teachers and their task orientation was also dependent on children's relational negativity toward their teacher as expressed through drawings (B=.116, *SE*=.065, *p*=.08). Figure 2 demonstrates that as children's relational negativity increased, the association between children's observed positive interactions with their teacher and children's task orientation became stronger. Thus, for children expressing high negativity toward their teacher, children's positive interactions with teachers were more strongly associated with higher task orientation, whereas for children with low relational negativity, the relation was weaker.

Discussion

The current study examined the teacher-child relationship from the perspective of preschool children. This is important given the theory that children develop an internal working model that they then use to independently engage in learning tasks and activities in the classroom (Howes, 2000). To examine children's internal working models, we developed a narrative procedure that asked children to tell a story about a picture that they drew of them and their teachers at school. We then adapted codes from the MacArthur Story Stem Battery (MSSB; Oppenheim et al., 2003), which have been

traditionally used in the parent-child attachment literature, to assess children's internalization of their relationships with their teacher. Our results indicate that the narrative procedure and scheme we adapted can be used to reliably and validly assess children's perceptions of the teacher-child relationship. Moreover, results support that children's perceptions of their relationships as assessed through both a drawing and a verbal narrative demonstrate characteristics of internal working models: children whose representations were indicative of more positive representations of their teacher were less dependent on positive interactions with their teachers to be oriented towards tasks. Below we discuss specific findings, limitations, and directions for future research.

Verbal Narratives to Assess the Teacher-Child Relationship

The codes that were adapted from the MSSB, which were designed to measure children's representations of the teacher-child relationship, generated similar constructs to those previously shown in the parent-child literature. Codes assessing the degree of teacher positive affect, child positive affect, and affective match in children's narratives formed a positive teacher-child affect composite, consistent with how MSSB codes have been shown to form a positive representational construct (Von Klitzing et al., 2003). Codes assessing the logic, detail, and relevance of children's answers were associated with each other as hypothesized to form a coherence composite. Another code, affiliation, or the extent to which the child described him or herself in a shared activity with the teacher, was also part of the coherence composite. Affiliation was not hypothesized to relate to coherence, as the code has been shown to be associated with empathy/helping

composites and harsh limit-setting constructs depending on the specific story stems being employed (Von Klitzing et al., 2003). In our study, when children used affiliation in their narrative, it is likely that their responses better fit the prompts in the story (e.g., "*what is your teacher doing," "what are you doing"*). Affiliation may also have been related to the stories' coherence because children who readily accessed a representation of them and their teacher doing things together were less likely to have been avoiding or defending against the task, which could have related to the organization of their narrative and the length of their responses (Von Klitzing et al., 2003).

Children's expressions of positive teacher-child affect in their narratives and the coherence of their stories demonstrated evidence of validity. Interestingly, although children's descriptions of positive teacher-child affect and the coherence of their stories were moderately related to each other, they tended to show unique associations with both children's and teachers' perceptions of conflict and warmth/closeness. Expressions of positive teacher-child affect and the coherence of children's stories were also differentially related to teachers' observed emotionally supportive and responsive classroom interactions and children's observed classroom conflict. This supports the value of coding the narratives for multiple constructs. Importantly, when comparing these findings with relational negativity towards the teacher as assessed via children's drawings, a similar pattern of unique associations emerged (e.g., relational negativity in drawings was inversely associated with children's observed positive engagement with teachers, an association that was non-significant for teacher-child positive affect and the

coherence of children's stories). Given the rapid mental growth that occurs during preschool (Brown & Jernigan, 2012), it is likely that different methods of assessment relate to how children express their internalizations. On the one hand, this highlights the benefit of the procedure that was tested in the current study—children were able to express their internalizations using their fine motor and linguistic abilities. At the same time, this suggests that the narrative procedure used in the current study was not fully able to stand alone to capture the range of how children internalize their relationship with their teacher.

Children's perceptions. Children who told more coherent narratives were more likely to endorse warmth toward their teacher and less likely to endorse conflict toward their teacher on a structured interview. Children who told more coherent narratives also expressed lower relational negativity towards their teachers as measured through their drawings. However, although expressions of positive teacher-child affect were associated with warmth and conflict on the structured interview in expected directions, these relations were not significant. This may be due to the fact that the expressions of positive teacher-child affect focused on a specific aspect of children's internalization of their relationship with their teacher (their own and the teacher's positive feelings), whereas the coherence of children's stories, relational negativity towards their teacher, conflict, and warmth were assessing broader dimensions of the teacher-child relationship.

Observed classroom interactions. Adding further support to the validity of children's representations, the expression of positive teacher-child affect and the

coherence of children's stories were modestly associated with observed classroom interactions in expected directions. When children were observed to exhibit difficulty controlling their behavior and demonstrated conflict with others, they were more likely to tell less coherent stories. This finding extends previous work by demonstrating that children who were less coherent in their narratives were reported by their parents to display more behavior problems (Oppenheim, Nir, Warren, & Emde, 2003; Von Klitzing, Kelsay, Emde, Robinson, & Schmitz, 2000). In addition, teachers' observed emotionally supportive and responsive classroom practice was linked with children's expression of positive teacher-child affect. Given that a hallmark of children's security with adults is affective matching (Pianta, 1999; Waters, 1985), this finding supports the idea that teachers' sensitive and warm behaviors contribute to the development of children's positive internal working models (Bowlby, 1988; Oppenheim et al., 2003).

Teachers' perceptions of relationship quality. The expression of teacher-child positive affect was inversely associated with teachers' perceptions of conflict in the relationship but not significantly associated with teachers' perceptions of closeness. Although we hypothesized that closeness would be associated with positive teacher-child affect, the link between children's positive affect and teachers' lower perceptions of conflict is supported by research showing that children who experience more positive emotions are rated by teachers as showing less aggression and conflict (Denham et al., 2003). There were no relations between the coherence of children's stories and teachers' perceptions of relationship quality, which mirrors previous findings regarding the limited

associations between disruptive preschoolers' report of the teacher-child relationship and teachers' own perceptions (Hartz & Williford, 2015).

Associations controlling for verbal ability. Of note, when verbal ability was partialled out, the majority of our associations remained similar in magnitude, suggesting that children's narratives assessed more than verbal ability. However, it should be noted that for children this age, verbal ability appears to be a significant contributor to the link between the coherence of children's stories and children's perceptions of the teacher-child relationship as expressed through a structured interview. Importantly, the finding that children's expression of positive teacher-child affect and the coherence of their stories were associated with children's verbal abilities mirrored the associations between MacArthur story stems and verbal ability (Bretherton & Oppenheim, 2003). These associations are also in line with work showing that children with higher receptive vocabulary form closer teacher-child relationships (Rudasill et al., 2006).

Child Characteristics. Findings related to the associations among child characteristics and the narratives provided further evidence of validity. Consistent with the MacArthur story stem literature, girls and older children were more likely to tell more coherent stories (Oppenheim et al., 2003). Interestingly, this was not the case for the expression of positive teacher-child affect. Although we hypothesized that expressions of positive affect would be associated with female gender and older age similar to associations shown with empathic relations themes, it may be that the way that our story stem procedure—which specifically prompted children for emotions (*i.e., How do you*

feel? How does your teacher feel?)—led to minimal associations by giving children a more structured opportunity to express their emotional state.

As expected, risk factors associated with poor teacher-child relationship quality were related to less expressed positive teacher-child affect and less coherent narratives. Children rated by teachers as evidencing disruptive behaviors tended to tell stories that were less coherent, replicating work linking parent-reported behavior problems to the coherence of children's narratives (Oppenheim et al., 2003; Von Klitzing et al., 2000). Children of minority ethnicity told narratives with less coherence and expressed less positive teacher-child affect, in line with research suggesting that teachers report less positive relationships with African-American elementary school children (Hamre & Pianta, 2001; Hughes, Gleason, & Zhang, 2005; Murray & Murray, 2004). Finally, lower SES and fewer years of parental education, both of which are associated with relationship quality and school-related performance (Howes et al., 2000; Howes & Ritchie, 1999) were inversely linked to the expression of positive teacher-child affect and the coherence of children's stories. This suggests that children at risk of forming more conflictual and less close relationships with their teachers do appear to hold less positive representations of their teachers.

Internal Working Models and a Secure Base

Children who expressed more positive teacher-child affect and less relational negativity were not as reliant on positive interactions with teachers to be oriented towards classroom tasks. Consistent with hypotheses, children who described high teacher-child

positive affect in their narratives were less dependent on their observed positive interactions with teachers to engage in classroom learning activities. Given that preschool is associated with increasing autonomy and these measures were gathered at the end of the year when children were likely to be familiar with the classroom, it makes sense that the balance in secure base behavior would favor exploration over teacher contact (Waters & Deane, 1985). This finding lends support to the hypothesis that children who have internalized emotionally positive relationships with their teacher are able to use their teacher as a secure base in the classroom to remain engaged in learning tasks (Howes, 2000; Pianta, 1998).

Unexpectedly, children with higher relational negativity expressed in their drawings were more dependent on positive interactions with teachers to successfully orient themselves to classroom tasks. Based on the way that children with resistant/avoidant attachment styles have been shown to interact in the classroom (Birch & Ladd, 1998; Howes & Ritchie, 2000), it was expected that as children's negativity increased, the relation between teacher interactions and task orientation would weaken. However, the opposite was the case—as relational negativity increased, the association between children's positive interactions with teachers and their orientation towards tasks strengthened. This suggests that children who internalized a more negative teacher-child relationship differentially benefited from their positive interactions with teachers to remain engaged in tasks. There are several explanations for these findings. Bivariate associations indicated that children's expressed negativity was associated with fewer

positive teacher-child interactions and less teacher-reported closeness (Hartz & Williford, 2015), but was not significantly associated with teacher perceptions of conflict or observed conflict. Thus, relational negativity may be more related to an avoidant rather than a conflictual behavioral orientation given that avoidant children are less likely to successfully engage in classroom tasks without the support of a teacher (Birch & Ladd, 1998). An alternate explanation may be that children's observed positive interactions with teachers included only interactions characterized by children's emotional connection, enjoyment of interactions, and positive communication. Thus, it may be that these children demonstrated characteristics of children with conflictual styles, but the behaviors that were measured were adaptive, thereby eliciting teachers' responses that were non-coercive and supportive, in turn helping children to remain engaged in classroom activities.

The ability of children to tell a coherent story did not relate to children's secure base behavior in the classroom, nor was there a main effect on children's ability to successfully orient towards classroom tasks. This null result may be due to the fact that coherence was most associated with verbal ability. As such, controlling for child characteristics in our model may have minimized these associations. Given that coherence was related to negative constructs such as disruptive behavior and classroom conflict, continuing to refine the narrative procedure to ensure that this code is less reliant on developmental level will be an important future direction.

Limitations and Future Directions

The current study has several limitations. First, the limited expression of negative emotions, negative content, and prosocial themes meant that these constructs were dropped from further analysis, despite the fact that the appearance of these themes was likely to be clinically significant (Von Klitzing et al., 2003). In prior research, different story stems have been shown to elicit distinct narrative content (Von Klitzing et al., 2003). Because our narrative task included only one prompt rather than several story stems, it is likely that the narrative used in the current study did not prompt for many of the themes elicited by the MSSB. Additionally, our task was not overly stress-inducing, nor did it specifically introduce conflict for children to solve, as is typical in attachment measures (O'Connor & Byrne, 2007). As such, it may be that children's typical responses in times of stress, both those that were prosocial (e.g., help, share, seek support) and maladaptive (e.g., aggress, avoid) were less likely to be activated given the low levels of challenge in the narrative task. Because our sample was from a group of preschoolers who were at risk of developing a disruptive behavior disorder, the low variability of negative codes was a prominent limitation, as we expected that aggressive themes and negative affect were likely to be salient in this group of children (Toth et al., 1999; Warren et al., 1996).

The protocol employed in the study, in addition to the challenges inherent in assessing young children, likely led to the modest associations among narrative measures and previously validated measures of the teacher-child relationship. Although the associations were larger than some relations between narrative constructs and teacher

reports of disruptive behavior in the parent-child literature (e.g., Von Klitzing et al., 2000), the majority of these associations were weaker (e.g., Warren et al., 2000; Toth et al., 2000). In part, this is likely due to how the protocol was adapted and the fact that conflictual and negative codes were dropped from our analyses. Moreover, we were unable to examine the concurrent validity of teachers' report of relationship quality because this measure was gathered at an earlier time-point. However, the teacher-child relationship has been shown to be moderately stable across the school year, particularly for ratings of conflict (Doumen et al., 2008), thereby suggesting that a reasonable estimate was collected. Although the strength of the associations we found were modest, our work indicates that there is signal around the narrative constructs assessed and offers direction on how to gain a better estimate of young children's internalizations of the teacher-child relationship.

The observational measure in the current study was not specifically designed to examine secure base behavior, although the behavioral indicators of children's observed positive interactions with teachers included many components of secure base behavior, such as proximity seeking, use of the teacher as a secure base, and shared enjoyment. Importantly, however, the observational protocol did not discern whether positive teacher-child interactions were child or teacher initiated. Thus, it may be that teachers were driving these relations, such that children who were less engaged were sought out by teachers, in line with work showing that teachers report offering more support for children with behavioral difficulties (Koomen & van der Leij, 2008). However, even if

this were the case, results from our study support the idea that children's internalizations relate to the balance between teacher-child contact and orientation to classroom activities. Because this study examined the role of internal working models and their relation to secure-base behavior from the child's perspective, it is important to remember that attachment relationships are co-constructed (Bowlby, 1988; Kennedy & Kennedy, 2004). Analyses controlled for teachers' level of emotionally supportive and responsive classroom practice to account for this fact, but teachers are likely to be key players in children's secure base behavior. Future work that temporally tracks children's independent exploration versus teacher contact will add to the current study's results. Ultimately, given the importance of linking internal working models and secure base behavior (Waters, 2000), this study makes a meaningful contribution to the teacher-child literature.

Strengths and Implications

The current study has several strengths. The narrative protocol examined relationships from the child's perspective, which is critical for testing hypotheses related to whether children develop internal working models of their relationships with their teachers. Moreover, associations examining the concurrent validity of the narrative took into consideration observational assessments, teachers' and children's perceptions, and children's own characteristics. This limited the shared source variance that is common in studies examining the links between the teacher-child relationship and children's outcomes. In addition, attachment-related hypotheses were specifically tested in a sample

of children at risk of developing disruptive behavior. Given the importance of the teacher-child relationship for this group of children, the current study adds to the literature by showing that children who have internalized a less positive relationship with their teacher differentially benefit from positive interactions to stay engaged.

Results point to the promise of using narratives as a way of accessing preschool children's internalization of their relationships with their teachers. However, findings also suggest the importance of using a protocol that is more likely to access both positive and negative representations in a way that is scalable. One possibility would be to deliver similar story stems to the MacArthur scheme but use computers to ease training and administration costs, a procedure that has already been piloted in the parent-child literature (Minnis et al., 2006). Another approach would be to adopt a procedure similar to the Separation Anxiety Test (Main, Kaplan, & Cassidy, 1985), which could introduce pictures of classroom situations, provide a description of a story, and ask children questions about how they might respond. When considering how to adapt the narrative procedure, findings suggest the importance of giving children the opportunity to express themselves through more than one medium—the narratives' and drawings' differential associations with measures of the teacher-child relationship imply that recruiting multiple developmental skills—similar to the way that the MSSB uses both play and language—may be important to comprehensively assess preschool children's internal representations.

Our work related to secure base behavior suggests that children who have internalized less positive representations of their teachers require more positive teacher contact to successfully engage with learning activities and classroom tasks. Future work will require refining measurement and examining the stability of children's perceptions at multiple time points, as internal working models are hypothesized to be modifiable but fairly stable (Bowlby, 1988). The results from the current study reinforce the important role of positive teacher-child interactions for children who are at risk of school failure due to challenging behaviors. Refining our understanding of how children view these relationships will lead to a better grasp of the applicability of attachment constructs to the teacher-child relationship, which may in turn lead to exploring new and more proximal targets for change.

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Table 1

Descriptive Statistics of Narrative Codes

	Min.	*Max*	*Mean*	*SD*	
Narrative Codes					*ICC*
Positive Themes/Representations					
Sharing	1.00	4.00	1.05	0.30	0.64
Empathy/Helping	1.00	5.00	1.24	0.70	0.84
Affiliation	1.00	5.00	2.42	1.30	0.84
Affection	1.00	5.00	1.34	0.95	0.87
Negative Themes/Representations					
Aggression	1.00	5.00	1.27	0.77	0.86
Personal Injury	1.00	4.00	1.11	0.54	0.85
Child Power	1.00	4.00	1.18	0.51	0.62
Danger	1.00	5.00	1.38	0.83	0.78
Emotion Codes					
Child Positive Affect	1.00	5.00	2.42	1.06	0.95
Child Negative Affect	1.00	5.00	1.36	0.95	0.85
Teacher Positive Affect	1.00	5.00	2.55	1.06	0.84
Teacher Negative Affect	1.00	5.00	1.35	0.97	0.88
Affective Match	1.00	5.00	2.41	1.06	0.81
Incoherence to Positive	1.00	5.00	1.34	0.81	0.83
Incoherence to Negative	1.00	5.00	1.30	0.78	0.91
Coherence					
Embellishment	1.00	5.00	3.88	0.96	0.84
Logic	1.00	5.00	3.11	1.15	0.84
Response to Prompt	1.00	5.00	3.88	1.11	0.89

Note: Child power and personal injury are part of the Narrative Emotion Coding System (Warren et al., 1993) but were hypothesized to relate with negative themes and representations. Child positive affect, child negative affect, teacher positive affect, teacher negative affect, and affective match were added for the purposes of the current study.

Table 2

Descriptive Statistics of Variables Used in Analyses

Variable	*Minimum*	*Maximum*	*Mean*	*SD*
Narrative Composites				
Teacher-Child Positive Affect	1.00	5.00	2.46	0.95
Coherence	1.00	4.75	3.12	0.94
Children's Perceptions				
Drawing Negativity	1.43	7.00	4.73	1.14
YCATS Warmth	0.18	1.00	0.85	0.19
YCATS Conflict	0.00	1.00	0.35	0.28
Teacher Perceptions				
Closeness	1.50	5.00	4.17	0.71
Conflict	1.00	4.86	2.42	1.04
Observed Interactions				
Positive Interactions	1.06	3.88	2.24	0.48
Conflictual Interactions	1.00	2.75	1.45	0.32
Task Orientation	1.95	5.93	4.17	0.71
Teachers' Emotional Support	3.48	6.44	4.97	0.62
Child Characteristics				
Disruptive Behavior	38.00	235.00	136.36	48.24
Male Gender			0.68	
Non-White Ethnicity			0.66	
Age (years)	3.45	6.12	4.88	0.54
Receptive Vocabulary	59.00	133.00	99.34	15.67
Parental Years Ed.	11.00	20.00	14.34	2.29
Income-to-Needs	0.22	5.16	1.78	1.51

Table 3
Bivariate and Partial Correlations Among Narrative Composites, Children's Perceptions, Observed Interactions, Teacher Perceptions, and Child Characteristics

	Coherence	Partial Coherence	Teacher-Child Positive Affect	Partial Teacher-Child Positive Affect
Narrative				
Teacher Child Positive Affect	.412***	.380***		
Children's Perceptions				
Drawing Negativity	-.365***	-.320***	-.157	-.121
Y-CATS Conflict	-.193*	-.125	-.098	-.054
Y-CATS Warmth	.194*	.159	.147	.123
Observed Interactions				
Positive Interactions	.119	.059	.145	.108
Conflictual Interactions	-.168*	-.149	-.083	-.069
Teachers' Emotional Support	.017	.027	.192*	.201*
Teacher Perceptions				
Closeness	.124	.071	.092	.093
Conflict	-.030	-.012	-.191*	-.183*
Child Characteristics				
Disruptive Behavior	-.180*	-.183*	-.108	-.106
Male Gender	-.176*		-.020	
Non-White Ethnicity	-.178*		-.203*	
Age	.228*		.014	
Receptive Vocabulary	.307*		.184*	
Parental Yrs. Education	.184*		.235*	
Income-to-Needs	.207*		.247**	

Note: Partial correlations control for children's verbal ability. *$p < .05$, **$p < .01$, ***$p < .01$

Table 4

Regression Model Examining the Moderating Effect of Children's Representations on the Relation Between Children's Observed Positive Interactions with Teachers and their Observed Task Orientation

Task Orientation			
	B	*SE*	*p*
Covariates			
Gender	**-.311**	.140	.02
Minority Ethnicity	-.025	.198	.90
Child Age	.012	.013	.38
Receptive Vocabulary	.007	.007	.32
Parental Years Education	-.067	.040	.10
Income-to-Needs	-.046	.072	.52
Disruptive Behavior	-.001	.002	.71
Teachers' Observed Emotional Support	.195	.128	.13
Predictors			
Children's Positive Interactions with Teachers	**.245****	.074	.00
Teacher-Child Positive Affect	.098	.080	.22
Coherence	.093	.090	.30
Negativity	-.069	.092	.45
T-C Positive Affect x Positive Interactions	**-.149**†	.078	.06
Negativity x Positive Interactions	**.116**†	.065	.08

Note: Intervention condition is controlled for in regression analysis.
**$p < .01$, * $p < .05$, † $p < .10$

Figure 1

Moderating Effect Of Positive Teacher-Child Affect On The Association Between Children's Observed Positive Interactions With Teachers And Task Orientation.

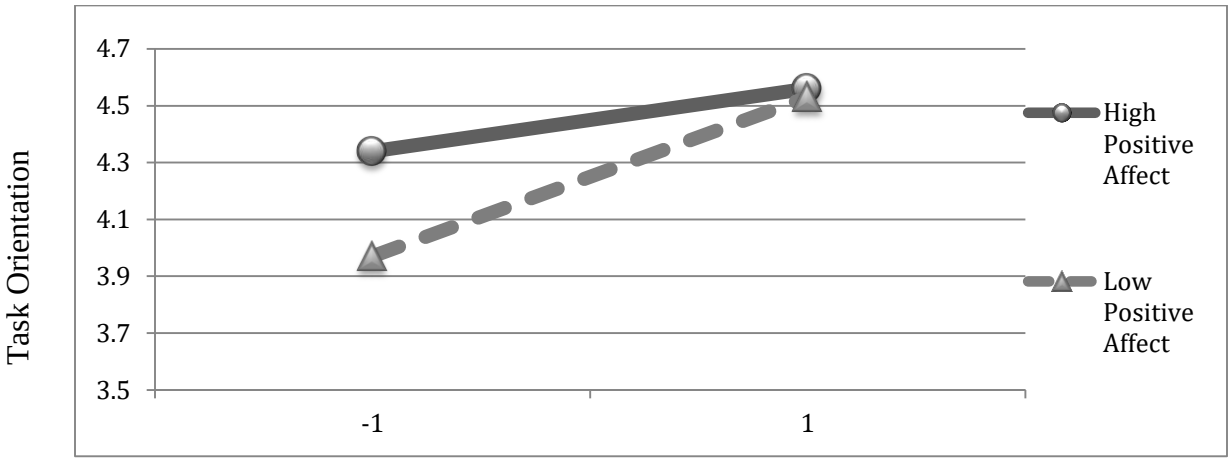
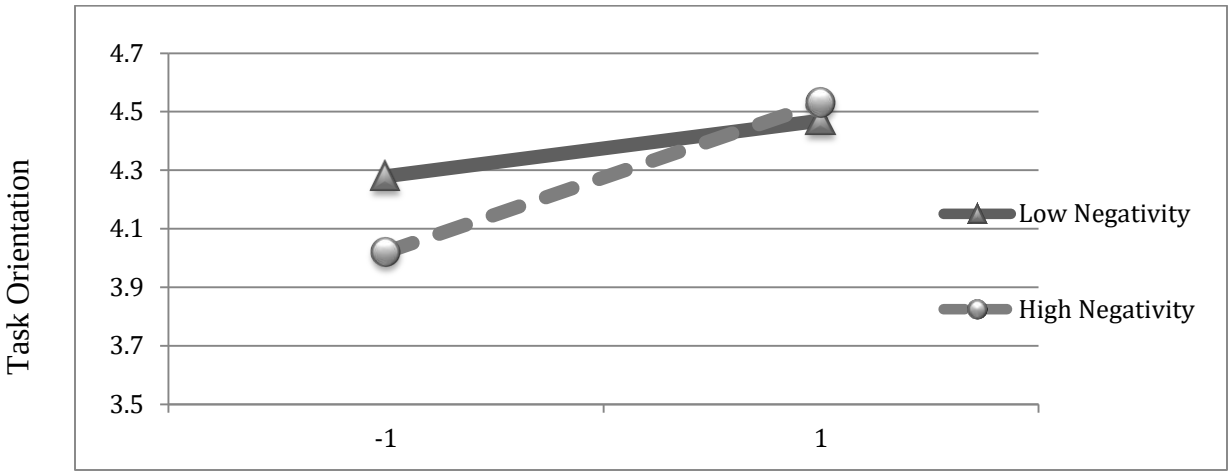


Figure 2

Moderating Effect Of Children's Relational Negativity On The Association Between Children's Observed Positive Interactions With Teachers And Task Orientation.



Note: The graphs above illustrate the isolated effects of the interaction terms at +/- 1 standard deviation.

Appendix A

Teacher-Child Narrative Coding Manual

Teacher-Child Narrative Coding Manual

Created by Catherine Wolcott, Blake Potts, and Amanda Williford

Adapted from:

Bretherton, I., Oppenheim, D., Buchsbaum, H., Emde, R. N., & The MacArthur Narrative Group (1990). MacArthur Story-Stem Battery. Unpublished manuscript.

Combs-Ronto, L. A. (2008). *Social-cognitive and Emotion Processing in Children's Aggression: Descriptors, Predictors, and Precursors*. ProQuest.

Warren, S. L., Mantz-Simmons, L.,& Emde, R. N. (1993). Narrative emotion coding. Unpublished manuscript.

General Coding Instructions

Make sure to use the manual EACH time you code. Take a break from coding every hour or so. Make sure to enter your codes carefully.

Teacher ID: This is the ID that begins with a "4."

Child ID: This is either the first four or second 4 digits. This number does *not* begin with a 4.

Data Collector Errors:

Mark yes for this item if the data collector asks an extra question or a question that is not in the prompts. If the data collector asks an additional question, do not include the child's response following the data collector's break in protocol. In the "notes" section, detail what the error was.

Verbatim Lost:

If the data collector writes VL, you will answer this question "yes." In the notes section, you will detail how many times this happened.

Interferes with understanding?

You will assess whether the data collector retained the meaning of the story, or whether the missing information appeared to make the story hard to follow.

Extenuating Circumstances:

If the data collector mentions in their notes an odd situation that occurred (e.g., a fire drill prevented them from finishing the interview), you should mark this as yes and provide an explanation in the "notes" section. If the data collector merely mentions the behavior of the child during the interview, do not mark "extenuating circumstances."

Empathic Relations Themes

Note: For Empathic Relation themes to be present in the narrative, the themes must exist between the teacher and the child.

Sharing

For this theme to be present, there must be some level of the **teacher or child** giving something up to the other. When sharing is clearly present in the child's narrative at the high range, the interactions between the teacher and the child will be positive, as evidenced by closeness or positive descriptions of the teacher and the child's relationship. The interactions between the teacher and child in the child's story will involve the sharing of some object.

For example:

-In the interview story, the child wants to eat popcorn and watch a movie with his teacher, so he shares his popcorn.

-In the story, the teacher shares her paint with the child so that he can paint too.

1. Low/Not present
There is no sharing present.
2. Low-Medium/Barely-Present
There is an example of low quality sharing by one of the characters in the story. This lower quality sharing will not be very explicit. The sharing will also only be briefly mentioned. For example, the child may say that his teacher is eating popcorn and drinking a drink at his house because he has popcorn at his house. This suggests that the child is sharing popcorn from his house with his teacher but he does not explicitly give the popcorn to his teacher.
3. Medium/Moderately Present
There is an example of low quality sharing present but the instance is clear. Sharing will be explicit and brief. The child represents the teacher in a neutral or matter of fact way, without making clear reference to closeness with the teacher. Or, sharing may initially be positive, but later in the story, the child represents the teacher in a negative light.

4. Medium-High/Present
At this level, the sharing that occurs between characters in the child's story will be more high quality and more explicit. The child or teacher in the story will more clearly give something up or share something with the other character. The child describes interactions with the teacher that are positive.
5. High/Very present
Sharing at this level is explicit. There is at least one instance in which a character in the child's story (the teacher and the child) clearly shares something with or gives something to the other character. The instance is detailed, there are multiple occasions of sharing, or sharing is returned to at multiple points in the story. In the story, the teacher and child have positive interactions throughout.

Empathy/Helping/Reassurance

When these themes are present in a child's story, a story character **(the teacher or child)** will identify with or demonstrate an understanding of the thoughts or feelings of another through action. A character may make helping movements or gestures towards another character that is in distress. For example, a character may seek out or attempt to comfort another character in distress, share something with them, or seek reassurance from them. All attempts made are to alleviate the other character's distress.

Helping behavior includes instances where one character in the child's story helps the other to perform a task or to provide some kind of assistance. However, for the instance to be a high quality instance, the task must be done together and not independently.

For example:

-The child offers something to the teacher in the story if she is injured.
-The teacher assists the child in cleaning something up.
-The teacher makes something go away that is scaring the child.

1. Low/Not present
There are no instances of empathy/helping/reassurance present in the child's story.

2. Low-Medium/Barely-Present
There is an instance of low quality empathetic helping or empathetic reassurance. A character may do or say something to help or show empathy towards another character, but the reassuring behavior may not seem to fulfill its purpose or may seem unclear (for example, the other character is not present during the gesture). In this instance, the character may act independently. The instance will not contain very explicit helping or reassuring actions/gestures.
3. Medium/Moderately Present
There is at least one instance of low quality empathetic helping or empathetic reassurance. In this instance, the other character is present and the task is done together. The helping/reassuring act will be low quality in that it will not be very explicit or detailed. For example, the teacher will not do something in service to the child but she may say something or give him some information that would help him with whatever he is working on.
4. Medium-High/Present
There is at least one instance of either explicit empathetic helping or empathetic reassurance. The instance is clear and has an emotional quality that conveys that the child is reassured, but there is not much elaboration or detail offered.
5. High/Very present
There are explicit instances of the entire theme present in the child's narrative, and either both empathetic helping and empathetic reassurance is provided or given significant attention and detail. For example, the child may explain that in his drawing he has spilled something and his teacher tells him that "It's okay!" and helps him clean it up.

Affiliation

This theme refers to a situation that may occur in the child's narrative in which the **teacher and child characters** participate in an activity together. To exhibit high quality affiliation, there must be a clear sense of inclusion or belonging that is described in doing the activity together. Affiliation can also be demonstrated through instances of turn taking in a child's narrative. The activity must be occurring between the teacher and the child.

1. Low/Not present
There are no instances of affiliation in the narrative. The teacher and the child in the child's story do separate activities completely independently of each other.
2. Low-Medium/Barely-Present
There is at least one instance of low quality affiliation. The teacher and child participate in similar activities but not clearly together or clearly at the same time. For example, when asked what the child is doing in his story, he may be painting while his teacher is drawing but there is no other information given about whether or not they are together.
3. Medium/Moderately Present
There is at least one instance of low quality affiliation. The teacher and child participate in similar or the same activities together. For example, the teacher may be painting while the child is drawing, but the child reveals that they are doing the activities in the classroom together.
4. Medium-High/Present
At this level, there is at least one instance of high quality affiliation. The teacher and child participate in the same activity together. For example, the child may say that both he and the teacher are both playing outside together. The instance may be clear, but there is not emotional or detailed information provided.
5. High/Very present
Affiliation at this level will be very explicit. The child and the teacher participate in a joint activity together that implies closeness. For example, the child says that he is going down the slide outside, and then offers that the teacher is going down the slide with him. They are clearly involved in a mutual activity that implies closeness or shared experience.

Affection

This theme includes any instances of expression of affection including hugs, kisses, compliments, warm or caring touch, or praise, **either expressed by the child or the teacher**. Touch that is included as a normal part of a game (e.g., tag, would be coded low-medium) whereas touch that is joining but in the context of a game is coded as moderate quality affection (e.g., ring around rosey).

1. Low/Not present
There are no instances of affection in the narrative. The teacher does not compliment the child or touch him in a warm or caring way at all.
2. Low-Medium/Barely-Present
There may be one instance of low quality affection, such as low quality touch or praise. While the teacher may touch the child or say something along the lines of praise, it will not be intentionally warm or caring. Or in the child's story, the teacher may thank the child. This is low quality affection.
3. Medium/Moderately Present
There is one instance in which the teacher or child is very briefly affectionate with the other. Or the teacher may give vague praise such as "good job," without complimenting something specific that the child did or something specific about the child. Also code physical affection that implies physical contact that does not appear to be for the purpose of creating closeness between the teacher and the child. For example, the teacher may touch the child when they are playing a game in which they hold hands.
4. Medium-High/Present
There is an instance of high quality affection in the form of either praise or physical affection in the child's story. However, at this level both do not need to occur. The teacher or child will be clearly physically affectionate by hugging, hand holding, or back rubbing. Or, the teacher or child will specifically compliment the other on a specific action or characteristic. Or, the teacher may pat the child's back briefly in his narrative.
5. High/Very present
At this level, the affection in the story is detailed and focused upon more than once

or more than briefly. Or, the affection is expressed strongly either physically or verbally through words such as "love." The child may make reference to the affection more than once throughout his narrative. For example, the child mentions that his teacher is rubbing his back in the story early in his narrative and then makes reference to the backrub other times throughout his story.

Aggressive Themes

Aggression

This theme characterizes interpersonal acts of aggression. Aggression may occur between the child and the teacher in his story or between other characters. Aggression may include verbal aggression (name calling, exclusion, shaming comments, threats, and insults), physical aggression (physical contact intended to cause harm like hitting or stabbing), or killing. Aggression that is regulated or provoked in the child's story will be given a lower code than aggression that is dysregulated or occurs without reason.

1. Low/Not present
There are no instances of aggression in the child's narrative.
2. Low-Medium/Barely-Present
There is at least one instance of verbal or physical aggression between any of the characters in the child's story. This level does not include physical aggression between people in the story. Aggression at this level will be regulated and may be quite subtle, or it may be hard to disentangle what the child means. For example, if the child mentions that another character is "messing with" someone else in the story and there are no other instances of aggression, this would be a 2.
3. Medium/Moderately Present
There is at least one instance of verbal aggression or physical aggression between any of the characters in the child's narrative. The instance may not be focused on and may be mentioned briefly. The severity of the aggression may be somewhat vague or unclear (e.g., characters are fighting, but it's unclear whether the fighting is

physical or is meant to be playful). However, aggression is clearly mentioned.
4. Medium-High/Present
There is at least one instance of physical aggression or verbal aggression in the child's story in which the child or teacher in the story acts in a way that harms something else, fictional or non-fictional. There may be other instances of verbal or physical aggression between other characters. Or, there are low-level aggression and violent themes throughout the narrative. For narratives that have frequent aggression throughout the narrative, aggression between nonfictional characters is provoked and more regulated than not. For example, a child may repeatedly reference killing bugs or animals throughout the story but also explain that the bugs were attacking the teacher and the child.
5. High/Very present
There is at least one instance of physical aggression or verbal aggression in the child's story in which the child or teacher in the story acts in a way that harms another nonfictional character. At this level, dysregulated aggression between nonfictional characters occurs. There is no reason for the physical or verbal aggression. For example, the child may suddenly kill his teacher.

Personal Injury

This theme describes an instance in the child's narrative when the child is physically hurt or injured. The child character may or may not acknowledge the pain of the injury. The injury may be self-inflicted or the result of an accident caused by another character.

1. Low/Not present
There are no instances of personal injury in the narrative in which the child is hurt or injured.
2. Low-Medium/Barely-Present
There is at least one instance in which the child is injured in his story, but this instance is subtle and not fully explained. For example, the child mentions having his hand hurt, but does not provide further detail or elaboration. The child's injury is inflicted by a prop in his story, not by himself or another character. Additionally, the child does not acknowledge or show that he feels pain in his story. Or, the child may

be seem to be referring to him or herself in real life (not the narrative).
3. Medium/Moderately Present
There is at least one instance in the child's story in which he is injured. The child's injury again is inflicted by a prop, not by himself or by another character and is minor. At this level, the child could receive a minor injury (e.g., a papercut) AND express hurt briefly. OR, the child could be describing a fantastic situation, but not express that the event is damaging. For example, the child could say that his hand is on fire, but does not explain why or what caused the burning.
4. Medium-High/Present
There is at least one instance in the child's story in which he is injured or in an accident that would clearly cause personal injury. The injury might be caused by another character in the story, the child might inflict the injury on himself, or the incident would clearly cause pain. For example, the child sticks his hand on a hot stove or gets hit by a car.
5. High/Very present
There is at least one instance in the child's story in which he is clearly injured. The injury is severe and caused by another character in the story or himself. The child gives a detailed response about suffering or pain.

Child Power

This theme refers to a time when the child in his story handles situations or behaves in a way that is not childlike. The child character in the narrative appears to have an inappropriate amount of power. There are instances in his narrative in which the child has more power than his teacher. At the lower end of the presence of this scheme, the child behaves like a little adult. This could occur when the child resolves situations in a way that portrays them as an adult. At the higher range of this scheme, the child demonstrates grandiose or superhuman powers such as killing monsters, cool karate moves, flying, etc.

1. Low/Not present
There are no instances of child power in the narrative.
2. Low-Medium/Barely-Present
There is one brief instance of inappropriate child power, in which the child acts like an adult. The child may engage in a response that seems somewhat adult-like, but the instance is not overt or overly clear. There is little detail about his power.
3. Medium/Moderately Present
In the child's narrative, there is a clear instance in which the child's actions and the teacher's actions depict the child as having more power or being more of an adult than the teacher. The child could explicitly reference role reversal. For example, the child mentions that his teacher is "a little kid" while he is "a giant." If the child has superhuman powers in the narrative, these superhuman powers do not place the child in a greater position of power than his teacher (e.g., they might both be superheroes).
4. Medium-High/Present
There are multiple or detailed instances when a child has inappropriate power. The child may mention on multiple occasions that he killed a monster, flies, has fancy karate moves, etc., and his teacher does not clearly have these same powers. For example, the whole story is centered on the child driving the teacher around in a car. The child makes reference to this multiple times.
5. High/Very present
Throughout the child's narrative, the child exhibits superhuman power. The child's story is based around his superhuman abilities and involves saving others. The

child provides detail about his super powers, uses these powers to save or rescue others, and is more powerful than his or her teacher.

Danger

Danger means that the character is at risk of something bad happening. The danger theme may represent the continuation of a danger theme, which was already presented, or a clear worsening of the danger. Do not code threats, only code dangers clearly present in the child's narrative. If a character dies as a result of a particular danger (e.g., the character is eaten by a monster), code this as danger. If in the child's story, characters are hiding from something, code the presence of danger.

1. Low/Not present
There are no instances of danger in the narrative.
2. Low-Medium/Barely-Present
There is one brief, low quality instance of danger mentioned in the child's narrative. The child may present a dangerous situation, but does not explain that the situation is dangerous (e.g., the child mentions a monster in his/her story but there is no explanation, or it is unclear whether this is a dangerous situation). Or, the child may mention that he/she is hiding from something but does not explain what the danger is and does not describe being afraid. The instance of danger is not elaborated.
3. Medium/Moderately Present
This code is assigned when the child presents a danger theme and continues addressing this danger throughout his/her narrative. In this code, the danger does not have a clear emotional or threatening quality throughout but is mentioned more than briefly.
4. Medium-High/Present
There is an instance or instances of danger where the detail and content provided make it clear that the instance represents a threatening or dangerous situation. Or, the child may present one danger theme in the story and then may present another worsening danger later in the story. New danger or worsening or danger could occur when the child is hiding from something dangerous or if he/she mentions that help is unobtainable.

5. High/Very present
The child presents a danger theme, continues addressing this danger throughout his/her narrative, and the danger has a clear emotional quality. Or, the child presents one danger theme in the story and then presents another new or worse danger later in the story. To be assigned this code, the danger is elaborated upon and has a clear emotional quality (i.e. the expression of fear or other negative emotions.)

Affect Themes

Child Positive Affect

The response is meant to describe the overall emotion felt by the child in the story. The scale should take into account the child's response to how he or she feels in the story, as well as considering any other explicit description of affect in the story. This code is not meant to take into account the child's answer to how their teacher feels.

1. Low/Not present
If no positive affect or themes are conveyed throughout the story, this code should be used. This might occur if the child responds to affect questions with "I don't know" or fails to name an emotion in response to the prompts.
2. Low-Medium/Moderately-Present
If there is a slight hint of a positive expressed emotion somewhere in the story, but the description is vague and the emotion is not clearly positive, this code should be used. The child may use such as "fine" or "ok" to express how they feel. The child might have only a brief mention of a semi-positive/neutral emotion somewhere in the narrative.
3. Medium/Moderately Present
This code should be used when the child answers how he or she feels with positive words such as "good" or "happy" only once without further explanation or discussion. This code may also be used if there is a presence of positive affect expressed only in response to the prompt "how do you feel in your drawing."
4. Medium-High/Present

This code should be used for positive expressed emotion that is present but discussed briefly with an accompanying explanation. The child may use words such as “happy” to describe how they feel and provide a brief explanation.
5. High/Very present
This code should be used for positive expressed emotion that is present on multiple occasions. For example, if the child mentions positive affect in several places throughout the narrative, this code should be used.

Child Negative Affect

The response is meant to describe negative emotion felt by the child in the story. The scale should take into account the child's response to how they feel in the story, as well as considering any other explicit description of affect in the story.

1. Low/Not present
If no negative affect or themes are conveyed throughout the story, this code should be used. This might occur if the child responds to affect questions with "I don't know" or fails to name an emotion in response to the prompts.
2. Low-Medium/Moderately-Present
If there is a slight hint of a negative expressed emotion related to the child expressed in the story, but the description is vague or the emotion is only slightly negative, this code should be used. These negative words might not be clearly in reference to affect—for example, the child could describe that he or she is feeling sick, unwell, or tired.
3. Medium/Moderately Present
If the child mentions an explicit negative emotion in the story that is later resolved, this code should be used. For example, the child might mention early in the story that he or she is scared, but the child may resolve this emotion later in the narrative.
4. Medium-High/Present
This code should be used for negative expressed emotion that is present but discussed briefly and not elaborated. Words that the child might describe include "sad" or "bad." These emotions are not resolved in any way during the narrative. The child may or may not provide an explanation.
5. High/Very present
This code should be used for negative expressed emotion that is mentioned repeatedly. For example, if the child mentions negative affect throughout the narrative, this code should be used.

Teacher Positive Affect

This code is meant to describe the overall emotion felt by the teacher in the story. The scale should take into account the teacher's response to how they feel in the story, as well as considering any other explicit description of affect in the story.

1. Low/Not present
If no positive affect or themes are conveyed throughout the story, this code should be used. This might occur if the child responds to the teacher affect question with "I don't know" or fails to name an emotion in response to the prompt.
2. Low-Medium/Moderately-Present
If there is a slight hint of positive teacher expressed emotion somewhere in the story, but the description is vague and the emotion is not clearly positive, this code should be used. The child may use such as "fine" or "ok" to express how the teacher feels.
3. Medium/Moderately Present
This code should be used when the child answers how the teacher feels with positive words such as "good" or "happy." This code may also be used if there is a presence of positive affect expressed only in response to the prompt "how does your teacher feel in your drawing."
4. Medium-High/Present
This code should be used for positive expressed emotion that is present and discussed briefly with an accompanying explanation. The child may use words such as "happy" to describe how the teacher feels and provide a brief explanation of why the teacher is happy.
5. High/Very present
This code should be used for the teacher's positive expressed emotion that is mentioned repeatedly. For example, if the child consistently mentions positive teacher affect throughout the narrative, this code should be used.

Teacher Negative Affect

The response is meant to describe negative emotion felt by the teacher in the story. The scale should take into account the child's response to how the teacher feels in the story, as well as considering any other explicit description of teacher affect in the story.

1. Low/Not present
If no negative affect or themes are conveyed throughout the story, this code should be used. This might occur if the child responds to teacher affect questions with "I don't know" or fails to name an emotion in response to the prompts.
2. Low-Medium/Moderately-Present
If there is a slight hint of a negative expressed emotion expressed by the teacher, but the description is vague or the emotion is only slightly negative, this code should be used. These negative words might not be clearly in reference to affect—for example, the child could describe that the teacher is feeling sick or unwell.
3. Medium/Moderately Present
This code may be used if there is a presence of negative affect that is mentioned briefly and is later resolved. Words that the child might describe include "sad" or "bad," but these are resolved later.
4. Medium-High/Present
This code should be used for negative expressed emotion that is present. Words that the child might describe in reference to the teacher include "sad," "bad," or "angry." These emotions are not resolved in any way during the narrative. There may or may not be an accompanying explanation.
5. High/Very present
This code should be used for negative teacher expressed emotion that is mentioned repeatedly. For example, if the child offers an explanation for why the teacher feels the negative emotion, or they consistently mention the teacher's negative affect throughout the narrative, this code should be used.

Affective Match Between Teacher and Child

This code refers to the extent to which the child's description of their affect matches the teacher's description. This response should primarily take into consideration the child's response to "How do you feel in your drawing" and "How does your teacher feel in your drawing," but can include any other explicit expression of affect in the narrative.

1. Low/Not present
The child and the teacher have clearly opposite emotions. For example, the teacher feels "happy" and the child feels "sad." Or, the child answers either or both affect questions with "I don't know" or does not respond with an emotion, preventing the coding of affective match.
2. Low-Medium/ Barely Present
There may be a brief instance of shared affect but then a description of opposite emotions. For example, the child might say "*we are scared because…"* but the child later responds to the prompts about how he and his teacher feel with opposing or conflicting emotions. Or, the child may say that he is scared throughout the story, and then indicate that both he and the teacher are happy without providing justification in the narrative for the shift in emotions, thereby making the match unclear. Or, the child says "I don't know" to one of the affect questions but provides clear affect in another section. The child may also report a negative or positive feeling in combination with a neutral feeling ("fine" and "sad" or "okay" and "bad" or "ok" and "good."
3. Medium/Moderately Present
The child and the teacher may have a similar or the same emotion in the story, but the only indication of the affective match is in reference to the questions related to how the teacher and the child feel in the drawing.
4. Medium-High/Present
The child and the teacher share a similar type of emotion in the story, and there is information provided that directly explains these feelings. For example, if the child feels "good" and the teacher feels "happy," and the child provides an explanation for why this might be, this code should be used. Or, if the child feels "bad" and the teacher feels "sad," and there is appropriate justification in the narrative for these

feelings, this code should be used. In this scenario, the child has to provide explanation for only one of the characters' (teacher's or child's) affect in the story. However, for this code to be used, both characters' emotions must fit with the story that is provided.
5. High/Very present
The child and the teacher share the same emotion in the story *and* there are multiple references to affect throughout the story that support an affective match. For example, both the teacher and the child are happy because they are playing together throughout the narrative, and this feeling is mentioned on multiple occasions.

Incoherence to Positive

This scale refers to emotional incoherence which occurs in terms of positive emotional themes in the story. This code should be used when there is an emotional shift in the story that does not make sense and ends with positive expression of emotion. For example, if the child is fighting with "bad guys" and then hugs them and feels good, this would be coded as incoherence to positive. Similarly, if the child describes negative and violent events in the story and then labels the emotions as positive, this would be classified as incoherence to positive. This code can be used with both the teacher's and child's response in the story. To summarize, for this code to be used, two elements are needed: A) A sudden shift in emotions B) A specific negative event or theme (e.g., sadness, hurt, violence, anger, aggression) transformed to a positive theme without explanation.

1. Low/Not present
There are no unexplained emotional shifts to a positive theme in the story.
2. Low-Medium/Barely Present
There is a shift to a positive theme in the story that is not fully explained, but some type of explanation is offered. This code should be used to detect shifts that occur that are very slight or are partially explained or understandable.
3. Medium/Moderately Present
There is a shift to a positive theme in the story that is unclear, but the shift is not overly unreasonable. This might occur of the teacher or the child's emotion seems

somewhat incongruent with the description of the story, but not overly so.
4. Medium-High/Present
There is a shift to a positive theme in the story that does not make sense. There may be no explanation for why the theme turned positive; however, the description of the negative scenario in the story is modulated and controlled.
5. High/Very present
There is a shift to a positive theme in the story from extreme or dysregulated emotions. For example, if the child described a violent scenario and then expressed positive emotions that were clearly and overtly incoherent with this scenario, this code should be chosen.

Incoherence to Negative

This scale refers to incoherence which occurs in terms of a shift to negative emotional themes in the story. If the child describes positive or happy events in the story and then labels their emotions as negative without explanation, this would be classified as incoherence to negative. This code can be used with both the teacher's and child's response in the story. To summarize, for this code to be used, two elements are needed: A sudden shift in emotions and no clear explanations for the shift. B) A specific positive or neutral event or theme (e.g., affection, hugging) transformed to a negative theme without rationale.

1. Low/Not present
There are no unexplained emotional shifts to a negative emotion in the story.
2. Low-Medium/Barely Present
There is a shift to a negative theme in the story that is not fully explained, but some type of explanation is offered. This code should be used to detect shifts that occur that are very slight or are partially explained or understandable. The shift may occur from a neutral situation to a negative situation in a way that is slightly perplexing or unexplained.
3. Medium/Moderately Present
There is a shift to negative theme in the story that is unclear, but the shift is not

completely incongruent. This might occur of the teacher or the child's emotions are negative in a way that seems somewhat incongruent with the description of the story, but not overly so.
4. Medium-High/Present
There is a shift to a negative theme in the story that does not make sense. There may be no explanation for why the theme turned negative. The description of the beginning scenario in the story is not overly positive, making the shift less bizarre.
5. High/Very present
There is a shift to a negative theme in the story from clearly happy or positive emotions. For example, if the child described an extremely happy scenario and then expressed negative emotions that were fully incoherent with this scenario, this code should be chosen.

Coherence Themes

Note: Do not consider "show me" questions when coding coherence of the narratives.

Embellishment

This code refers to the extent to which a child provides details in their answer. For embellishment to be coded, the detail must be related to the prompt being asked. When including spontaneous comments, comments that include the teacher, the child, or school should be considered on-task.

1. Low/Not present
The majority of the child's responses include "I don't know," or responses that do not pertain to the prompt. For nearly each of the questions, the child may only offer 1-2 single word answers to the questions.
2. Low-Medium/Barely-Present
The child provides some related detail, but details in this case are very limited. If there is extensive detail, it is off-topic. There may be a mix of "I don't knows" or mostly single or very few word answers.
3. Medium/Moderately Present
The child may provide more than single word explanations to the prompts, but there is generally limited detail and brief responding. The child may offer the minimal amount of detail necessary to tell the story and respond to the prompts.
4. Medium-High/Present
Some responses to the prompt have multiple sentence/word answers that provide detailed information. Other prompts, however, may be responded to briefly. In general, the child provides quite a bit of detail on multiple occasions.
5. High/Very present
The majority of responses to the prompt have multiple sentence answers that provide detailed information. Overall, the child provides detailed explanations to the prompt. (3249_4286_04302013)

Logic

This code refers to how much sense the story makes and how logical the story seems as a whole. It is important to recognize that many children involve fantasy in their story. In these situations, you should not code the content of the story, but rather how events are explained and relate to each other. Stories that have a bizarre quality to them will be coded as low, whereas stories that have a logical sequence of events, even if they are unrealistic, can be coded in the high range. In general, you will take into consideration how easy it was to follow and understand how events relate to each other. Spontaneous comments can be used to provide context for the story if the child is describing what's happening in their picture, but spontaneous comments where the child is merely commenting on the task or unrelated events during the portion of the task before the story prompts are provided should NOT be used to score the narrative lower on this code.

1. Low/Not present
There is a fragmented shift in the story line, such that the story does not make sense. Or, the child provides so little detail that logic is unable to be determined or detected.
2. Low-Medium/Barely-Present
Some parts of the story make sense, but in general, the story retains a bizarre quality that makes what the child described unclear.
3. Medium/Moderately Present
There is a balance of parts of the story that make sense in combination with parts that are unclear. Overall, the story is logical, but there are several pieces that are unclear, difficult to follow, or disjointed from the larger story.
4. Medium-High/Present
The story generally makes sense, but there may be brief comments that are unclear or don't seem to make sense. Overall, the story makes sense and is logical.
5. High/Very present
The story makes sense. There are not parts that are unclear, illogical, or disconnected.

Response to Prompt

This code assesses the extent to which the child responds to the questions asked by the examiner. When coding this category, do not consider show me you, or show me your teacher as a response to the prompt. You should consider how well the child answers the question. If, in addition to answering the question, the child provides unrelated detail, this unrelated detail should not bring down the code that assesses whether the child answered the prompt. When assessing whether the child responded to the prompt in spontaneous comments, count whether the child mentions them, their teacher, their school or their drawing. The child does not have to mention all three of these things.

1. Low/Not present
The child responds to the prompts with "I don't know," "nothing," or does not answer the examiner's questions.
2. Low-Medium/Barely-Present
The child responds to a few of the prompts, but in general, the child's answers do not answer the questions in the narrative.
3. Medium/Moderately Present
The child responds to multiple prompts, but there are also responses such as "I don't know," or several responses that do not offer a clear answer to the question that was asked. A child may answer some questions by answering the prompt, but in response to other questions, may not provide an answer that directly responds to the question.
4. Medium-High/Present
The child responds to nearly all prompts in the story with an appropriate answer. There may be 1 or 2 questions that are not fully answered. If they respond to a question with "I don't know," the full meaning is not lost and the content is captured in the child's response to other prompts. For example, the child may provide an answer to the majority of the questions that are later asked by the examiner in the spontaneous comments section. However, when asked again, the child may only respond briefly.
5. High/Very present
The child clearly responds to all prompts in the story.

Unrelated Detail

This code assesses the amount of unrelated information the child provides in response to the prompts. Unrelated detail includes information that is not pertinent to the child's drawing, the story that they tell, or the questions that the child is asked to answer. During spontaneous comments, this might include talking about their family, a friend in their classroom, or asking questions to the examiner. In response to the questions, the child may provide information that is irrelevant to the question that was asked of them.

1. Low/Not present
All of the child's responses are on task and relate to the question being asked.
2. Low-Medium/Barely-Present
Nearly all the child's responses pertain to the prompt being asked. There may be a few brief comments that are unrelated to the prompt, but these are brief. The majority of the child's talk is on task.
3. Medium/Moderately Present
There is a mixture of the child responding to the prompts with both related and unrelated information. This might occur if the child initially answers questions, but frequently goes on to add extensive comments or thoughts that are not related to the question. Or, there may be a balance of related and unrelated responses across different prompts.
4. Medium-High/Present
The majority of the child's talk is unrelated to the prompt and provides extraneous detail. There may be some portions of the child's narrative that are related to the prompt, but overall, the majority of the child's responses contain unrelated detail.
5. High/Very present
Nearly all or all of the child's responses have extraneous or unrelated detail. The child's talk is primarily centered on details that are not closely related to the prompt and what the child is being asked to comment upon.

Spontaneous Comments Section

You will provide a word count for the spontaneous comments section, and you will also note whether the child's spontaneous comments contained the following. You will simply code the presence or absence of the following content:

1. **Discusses materials, drawing, or task?**
   The child may discuss supplies, the task, markers, paper, the colors of the markers, the objects in their drawing, etc.

2. **Tells Story?**
   The child may begin to tell a story about what is happening in their picture. If they mention a character and an action HAPPENING IN THE DRAWING, this code should be marked. Simply naming objects in their drawing should not be counted as telling a story. Discussing characters or events outside the drawing should not be coded.

3. **Mentions Teacher?**
   You will code whether or not the child makes reference to their teacher. This could be a reference to the teacher "in real life," or the child could discuss something that they are drawing about their teacher.

4. **Engages the examiner?**
   You will assess whether the child engages the examiner during the spontaneous comments. This may be by asking the examiner questions, or by putting the examiner in their drawing. The child must explicitly ask the examiner a question. If it's not clear whether the child is speaking to the examiner or themselves, mark no.

5. **Mentions factual/real life events?**
   You will code whether or not the child discusses factual or real events. They may describe what their teacher likes, or talk about what other kids are doing at school.

General Impressions- Odd, Positive, Negative

For these questions, you will give your general impressions about the narrative as a whole on a scale from 1-5. These are meant to be a global assessment and take into account all the questions—the point of these codes is to respond with your initial instinct.

Odd- Rank how bizarre or concerning the narrative was (1=not concerning or not odd; 5=very concerning or odd)

Positive- Rank how positive the narrative felt (1=not at all positive, 3= somewhat positive, 5=very positive)

Negative- Rank how negative the narrative felt (1=not at all negative, 3= somewhat negative, 5=very negative)

Appendix B

Percent of codes assigned each value.

	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Sharing	95.5	1.9	1.3	0.6	0.0	0.0	0.6	0.0	0.0
Empathy/Helping	84.6	3.8	3.8	1.9	1.3	2.6	0.6	0.6	0.6
Affiliation	30.8	10.3	8.3	9.6	11.5	9.0	9.6	5.8	5.1
Affection	85.9	1.3	0.6	1.9	2.6	1.3	3.2	0.6	2.6
Aggression	82.7	5.1	4.5	1.9	0.0	0.6	3.8	0.6	0.6
Personal Injury	94.9	0.0	0.6	0.6	1.3	0.6	1.3	0.6	0.0
Child Power	84.6	7.1	3.2	0.6	3.2	0.6	0.6	0.0	0.0
Danger	76.3	5.1	5.1	5.8	0.6	3.2	2.6	0.6	0.6
Child Positive Affect	29.5	1.3	7.7	1.3	49.4	5.8	1.9	0.0	3.2
Child Negative Affect	84.6	1.9	1.9	1.3	0.0	1.3	7.1	1.3	0.6
Teacher Positive Affect	25.6	1.3	5.8	0.6	53.8	5.8	1.9	1.3	3.8
Teacher Negative Affect	86.5	0.6	1.3	1.3	0.0	1.3	5.8	2.6	0.6
Affective Match	28.8	3.2	6.4	7.1	39.1	10.3	1.9	0.6	2.6
Incoherence to Positive	78.8	5.8	4.5	2.6	1.9	2.6	1.9	1.9	0.0
Incoherence to Negative	82.1	5.1	2.6	2.6	1.3	3.2	1.9	0.6	0.6
Embellishment	3.8	9.6	9.6	9.6	21.8	16.0	22.4	6.4	0.6
Logic	9.0	7.7	7.0	13.4	11.5	15.4	19.9	10.3	5.8
Response to Prompt	1.9	3.8	5.1	7.7	8.3	9.6	15.4	18.6	29.5

Note: All narratives were double coded. Assigned codes represent the average score of the two coders. A total of 157 children participated in the narrative procedure. One narrative was not coded because the child did not answer the narrative questions.

Appendix C

Bivariate Correlations Among Narrative Codes

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. Sharing	.002	.180*	.143	-.049	.103	-.039	-.073	.096	-.061	.094	-.064	.077	-.053	.030	.110	.139	.097
2. Empathy/Helping		.131	.089	.236**	.295**	.179**	.337**	-.054	.129	-.021	.093	-.006	.133	.048	.321**	.112	.220**
3. Affiliation			.201*	-.128	.023	-.027	.101	.216**	-.047	.169*	-.076	.263**	-.107	-.074	.420**	.626**	.464**
4. Affection				-.087	.014	-.024	.040	.150	-.022	.094	-.009	.114	-.117	-.070	.186*	.157*	.136
5. Aggression					.044	.583**	.369**	-.125	.170*	.049	.119	.018	.560**	.007	.305**	.034	.213**
6. Personal Injury						.017	-.022	-.059	-.028	-.072	-.038	-.056	.125	.124	.100	.056	.117
7. Child Power							.407**	-.221**	.193*	-.058	.150	-.035	.280**	.044	.245**	.002	.133
8. Danger								-.137	.235**	-.031	.211**	-.047	.467**	.001	.422**	.029	.252**
9. Child Positive Affect									-.412	.638**	-.139	-.139	.698**	-.057	-.140	.187*	.388**
10. Child Negative Affect										-.093	.506**	-.090	.162*	.424**	.206**	-.160*	.188*
11.Teacher Positive Affect											-.283**	.702**	.141	-.293**	.230**	.359**	.381**
12.Teacher Negative Affect												-.030	-.081	.565**	.225**	-.128	.160*
13.Affective Match													-.055	-.259**	.290**	.408**	.427**
14. Incoherence to Positive														-.140	.232**	-.039	.199*
15. Incoherence to Negative															.175*	-.075	.144
16. Embellishment																.547**	.790**
17. Logic																	.690**
18. Response to Prompt																	1.00