CONSIDERING THE CLASSROOM: A LOOK INTO THE SOCIAL CONTEXT OF PRESCHOOLERS WHO DISPLAY DISRUPTIVE BEHAVIORS

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

---

by

Michelle L. Yoder, M.Ed.

August 2020

© Copyright by
Michelle L. Yoder
All Rights Reserved
August 2020

Department of Human Services
Curry School of Education
University of Virginia
Charlottesville, Virginia

APPROVAL OF THE DISSERTATION

This dissertation, "Considering the Classroom: A Look into the Social Context of Preschoolers Who Display Disruptive Behaviors," 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.

_____
Amanda Williford, Ph.D. (Chair of Committee)

_____
Jason Downer, Ph.D.

_____
Virginia Vitiello, Ph.D.

_____
Julia Blodgett, Ph.D.

_____Date

ACKNOWLEDGEMENTS

This dissertation is a reflection of the ongoing support and encouragement that I have received throughout my doctoral studies at the University of Virginia. These past four years have been some of the most challenging and rewarding that I have experienced, and I would not have made it to this point without the role of many key players.

First, I'd like to thank my dissertation committee – thank you Amanda, Jason, Ginny, and Julia for agreeing to actively support me as I take one of the biggest steps in my time as a graduate student. I can only hope that one day my own career will reflect the knowledge, passion, and dedication that you all exude toward helping little ones. In particular, I'd like to thank my advisor, Amanda. Thank you for challenging me to not always take the easy way out, and for encouraging me to trust myself when I did not always think I could.

To my friends and family members – thank you for not only the continued laughter and encouragement that you provide, but also for helping weave the path that led me to where I am. I'd specifically like to thank Kyle for always making me smile and being the listening ear and supportive shoulder that I've so often needed. I'd also like to express my gratitude to my parents for their ongoing love and encouragement. Mom, you have *always* been my biggest cheerleader, and your constant affirmation has helped refresh my spirit more times than I can count. Dad, you continuously inspire me to work hard and keep persisting, even when things get tough.

Last but not least, I could not have gotten through these past four years without the invaluable support and friendship of my cohort. Anna Grace, Shannon, and Supriya – we have been through the woods and back together, but there is no one else that I would have rather gone on this journey with.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

Page

Conceptual Linking Document

The experiences that children have during their preschool years are some of the most formative to their social, emotional, and behavioral development (Blair, 2002; Denham et al., 2003; Murray, 2015; National Association for the Education of Young Children [NAEYC], 2009). Not only is preschool an opportunity for young children to begin acquiring and practicing the skills needed to engage successfully in the classroom, but it is often one of the first chances for many to interact regularly with peers and adults outside of those in their families (Hay, Payne, & Chadwick, 2004; Rimm-Kaufman & Pianta, 2000). Most preschoolers are able to navigate this new social context with little difficulty; however, those who display hyperactive, inattentive, and/or oppositional behaviors often face barriers to positive engagement with both peers and teachers (Bulotsky-Shearer, Bell, Romero, & Carter, 2012; Denham et al., 2003). As young children's development is largely shaped by the experiences that they have with those who are most proximal to them (Bronfenbrenner, 1978; Pianta, 1999), the implications of early social challenges contribute not only to children's immediate experience in the preschool classroom, but also to their emerging attitude toward school, development of social-emotional skills, and overall well-being (Bulotsky-Shearer, Bell, Carter, & Dietrich, 2014; Eggum-Wilkens et al., 2014; Myers & Pianta, 2008; NAEYC, 2009). Understanding how to promote positive social engagement for children who are vulnerable to such challenges has therefore been a central goal of early childhood research (Girolametto & Weitzman, 2007; Wang, Hatzigianni, Shahaeian, Murray, & Harrison, 2016).

Social Development Within Context

In examining the salience of young children's early social functioning, it is first necessary to understand development as it is embedded within context. Children do not develop in isolation, but rather exist within a larger system comprised of many moving pieces (Bronfenbrenner, 1978; Brophy-Herb, Lee, Nievar, & Stollak, 2007; Myers & Pianta, 2008). These pieces – whether at home or in the community – all interact with one another to shape how children perceive and experience the world around them (Farmer, Lines, & Hamm, 2011; Hay et al., 2004; Howes & Tonyan, 2000; Pianta, 1999). The preschool years in particular encapsulate a unique time during young children's development when this system expands to include a new piece – the classroom. With over half of all children between the ages of 3 to 6 attending some form of center-based care (Federal Interagency Forum on Child and Family Statistics, 2017), the experiences that preschoolers have in the classroom play a foundational role in helping them develop and practice an array of skills important not only to early learning, but social-emotional development more broadly (Blair, 2002; Broekhuizen, Slot, van Aken, & Dubas, 2017; Denham et al., 2003).

In particular, the classroom offers countless opportunities for social interaction. Whether with peers or teachers, the frequency and quality of these interactions contribute largely to children's overall preschool experience (Bulotsky-Shearer et al., 2014; Leggett & Ford, 2016; Ortlieb, 2010; Rushton, Huola-Rushton, & Larkin, 2010). Beyond the association that these early exchanges have with children's social development (e.g., Howes & Tonyan, 2000; NAEYC, 2009; Pianta, 1999; Williams, Mastergeorge, & Ontai, 2010), research has repeatedly identified the link between these interactions and learning-

related outcomes, including those pertaining to development of pre-academic skills (e.g., language, literacy, math) and approaches to learning (e.g., classroom initiative, self-determination, executive functioning; Fantuzzo, Sekino, & Cohen, 2004; Holmes, Kim-Spoon, & Deckard, 2016; Torres, Domitrovich, & Bierman, 2015). As such, understanding how to best promote positive social experiences for preschoolers has implications that pervade a wide range of developmental domains (Hay et al., 2004; Myers & Pianta, 2008; NAEYC, 2009).

The Relationship Between Behavior and Preschool Social Engagement

In order to navigate the social dynamics of the preschool classroom, children must draw upon and integrate a number of diverse skillsets, including those needed to regulate behavior (e.g., impulse control, attention, cognitive flexibility) and engage prosocially with others (e.g., sharing, empathy, conflict resolution). These self-regulatory and social skills have been developing since toddlerhood, but it is during the preschool years when they begin to consolidate and children are expected to display them with growing independence (e.g., Bierman, 2011; Girolametto & Weitzman, 2007; Hay et al., 2004). As the structure and organization of the preschool classroom place increased demands on these newly emerging skills, it is not uncommon for preschoolers to display hyperactive, inattentive, and oppositional tendencies in the midst of learning how to navigate the classroom environment (Bierman, 2011; Hay et al., 2004). However, while most are anticipated to outgrow these behaviors (Hay et al., 2004), approximately 9 to 13% of preschoolers continue to display these challenges with greater severity and/or frequency then their peers (e.g., Egger & Angold, 2006). For these children, engaging socially in the classroom may pose a greater challenge and can result in difficulties that ultimately place them at risk for

negative social-emotional, behavioral, and/or academic outcomes (Bulotsky-Shearer et al., 2014; Eggum-Wilkens et al., 2014).

Despite this elevated risk, however, there exists a unique opportunity to interrupt and redirect young children's developmental trajectories during the preschool years (Blair, 2002; Denham et al., 2003; Hay et al., 2004). By the time a child enters preschool, behavioral tendencies have begun to consolidate with enough stability to be detected, but are not yet set in stone (Hay et al., 2004). As such, the preschool years have been identified as a critical window for early intervention for children at risk for negative social outcomes (Blair, 2002; Denham et al., 2003). If provided with the appropriate amount of attention, intervention, and support, preschoolers who display early disruptive behaviors that interfere with social engagement have the potential to overcome these challenges and develop positive replacement behaviors that will set them up for social success (Myers & Pianta, 2008; Pianta, 1999; Wang et al., 2016). It is therefore necessary to understand how certain factors contribute to and hinder positive social experiences in the classroom for this unique subsample of preschoolers.

Social Engagement in the Preschool Classroom

One area that has been recognized as a focus for early social intervention pertains to the role of the teacher. Particularly during early childhood when children rely heavily on adult support to learn about and navigate their environment (Hamre, Pianta, Downer, & Mashburn, 2008; Myers & Pianta, 2008; Wang et al., 2016), how teachers both interact with and promote interaction between children can be especially important in shaping children's social experiences (Brophy-Herb et al., 2007; Farmer et al., 2011; Pianta, 1999; Stanton-Chapman & Hadden, 2011; Vygotsky, 1978). Among other considerations, the

ways in which teachers perceive children's behavior, scaffold peer engagement, and provide support to the classroom can play key roles in children's developing social competence, especially for those who display disruptive behaviors (Brophy-Herb et al., 2007; Farmer et al., 2011; Howes & Tonyan, 2000; Madill, Gest, & Rodkin, 2014; Myers & Pianta, 2008; Stanton-Chapman, 2015; Vygotsky, 1978).

Teacher perception of behavior. The way that teachers interact with individual children not only impacts the teacher-child relationship, but also "serves as a guide" for how peers perceive and subsequently relate to their classmates (McAuliffe, Hubbard, & Romano, 2009, p. 676; Farmer et al., 2011). Underlying these interactions are teachers' attitude and behavior toward children. Specifically, literature has identified teachers' *perception* – or the way in which they interpret or think about a child's behavior – as a critical contributor to how teachers relate to children (Coplan, Bullock, Archbell, & Bosacki, 2015; Dobbs & Arnold, 2009; Hamre et al., 2008; Myers & Pianta, 2008). Teachers have been shown, for example, to respond more harshly or punitively toward children whom they perceive to display greater behavioral problems compared to their peers (DiCarlo, Baumgartner, Ota, & Jenkins, 2015; Dobbs & Arnold, 2009; Glock & Kleen, 2017). With teachers' responses to young children's behavior influential to both the quality of immediate interactions and formation of social relationships more broadly, understanding the perceptions that underlie these responses is important in considering how to best promote positive social experiences in the classroom for both teachers and children (e.g., Bierman, 2011; Coplan et al., 2015; Myers & Pianta, 2008).

Peer scaffolding. Specifically with regard to peer engagement, teachers play a monumental role in promoting preschoolers' social development by intentionally

scaffolding and supporting peer interaction in the classroom. Combining their intimate knowledge of individual children with that of the broader classroom peer context, teachers are in a unique position to serve as an "invisible hand" that facilitates and shapes the classroom peer ecology (Farmer et al., 2011, p. 247; Farmer, Reinke, & Brooks, 2014; Kindermann, 2011; Williams et al., 2010). There are a number of ways that teachers can scaffold peer interactions, both indirectly and directly; however, one of the most invaluable ways for teachers to promote peer engagement is through the use of naturalistic guidance (Farmer et al., 2014; Pianta, 1999; Stanton-Chapman & Hadden, 2011). As children have the opportunity to engage with one another, teachers can support positive socialization by helping stage and/or by actively facilitating interactions as they occur (Brown et al., 2001; Stanton-Chapman, 2015; Stanton-Chapman & Hadden, 2011). In both roles, teachers are able to provide direct and individualized support to children that enhances positive peer engagement in the moment. For children who display hyperactivity, inattention, and/or oppositionality that may impede their ability to engage positively with peers, teachers' direct scaffolding may play a particularly important role in development of peer relationships (Farmer et al., 2014; Girolametto & Weitzman, 2007; Pianta, 1999; Stanton-Chapman & Hadden, 2011). Understanding how teachers translate this notion to the preschool classroom is therefore an important area to explore in determining what teachers are already doing to support positive peer engagement, and what steps they can take to further promote positive interactions amongst children.

Classroom support. In order for children to have both the opportunity and desire to engage with peers, their classroom environment must be one that is supportive and encouraging of social interaction. For this to occur, it is important that teachers "set the

context" by communicating the value of and expectations for social interaction (Farmer et al., 2011, p. 248; Bierman, 2011; Brophy-Herb et al., 2007; Madill et al., 2014; Stanton-Chapman, 2015). This relates both to teachers' modeling of desired social behaviors, as well as through the creation of an atmosphere where children have the opportunity and supports needed to engage positively with others (Howes & Tonyan, 2000; Pianta, 1999). Studies have found, for example, that children display greater prosocial skills when their teachers communicate positively, show affection, and respond sensitively to children's needs (Brophy-Herb et al., 2007; Farmer et al., 2011). Similarly, young children are more likely to engage in positive peer interactions when their classroom is engaging, organized, and productive (Downer, Sabol, & Hamre, 2010; Farmer et al., 2014). This may be especially true for children who display disruptive behaviors and who may need more individualized guidance and behavior management in order to successfully navigate the social context (Broekhuizen et al., 2017). As such, understanding the ways in which teachers support and manage the classroom is important in catering efforts to promote positive social engagement in preschool.

A Three Study Approach

The three studies presented within this dissertation share the aim of better understanding the classroom social experiences of preschoolers who display disruptive behaviors. As young children who display hyperactivity, inattention, and/or oppositionality are at an elevated risk for interpersonal challenges (e.g., Blair, 2002; Bulotsky-Shearer et al., 2012; Denham et al., 2003), it is critical to examine factors that contribute to social engagement for this subsample in order to understand how to best promote their social development. Guided by the notion that preschoolers' development occurs within a broader

classroom context (e.g., Pianta, 1999; Vygotsky, 1978), the current studies add to existing literature pertaining to the role of the teacher in fostering positive relational experiences for children whose behaviors place them at risk for social challenges. Specifically, studies explore 1) how teachers perceive preschoolers' display of disruptive behavior in the classroom and 2) the nature of and contributing factors associated with peer engagement for preschoolers who display hyperactivity, inattention, and/or oppositionality. Results highlight the critical role of the teacher in creating a classroom environment that best situates preschoolers for social success, and can be used to inform teacher training and intervention efforts to better meet the individual needs of preschoolers who display disruptive behaviors.

Study 1: Teacher Perception of Preschool Disruptive Behavior: Prevalence and Contributing Factors

The first study in this dissertation examined the prevalence and variability of teacher-reported disruptive behavior at the beginning of the preschool year. By exploring teacher ratings of hyperactivity, inattention, and oppositionality for a diverse and representative sample of 2,427 preschoolers, we were able to descriptively capture the nature and degree with which teachers perceived these behaviors to occur within the general preschool classroom at the start of the year. Findings indicated that teachers perceived approximately one-fourth of students to display elevated levels of disruptive behavior, with almost half of these children reported to display more than one type of disruptive behavior. In addition, we examined the association between teacher perception of preschoolers' behavior and teachers' demographic, professional background, and belief characteristics. Findings identified a nuanced relationship, with teachers' minority status,

behavioral attribution beliefs, and teaching self-efficacy uniquely related to their perception of preschoolers' hyperactivity, inattention, and/or oppositionality. Findings of this study contribute to the literature by providing updated prevalence data of teacher-reported disruptive behavior that can be used to inform school-based training and intervention efforts to better address the needs and concerns that preschool teachers have related to children's display of hyperactivity, inattention, and oppositionality (Alter, Walker, & Landers, 2013; Fabiano et al., 2013).

Study 2: Observed Quality of Classroom Peer Engagement in a Sample of Preschoolers Displaying Disruptive Behaviors

The second study within this dissertation descriptively explored the nature and variability of classroom peer engagement for preschoolers identified as displaying disruptive behaviors. Using data collected on children's naturally observed sociability, communication, assertiveness, and conflict with peers throughout the preschool year, results provide a window into the quality of preschoolers' peer experiences across time and classroom context. Findings highlight the low frequency and variability with which children were observed to engage in both positive *and* negative peer interactions, even during times of free play. Additionally, analyses examined the relationship between peer engagement quality and type of disruptive behavior, pointing to a differential association based on severity and nature of disruptive behavior(s) displayed. Overall, findings have implications for the understanding, structure, and management of the preschool classroom, namely with regard to the need for greater emphasis to be placed on structuring the classroom environment in ways that permit and encourage peer engagement for children who display disruptive behaviors (Brown et al., 2001). In addition, findings highlight the

importance of early intervention during the preschool years for those who display disruptive behaviors in order to prevent further development of emerging peer difficulties before they begin to interfere with classroom functioning (Blair, 2002; Denham et al., 2003).

Study 3: The Role of Teacher Responsiveness and Classroom Management in the Peer Engagement of Preschoolers Who Display Disruptive Behaviors

The third study in this dissertation examined the association that teachers' observed responsiveness and classroom management skills had with children's development of positive peer engagement throughout the preschool year. Drawing from observational data collected from fall to spring related to the peer sociability, assertiveness, and communication of preschoolers displaying disruptive behaviors, we found that positive peer engagement did not follow linear patterns of change across the school year. We instead discovered that children's development of peer engagement was highly variable over time and across children, and was associated with a number of characteristics related to both the child and the classroom. We also found that while teachers' level of observed responsiveness was surprisingly unrelated to this sample of preschoolers' engagement, teachers' skills in managing and organizing the classroom were associated with overall peer engagement quality. Finally, the peer engagement of children who displayed greater levels and/or certain types of disruptive behavior did not benefit from either type of teacher support more so than their peers. Findings point to the value of examining variability within preschoolers' behavior across time (van Dijk & van Geert, 2014), and highlight the importance of a well-organized and predictable classroom in promoting positive social

experiences for children with diminished self-regulatory skills (Broekhuizen et al., 2017; Rimm-Kaufman et al., 2009).

Contributions to the Literature

The findings reported within this three-study dissertation have practical implications for the field of early childhood education. Results from the first study contribute to the literature by providing current prevalence data around and identifying factors related to teacher perception of preschoolers' disruptive behavior in the classroom. Further, this is the first known study to look extensively at teacher perception of co-occurring hyperactivity, inattention, and oppositionality in a large, representative sample of preschoolers at the beginning of the school year. Understanding the nature and frequency with which these behaviors are reported to occur through the eyes of the preschool teacher is critical in informing training and intervention efforts to better support teachers with the skills needed to both accurately perceive and manage children's disruptive behaviors (Alter et al., 2013; Fabiano et al., 2013). Findings from the second study also have implications pertaining to teacher training and intervention, specifically related to the importance of placing greater emphasis on promoting peer interaction for children who display disruptive behaviors. Further, our use of natural observational data to explore preschoolers' peer interactions throughout the year – as opposed to teacher report or direct assessment – provides unique insight into how peer interactions actually unfold in the classroom for children who display different types of disruptive tendencies (e.g., Eggum-Wilkens, 2014). Finally, the third study has implications for both research and practice in highlighting the value of examining how young children's behavior varies over time (van Dijk & van Geert, 2014) and the need for further research to explore what this variability means for children's

social-emotional development. In addition, findings provide nuanced information about how teachers can support the positive peer engagement of preschoolers who exhibit hyperactive, inattentive, and/or oppositional tendencies. Collectively, studies provide a more extensive understanding of the classroom social context for children who display disruptive behaviors, and what actions can be taken to best situate young children for social success.

References

Alter, P., Walker, J., & Landers, E. (2013). Teachers' perceptions of students' challenging behavior and the impact of teacher demographics. *Education and Treatment of Children, 36*(4), 51-69.

Bierman, K. L. (2011). The promise and potential of studying the "invisible hand" of teacher influence on peer relations and student outcomes: A commentary. *Journal of Applied Developmental Psychology, 32*, 297-303.

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist, 57*(2), 111-127.

Broekhuizen, M. L., Slot, P. L., van Aken, M. A. G., & Dubas, J. S. (2017). Teachers' emotional and behavioral support and preschoolers' self-regulation: Relations with social and emotional skills during play. *Early Education and Development, 28*(2), 135-153.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design.* Cambridge, MA: Harvard University Press.

Brophy-Herb, H. E., Lee, R. E., Nievar, M. A., & Stollak, G. (2007). Preschoolers' social competence: Relations to family characteristics, teacher behaviors and classroom climate. *Journal of Applied Developmental Psychology, 28*, 134-148.

Brown, W. H., Odom, S. L., & Conroy, M. A. (2001). An intervention hierarchy for promoting young children's peer interactions in natural environments. *Topics in Early Childhood Special Education, 21*(3), 162-175.

Bulotsky-Shearer, R. J., Bell, E. R., Carter, T. M., & Dietrich, L. R. (2014). Peer play interactions and learning for low-income preschool children: The moderating role of classroom quality. *Early Education and Development, 25*, 815-840.

Bulotsky-Shearer, R. J., Bell, E. R., Romero, S. L., & Carter, T. M. (2012). Preschool interactive peer play mediates problem behavior in low-income children. *Journal of Applied Developmental Psychology, 33*, 53-65.

Coplan, R. J., Bullock, A., Archbell, K. A., & Bosacki, S. (2015). Preschool teachers' attitudes, beliefs, and emotional reactions to young children's peer group behaviors. *Early Childhood Research Quarterly, 30*, 117-127.

Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., & Queenan, P. (2003). Preschool emotional competence: Pathway to social competence? *Child Development, 74*, 238-256.

DiCarlo, C. F., Baumgartner, J., Ota, C., & Jenkins, C. (2015). Preschool teachers' perceptions of rough and tumble play vs. aggression in preschool-aged boys. *Early Child Development and Care, 185*(5), 779-790.

Dobbs, J., & Arnold, D. H. (2009). Relationship between preschool teachers' reports of children's behavior and their behavior toward those children. *School Psychology Quarterly, 24*(2), 95-105.

Downer, J., Sabol, T. J., & Hamre, B. (2010). Teacher-child interactions in the classroom: Toward a theory of within- and cross-domain links to children's developmental outcomes. *Early Education and Development, 21*(5), 699-723.

Egger, H. L., & Angold, A. (2006). Common emotional and behavioral disorders in preschool children: Presentation, nosology, and epidemiology. *Journal of Child Psychology and Psychiatry, 47*(3), 313-337.

Eggum-Wilkens, N. D., Fabes, R. A., Castle, S., Zhang, L., Hanish, L. D., & Martin, C. L. (2014). Playing with others: Head Start children's peer play and relations with kindergarten school competence. *Early Childhood Research Quarterly, 29,* 345-356.

Fabiano, G. A., Pelham Jr, W. E., Majumdar, A., Evans, S. W., Manos, M. J., Caserta, D.,...Carter, R. L. (2013). Elementary and middle school teacher perceptions of attention-deficit/hyperactivity disorder prevalence. *Child Youth Care Forum, 42*, 87-99.

Fantuzzo, J., Sekino, Y., & Cohen, H. L. (2004). An examination of the contributions of interactive peer play to salient classroom competencies for urban Head Start children. *Psychology in the Schools, 41*(3), 323-336.

Farmer, T. W., Lines, M. M., & Hamm, J. V. (2011). Revealing the invisible hand: The role of teachers in children's peer experiences. *Journal of Applied Developmental Psychology, 32,* 247-256.

Farmer, T. W., Reinke, W. M., & Brooks, D. S. (2014). Managing classrooms and challenging behavior: Theoretical considerations and critical issues. *Journal of Emotional and Behavioral Disorders, 22*(2), 67-73.

Federal Interagency Forum on Child and Family Statistics. (2017). *America's children: Key national indicators of well-being, 2017*. Washington, DC: U.S. Government Printing Office.

Girolametto, L., & Weitzman, E. (2007). Promoting peer interaction skills: Professional development for early childhood educators and preschool teachers. *Topics in Language Disorders, 27*(2), 93-110.

Glock, S., & Kleen, H. (2017). Gender and student misbehavior: Evidence from implicit and explicit measures. *Teaching and Teacher Education, 67*, 93-103.

Hamre, B. K., Pianta, R. C., Downer, J. T., & Mashburn, A. J. (2008). Teachers' perceptions of conflict with young students: Looking beyond problem behaviors. *Social Development, 17*(1), 115-136.

Hay, D. F., Payne, A., & Chadwick, A. (2004). Peer relations in childhood. *Journal of Child Psychology and Psychiatry, 45*, 84-108.

Holmes, C. J., Kim-Spoon, J., & Deater-Deckard, K. (2016). Linking executive function and peer problems from early childhood through middle adolescence. *Journal of Abnormal Child Psychology, 44*, 31-42.

Howes, C., & Tonyan, H. (2000). Links between adult and peer relations across four developmental periods. In K. A. Kerns, J. M. Contreras, & A. M. Neal-Barnett (Eds.), *Family and peers: Linking two social worlds* (pp. 85-113). Westport, CT: Praeger Publishers/Greenwood Publishing Group.

Kindermann, T. A. (2011). Commentary: The invisible hand of the teacher. *Journal of Applied Developmental Psychology, 32*, 304-308.

Leggett, N., & Ford, M. (2016). Group time experiences: Belonging, being and becoming through active participation within early childhood communities. *Early Childhood Education Journal, 44*, 191-200.

Madill, R. A., Gest, S. D., & Rodkin, P. C. (2014). Students' perceptions of relatedness in the classroom: The roles of emotionally supportive teacher-child interactions, children's aggressive-disruptive behavior, and peer social preference. *School Psychology Review, 43*(1), 86-105.

McAuliffe, M. D., Hubbard, J. A., & Romano, L. J. (2009). The role of teacher cognition and behavior in children's peer relations. *Journal of Abnormal Child Psychology, 37*, 665-677.

Murray, J. (2015). Early childhood pedagogies: Spaces for young children to flourish. *Early Child Development and Care, 185*, 11-12.

Myers, S. S., & Pianta, R. C. (2008). Developmental commentary: Individual and contextual influences on student-teacher relationships and children's early problem behaviors. *Journal of Clinical Child and Adolescent Psychology, 37*(3), 600-608.

National Association for the Education of Young Children [NAEYC] (2009). *Position paper: Developmentally appropriate practice in early childhood programs serving children from birth through age 8.* Washington, DC: Author.

Ortlieb, E. T. (2010). The pursuit of play within the curriculum. *Journal of Instructional Psychology, 37*(3), 241-246.

Pianta, R. C. (1999). How the parts affect the whole: Systems theory in classroom relationships. In R. C. Pianta (Ed.) *Enhancing relationships between children and teachers* (pp. 23-43). Washington, DC: American Psychological Association.

Rimm-Kaufman, S. E., & Pianta, R. C. (2000). An ecological perspective on the transition to kindergarten: A theoretical framework to guide empirical research. *Journal of Applied Developmental Psychology, 21*(5), 491-511.

Rushton, S., Huola-Rushton, A., & Larkin, E. (2010). Neuroscience, play and early childhood education: Connections, implications and assessment. *Early Childhood Education Journal, 37*, 351-361.

Stanton-Chapman, T. L. (2015). Promoting positive peer interactions in the preschool classroom: The role and responsibility of the teacher in supporting children's sociodramatic play. *Early Childhood Education Journal, 43*, 99-107.

Stanton-Chapman, T. L., & Hadden, S. D. (2011). Encouraging peer interactions in the preschool classroom: The role of the teacher. *Young Exceptional Children, 14*(1), 17-28.

Torres, M. M., Domitrovich, C. E., & Bierman, K. L. (2015). Preschool interpersonal relationships predict kindergarten achievement: Mediated by gains in emotion knowledge. *Journal of Applied Developmental Psychology, 39*, 44-52.

van Dijk, M., & van Geert, P. (2014). The nature and meaning of intraindividual variability in development in the early life span. In M. Diehl, K. Hooker, & M. J. Sliwinski (Eds.), *Handbook of intraindividual variability across the life span* (pp. 37-58). Abingdon: Routledge.

Vygotsky, L. S. (1978). Interaction between learning and development. In M. Cole, V. John-Steiner, & E. Souberman (Eds.), *Mind in society: The development of higher order psychological processes* (pp. 79–91). Cambridge, MA: Harvard University Press.

Wang, C., Hatzigianni, M., Shahaeian, A., Murray, E., & Harrison, L. J. (2016). The combined effects of teacher-child and peer relationships on children's social-emotional adjustment. *Journal of School Psychology, 59*, 1-11.

Williams, S. T., Mastergeorge, A. M., & Ontai, L. L. (2010). Caregiver involvement in infant peer interactions: Scaffolding in a social context. *Early Childhood Research Quarterly, 25*, 251-266

Manuscript 1

Teacher Perception of Preschool Disruptive Behavior: Prevalence and Contributing Factors

Michelle L. Yoder & Amanda P. Williford
University of Virginia

(Published in *Early Education and Development*)

Yoder, M. L., & Williford, A. P. (2019). Teacher perception of preschool disruptive behavior: Prevalence and contributing factors. *Early Education and Development, 30*(7), 835-853. doi:10.1080/10409289.2019.1594531

Abstract

The ways in which teachers perceive and subsequently respond to preschoolers' behavior have significant implications for children's experience in the classroom. To further understand the nature and variability of teacher perception of young children's behavior, this study examined how teachers characterized the disruptive behaviors of a large and diverse sample of preschoolers (N = 2,427) at the beginning of the school year. Descriptive analyses provide extensive information regarding the frequency, severity, and comorbidity with which teachers reported preschoolers to display hyperactivity, inattention, and oppositionality in the classroom. Further, multilevel regression models allowed for examination of the association between perception of disruptive behavior and teachers' demographic, professional background, and belief characteristics. Findings provide a current understanding of the salience of classroom disruptive behavior as seen through the eyes of the preschool teacher and indicate a nuanced relationship between this perception and teacher characteristics. Specifically, findings highlight teacher race/ethnicity, behavioral attribution beliefs, and self-efficacy to be uniquely associated with perception of preschoolers' various behavior problems. Implications for teacher training and school-based intervention are discussed.

Teacher Perception of Preschool Disruptive Behavior: Prevalence and Contributing Factors

The way that teachers initially perceive a child's behavior sets the stage for how they respond to and interact with that child for the rest of the year (e.g., Coplan, Bullock, Archbell, & Bosacki, 2015; Myers & Pianta, 2008; Pochtar & Del Vecchio, 2014). As teacher-child interaction quality is directly linked to children's social, emotional, and academic functioning (Myers & Pianta, 2008; Spilt & Koomen, 2009), these early perceptions can have far-reaching implications for children's school experience and development more broadly. This is especially true for young children whose teachers perceive them to display hyperactivity, inattention, and/or oppositionality, as teachers tend to have greater difficulty forming positive relationships with those whom they view as "disruptive" (Dobbs & Arnold, 2009; Thijs & Koomen, 2009). Understanding how to best support teachers in responding to young children's disruptive behaviors is therefore critical during preschool in effort to prevent the formation, exacerbation, and stabilization of negative teacher-child relationships (Coplan et al., 2015; Dobbs & Arnold, 2009; Thijs & Koomen, 2009). To move toward this goal, it is first necessary to understand how teachers are perceiving these behaviors and what influences these perceptions.

Although literature has begun to explore factors related to teacher perception of preschool disruptive behavior (e.g., Dobbs & Arnold, 2009; Downer, Goble, Myers, & Pianta, 2016; Hamre, Pianta, Downer, & Mashburn, 2008; Harvey, Fischer, Weieneth, Hurwitz, & Sayer, 2013), research is limited in examining how preschool teachers view the behavior of all children within their classroom at the beginning of the school year. Previous studies have tended to draw from subsamples of classrooms and/or children with

targeted demographic (e.g., low income) or behavioral (e.g., identified as disruptive) characteristics and therefore do not adequately capture how teachers perceive the behavior of every child with whom they must interact (e.g., Bulotsky-Shearer, Bell, Romero, & Carter, 2014; Carter, Williford, & LoCasale-Crouch, 2014; Downer et al., 2016; Harvey et al., 2013). Further, whether using global behavior terms (e.g., "problem behaviors") or focusing on certain subtypes of disruptive behaviors, literature has rarely examined hyperactivity, inattention, and oppositionality as distinct, yet co-occurring behaviors within a single study (e.g., Berg-Nielsen, Solheim, Belsky, & Wichstrom, 2012; Poulou, 2017). To address these gaps in the literature, the goal of the present study was to descriptively examine teacher perceptions of hyperactivity, inattention, and oppositionality in a large and diverse sample of preschoolers at the start of the preschool year. Further, we explored what teacher characteristics (i.e., demographic, professional background, beliefs) are associated with teachers' ratings of children's behavior.

Disruptive Behavior During the Preschool Years

The term disruptive behavior has been used to describe a wide range of behaviors. It can refer to the actions of a child who is easily distracted and off-task (inattention), a child who is often out of their seat and on the move (hyperactivity), or a child who displays defiance (oppositionality). Although differing in how they manifest, the hallmark of inattention, hyperactivity, and oppositionality is the degree to which these behaviors present as distracting to the classroom environment (Chacko, Wakschlag, Hill, Danis, & Espy, 2009; Martel, 2012). Display of such behaviors is common during the preschool years, when children are just beginning to develop self-regulatory and social skills (Chacko et al., 2009; Keenan & Wakschlag, 2002; Purpura, Wilson, & Lonigan, 2010; Sonuga-

Barke, Auerbach, Campbell, Daley, & Thompson, 2005). However, where most children experience a normative decline in these behaviors as they develop (Chacko et al., 2009; Purpura et al., 2010), some continue to display these behaviors with greater severity and/or frequency than would be considered developmentally appropriate. It is these children whose behaviors are at risk for exacerbating and presenting as a barrier to learning and social-emotional development (e.g., Berger, 2011; Brennan, Shaw, Dishion, & Wilson, 2015; Chacko et al., 2009; Keenan & Wakschlag, 2002).

Estimates from parent and clinical reports of young children's behavior indicate that 9%–13% of children under the age of 5 display significant levels of disruptive behaviors (e.g., Egger & Angold, 2006; Wakschlag et al., 2007). And, approximately 2%–4% of preschoolers are reported to display these behaviors to a clinical degree and have received diagnoses of Attention-Deficit/Hyperactivity Disorder (ADHD) and/or Oppositional Defiant Disorder (ODD; Danielson et al., 2018; Child and Adolescent Health Measurement Initiative, 2018). Of the various types of disruptive behaviors, studies have found that oppositionality and hyperactivity are more common than inattention in preschool populations (Chacko et al., 2009; Egger & Angold, 2006). And though children who display any one of these behaviors are at risk for developing social, emotional, and learning challenges, children who display more than one type of disruptive behavior are most vulnerable (Chacko et al., 2009). It is therefore necessary to understand hyperactivity, inattention, and oppositionality as distinct, yet co-occurring behaviors.

Above and beyond considering those children who display significant or "clinical" levels of disruptive behaviors, it is important to also consider preschoolers who display "subclinical" yet still elevated behaviors (Fabiano et al., 2013; Motamedi, Bierman, &

Huang-Pollock, 2016; Sonuga-Barke et al., 2005; Studts & van Zyl, 2013; Wakschlag et al., 2007). In research and practice, disruptive behavior tends to be viewed as a dichotomous construct – a child either falls above or below a certain threshold, typically determined by number and severity of symptoms displayed (Chacko et al., 2009; Fabiano et al., 2013). However, because clinical symptoms of ADHD and ODD are still emerging during the preschool years (Fabiano et al., 2013; Motamedi et al., 2016; Sonuga-Barke et al., 2005), it is important to identify those who display elevated disruptive behaviors that fall below the threshold in order to prevent these behaviors from stabilizing or increasing over time (Banaschewski, 2010; Motamedi et al., 2016; Studts & van Zyl, 2013). The role of early identification and intervention is therefore critical for children currently *and* at risk for displaying significant symptoms of ADHD and/or ODD during the preschool years (Banaschewski, 2010; Fabiano et al., 2013; Motamedi et al., 2016; Sonuga-Barke et al., 2005; Studts & van Zyl, 2013).

Teacher Perception of Student Disruptive Behavior

Previous studies examining the prevalence of disruptive behavior in young children have relied heavily on data derived from parent and/or clinical report (e.g., Egger & Angold, 2006; Fabiano et al., 2013). This information is useful in understanding the general frequency of reported disruptive behaviors. However, with more than one half of all children between ages 3 to 6 attending center-based care prior to formal school entry (Federal Interagency Forum on Child and Family Statistics, 2017), it is important to also understand how *teachers* perceive preschoolers' display of these behaviors in their classrooms. The ways in which teachers interpret a child's behavior informs not only how they manage this behavior in-the-moment, but their interactions with that child for the rest

of the school year (e.g., Coplan et al., 2015; Myers & Pianta, 2008; Pochtar & Del Vecchio, 2014). This is especially critical during preschool when classroom experiences set the stage for children's developing attitude toward school and learning (Myers & Pianta, 2008).

One of the most common ways of measuring teacher perception of student behavior is through the use of behavior rating scales (Mashburn, Hamre, Downer, & Pianta, 2006; Phillips & Lonigan, 2010). When teachers are asked to complete a rating scale, the intent is to capture their judgment of a child's overt display of a particular type of behavior in context (Sattler, 2014). However, as is implied by the term *judgment*, teachers have their own characteristics and perspectives that serve as a filter in their observation and subsequent interpretation of children's behavior (Dobbs & Arnold, 2009; Hamre et al., 2008; Harvey et al., 2013). These ratings are therefore naturally subject to variability attributed to factors at the teacher level (Achenbach, 2006; Dobbs & Arnold, 2009; Harvey et al., 2013; Mashburn et al., 2006; Pas & Bradshaw, 2014). Research has begun to explore the role of such factors; however, findings are inconsistent and rarely focus on this perception in preschool populations (e.g., DiCarlo, Baumgartner, Ota, & Jenkins, 2015; Downer et al., 2016).

Teacher demographic characteristics. Previous studies examining the association between teacher perceptions of student disruptive behavior and teacher demographic characteristics have presented with mixed findings. Specifically with regard to teachers' race/ethnicity, it has been argued that the personal and cultural experiences often had by teachers of color may in turn lead them to reject more deficit-based perspectives toward children's behavior and subsequently show greater tolerance for behavior problems (e.g., Acosta, Foster, & Houchen, 2018; Burciaga & Kohli, 2018; Pigott

& Cowen, 2000). Although there is some supporting research to suggest that teachers of ethnically diverse backgrounds report lower disruptive behavior ratings (e.g., Bates & Glick, 2013), findings have largely been inconsistent. For example, some have identified teacher minority status to have a positive association with disruptive behavior ratings (e.g., DuPaul et al., 2016; Pas & Bradshaw, 2014), whereas others have identified the absence of an association altogether (e.g., Alter, Walker, & Landers, 2013; Pigott & Cowen, 2000; Splett et al., 2018). Further exploration into the nature of this association, particularly in the preschool population, is therefore warranted.

Teacher professional background. With regard to teachers' professional background, theory suggests that teachers with greater educational and teaching experience are more practiced in their behavior management skills. Consequently, they are less likely to report disruptive behavior compared to teachers who have less experience (Mavropoulou & Padeliadu, 2002). Here again, however, results of previous studies are inconsistent. Although some findings pertaining to preschool (DiCarlo et al., 2015) and K-12 teachers (e.g., DuPaul, Reid, Anastopoulos, & Power, 2014; Pas & Bradshaw, 2014) support the aforementioned theory, other studies of older populations have identified the opposite effect (e.g., Mavropoulou & Padeliadu, 2002) or the absence of this association altogether (e.g., Alter et al., 2013; Hamre et al., 2008; Splett et al., 2018). As is the case for teacher demographic characteristics, the lack of consensus about this relationship in preschool indicates a need for further study.

Teacher beliefs. The degree to which teachers feel competent in their role as a teacher (i.e., self-efficacy) and the way that they ascribe meaning to behavior (i.e., behavioral attributions) are also recognized as significant contributors to perception of and

response to student behavior (Brady & Woolfson, 2008; Carter et al., 2014; Dobbs & Arnold, 2009). Theory suggests that teachers who are more confident in their ability to manage the classroom feel less overwhelmed by challenging behaviors when they arise. As such, they are less likely to perceive a behavior as "disruptive" compared to teachers who feel less equipped to manage these behaviors (Gebbie, Ceglowski, Taylor, & Miels, 2012). And with regard to behavioral attributions, it is posited that teachers who view children's behavior as stable (i.e., causal attribution) and purposeful (i.e., responsibility attribution) are more likely to perceive and rate behavior in a negative light (Bibou-Nakou, Kiosseoglou, & Stogiannidou, 2000; Carter et al., 2014; Mavropoulou & Padeliadu, 2002).

Research has supported both theories, with studies finding that elementary teachers perceive behaviors as less problematic when they report greater confidence in their teaching abilities (Brady & Woolfson, 2008; Pas & Bradshaw, 2014) and when they perceive behaviors as less stable and intentionally driven (Mavropoulou & Padeliadu, 2002; Thijs & Koomen, 2009). This relationship, however, has rarely been examined in preschool populations. As self-efficacy and behavioral attributions are known to influence teachers' expectations, persistence, and sensitivity toward children's behavior in preschool (e.g., Carter et al., 2014), it is especially important to understand the role that these beliefs play in teachers' perception of disruptive behavior during these early, foundational years.

The Current Study

Drawing from teacher-report data collected on a demographically diverse and classroom-representative sample of preschoolers, this study aimed to address two primary research questions:

1. How are preschool teachers describing the nature and severity of hyperactivity,

inattention, and oppositionality displayed in their classrooms at the beginning of the school year?

2. What teacher factors are associated with teachers' reports of preschool children's disruptive behavior? Do the patterns of these associations differ based on type of disruptive behavior displayed (i.e., hyperactivity, inattention, oppositionality)?

We anticipated that teachers would report higher levels of disruptive behavior in our sample compared to previous clinical or diagnostically based prevalence studies using more stringent diagnostic criteria (Chacko et al., 2009; Fabiano et al., 2013). Consistent with patterns of disruptive behavior reported in previous studies, we predicted that teachers would report the highest levels of hyperactivity and oppositionality and the lowest levels of inattention (Chacko et al., 2009; Egger & Angold, 2006). We also predicted comorbidity amongst disruptive behavior subtypes to occur as often, if not more frequently, than single subtype endorsement (Egger & Angold, 2006; Sonuga-Barke et al., 2005).

Based on theory and previous literature, we hypothesized that preschool teachers would report higher levels of disruptive behavior if they were White (e.g., Acosta et al., 2018; Bates & Glick, 2013; Burciaga & Kohli, 2018; Pigott & Cowen, 2000) and if they had fewer years of educational and teaching experience (e.g., DiCarlo et al., 2015; Mavropoulou & Padeliadu, 2002; Pas & Bradshaw, 2014). Regarding teacher beliefs, we anticipated that lower self-efficacy (e.g., Brady & Woolfson, 2008; Pas & Bradshaw, 2014) and more negative casual and responsibility attributional beliefs (e.g., Mavropoulou & Padeliadu, 2002; Thijs & Koomen, 2009) would be associated with greater disruptive behavior ratings. Finally, we predicted that the relationship between behavior rating and teacher-level factors would present similarly across all types of disruptive behaviors, but

would have a stronger association with ratings of oppositionality because of the high emotional reactivity and salience specifically associated with defiant behaviors (Coplan et al., 2015; Doumen, Verschueren, Buyse, Germeijs, & Luyckx, 2008).

Method

Participants

Participants for this study were part of a larger efficacy trial that assessed an early teacher-child intervention aimed at improving the behavioral outcomes of preschool children reported to display disruptive behaviors. Over the course of 3 years, baseline data were collected on all children within 160 classrooms from across three sites in two U.S. eastern states. The full sample included 2,427 preschool children ranging in age from 2 to 5 years and 160 lead preschool teachers.

Fifty-two percent of children were boys and average age was 49.17 months (*SD* = 6.76). Children were racially and ethnically diverse (40% Black, 38% White, 10% Latino, 9% Multiracial, 2% Asian, <1% Other), and families ranged in socioeconomic status (average income-to-needs ratio [INR] of 1.86, *SD* = 1.50) but were primarily from low-income backgrounds. Children were enrolled in classrooms from a range of programs including Head Start (26%), state-funded public (19%), and private (55%) programs serving children ages three through five for 5 days a week; average class size was 15.17 (*SD* = 3.58). Lead classroom teachers (*n* = 160) were majority female (97.4%) and were age 40.88 years on average (*SD* = 11.67). Teachers were racially diverse (52% White, 41% Black, 7% Other). Approximately 18% of teachers had less than a college degree, 15.3% had a 2-year degree, 52.9% had a bachelor's degree, and 14.0% had a master's degree. On average, teachers had 12.31 years (*SD* = 9.23) of teaching experience (see Table 1 for

summary of child, classroom, and teacher demographics).

Procedure

Directors of preschool programs (Head Start, state-funded public, and private [for- and not-for-profit]) from three urban or semi-urban regions across two U.S. eastern states were recruited for participation in a teacher-child intervention study via email, phone, or in person. Once receiving director approval, teachers were contacted to obtain consent followed thereafter by caregivers of their students (76% agreed to participate). Child characteristics were reported via teacher and family survey. As further outlined below, participating preschool teachers completed a battery of surveys at the beginning of the year to obtain information about teacher and classroom demographic characteristics and teaching-related beliefs. They also completed a disruptive behavior rating scale for each student in their class. For the current analyses, only data collected before intervention implementation at the beginning of the school year were used, and intervention status is therefore unrelated to analyses (for more information about the intervention, see Williford et al., 2017).

Measures

Demographic and Background Characteristics

Information pertaining to children's familial and demographic characteristics was obtained at the beginning of the school year from surveys completed by caregivers and teachers. For the present study, children's age (in months), gender, race/ethnicity, and family INR (i.e., calculated from family income and number of family members) were included in analyses as covariates to control for child-level demographic characteristics. Teachers' self-reported demographic (i.e., race/ethnicity) and professional background

(i.e., years of education, years of teaching experience) characteristics were used as teacher-level predictors. Additional teacher self-reported demographic characteristics of gender and age were used as covariates. These variables were not included as predictors because of the limited variability in our sample for gender (97.4% female) and to avoid multicollinearity between teachers' age and years of experience.

Child Disruptive Behavior

To measure children's perceived level of disruptive behavior at the beginning of the school year, teachers completed a rating scale containing all items from the ADHD Rating Scale-IV (ADHD-RS-IV; DuPaul, Power, Anastopoulos, & Reid, 1998) and the ODD Rating Scale (ODD-RS; Anastopoulos, 1998). The ADHD-RS-IV is an 18-item rating scale used to assess individual children's inattentive (nine items) and hyperactive/impulsive (nine items) behaviors on a 4-point Likert-type scale. Sample items include "fails to give close attention to details or makes careless mistakes" (i.e., inattention) and "fidgets with hands or feet or squirms in seat" (i.e., hyperactivity; DuPaul et al., 1998). The ODD-RS is an 8-item rating scale that assesses for oppositional behavior using a similar Likert-type scale. Sample items include "loses temper," "argues with adults," and "is angry and resentful" (Anastopoulos, 1998). Items on the ADHD-RS-IV and ODD-RS are the same as those used to indicate symptom criteria for ADHD and ODD, respectively, in the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5; American Psychiatric Association [APA], 2013). Both measures are psychometrically sound tools that have been used to measure externalizing behavior in clinical research and show validity and reliability with preschool-age populations (e.g., McGoey, DuPaul, Haley, & Shelton, 2007; Purpura et al., 2010).

All items from the ADHD-RS-IV and ODD-RS were combined to create one 26-item disruptive behavior rating scale. Results from the combined scale are presented through a Total Disruptive Behavior score, as well as through three subscale scores that align with DSM-5 (APA, 2013) symptoms for ADHD hyperactive and inattentive subtypes and ODD: Hyperactivity (nine items), Inattention (nine items), and Oppositionality (eight items). A series of confirmatory factor analyses (CFAs) were conducted to examine estimates and measures of fit to support the use of this three-factor structure for the current sample. As theorized, results supported the use of a three-factor model as opposed to a one- or two-factor model. Internal consistency for each of the subscales was good in this sample (α = 0.92, 0.93, and 0.93, respectively). In addition, a symptom count score was obtained for each subscale to indicate the number of items/symptoms endorsed to a significant level (i.e., rating of 3 or 4), as recognized by DSM-5 criteria (APA, 2013).

Teacher Self-Efficacy

To measure teachers' perceived self-efficacy, teachers completed the short-version of the Teachers' Sense of Self Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001). This 12-item rating scale assesses teachers' judgment of their capability to bring about desired outcomes of student engagement and learning. The current study utilized nine items from the scale, with three items each attributed to Classroom Management, Instructional Support, and Student Engagement subscales. Teachers rated items on a 9-point Likert-type scale representing the degree to which they perceived themselves to have the power to influence children's behavior (1 = nothing, 9 = a great deal). Scores are presented via the aforementioned subscales, as well as through an Overall Efficacy Score, with higher scores representing greater perceived self-efficacy. To avoid multicollinearity

amongst subscales (*r*s = .57 – .63, $p < .001$), only the Overall Efficacy Score was used to represent teacher self-efficacy in the current analyses. This measure has been shown to demonstrate reliability and validity (Tschannen-Moran & Woolfolk Hoy, 2001). Internal consistency was good in this sample ($\alpha = 0.88$; Altman, 1991; Landis & Koch, 1977).

Teacher Behavioral Attributions

To measure teachers' causal and responsibility attributions of children's behavior, teachers completed the Preschool Teaching Attributions (PTA; Carter et al., 2014) measure. Adapted from the Attributional Style Measure for Parents (ASMP; O'Brien & Peyton, 2002), the PTA is a 40-item vignette-style measure that asks teachers to think about five recent incidences of classroom misbehavior related to (1) noncompliance with teacher requests, (2) aggression toward peers, (3) aggression or disrespect toward the teacher, (4) interruption, and (5) noncompliance with routine. For each scenario, teachers describe and then rate eight items assessing attributional beliefs on a scale from 1 to 6 for each scenario, with higher scores indicating more negative attributional beliefs (O'Brien & Peyton, 2002). The eight items reflect the same eight dimensions of behavior attributions used on the ASMP, including internal/external locus, controllability, stability, globality, purposefulness, motivation, blame, and negative intent (O'Brien & Peyton, 2002).

As supported and validated in previous studies, item ratings are aggregated across scenarios to provide two overall attributional belief scores based on Weiner's (1985) attribution theory (Carter et al., 2014; Williford, Graves, Shelton, & Woods, 2009). The Causal score – aggregated from globality, stability, and internal/external locus scores – reflects beliefs about why behavior is displayed and whether or not it remains stable. The Responsibility score – aggregated from purposefulness, motivation, blame, and negative

intent scores – reflects the degree to which the teacher perceives the behavior to be purposeful and deserving of discipline. This measure has been shown to demonstrate reliability and validity (Carter et al., 2014). Internal consistency was good in this sample (α = 0.66 and 0.70, respectively; Altman, 1991; Landis & Koch, 1977).

Data Analysis

All analyses were conducted using SPSS version 25 and MPlus version 7. To explore teacher perception of children's disruptive behavior at the beginning of the preschool year, ratings from the combined ADHD-RS-IV/ODD-RS rating scale were analyzed descriptively. Analyses were performed using the Total Disruptive Behavior score, in addition to Hyperactivity, Inattention, and Oppositionality subscales individually. Descriptive statistics were identified for the full sample, as well as by child gender. In addition, teacher report of children's behavior was descriptively examined using symptom count. Children were identified as displaying a "symptom" if receiving a rating of at least three on the 4-point scale for an item on the ADHD-RS-IV or ODD- RS. Using DSM-5 diagnostic criteria (APA, 2013), children were then identified as displaying clinically significant levels of a particular disruptive behavior type if reported to meet the minimum symptom count threshold – six symptoms for hyperactivity, six symptoms for inattention, and/or four symptoms for oppositionality. For example, if a child received a score of 3 on at least six items related to hyperactivity, that child would be viewed as meeting the symptom count criteria for Hyperactivity. Symptom count analyses allowed for exploration of teachers' characterization of the proportion of children perceived to display clinically significant levels of disruptive behavior. Analyses were also conducted for those children whose symptom count was one point below the DSM-5 threshold for each subscale to allow

for the identification of children with ratings that were subclinical but still notably elevated (e.g., Motamedi et al., 2016; Wakschlag et al., 2007). From this, rate of comorbidity (i.e., more than one subscale of significance) was also explored at clinical and subclinical levels.

To examine teacher factors associated with disruptive behavior rating, we first ran two-tailed correlational analyses between predictors (teacher race/ethnicity, years of education, years of teaching experience, self-efficacy, causal and responsibility attributional beliefs) and outcomes (overall disruptive behavior, hyperactivity, inattention, oppositionality). Then, we looked at the proportion of variance in disruptive behavior scores attributed to child (level 1) versus teacher (level 2) factors by calculating intraclass correlation coefficients (ICCs) for Total Disruptive Behavior and each subscale. The majority of the variance in disruptive behavior ratings was due to differences between children; however, 14%–20% of the variance was attributed to between-classroom teacher factors (design effects between 2.88–3.78).

Analyses were therefore conducted using a multilevel model (i.e., children nested within teachers) in MPlus, with children's Total Disruptive Behavior score as the primary outcome. Child-level covariates at level 1 included age in months, gender (dummy coded; 1 = male, 0 = female), two race/ethnicity variables (dummy coded; 1 = Black, 0 = White/Other; 1 = Other, 0 = White/Black), and INR. Level 2 variables included race/ethnicity (dummy coded; 1 = Non-White, 0 = White) as a teacher demographic predictor, along with age and gender (dummy coded; 1 = male, 0 = female) as covariates. Teacher-reported years of education and years of teaching experience were included to represent teachers' professional background. Finally, the TSES Overall Efficacy Score and the PTA Causal and Responsibility attribution scores were included to measure teachers'

self-efficacy and attributional beliefs, respectively.

A second multilevel model was then used to explore the differential association of teacher variables with individual subtypes of disruptive behavior. Given that two-tailed correlations between hyperactivity, inattention, and oppositionality were all significant (*r*s = .54 – .76, $p < .001$), outcomes were evaluated in one model to allow for the controlling of the correlation between each subtype (Evans, 1996). Predictor and covariate variables were identical to those used in the first model.

With regard to missing data, 2.3% of children ($n = 56$, from 28 classrooms) had missing or incomplete ADHD-RS-IV/ODD-RS teacher behavior ratings. Approximately 6% ($n = 137$) of children were missing all pertinent demographic data, whereas another 30% were missing only one or few demographic variable(s). Regarding teacher variables, approximately 3% ($n = 5$) of teachers were missing data related to one or more demographic characteristic, 5% ($n = 8$) were missing professional background information, 2.5% ($n = 4$) were missing self-efficacy scores, and 11.3% ($n = 18$) were missing attribution scores. There were no significant differences in behavior ratings nor in child and/or teacher demographic characteristics between children with and without missing data (all *p*'s > .05). Full Information Maximum Likelihood (FIML) estimation with robust Standard Errors was used to account for missing data by estimating parameters under the assumption that data were missing at random (e.g., McArdle et al., 2004). This type of estimation uses all available data for each child when estimating parameters and, therefore, increases the statistical power of estimated parameters (Enders & Bandalos, 2001).

Results

Teacher Perception of Disruptive Behavior

Average scores. Means and Standard Deviations of teacher-reported disruptive behavior are presented in Table 2 for the full sample and by gender. On average, boys had higher ratings for overall disruptive behavior and for each of the subscales. Subscale ratings indicated the highest ratings for hyperactivity, followed by inattention, and then oppositionality.

Symptom count. Using the DSM-5 (APA, 2013) symptom count criteria, the vast majority of children (83.9%, *n* = 1988) were not reported to display clinically significant levels of disruptive behavior. Teachers reported 9.6% of children to meet the clinical threshold for hyperactivity (≥six symptoms; *n* = 229), 7.8% for inattention (≥six symptoms; *n* = 186), and 7.5% for oppositionality (≥four symptoms; *n* = 179). In addition, frequency statistics were conducted for those children who met a subclinical threshold of five symptoms for hyperactivity and inattention and/or three symptoms for oppositionality (i.e., one point below the clinical threshold; Motamedi et al., 2016). This resulted in an additional 132 children reported to display elevated, but subclinical levels of hyperactivity (4.3%, *n* = 103), inattention (3.3%, *n* = 79), and/or oppositionality (3.3%, *n* = 79). Figure 1 depicts the percentage of children who met the clinical and subclinical symptom thresholds for each subtype. Taken together, teachers reported approximately 22% of children (*n* = 514) to display elevated levels of at least one subtype of disruptive behavior, with almost three fourths of these children (*n* = 382) perceived to exhibit behaviors to a clinically significant degree as indicated by symptom count.

Disruptive Behavior Patterns

To explore comorbidity amongst disruptive behavior subtypes, we first ran two-tailed correlational analyses between hyperactivity, inattention, and oppositionality to

determine the statistical relationship between subtypes. All correlations were significant at the $p < .001$ level; hyperactivity was strongly correlated with inattention ($r = 0.76$) and oppositionality ($r = 0.68$), and inattention and oppositionality were moderately correlated ($r = 0.54$; Evans, 1996). Comorbidity amongst disruptive behavior subtypes was then explored using symptom count threshold (see Table 3 and Figure 2). Approximately 9% ($n = 220$) of children met the clinical symptom threshold for only one subtype of disruptive behavior, whereas 6.7% ($n = 161$) met the clinical threshold for more than one subtype. The most common patterns were hyperactivity-only (3.2%, $n = 77$) and oppositionality-only (3.2%, $n = 75$). For those with more than one subtype, the most frequently reported combination was hyperactivity-inattention (2.4%, $n = 57$), followed by hyperactivity-inattention-oppositionality (2.1%, $n = 51$). The combination of inattention-oppositionality was extremely rare (0.4%) in this sample, with only 10 identified children in this category. When considering children at or above the subclinical threshold (hyperactivity and inattention ≥five symptoms, oppositionality ≥three symptoms), 10.9% ($n = 260$) of children met the subclinical symptom threshold for only one subtype of disruptive behavior, whereas 10.6% ($n = 254$) met the subclinical threshold for more than one subtype. Patterns of comorbidity were similar to those of children meeting the clinical threshold.

Factors Associated with Disruptive Behavior Ratings

Overall disruptive behavior. Two-tailed correlations between covariate, predictor, and outcome variables are presented in Table 4. Model 1 (see Table 5) tested the direct effects of teacher-level factors on Total Disruptive Behavior while controlling for teacher age and gender and child age, gender, race/ethnicity, and INR. Teachers' race/ethnicity approached a marginally significant association with total disruptive

behavior ratings (p = .05) – teachers who were White tended to report that children in their classrooms displayed greater disruptive behavior. Teachers' years of education and years of teaching were unrelated to how they rated children's disruptive behavior. Teachers' beliefs were significantly associated with behavior ratings, with those who had greater reported overall self-efficacy and/or who endorsed more negative causal and responsibility attributions more likely to rate children in their classrooms as displaying disruptive behavior.

Disruptive behavior subtypes. Model 2 (see Table 5) tested the direct effects of teacher-level factors on Hyperactivity, Inattention, and Oppositionality variables separately (while controlling for each subtype and child/teacher covariates). Consistent with Total Disruptive Behavior, years of education and years of teaching were unrelated to how teachers rated children's hyperactivity, inattention, and oppositionality. And teachers who reported greater negative responsibility attributional beliefs were more likely to rate children higher on all three subtypes of disruptive behavior. However, differential associations emerged with regard to teachers' race/ethnicity, causal attribution beliefs, and self-efficacy. Where teachers who were White were more likely to rate children's overall disruptive behavior higher, teachers' race/ethnicity was unrelated to their ratings of children's hyperactivity and inattention and was only associated with their report of children's oppositionality. Conversely, where teachers who endorsed more negative causal attribution beliefs tended to rate children as more disruptive overall, these beliefs were unrelated to how they rated children's oppositionality and were associated only with ratings of hyperactivity and inattention. Lastly, where teachers who reported greater self-efficacy were more likely to rate children as disruptive, self-efficacy was unrelated to perception of

hyperactivity and oppositionality and was associated only with ratings of children's inattention.

Discussion

To better understand how teachers perceive the display of preschoolers' disruptive behavior in the classroom, we explored teacher-reported hyperactivity, inattention, and oppositionality in a large and diverse sample of preschoolers at the start of the preschool year. Findings not only provide a current understanding of the prevalence with which teachers initially report disruptive behaviors to occur within the general preschool population, but also highlight nuanced associations between teachers' rating of disruptive behavior and their demographic, professional, and belief characteristics.

Prevalence of Preschool Disruptive Behavior

Of the 2,427 preschoolers in the present study, approximately one fourth were rated by teachers as displaying elevated levels of disruptive behavior based on symptom count at the beginning of the school year. And three fourths of this subgroup (i.e., 16% of the full sample) were perceived to display these behaviors to a clinical degree as indicated by DSM-5 symptom count criteria for ADHD and/or ODD (APA, 2013). These data are the first in recent years to provide a comprehensive picture of how teachers are perceiving the co-occurring hyperactive, inattentive, and oppositional behaviors of a classroom-representative sample of preschoolers at the start of the school year.

As anticipated, teacher-report estimates of clinical levels of disruptive behavior (16%) were greater than those reported in previous prevalence studies (9%–13%) that have used more rigid clinical and diagnostic report (e.g., Egger & Angold, 2009; Danielson et al., 2018). The significance of this finding is twofold. First, this indicates that teachers are

perceiving preschoolers to display greater levels of disruptive behavior than is reported in the general population of preschool-aged children. Although recognized that this higher rate could be attributed to a number of factors, it may point to the potentially inaccurate developmental expectations held by some early childhood teachers about what is "typical" behavior for preschoolers (Chacko et al., 2009; DiCarlo et al., 2015). It is therefore important to make sure that pre- and in-service teacher training emphasize the nature and variability of behavioral expectations for young children (Keenan & Wakschlag, 2002; Purpura et al., 2010). Further, these findings serve as a reminder to consider children's behavior as seen through the eyes of teachers when selecting intervention supports, as what matters most to classroom functioning is the perception and actions of the teachers tasked with managing these behaviors (Alter et al., 2013; Fabiano et al., 2013).

Disruptive Behavior Patterns

Our study also allows for a better understanding of the frequency with which specific disruptive behavior subtypes and patterns are reported to occur in the preschool classroom. Consistent with hypotheses, preschool teachers reported children to display greater levels of hyperactivity than they did inattention (Chacko et al., 2009; Egger & Angold, 2006). Oppositionality, however, was unexpectedly the least reported behavior type. As we see in later findings from our study, oppositionality may have particular salience in the preschool classroom; however, the current finding demonstrates that this is not necessarily the behavior that teachers report seeing and managing most frequently among their students. Rather, teachers perceive overactive and impulsive behaviors to be the most prominent. This is not surprising due to the naturally and highly active nature of young children (Chacko et al., 2009; Purpura et al., 2010) but nonetheless emphasizes the

need for equipping teachers with the skills and strategies needed to manage preschoolers' hyperactivity in the classroom.

With regard to symptom comorbidity, almost one half of children with ratings at or just below the clinical symptom threshold were reported to display elevated levels of more than one type of disruptive behavior based on DSM-5 symptom count criteria (APA, 2013). Specifically, children were most often perceived to display comorbid hyperactivity and inattention, either with (3.5%) or without (3.5%) accompanying oppositionality. As children are at greater risk for negative outcomes when presenting with comorbid symptoms of disruptive behavior (e.g., Chacko et al., 2009), this finding points to the need for teacher training and intervention to consider these behaviors as co- occurring with one another.

Teacher Factors Associated with Preschoolers' Disruptive Behavior Ratings

Findings from this study point to a nuanced association between teachers' perception of student behavior and their demographic, professional, and belief characteristics. All teacher factors were associated with teacher ratings of children's disruptive behavior to some degree with the exception of professional background. Unexpectedly, teachers' years of education and teaching experience were unrelated to their report of disruptive behavior. Taken in conjunction with the findings described below, this suggests that it is not teachers' degree of training alone that drives their perception of young children's behavior, but rather the characteristics inherent to teachers themselves that matter most (e.g., Hamre et al., 2008).

Teacher race/ethnicity. An approximately significant association was found between teachers' race/ethnicity and perception of disruptive behavior, where teachers of

ethnically diverse backgrounds were less likely to report elevated levels of oppositionality. As suggested in the literature (e.g., Acosta et al., 2018; Philip, 2011; Pigott & Cowen, 2000), the perspectives and ideologies that tend to underpin communities of color may result in teachers from such backgrounds endorsing higher thresholds for what they consider to be oppositional behaviors. With misinterpretation of normative play behavior as "aggressive" fairly common with preschoolers (DiCarlo et al., 2015), it is not surprising that this difference emerged with oppositionality only. In interpreting these findings, however, it is important to note that our study does not allow for sensitivity to teacher-child racial match. Research has shown that teacher perception of behavior is especially sensitive to race for children from ethnically diverse backgrounds (e.g., Bates & Glick, 2013; Downer et al., 2016). And with more than one half of our sample comprising ethnically diverse preschoolers, it is important to consider the role that this may have played in our results. Regardless of the mechanism by which these ratings differ, however, findings highlight the importance of incorporating perspectives of teachers from all ethnic backgrounds in effort to bridge any gaps in behavioral expectations (Acosta et al., 2018; Haddix, 2017).

Teacher beliefs. We found that teachers who reported greater self-efficacy and who endorsed more negative responsibility and causal attributions were more likely to rate preschoolers' behavior as disruptive. The directionality of the association between self-efficacy and behavior perception was unexpected, however is not unprecedented upon revealing this relationship to exist solely and uniquely with inattention. As preschoolers are not yet expected to sustain attention or perform tasks requiring self- monitoring and independent organization (e.g., Chacko et al., 2009; Purpura et al., 2010), our findings may

very well reflect a tendency for some teachers to endorse inaccurate behavioral expectations and/or possess lower frustration tolerance for these types of behaviors in young children. As such, this indicates a need for early childhood teacher training and support to emphasize developmentally appropriate expectations and practice, specifically with regard to early development of attentional skills (Chacko et al., 2009; DiCarlo et al., 2015).

As expected, we found that the degree to which teachers perceived behaviors to be stable (i.e., causal attribution) and purposeful (i.e., responsibility attribution) was positively associated with disruptive behavior ratings. This highlights the importance of encouraging teachers to consider a variety of factors internal (e.g., biological, temperament) and external (e.g., family, school) to children in understanding displays of disruptive behavior (Mavropoulou & Padeliadu, 2002). Similarly, findings point to the need for teachers to endorse appropriate developmental expectations regarding the degree to which they can expect young children to plan and control their behavior (e.g., Chacko et al., 2009; DiCarlo et al., 2015). Although discovering this pattern of results to be true at the subtype level with ratings of hyperactivity and inattention, we found that ratings of oppositionality were more nuanced. Interestingly, teachers were equally likely to report oppositional symptoms regardless of their causal attribution beliefs. As oppositional behaviors tend to elicit the most negative responses and the least amount of tolerance in teachers (e.g., Coplan et al., 2015), this may suggest that it does not matter to teachers whether they perceive oppositional behavior to have the potential to change or to be due to factors external to the child – its presence and immediate consequences are still salient. Similar to findings pertaining to teacher race/ethnicity, this points to a unique relationship between teacher-

related factors and perception of children's oppositional behavior.

Limitations

In interpreting study results, the following limitations should be kept in mind. First, it is important to recognize that the ADHD-RS-IV (DuPaul et al., 1998) and ODD-RS (Anastopoulos, 1998) are not designed to be used as universal screening measures and therefore may not be applicable to the general preschool population. However, these measures provide value in guiding our understanding of teachers' conceptualization of disruptive behavior based on what is empirically and clinically known to be symptomatic of specific behavioral challenges. In addition, teachers' ratings on the ADHD-RS-IV/ ODD-RS pertain only to symptom presentation of ADHD- and ODD-related behaviors and do not allow for measurement of actual functional impairment across settings – a critical piece to ADHD and ODD clinical diagnosis (APA, 2013; DuPaul et al., 2014). Our data also do not incorporate diagnostic information or other measures for assessing disruptive behavior (e.g., observation, direct assessment, parent report) with which to reference and/or compare teacher ratings. As such, interpretation of teacher ratings is descriptive in nature, and referring to "clinical thresholds" of behavior is interpreted only in the sense of symptom count as perceived by the teacher, not actual clinical presence of ADHD or ODD. Future studies should consider obtaining such collateral information to explore agreement between teacher perceived and actual diagnosis of ADHD and/or ODD.

Due primarily to lack of parental involvement in the study, approximately one third of our sample were missing data to some extent. Our analyses indicate no significant difference between those with and without missing data, and statistical methods are incorporated to account for missingness where appropriate; however, it is important to

recognize that a portion of data are based on statistical estimates. Further, though our sample is large, diverse, and inclusive of all children within selected classrooms, the demographic characteristics of children and teachers must be accounted for in generalization of findings to other samples. Finally, relationships between variables cannot be interpreted causally based on the nature of the analyses utilized and therefore cannot identify the presence or absence of directionality.

Conclusions and Implications

Findings of the present study contribute to the field of early childhood education in two major ways. First, this is the only study known to authors to explicitly investigate co-occurring prevalence rates and patterns of teacher-reported hyperactivity, inattention, and oppositionality in the general preschool population at the beginning of the preschool year. As allotment of resources and intervention efforts is based largely on the specific needs of the population being served, understanding prevalence rates is critical within early educational policy and practice (Danielson et al., 2008). Further efforts are encouraged to replicate our findings in large, diverse, and nationally-representative samples. Second, our findings indicate a nuanced relationship between teachers' perceptions of preschoolers' disruptive behavior at the beginning of the year and their demographic, professional, and belief characteristics – an area most frequently explored in older student populations (e.g., Brady & Woolfson, 2008; Pas & Bradshaw, 2014; Splett et al., 2018). Additional study is encouraged to replicate and build upon our findings, specifically with regard to perception of oppositionality, the role of teacher-child ethnic match (e.g., Bates & Glick, 2013; Downer et al., 2016), and other teacher (e.g., age, gender) and classroom (e.g., center type, classroom size) factors. Overall, study findings can be used to shape teacher training and

professional development to promote more accurate perception of student behavior in order to better meet the needs of preschool teachers and their students (Doumen et al., 2008; Gebbie et al., 2012).

References

Achenbach, T. M. (2006). As others see us: Clinical and research implications of cross-informant correlations for psychopathology. *Current Directions in Psychological Science, 15*(2), 94-98.

Acosta, M. M., Foster, M., & Houchen, D. F. (2018). "Why seek the living among the dead?" African American pedagogical excellence: Exemplar practice for teacher education. *Journal of Teacher Education, 69*(4), 341-353.

Alter, P., Walker, J., & Landers, E. (2013). Teachers' perceptions of students' challenging behavior and the impact of teacher demographics. *Education and Treatment of Children, 36*(4), 51-69.

Altman, D. G. (1991). *Practical statistics for medical research.* London: Chapman and Hall.

American Psychiatric Association [APA]. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Anastopoulos, A. D. (1998). *Oppositional defiant disorder/conduct disorder rating scale.* Unpublished manuscript, University of North Carolina at Greensboro.

Banaschewski, T. (2010). Editorial: Preschool behaviour problems – over-pathologised or under-identified? A developmental psychopathology perspective is needed. *Journal of Child Psychology and Psychiatry, 51*(1), 1-2.

Bates. L. A., & Glick, J. E. (2013). Does it matter if teachers and schools match the students? Racial and ethnic disparities in problem behaviors. *Social Science Research, 42,* 1180-1190.

Berger, A. (2011). *Self-Regulation: Brain, cognition, and development.* Washington, DC: American Psychological Association.

Berg-Nielsen, T. S., Solheim, E., Belsky, J., & Wichstrom, L. (2012). Preschoolers' psychosocial problems: In the eyes of the beholder? Adding teacher characteristics as determinants of discrepant parent-teacher reports. *Child Psychiatry of Human Development, 43,* 393-413.

Bibou-Nakou, I., Kiosseoglou, G., & Stogiannidou, A. (2000). Elementary teachers' perceptions regarding school behavior problems: Implications for school psychological services. *Psychology in the Schools, 37*(2), 123-134.

Brady, K., & Woolfson, L. (2008). What teacher factors influence their attributions for children's difficulties in learning? *British Journal of Educational Psychology, 78,* 527-544.

Brennan, L. M., Shaw, D. S., Dishion, T. J., & Wilson, M. N. (2015). The predictive utility of early childhood disruptive behaviors for school-age social functioning. *Journal of Abnormal Child Psychology, 43*, 1187-1199.

Bulotsky-Shearer, R. J., Bell, E. R., Romero, S. L., & Carter, T. M. (2014). Identifying mechanisms through which preschool problem behavior influences academic outcomes: What is the mediating role of negative peer play interactions? *Journal of Emotional and Behavioral Disorders, 22*(4), 199-213.

Burciaga, R., & Kohli, R. (2018). Disrupting Whitestream measures of quality teaching: The community cultural wealth of teachers of color. *Multicultural Perspectives, 20*(1), 5–12.

Carter, L., M., Williford, A. P., & LoCasale-Crouch, J. (2014). Reliability and validity of a measure of preschool teachers' attributions for disruptive behavior. *Early Education and Development, 25*, 949-972.

Chacko, A., Wakschlag, L., Hill, C. Danis, B., & Espy, K. A. (2009). Viewing preschool disruptive behavior disorders and attention-deficit/hyperactivity disorder through a developmental lens: What we know and what we need to know. *Child and Adolescent Psychiatric Clinics of North America, 18*, 627-643.

Child and Adolescent Health Measurement Initiative, Data Resource Center for Child and Adolescent Health (2018). *2016 National Survey of Children's Health*. Retrieved from childhealthdata.org

Coplan, R. J., Bullock, A., Archbell, K. A., & Bosacki, S. (2015). Preschool teachers' attitudes, beliefs, and emotional reactions to young children's peer group behaviors. *Early Childhood Research Quarterly, 30*, 117-127.

Danielson, M. L., Bitsko, R. H., Ghandour, R. M., Holbrook, J. R., Kogan, M. D., & Blumberg, S. J. (2018). Prevalence of parent-reported ADHD diagnosis and associated treatment among U.S. children and adolescents, 2016. *Journal of Clinical Child & Adolescent Psychology, 47*(2), 199-212.

DiCarlo, C. F., Baumgartner, J., Ota, C., & Jenkins, C. (2015). Preschool teachers' perceptions of rough and tumble play vs. aggression in preschool-aged boys. *Early Child Development and Care, 185*(5), 779-790.

Dobbs, J., & Arnold, D. H. (2009). Relationship between preschool teachers' reports of children's behavior and their behavior toward those children. *School Psychology Quarterly, 24*(2), 95-105.

Doumen, S., Verschueren, K., Buyse, E., Germeijs, V., & Luyckx, K. (2008). Reciprocal relations between teacher-child conflict and aggressive behavior in kindergarten: A three-wave longitudinal study. *Journal of Clinical Child and Adolescent Psychology, 37*(3), 588-599.

Downer, J. T., Goble, P., Myers, S. S., & Pianta, R. C. (2016). Teacher-child racial/ethnic match within pre-kindergarten classrooms and children's early school adjustment. *Early Childhood Research Quarterly, 37*, 26-38.

DuPaul, G. J., Power, T. J., Anastopoulos, A. D., & Reid, R. (1998). ADHD Rating Scale—IV: Checklists, norms, and clinical interpretation. New York: Guilford Press.

DuPaul, G. J., Reid, R., Anastopolous, A. D., & Power, T. J. (2014). Assessing ADHD symptomatic behaviors and functional impairment in school settings: Impact of student and teacher characteristics. *School Psychology Quarterly, 19*(4), 409-421.

DuPaul, G. J., Reid, R., Anastopoulos, A. D., Lambert, M. C., Watkins, M. W., & Power, T. J. (2016). Parent and teacher ratings of attention-deficit/hyperactivity disorder symptoms: Factor structure and normative data. *Psychological Assessment, 28*(2), 214-225.

Egger, H. L., & Angold, A. (2006). Common emotional and behavioral disorders in preschool children: Presentation, nosology, and epidemiology. *Journal of Child Psychology and Psychiatry, 47*(3), 313-337.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling, 8*(3), 430-457.

Evans, J. D. (1996). *Straightforward statistics for the behavioral sciences*. Pacific Grove, CA: Brooks/Cole Publishing.

Fabiano, G. A., Pelham Jr, W. E., Majumdar, A., Evans, S. W., Manos, M. J., Caserta, D.,...Carter, R. L. (2013). Elementary and middle school teacher perceptions of attention-deficit/hyperactivity disorder prevalence. *Child Youth Care Forum, 42*, 87-99.

Federal Interagency Forum on Child and Family Statistics. (2017). *America's children: Key national indicators of well-being, 2017*. Washington, DC: U.S. Government Printing Office.

Gebbie, D. H., Ceglowski, D., Taylor, L. K., & Miels, J. (2012). The role of teacher efficacy in strengthening classroom support for preschool children with disabilities who exhibit challenging behaviors. *Early Childhood Education Journal, 40*, 35-46.

Haddix, M. M. (2017). Diversifying teaching and teacher education: Beyond rhetoric and toward real change. *Journal of Literacy Research, 49*(1), 141-149.

Hamre, B. K., Pianta, R. C., Downer, J. T., & Mashburn, A. J. (2008). Teachers' perceptions of conflict with young students: Looking beyond problem behaviors. *Social Development, 17*(1), 115-136.

Harvey, E. A., Fischer, C., Weieneth, J. L., Hurwitz, S. D., & Sayer, A. G. (2013). Predictors of discrepancies between informants' ratings of preschool-aged children's behavior: An examination of ethnicity, child characteristics, and family functioning. *Early Childhood Research Quarterly, 28*, 668-682.

Keenan, K., & Wakschlag, L. S. (2002). Can a valid diagnosis of disruptive behavior disorder be made in preschool children? *American Journal of Psychiatry, 159*(3), 351-358.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*(1), 159-174.

Martel, M. M. (2012). Dispositional trait types of ADHD in young children. *Journal of Attention Disorders, 20*(1), 43-52.

Mashburn, A. J., Hamre, B. K., Downer, J. T., & Pianta, R. C. (2006). Teacher and classroom characteristics associated with teachers' ratings of prekindergartners' relationships and behaviors. *Journal of Psychoeducational Assessment, 24*(4), 367-380.

Mavropoulou, S., & Padeliadu, S. (2002). Teachers' causal attributions for behaviour problems in relation to perceptions of control. *Educational Psychology, 22*(2), 191-202.

McArdle, J. J., Hamgami, F., Jones, K., Jolesz, F., Kikinis, R., Spiro, A., III, & Albert, M. S. (2004). Structural modeling of dynamic changes in memory and brain structure using longitudinal data from the Normative Aging Study. *Journals of Gerontology: Psychological Sciences, 59B*(6), P294-P304.

McGoey, K. E., DuPaul, G. J., Haley, E., & Shelton, T. L. (2007). Parent and teacher ratings of attention-deficit/hyperactivity disorder in preschool: the ADHD Rating Scale-IV Preschool Version. *Journal of Psychopathology and Behavioral Assessment, 29*(4), 269-276.

Motamedi, M., Bierman, K., & Huang-Pollock, C. L. (2016). Rejection reactivity, executive function skills, and social adjustment problems of inattentive and hyperactive kindergartners. *Social Development, 25*(2), 322-339.

Myers, S. S., & Pianta, R. C. (2008). Developmental commentary: Individual and contextual influences on student-teacher relationships and children's early problem behaviors. *Journal of Clinical Child and Adolescent Psychology, 37*(3), 600-608.

O'Brien, M., & Peyton, V. (2002, April). Parents' attributions for their children's behavior: Relation to parenting style, parenting stress, and parents' goals. Poster presented at the Biennial Conference on Human Development, Charlotte, NC.

Pas, E. T., & Bradshaw, C. P. (2014) What affects teacher ratings of student behaviors? The potential influence of teachers' perceptions of the school environment and experiences. *Prevention Science, 15*, 940-950.

Philip, T. M. (2011). Moving beyond our progressive lenses: Recognizing and building on the strengths of teachers of color. *Journal of Teacher Education, 62*(4), 356–366.

Phillips, B. M., & Lonigan, C. J. (2010). Child and informant influences on behavioral ratings of preschool children. *Psychology in the Schools, 47*(4), 374-290.

Pigott, R. L., & Cowen, E. L. (2000). Teacher race, child race, racial congruence, and teacher ratings of children's school adjustment. *Journal of School Psychology, 38*(2), 177-196.

Pochtar, R., & Del Vecchio, T. (2014). A cross-cultural examination of preschool teacher cognitions and responses to child aggression. *School Psychology International, 35*(2), 176-190.

Poulou, M. S. (2017). The relation of teachers' emotional intelligence and students' social skills to students' emotional and behavioral difficulties: A study of preschool teachers' perceptions. *Early Education and Development, 28*(8), 996-1010.

Purpura, D. J., Wilson, S. B., & Lonigan, C. J. (2010). ADHD symptoms in preschool children: Examining psychometric properties using IRT. *Psychological Assessment, 22*(3), 546-558.

Sattler, J. M. (2014). *Foundations of behavioral, social, and clinical assessment of children* (6th ed.). La Mesa, CA: Jerome M. Sattler, Publisher, Inc.

Sonuga-Barke, E. J. S., Auerbach, J., Campbell, S. B., Daley, D., & Thompson, M. (2005). Varieties of preschool hyperactivity: Multiple pathways from risk to disorder. *Developmental Science, 8*(2), 141-150.

Spilt, J. L., & Koomen, H. M. Y. (2009). Widening the view on teacher-child relationships: Teachers' narratives concerning disruptive versus nondisruptive children. *School Psychology Review, 38*(1), 86-101.

Splett, J. W., Smith-Millman, M., Raborn, A., Brann, K., Flaspohler, P., & Maras, M. (2018). Student, teacher, and classroom predictors of between-teacher variance of students' teacher-rated behavior. *School Psychology Quarterly, 33*(3), 460-468.

Studts, C. R., & van Zyl, M. A. (2013). Identification of developmentally appropriate screening items for disruptive behavior problems in preschoolers. *Journal of Abnormal Child Psychology, 41*, 851-863.

Thijs, J., & Koomen, H. M. Y. (2009). Toward a further understanding of teachers' reports of early teacher-child relationships: Examining the roles of behavior appraisals and attributions. *Early Childhood Research Quarterly, 24*, 186-197.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, 17, 783-805.

Wakschlag, L. S., Briggs-Gowan, M. J., Carter, A. S., Hill, C., Danis, B., Keenan, K.,…Leventhal, B. L. (2007). A developmental framework for distinguishing disruptive behavior from normative misbehavior in preschool children. *Journal of Child Psychology and Psychiatry*, *48*(1), 976-987.

Weiner, B. (1985). An attribution theory of achievement, motivation, and emotion. *Psychological Review, 92*, 548–573.

Williford, A., Graves, K., Shelton, T., & Woods, J. (2009). Contextual risk and parental attributions of children's behavior as factors that influence the acceptability of empirically supported treatments. *Vulnerable Children and Youth Studies*, *4*(3), 226–237.

Williford, A. P., LoCasale-Crouch, J., Vick Whittaker, J., DeCoster, J., Hartz, K. A., Carter, L. M.,…Hatfield, B. E. (2017). Changing teacher-child dyadic interactions to improve preschool children's externalizing behavior. *Child Development, 88*(5), 1544-1553.

Table 1
Child, Classroom, and Teacher Demographic Characteristics

	Percent	*M*	*SD*	Range
Child demographics (*n* = 2,427)				
Age (in months)		49.17	6.76	26-70
Gender (% Male)	51.8			
Ethnicity				
Black	39.9			
White	37.9			
Latino	10.2			
Multiracial	9.0			
Asian	2.1			
Native American	0.5			
Other	0.4			
Income-to-needs ratio		1.86	1.50	0.16-6.15
Classroom demographics (*n* = 160)				
Average Class Size		15.17	3.58	5-25
Center Type				
Private	55			
Head Start	26			
Public	19			
Teacher demographics (*n* = 160)				
Age (in years)		40.88	11.67	21-67
Gender (% Female)	97.4			
Ethnicity				
White	52.3			
Black	41.3			
Multiracial	2.6			
Latino	1.3			
Native American	1.3			
Asian	0.6			
Other	0.6			
Years Education		15.44	1.60	12-18
Years Teaching Experience		12.31	9.23	0-43

Table 2
Means and Standard Deviations of Teacher Reported Disruptive Behavior

	Full Sample (n = 2,427)	Boys (n = 1,182)	Girls (n = 1,100)
Total Disruptive Behavior	14.30 (14.99)	17.10 (16.17)	11.57 (13.16)
Hyperactivity	5.84 (6.28)	7.09 (6.87)	4.65 (5.34)
Inattention	5.46 (5.93)	6.54 (6.28)	4.44 (5.38)
Oppositionality	2.98 (4.75)	3.47 (5.04)	2.57 (4.41)

Note. Total Disruptive Behavior range 0-78; Hyperactivity and Inattention range 0-27; Oppositionality range 0-24. Full sample includes 145 children with missing gender data.

Table 3
Disruptive Behavior Rating Frequency by Symptom Count

	Clinical Threshold		Subclinical Threshold	
	Valid %	*n*	Valid %	*n*
None	**83.9**	**1988**	**78.3**	**1857**
1 subtype	**9.1**	**220**	**10.9**	**260**
Hyperactivity	3.2	77	3.9	93
Inattention	2.9	68	3.3	79
Oppositionality	3.2	75	3.7	88
2 subtypes	**4.6**	**110**	**7.1**	**168**
Hyperactivity-Inattention	2.4	57	3.5	85
Hyperactivity-Oppositionality	1.8	43	2.8	68
Inattention-Oppositionality	0.4	10	0.6	15
3 subtypes	**2.1**	**51**	**3.5**	**86**

Note. Subclinical Threshold includes children within the Clinical Threshold group.

Table 4
Two-Tailed Correlations Between Covariate, Predictor, and Outcome Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Outcomes															
1 Tot Dis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 Hyp	.93***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 Inatt	.89***	.76***	-	-	-	-	-	-	-	-	-	-	-	-	-
4 Opp	.82***	.68***	.54***	-	-	-	-	-	-	-	-	-	-	-	-
Child Factors															
5 Male	.18***	.20***	.18***	.09***	-	-	-	-	-	-	-	-	-	-	-
6 Non-White	.07**	.06*	.09***	.02	-.03	-	-	-	-	-	-	-	-	-	-
7 Age	-.09***	-.06*	-.12***	-.07**	.04	.13	-	-	-	-	-	-	-	-	-
8 INR	-.05	-.04	-.07**	.01	.02	-.56***	.20***	-	-	-	-	-	-	-	-
Teacher Factors															
9 Age	.03	.00	.07**	-.02	.04	.00	-.03	-.03	-	-	-	-	-	-	-
10 Male	.01	.02	-.01	.03	-.01	.01	-.03	-.02	.07**	-	-	-	-	-	-
11 Non-White	-.06**	-.05*	-.04	-.08***	.03	.29***	.02	-.26***	-.07**	.00	-	-	-	-	-
12 Education	.03	.03	.04*	.01	.00	.13***	.20***	-.18***	-.11***	-.08***	.08	-	-	-	-
13 Teaching	.03	.02	.06**	.01	.01	.04	.01	-.03	.50***	.02	-.06**	-.13***	-	-	-
14 Attr (C)	.16***	.13***	.14***	.14***	.01	-.03	.07*	.01	-.06**	.06**	-.12***	.04	.11***	-	-
15 Attr (R)	.18***	.14***	.17***	.17***	-.01	-.08**	-.02	.09**	.01***	-.07**	-.15***	.01	.14***	.53***	-
16 Self-Efficacy	.01	.01	.02	-.02	-.01	.00	.17***	-.02	-.07**	-.03	.10***	.21***	.03	-.18***	-.17***

Note. Tot Dis = Total Disruptive; Hyp = Hyperactivity; Inatt = Inattention; Opp = Oppositionality; Attr = Attribution; C = Causal; R = Responsibility.
*p<.05, **p<.01, ***p<.001.

Table 5
Multi-Level Model. Teacher Characteristics Predicting Disruptive Behavior Ratings

	Model 1		Model 2					
	Total Disruptive Behavior		Hyperactivity		Inattention		Oppositionality	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Non-White	-2.28*	1.07	-0.83	0.42	-0.73	0.47	-0.74*	0.33
Yrs Education	0.14	0.39	0.03	0.14	0.11	0.17	0.00	0.12
Yrs Teaching	0.03	0.06	0.01	0.02	0.02	0.03	0.01	0.02
Attribution (C)	1.95**	0.71	0.63*	0.28	0.83**	0.30	0.44	0.29
Attribution (R)	2.62**	0.84	0.94**	0.33	0.94*	0.36	0.81**	0.29
Self-Efficacy	1.30*	0.65	0.46	0.26	0.60*	0.27	0.21	0.20

Note. Yrs = Years; C = Causal; R = Responsibility. Coefficients represent unstandardized betas. Models control for teacher age and gender and child-level demographic variables.

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

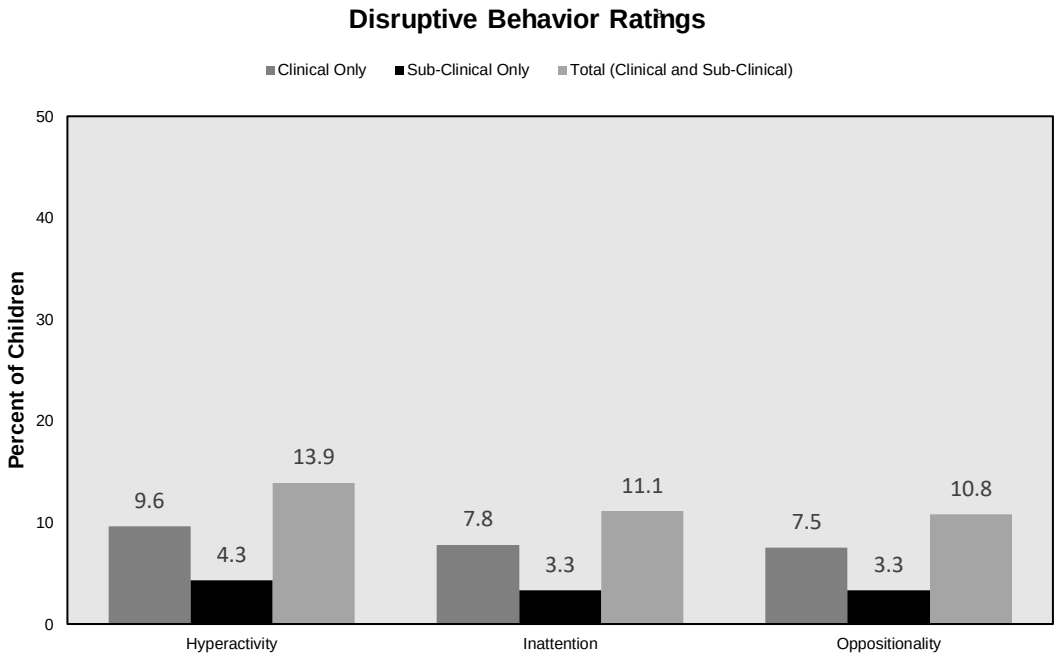

Figure 1. Children meeting clinical and subclinical thresholds of disruptive behavior by subtype (*Note*. A single child may be represented across one, two, or all three subtypes).

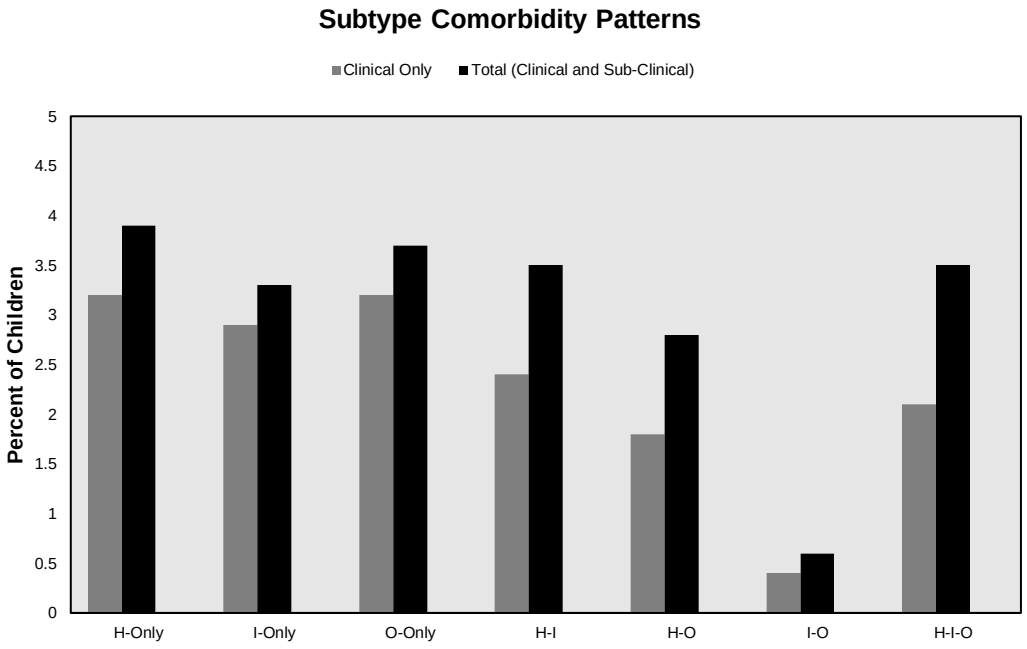

Figure 2. Patterns of comorbidity amongst disruptive behavior subtypes based on clinical and subclinical thresholds (H = Hyperactivity, I = Inattention, O = Oppositionality).

Manuscript Two

Observed Quality of Classroom Peer Engagement in a Sample of Preschoolers Displaying Disruptive Behaviors

Michelle L. Yoder, Amanda P. Williford, & Virginia E. Vitiello
University of Virginia

(Published in *Early Childhood Research Quarterly*)

Yoder, M. L., Williford, A. P., & Vitiello, V. E. (2019). Observed quality of classroom peer engagement in a sample of preschoolers displaying disruptive behaviors. *Early Childhood Research Quarterly*, *47*, 206-217. doi:10.1016/j.ecresq.2018.12.011

Abstract

The current study used naturalistic observations to explore the peer engagement of 428 preschoolers whom teachers identified as displaying elevated levels of disruptive behavior. Children's peer sociability, communication, assertiveness, and conflict were independently observed as they naturally occurred in the classroom throughout the preschool year. Data were analyzed to examine patterns of peer engagement, explore variability across time and classroom context, and identify associations between disruptive behavior type and peer engagement quality. Results showed that, on average, children were not engaging in high-quality peer interactions nor were they displaying significant levels of negative peer engagement. Though children varied in their initial peer engagement quality, there was no linear change in positive or negative peer engagement quality across the year. Children's peer engagement was of higher quality when in unstructured settings and when teachers were less directive of activities. The relationship between disruptive behavior and peer engagement differed based on the nature of the disruptive behavior displayed – positive peer engagement was positively associated with hyperactivity and negatively associated with inattention, and negative peer engagement was positively associated with oppositionality. Results highlight the low level with which children are interacting with peers (both positively and negatively) in the preschool classroom and suggest that preschoolers who are perceived as disruptive are not yet engaging in a significant degree of negative peer interaction. Implications for the understanding, structure, and management of the preschool classroom are discussed in relation to both practice and research.

Observed Quality of Classroom Peer Engagement in a Sample of Preschoolers Displaying Disruptive Behaviors

The experiences that children have during their preschool years are critical in setting the stage for later development (Blair, 2002; Denham et al., 2003). Simultaneous to managing a variety of physical, cognitive, and behavioral changes, preschoolers are transitioning into new and unfamiliar environmental contexts where they spend less time with their caregivers and increasingly more time with peers (Bulotsky-Shearer, Bell, Carter, & Dietrich, 2014; Hay, Payne, & Chadwick, 2004; Rimm-Kaufman & Pianta, 2000). The way in which children respond to and manage these novel peer interactions not only impacts their immediate preschool experience, but also shapes their subsequent social-emotional, cognitive, and academic development (Chen, McComas, Hartman, & Symons, 2011; Hay et al., 2004; Jamison, Forston, & Stanton-Chapman, 2012). For children who display early disruptive behaviors, navigating the preschool peer context can be especially challenging. The inattentive, impulsive, and/or oppositional tendencies that these children exhibit often present as barriers to their ability to engage in positive interactions with peers (Bulotsky-Shearer, Bell, Romero, & Carter, 2012; Denham et al., 2003; Fantuzzo, Sekino, & Cohen, 2004; Jamison et al., 2012). As a result, they are more likely to form negative relationships, experience peer rejection, and develop maladaptive social-emotional tendencies (Bulotsky-Shearer et al., 2012; Chen et al., 2011; Cohen & Mendez, 2009).

While the association between disruptive behavior and peer interaction quality has been an area of empirical interest, previous studies have relied heavily on teacher- and/or parent-report to assess young children's social functioning (Campbell et al., 2016). These measures provide valuable information regarding how children's behaviors are perceived

by those who frequently interact with them; however, teachers' and parents' knowledge of and personal experiences with children often make their ratings more susceptible to bias (Milfort & Greenfield, 2002). Furthermore, teachers and parents have been cited as less effective at rating children's social competence with peers, given the salience of their own interactions with children and varying definitions of "social skills" (Eggum-Wilkens et al., 2014; Lillvist, Sandberg, Björk-Akesson, & Granlund, 2009; Milfort & Greenfield, 2002). As such, there is great value in the perspective offered by direct observation of peer engagement quality, where children's social behaviors can be assessed within their natural context as they occur (Campbell et al., 2016; Eggum-Wilkens et al., 2014; Mathieson & Banerjee, 2010; Miller, Gouley, Seifer, Dickstein, & Shields, 2004). Specifically, children's positive peer engagement can be captured through their display of sociability, assertiveness, and functional communication with peers, while observed peer conflict can be an indicator of negative peer engagement (Ladd, 2005).

The goal of the present study was to use observational data to gain a more extensive understanding of how children's interactions with peers unfold in the preschool classroom. Specifically, we aimed to descriptively examine the relationship between positive and negative peer engagement, classroom context (i.e., activity setting, teacher involvement), and child characteristics for children who were reported to display elevated levels of disruptive behavior. While well-established links exist between disruptive behavior and peer engagement quality for young children (e.g., Bulotsky-Shearer et al., 2012; Denham et al., 2003; Fantuzzo et al., 2004; Jamison et al., 2012), this study is unique in its looking beyond these associations to encapsulate the descriptive nature and quality of these interactions as a whole. That is, previous studies have identified that a relationship exists

between these factors, but our study provides a glimpse into how this relationship actually manifests in the classroom. In addition, our focus on classroom context and type of disruptive behavior provides a more nuanced exploration of factors that may contribute to preschool peer engagement at both the classroom and child levels. As such, findings from this study further add to the knowledge base on how to best support young children's development of peer relationships and the social skills that are critical for later school and life success, particularly for those who are at risk for social challenges (Bulotsky-Shearer et al., 2012; Chen et al., 2011; Cohen & Mendez, 2009).

The Importance of Peer Interactions in Early Childhood

During the preschool years, children are not only beginning to develop and refine the cognitive and social-emotional skills necessary to interact with peers (Craig-Unkefer & Kaiser, 2002; Hay et al., 2004), but they are often placed in settings where these skills are quickly put to the test. When first stepping foot into the preschool classroom, for example, children are faced with and must learn how to engage in complex and unfamiliar group interactions, often times having had little to no previous exposure or practice in doing so (Fantuzzo et al., 2004; Hay et al., 2004; Rimm-Kaufman & Pianta, 2000). This preschool transition can be overwhelming, but a child's ability to draw upon these skills and effectively manage these increased social demands is foundational to both immediate and future development (Bulotsky-Shearer et al., 2014; Denham et al., 2003; Hay et al., 2004).

Quality of peer engagement is particularly important to children's social-emotional development. The early interactions that children have with peers provide a platform from which they can develop and practice a wide array of self-regulatory and social skills that are essential to adaptive adjustment and behavior. For example, preschoolers must learn

how to read and interpret social cues, effectively navigate peer play, cooperate with others, and cope with conflict, all while managing their own internal states (Cohen & Mendez, 2009; Fantuzzo et al., 2004; Hay et al., 2004; Williford, Whittaker, Vitiello, & Downer, 2013). Though children have been developing these skills since they were toddlers, it is during the preschool years that behavioral patterns begin to emerge and stabilize (Hay et al., 2004). Thus, when a preschooler struggles to engage positively with peers, he or she is missing out on valuable opportunities to build and practice social-emotional skills during a critical developmental period (Bell, Greenfield, Bulotsky-Shearer, & Carter, 2016; Jamison et al., 2012; Stanton-Chapman, Denning, & Jamison, 2012).

Early peer interactions are also key contributors to children's academic and school success. The knowledge and competencies that children develop and utilize during peer interactions (i.e., problem solving, cognitive flexibility, sustaining attention) overlap with those needed for classroom learning (Bell et al., 2016; Bulotsky-Shearer et al., 2012; Vitiello & Williford, 2016). Further, for those children who have frequent peer altercations, the amount of energy that they exert managing these social difficulties reduces the resources available for their active engagement in classroom activities (e.g., Cohen & Mendez, 2009; Fantuzzo et al., 2004; Holmes, Kim-Spoon, & Deater-Deckard, 2016). Children are therefore more likely to behave in ways that are conducive to and supportive of learning when they have positive relationships with peers (Bulotsky-Shearer et al., 2012; Fantuzzo et al., 2004). As such, early peer interactions have repeatedly been linked to school readiness and academic achievement in a wide range of areas, including language, literacy, and math (e.g., Bulotsky-Shearer et al., 2012; Fantuzzo et al., 2004; Torres, Domitrovich, & Bierman, 2015).

The Role of the Preschool Classroom in Facilitating Peer Engagement

Young children's learning is predominately social in nature, and a high-quality preschool environment is one that creates an atmosphere that is "active, meaningful, and connected" (National Association for the Education of Young Children [NAEYC], 2009, p. 8; Bulotsky-Shearer et al., 2012). As such, the preschool classroom serves as a "natural boundary" for children to interact and form relationships with peers (Schaefer, Light, Fabes, & Hanish, 2010, p. 62). Some preschool activity settings, however, are inherently more conducive to social interaction than others (Bulotsky-Shearer et al., 2012; Kontos, 1999; Stanton-Chapman, 2015). Research has shown that children are more likely to interact with peers during less-structured activities (i.e., free play), for example, compared to more-structured activities (i.e., whole or small group; e.g., Booren, Downer, & Vitiello, 2012; Bulotsky-Shearer, Domínguez, Bell, Rouse, & Fantuzzo, 2010; Vitiello, Booren, Downer, & Williford, 2012). This is not surprising, as activities that impose greater structure are usually more goal-oriented or directive in nature and consequently allow less opportunity to socialize with peers (Bulotsky-Shearer et al., 2012; Kontos, 1999). Nonetheless, preschool pedagogy places emphasis on fostering social interaction as much as possible, even when not necessarily the focus or goal of an activity (Bulotsky-Shearer et al., 2012; Lillvist et al., 2009; Stanton-Chapman, 2015).

As young children are highly dependent on adult support in drawing upon and utilizing the skills needed to navigate their social world (Buysse et al., 2003), preschool teachers are tasked with ensuring that their students have both *opportunities* to interact with peers and the *supports* needed to facilitate these interactions (Brown, Odom, & Conroy, 2001; Bulotsky-Shearer et al., 2012; Kontos, 1999; Stanton-Chapman & Hadden, 2011). It

is not enough to simply provide time and space for social interaction – teachers must also actively attend to and facilitate children's interactions with one another during these moments. One of the most effective ways for teachers to do this is by observing, encouraging, and supporting children's interactions with one another as they naturally unfold in the classroom (Buysse et al., 2003; Kwon, Elicker, & Kontos, 2011). Teachers' intentional scaffolding of these interactions – offering suggestions or ideas, giving cues and prompts, modeling roles and behaviors, facilitating communication, or helping resolve or divert conflict – has been shown to enhance the social environment in which children are engaging, especially during play (Buysse et al., 2003; Kontos, 1999; Stanton-Chapman & Hadden, 2011). As such, best practice suggests that a teacher's presence or involvement during free play and other socially-focused activities should promote rather than hinder peer engagement (Ashiabi, 2007; Brown et al., 2001; Kwon et al., 2011; Stanton-Chapman & Snell, 2011).

The Relationship Between Disruptive Behavior and Peer Engagement

In addition to classroom factors, individual child-level factors can also influence preschoolers' quality of peer engagement. For example, children who display behaviors of inattention, hyperactivity, and/or oppositionality are more vulnerable to peer challenges (Bulotsky-Shearer et al., 2012; Denham et al., 2003; Fantuzzo et al., 2004; Jamison et al., 2012). Though all considered "disruptive," children's engagement with peers is impacted differently depending on the nature of the behavior(s) displayed. Children with symptoms of inattention, for example, often struggle to relate to peers because of the difficulty that they have attending to others' actions, behaviors, and social cues (Arnold, Kupersmidt, Voegler-Lee, & Marshall, 2012; Brennan, Shaw, Dishion, & Wilson, 2015; Diamond,

2005; Zoromoski, Owens, Evans, & Brady, 2015). Those who display elevated levels of hyperactivity or impulsivity find it harder to inhibit behavior and, consequently, are more likely to interrupt, intrude, or display socially inappropriate behaviors in social settings (Brennan et al., 2015; Diamond, 2005; Zoromoski et al., 2015). Children who express oppositional or defiant behaviors often have the greatest difficulty with peers, as they are more likely to violate the social norms of others or engage in conflict (Brennan et al., 2015; Zoromoski et al., 2015). As such, preschoolers who exhibit any one or combination of these disruptive tendencies are at risk for developing maladaptive social and behavioral patterns that not only impede their current interactions with peers, but also set the precedent for future relationships (Bulotsky-Shearer et al., 2014; Gülay, 2011; Jamison et al., 2012).

Previous studies have begun to highlight the relationship between disruptive behavior and early peer interaction quality. Bulotsky-Shearer and colleagues (2014), for example, examined teacher-report of preschoolers' social competence and behavioral adjustment and found that children's externalizing problem behavior (i.e., aggression, oppositionality, inattention, hyperactivity) was positively associated with their level of disruptive peer play. In another study, externalizing behavior reported by teachers at the beginning of the school year negatively predicted quality of interactive peer play reported at the end of the school year (Bulotsky-Shearer et al., 2012). Denham and colleagues (2001) described similar findings while exploring preschoolers' play group membership, social competence, and emotional responsiveness toward peers. They found that children involved in negative peer groups (i.e., more likely to display negative affect) typically exhibited greater externalizing behaviors compared to those involved in positive peer groups (i.e., more likely to display positive affect). As these and other studies suggest,

children's display of disruptive behavior is not only associated with negative peer engagement, but may actually hinder the development of positive peer interactions as well. It is therefore important to attune to and take action when a child begins to show signs of early disruptive behavior in order to prevent these tendencies from stabilizing and interfering with development of peer relationships over time.

The Current Study

In order to develop effective social interventions for preschoolers, we must first understand the nature of their peer interactions as they occur within the classroom context (Campbell et al., 2016). Knowing what factors support or hinder children's engagement with peers can better inform teachers on how to intentionally shape their teaching and classroom environment to create an atmosphere that is supportive of peer engagement. The purpose of this study was to expand upon the current understanding of early peer interactions by exploring the observed positive and negative peer engagement of a large and diverse sample of preschoolers reported to display disruptive behavior. Results contribute to the literature by using naturalistic observational data – as opposed to parent- or teacher-report – to measure children's peer interaction quality. This study also contributes to the understanding of the complex environment of the preschool classroom by descriptively exploring the relationship between peer engagement and various classroom factors. Further, the specific emphasis placed on children who display disruptive behaviors allows for a more nuanced understanding of how developmental and behavioral patterns apply within specific subgroups of children – in this case for those whose behaviors make them more vulnerable to peer challenges (Bulotsky-Shearer et al., 2012; Carpenter & Drabick, 2011; Chen et al., 2011).

To explore the nature of peer engagement for this unique subsample of children, we asked four primary research questions. For preschoolers who display disruptive behaviors:

1. What is their average quality of peer engagement?
2. How does their peer engagement change across the school year?
3. Is classroom context (i.e., activity setting, teacher involvement) associated with variability in children's peer engagement? Specifically, what does children's peer engagement look like during free play?
4. Is the degree and manner in which children display disruptive behavior related to their peer engagement quality?

Based on previous literature highlighting the relationship between disruptive behavior and peer engagement (e.g., Bulotsky-Shearer et al., 2014; Denham et al., 2001), we anticipated that positive peer engagement would be low and negative peer engagement would be elevated for this subsample of children. We hypothesized that children's peer engagement quality would improve across the school year as a function of their anticipated social and regulatory skill development (Craig-Unkefer & Kaiser, 2002; Hay et al., 2004). As suggested by previous studies (e.g., Booren et al., 2012; Bulotsky Shearer et al., 2010; Vitiello et al., 2012), we also predicted that children would have greater positive peer engagement during unstructured activities – specifically free play – and that teacher involvement would be associated with higher quality peer engagement during free play. Lastly, we hypothesized that children's level of disruptiveness, regardless of the type, would be positively associated with negative peer engagement and negatively associated with positive peer engagement (Bulotsky-Shearer et al., 2014; Denham et al., 2001).

Specifically, we anticipated children's oppositional behavior to have the greatest association with both positive and negative peer engagement (Brennan et al., 2015).

Method

Participants

Data for this study come from a larger efficacy trial that assessed an early teacher-child intervention aimed at improving behavioral outcomes in a sample of 470 preschoolers identified as displaying elevated disruptive behaviors. Forty-two children either did not have observational data (n = 13) or were replaced (n = 29) within the first half of the study (see further elaboration in description of data collection below); as such, the sample for the current analyses consisted of 428 preschool children. There was no significant difference in gender, age, ethnicity, and INR between children who were excluded and those who were included in the present analyses (one-way analysis of variance (ANOVA) p-values > .05).

Sixty-five percent of the current sample were boys and average age at the start of the study was 48.90 months (SD = 6.82). Children were racially and ethnically diverse (42% Black, 38% White, 20% Other), and families ranged in socioeconomic status (average income-to-needs ratio (INR) of 1.91 (SD = 1.55)). Children were enrolled in 156 preschool classrooms from 89 Head Start (27%), state-funded public (19%), and private (54%) preschool programs serving children ages three through five for 5 days a week; average class size was 15.18 (SD = 3.64). Classroom teachers (n = 156), on average, had 15.44 years (SD = 1.59) of education and 12.04 years (SD = 9.27) of teaching experience, and 67% had a bachelor's degree or higher.

Procedure

Recruitment and selection criteria. Directors of preschool programs from across two Mid-Atlantic states were recruited via email, phone, and/or in person for participation in a trial examining the impact of a teacher-child dyadic intervention. The intervention, known as *Banking Time*, is intended to improve teacher interaction quality with children who display disruptive behaviors through a set of time-limited, one-on-one meetings between a teacher and child that take place 2-3 times per week at school (Williford et al., 2017). Once receiving director approval, teachers were contacted to obtain consent, followed by caregivers of consenting teachers' students. Participating preschool teachers completed a disruptive behavior rating scale (see Measures for description) for each of their students. The two or three children in each class with the highest rated level of disruptiveness and who had caregiver consent (76% agreed to participate) were selected for participation in the study. Twelve percent of children were rated by their teachers as being one of the most disruptive in their class but did not have caregiver consent; in these cases, the child with the next-highest rating and who had caregiver consent was selected for participation. Selected children's total disruptive behavior score (M = 28.43, SD = 16.18) was significantly higher than that of non-selected children (M = 10.82, SD = 12.43; $t(2369) = 24.92$, $p < .001$). The teacher-child intervention was not of interest in the current study, and analyses indicate no statistical association between the intervention and variables pertinent to this study (two-tailed correlation p-values > .05). Nonetheless, intervention status is controlled for where appropriate in analyses (for additional information regarding the intervention, see Williford et al., 2017).

Data collection. At the beginning of the preschool year, child characteristics were collected via family survey, and teacher and classroom characteristics were collected via teacher report. Additional reported and observational data were collected at four time points across the school year from fall to spring. Due to the longitudinal nature of the study, attrition occurred as expected. Throughout the preschool year 80% of children and 79% of classrooms were retained. The vast majority of attrition at the teacher level was due to the teacher leaving the school and/or classroom; child level attrition was primarily in response to either the child or teacher leaving the school and/or participating classroom. For children who withdrew from the study or moved classrooms before their selected window (n = 29), the child with the next-highest rating and caregiver consent was selected for participation. There was no significant difference in gender, age, ethnicity, or INR between children who withdrew from the study and the overall sample (one-way ANOVA p-values > .05). All replacement children joined the study no later than the second data collection time point and are included in analyses in place of the children whom they substituted.

Observational data were collected across multiple days throughout the school year by independent data collectors. Data collectors first underwent a two-day training for the Individualized Classroom Assessment Scoring System (Downer, Booren, Lima, Luckner, & Pianta, 2010), a child-level observational measure (see Measures for description). They were considered reliable upon successfully coding five training clips within one point of a master code on 80% of the constructs' dimensions. In order to maintain reliability, data collectors participated in weekly calibration meetings.

Data collectors (n = 43) were assigned to school centers (n = 89). On average, each data collector observed a total of 46.32 children (SD = 27.00) from 20.23 classrooms (SD

= 10.58) across 13.70 centers (*SD* = 6.71). Observation days began in the morning and continued for 3-4 hours until mid-afternoon. Participating children were observed in a series of alternating cycles, where data collectors observed one child for 10 minutes and immediately coded his or her observed behavior (i.e., one cycle) and then switched to observe the next selected child for one cycle, and so on. Data collectors also recorded the activity settings in which children participated, whether the teacher was present during observation, and whether the activity was teacher-directed. Average number of cycles observed per data collector was 290.09 (*SD* = 201.09), and average number of observation days was 44.27 (*SD* = 30.76). Each participating child was observed for an average of 24.06 ten-minute cycles (*SD* = 7.81) and 7.66 days (*SD* = 2.63) across the preschool year. At each of the four time points, children were observed for approximately 2.63 days (*SD* = 0.67) and 8.37 cycles (*SD* = 1.45; see Figure 1 for sample visual representation of data structure).

Measures

Demographic information. Information pertaining to children's familial and demographic background was obtained at the beginning of the school year from a survey completed by caregivers. Variables pertinent to these analyses include children's age (in months), gender, race/ethnicity, and family INR (calculated from family income and number of family members).

Disruptive behavior. To measure children's perceived disruptive behavior at the beginning of the year, teachers completed a rating scale containing all items from the ADHD Rating Scale-IV (ADHD-RS-IV; DuPaul, Power, Anastopoulos, & Reid, 1998) and the ODD Rating Scale (ODD-RS; Anastopoulos, 1998). The ADHD-RS-IV is an 18-item rating scale used to assess individual children's inattentive and hyperactive/ impulsive

behaviors on a four-point Likert-type scale. Sample items include "fails to give close attention to details or makes careless mistakes" (i.e., inattention) and "fidgets with hands or feet or squirms in seat" (i.e., hyperactivity; DuPaul et al., 1998). The ODD-RS is an 8-item rating scale that assesses for oppositional behavior using a similar Likert-type scale. Sample items include "loses temper," "argues with adults," and "is angry and resentful" (Anastopoulos, 1998). Both measures are psychometrically sound tools that have been used to measure externalizing behavior in clinical research and show validity and reliability with preschool-aged populations (e.g., McGoey, DuPaul, Haley, & Shelton, 2007; Purpura, Wilson, & Lonigan, 2010). Items from both measures were combined to create one 26-item disruptive behavior rating scale. Results from the combined scale are presented through a Total Disruptive Behavior score, as well as through three subscale scores: Hyperactivity, Inattention, and Oppositionality. Internal consistency for each of the subscales was good in this sample (α = 0.92, 0.93, and 0.93, respectively).

Observed peer interactions. Participating children's classroom peer interactions were measured using the Individualized Classroom Assessment Scoring System (inCLASS; Downer et al., 2010). The inCLASS is an observational tool used to assess children's classroom behavior in relation to three broad domains: Teacher Interactions, Peer Interactions, and Task Orientation. Trained data collectors observe a child for 10 minutes and then rate his or her behavior on a scale from 1 to 7 across ten specific dimensions. Scores within the low-range (i.e., 1-2) indicate that the child was observed to display few to no behaviors related to the dimension; scores within the mid-range (i.e., 3-5) indicate the occasional display of dimension-related behaviors; scores within the high-range (i.e., 6-7) suggest frequent or consistent display of dimension-related behaviors. For

the present study, only dimensions from the Peer Interactions domain (Sociability, Communication, Assertiveness, and Peer Conflict) were used (see Table 1 for overview of dimensions). Sociability, Communication, and Assertiveness dimensions were used to represent the construct of positive peer engagement, measured through an aggregate Positive Peer Engagement score. Peer Conflict was used to indicate negative peer engagement, the variable of which is referred to as Negative Peer Engagement to better encapsulate the broader construct measured by dimension indicators, which include those related to conflict (i.e., aggression, confrontation) as well as those that more broadly contribute to negative peer interaction (i.e., negative affect, attention-seeking).

The inCLASS has shown construct and criterion validity specific to both positive and negative peer engagement constructs, with studies identifying mild to moderate associations between inCLASS peer dimensions and teacher-rated social skills on measures such as the California Preschool Competency Scales (CPSCS; Levine, Elzey, & Lewis, 1970) and the Teacher-Child Rating Scale (TCRS; Hightower et al., 1986; Downer et al., 2010). Inter-rater reliability was calculated across 20% of all observations with two data collectors independently observing and rating the same children. Intraclass correlation coefficients (ICCs; Sociability = .70; Communication = .71; Assertiveness = .66; Conflict = .54) for each dimension ranged from fair to good in this sample (Altman, 1991; Cicchetti et al., 2006; Landis & Koch, 1977). Of note, ICCs (particularly for Conflict) are likely lower due to the skewness of the data, a pattern common in inCLASS Conflict ratings (Downer et al., 2010). Rater agreement within one point – the measure developers' benchmark for reliability – averaged 88% (Sociability = 86%; Communication = 85%; Assertiveness = 85%; Conflict = 97%). Inter-rater reliability is in line with previous studies

using the inCLASS, where ICCs ranged from .60 to .93 and percent agreement within one point ranged from 71% to 100% (e.g., Booren et al., 2012; Vitiello & Williford, 2016; Williford et al., 2013). Internal consistency for the dimensions was acceptable, with the lowest scale reliability being for Conflict (Sociability α = .69-.74; Communication α = .70-.72; Assertiveness α = .70-.72; Conflict α = .57-.67).

Activity settings and teacher involvement. At the end of each observation cycle, the activity setting that had consumed the most observation time was coded as the "primary activity setting." Free Play (child is able to select what/where he or she would like to play) accounted for 41% of observation cycles, followed by Whole Group (teacher-structured activity with 6 or more children; 24%), Transitions/Routines (part of major transition from one activity to another or routine classroom procedure; 18%), Meals (eating breakfast, lunch, or snack; 13%), Small Group (teacher-structured activity with 5 or fewer children; 4%), and Individual (assigned to work individually; <1%). These definitions were adapted from Ritchie and colleagues' (2001) Emerging Academic Snapshot. Data collectors also coded whether a teacher was present (i.e., working with or near child) during an activity for the majority of the cycle. If a teacher was present, data collectors reported whether the teacher was directing the activity (i.e., activity is set up and managed by teacher). As such, there were three groups to represent teacher involvement: a) Teacher Absent, b) Teacher Present/Directing, and c) Teacher Present/Not Directing. Inter-rater reliability was conducted, and percent agreement between raters was 81% for primary activity setting, 78% for teacher presence, and 80% for teacher direction of activity. Teachers were present during 64% of cycles, and they directed activities during 44% of the cycles in which they were present.

Data Analysis and Results

Scores from all available inCLASS cycles observed throughout the school year were used for analyses with the exception of those in which the primary activity setting was Individual (n = 116, <1% of cycles). The resulting sample consisted of 10,203 cycles. Data were analyzed descriptively by examining children's overall positive and negative peer engagement. Two-tailed correlational analyses showed that Sociability, Communication, and Assertiveness dimension scores were highly correlated (all rs ≥ .82, p < .001) and were subsequently aggregated to form one variable; as such, children had both a Positive Peer Engagement score (i.e., average of Sociability, Communication, Assertiveness) and a Negative Peer Engagement score (i.e., re-named from Peer Conflict) to represent positive and negative peer engagement, respectively. Variables were analyzed at either the child- or cycle-level using SPSS version 24 and MPlus version 7. Child-level interpretation refers to analyses in which scores from observation cycles across all time points were averaged together to create a single score for each child; cycle-level interpretation involved the comparison of scores drawn from all observation cycles without aggregating to the child level, and therefore without accounting for differences between children.

RQ1. What is the average quality of peer engagement?

To explore children's average quality of peer engagement, data were analyzed at both the cycle- and the child-levels. Descriptive results from both are presented in Table 2 and described below.

Cycle-level analysis. Cycle-level analyses provided information about how frequently children were observed to engage in high-, medium-, or low-quality positive

peer interactions and high, medium, or low levels of negative peer engagement. Results indicated that average positive peer engagement was low (M = 2.76) with substantial variability (SD = 1.34) across cycles. More than half of all cycles were characterized by low-quality positive peer engagement, and only a small portion of cycles was characterized by high-quality positive peer engagement. For negative peer engagement, ratings were low (M = 1.27) on average with little variability (SD = 0.64) across cycles. The vast majority of cycles were characterized by low levels of negative peer engagement, with high-levels occurring in only 11 cycles. As a whole, these data suggest that both positive and negative examples of peer engagement occurred infrequently among this sample of children.

Child-level analysis. Analyses at the child-level allowed us to describe children's average positive and negative peer engagement quality using their mean scores. Results indicated that children had average positive peer engagement within the low range (M = 2.73) with some variability (SD = 0.63) across children. Data were positively skewed; the majority of children had low-quality average positive peer engagement and none had an average score within the high-range. For negative peer engagement, children's average scores were low (M = 1.29) with little variability (SD = 0.28) across children. Data were positively skewed; all children had average negative peer engagement within the low-range with the exception of one child whose average score was within the mid-range.

We also looked at each child's range of inCLASS scores across all cycles to determine the proportion of children who were observed to display high-quality positive peer engagement and high levels of negative peer engagement on at least one occasion. The vast majority of children (n = 302, 71%) never had an observation cycle characterized by high-quality positive peer engagement. For negative peer engagement, approximately

40 percent of children (n = 173) were never observed engaging in negative interactions that surpassed the low-range, and only 7 children (<2%) were rated to display high levels of negative peer engagement on at least one occasion. Overall, these data suggest that majority of children in this sample generally experienced low positive and negative peer engagement, and rarely experienced high-quality peer interaction and high levels of negative peer engagement.

RQ2. How does peer engagement change across the school year?

Positive and negative peer engagement were analyzed at the child-level using growth curve analyses to explore trajectories of change across the year. Summary scores for both positive and negative peer engagement were created for each child by aggregating Positive Peer Engagement scores and Negative Peer Engagement scores from all cycles within a single time point, respectively. As such, each child had four Positive Peer Engagement summary scores and four Negative Peer Engagement summary scores to represent their peer engagement as observed across the year. To account for missing data, Full Information Maximum Likelihood (FIML) estimation with robust Standard Errors was used to estimate parameters under the assumption that data were missing at random (e.g., McArdle et al., 2004). This type of estimation uses all available data for each child when estimating parameters and, therefore, increases the statistical power of estimated parameters (Enders & Bandalos, 2001). Separate conditional models were used for Positive Peer Engagement and Negative Peer Engagement, with covariates controlling for child gender, age, minority status, family INR, and treatment condition. Outcome variables were centered at Time 1 that so that the intercept indicated initial levels of peer engagement at the beginning of the school year.

The model for Positive Peer Engagement showed good fit to the data ($\chi_2(17)$ = 23.44, p = .14, Confirmatory Fit Index (CFI) = .98, Root Mean Square Error of Approximation (RMSEA) = .03, Standardized Root Mean Square Residual (SRMR) = .04). Analyses indicated that the intercept was significant (b = 2.80, SE = .07, p < .001), but that the slope was not significant (b = -.04, SE = .04, p = .26). The variance component was significant for the intercept (b = .27, SE = .05, p < .001) but not for the slope (b = .004, SE = .01, p = .74). These results indicate that children began the year demonstrating relatively low positive peer engagement that varied within children at baseline, that there was no linear change detected on average, and that children did not vary in their linear change in positive peer engagement across time.

The Negative Peer Engagement model showed good fit to the data ($\chi_2(17)$ = 22.68, p = .16, CFI = .95, RMSEA = .03, SRMR = .04). Analyses indicated that the intercept was significant (b = 1.25, SE = .04, p < .001), but that the slope was not significant (b = .003, SE = .02, p = .88). The variance component was significant for the intercept (b = .06, SE = .03, p < .05) but not for the slope (b = .003, SE = .004, p = .51). Similar to positive peer engagement, these results indicate that children began the year demonstrating relatively low levels of negative peer engagement that varied within children at baseline, that there was little linear change detected on average, and that children did not vary in their linear change in negative peer engagement across time.

RQ 3a: Is classroom context (i.e., activity setting, teacher involvement) associated with variability in children's peer engagement?

To explore how children's average quality of peer engagement varied based on classroom context, we used a multilevel framework (i.e., cycles nested within days and

children) to analyze the effects of classroom primary activity setting and teacher involvement predicting positive and negative peer engagement. Positive Peer Engagement and Negative Peer Engagement were analyzed in separate models. Both models included child-level demographic characteristics (i.e., gender, age, minority status, family INR), treatment condition, reported level of disruptive behavior, primary activity setting (dummy coded), and teacher involvement (dummy coded). Whole Group was used as the referent group for activity setting, and Teacher Present/Directing was used as the referent group for teacher involvement. Missing data were addressed using FIML.

Classroom activity setting. To assess variability in peer engagement across activity settings (controlling for teacher involvement), we varied the activity setting referent group to estimate differences in engagement across all activity setting pairs. As anticipated, our findings replicated those previously mentioned in non-disruptive samples (Booren et al., 2012; Bulotsky Shearer et al., 2010; Vitiello et al., 2012) and indicated that positive peer engagement was significantly higher during free play and significantly lower during whole group compared to all other activity settings (see Table 3 for average peer engagement across settings). Meals/Snacks were also characterized by greater positive peer engagement compared with routines/transitions and small group. Like positive peer engagement, negative peer engagement was higher during free play compared to all other activity settings and lower during whole group activities compared to all settings with the exception of small group (with which it did not statistically differ). Overall, results indicate that both positive and negative peer engagement were higher in settings that were less structured.

Teacher involvement. Analysis of children's positive peer engagement based on teacher involvement (controlling for activity setting) indicated that children engaged in significantly higher quality positive peer interactions when teachers were absent compared to when they were present (see Table 4). When present, positive peer engagement was significantly lower when teachers were directing the activity compared to times when they were not. For negative peer engagement, children engaged in significantly more negative interactions when teachers were absent compared to when they were present. When present, however, negative peer engagement did not significantly differ based on teachers' direction of the activity.

RQ 3b: What does children's peer engagement look like during free play?

To explore peer engagement only within the context of free play, descriptive and predictive analyses were performed on all cycles in which free play was the primary activity setting (n = 4,196). As illustrated in Figure 2, fewer instances of low-quality (43% of cycles) and more instances of mid-quality (53% of cycles) positive peer engagement were observed during free play compared to all other activity settings; however, examples of high-quality peer engagement still occurred relatively infrequently during free play (4% of cycles). Engagement in negative peer engagement presented similarly across cycles during free play compared to all other activity settings.

To explore the predictive effect of teacher involvement on children's peer engagement during free play, we applied the same multilevel model framework used above (excluding activity setting) on free play cycles. Analyses yielded a similar pattern of results to those found in the original model for positive peer engagement. That is, compared to when teachers were present and directing free play, children displayed greater positive peer

engagement when teachers were absent (b = .291, SE = .036, p < .001) and, to a lesser extent, when they were present but not directing the free play (b = .078, SE = .034, p < .05). Display of negative peer engagement, however, did not significantly differ based on whether or not teachers were present and/or directing play (p's > .05).

RQ4. Is the degree and manner in which children display disruptive behavior related to their peer engagement quality?

To examine whether children's display of disruptive behavior was associated with their peer engagement quality, we applied the previously used multilevel model framework (including activity setting and teacher involvement) to look at how overall disruptive behavior, as well as hyperactivity, inattention, and oppositionality separately, predicted positive and negative peer engagement at the cycle level. Results are presented in Table 4. Consistent with hypotheses, results indicated that children's overall disruptive behavior was negatively related to positive peer engagement and positively related to negative peer engagement after controlling for child-level demographic characteristics and classroom context. However, when looking separately at the types of disruptive behavior, there was a differential association. Children rated higher on hyperactivity engaged in significantly more positive peer engagement, while children rated higher on inattention displayed less. Oppositionality was not associated with positive peer engagement. Hyperactivity and inattention ratings were not associated with negative peer engagement, but children rated higher on oppositionality were observed to engage in more negative interactions. Despite all behaviors being labeled as "disruptive," results suggest that the association between disruptive behavior and peer engagement quality differs based on the *type* of disruptive behavior displayed.

Discussion

Children's early interactions with peers play an important role in their development of social-emotional skills and overall school success (Bulotsky-Shearer et al., 2012; Jamison et al., 2012). For children who display inattentive, hyperactive, and/or oppositional behaviors, the formation and maintenance of positive social relationships can be particularly difficult (Denham et al., 2003; Fantuzzo et al., 2004). In order to better understand how to promote early development of positive peer relationships for children who experience these behavioral challenges, we explored the nature and variability of the observed positive and negative peer engagement of a sample of preschoolers whom teachers identified as displaying elevated levels of disruptive behavior. Below, we summarize the results and discuss their implications.

Children's Average Peer Engagement Quality

Positive peer engagement. Our results indicate that this sample of preschoolers typically experienced low levels of positive peer engagement and seldom experienced high-quality interactions. As children were selected for this study based on their perceived display of disruptive behavior, this pattern of low positive peer engagement was anticipated (e.g., Bulotsky-Shearer et al., 2014; Denham et al., 2001). However, when compared to other studies that have used the inCLASS (e.g., Acar et al., 2015; Downer et al., 2010; as cited in Downer, Booren, Hamre, Pianta, & Williford, 2012), our sample's average peer engagement ratings fell within the same range or only slightly below those of preschoolers who were not explicitly identified as displaying disruptive behaviors. As such, while our results indicate that preschoolers who display disruptive behavior are rarely observed engaging in high-quality positive peer interactions, this pattern of engagement may not be

significantly different from those who do not display these behaviors. This lack of high-quality interaction observed across subsamples introduces a broader concern surrounding the opportunities and frequency with which *all* children are positively engaging with peers in preschool classrooms (Brown et al., 2001; Harper & McCluskey, 2003; Stanton-Chapman, 2015). While not expecting preschoolers to engage in high-quality peer interactions at all times throughout the day, we would at least anticipate average peer engagement quality to surpass the "low range" based on the highly social nature of the preschool classroom (e.g., Bulotsky-Shearer et al., 2012; NAEYC, 2009; Schaefer et al., 2010; Stanton-Chapman, 2015).

Negative peer engagement. Surprisingly, the presence of aggression, negativity, attention-seeking, and confrontation was largely uncommon in our sample. And, when these instances were observed to occur they were of a relatively mild nature. Like positive peer engagement, our sample's average pattern of observed negative peer engagement was similar to those found in previous studies using the inCLASS with preschoolers not identified as disruptive (e.g., Acar et al., 2015; Downer et al., 2010; as cited in Downer et al., 2012). While noted that inCLASS Conflict dimension ratings trend toward negative skewness and limited variance in general preschool populations, previous studies have repeatedly identified the link between these ratings and those of commonly used teacher-report social skills measures, such as the CPSCS (Levine et al., 1970) and the TCRS (Hightower et al., 1986; Downer et al., 2010). As such, even if not displaying "high" levels of negative peer engagement (i.e., ratings of 6 or 7), we would at least expect greater variability and elevation in scores for children who display disruptive behaviors and who are subsequently expected to face greater social challenges with peers (Bulotsky-Shearer

et al., 2012; Chen et al., 2011; Cohen & Mendez, 2009). While our results do support a significant association between disruptive behavior and increased negative peer engagement, the degree to which our sample was observed to engage in negative interactions with peers indicates that this association is mild and therefore may not be as impactful on preschoolers' peer interactions as hypothesized (e.g., Bulotsky-Shearer et al., 2012; Denham et al., 2003; Fantuzzo et al., 2004; Jamison et al., 2012). Rather, it may be that it is not until the continuance and stabilization of these behaviors into the early elementary school years that the relationship between disruptive behavior and negative peer engagement truly begins to manifest (Brennan et al., 2015; Rimm-Kaufman & Pianta, 2000). This highlights the critical opportunity for intervention during the preschool years, as preschoolers' social patterns, behaviors, and tendencies have started to emerge, but have not yet begun to significantly interfere with the quality of their peer interactions.

Growth in Peer Engagement Quality

The preschool years are a time of rapid social-emotional maturation, and we expected children's quality of peer interactions to improve over time in concordance with the anticipated development of these skills (e.g., Craig-Unkefer & Kaiser, 2002; Hay et al., 2004). We found that children began the year demonstrating varying levels of positive and negative peer engagement, but that both remained fairly stable with regard to linear change over time. These results generally run counter to our expectations, where we anticipated that children who began preschool displaying elevated levels of disruptive behavior would demonstrate improvements in their peer engagement throughout the year (i.e., we expected to see a positive linear slope for positive peer engagement and a negative linear slope for negative peer engagement). In addition, we expected to see child-level variability in how

children's peer engagement changed over time. Our findings, however, indicate that children did not vary in their linear patterns of peer engagement. Results suggest that change in peer engagement for this subsample may not follow a linear trajectory, and thus points to the need for examining potential non-linear patterns of change in children's development of peer engagement over time. Additionally, results highlighting children's varying levels of initial peer engagement quality lead to the question of what factors are associated with children's peer engagement at the beginning of the school year – an important area for future research.

Variability in Peer Engagement Quality

Peer engagement across classroom context. As anticipated, we found that the degree to which classroom activities were structured and/or directed by teachers played a significant role in children's engagement with peers for this sample. Children engaged in higher quality positive peer interactions when activities were less-structured (i.e., free play) and when teachers had less involvement in activities. Negative peer engagement – though rarely observed – was also more common during free play compared to settings with greater structure (i.e., meals/snacks, whole group) but did not differ based on teacher involvement. These findings suggest that the peer engagement of children who display disruptive behaviors generally follows the same context-dependent pattern as the engagement of those who do not display these behaviors (e.g., Booren et al., 2012; Bulotsky Shearer et al., 2010; Vitiello et al., 2012). As teachers impose more structure or direction upon an activity, children have less opportunity to interact with one another – positively *or* negatively. This is not surprising as activity settings like whole or small group tend to consist of organized activities that orient attention toward a task led or directed by

the teacher (i.e., instruction, song, book reading). In contrast, more child-led activity settings like free play not only allow children more choice in where they direct their engagement, but are also more encouraging of peer interaction.

While our results align with previous literature suggesting that children's peer interactions are of the highest quality during free play (e.g., Booren et al., 2012; Vitiello et al., 2012), the quality of these interactions was far below what we anticipated. On average, children's peer engagement quality fell within the low-mid range, indicating that children only *occasionally* exhibited sociability, assertiveness, and/or communication with peers during these times. As free play is the setting where social interaction is both most opportune and most encouraged (Ashiabi, 2007; Brown et al., 2001; Craig-Unkefer & Kaiser, 2002; Hay et al., 2004), the fact that peer engagement quality remained this low during these times is particularly concerning. Furthermore, teachers' observed involvement during free play was not associated with children's positive interactions with peers to the degree that we had hoped (e.g., Ashiabi, 2007; Harper & McCluskey, 2003; Kwon et al., 2011). In fact, our findings show the opposite trend – teacher involvement was associated with lower positive peer interaction quality. While our data do not allow us to explicitly capture what teachers were or were not doing during these times in regard to facilitating peer engagement, it is evident that instances of high quality positive peer engagement were not occurring as frequently as expected in teachers' presence during free play. As such, greater effort is warranted in creating an environment that is active and intentional in promoting peer interaction, particularly during more play-based activities.

Disruptive behavior and peer engagement. In addition to classroom contextual factors, we discovered that the degree to which children were reported to display disruptive

behavior explained a small but significant amount of variability in peer interaction quality. Consistent with previous research (e.g., Bulotsky-Shearer et al., 2014; Denham et al., 2001), children's perceived level of disruptive behavior was negatively associated with positive peer engagement and positively associated with negative peer engagement. The association between disruptive behavior and peer engagement, however, differed depending on the type of behavior displayed (i.e., hyperactivity, inattention, oppositionality).

Oppositionality was the only type of disruptive behavior associated with greater levels of negative peer engagement in our sample. As children who display oppositional behavior tend to exhibit more socially intrusive or aggressive acts (Brennan et al., 2015; Zoromoski et al., 2015), this finding was expected. However, the fact that inattention and hyperactivity were *not* significantly related to negative peer engagement was surprising. This suggests that preschoolers' abilities to inhibit behavior and attend to others may not significantly contribute to their engagement in negative peer interactions on their own, and that it is rather the comorbid display of aggression or defiance that drives this relationship (Brennan et al., 2015). For positive peer engagement, however, the opposite seems to be true. Oppositionality was unrelated, inattention had a negative relationship, and hyperactivity actually had a positive association with positive peer engagement. Though unexpected, this pattern it is not unprecedented from a developmental perspective.

As preschoolers are just beginning to develop the social-emotional skills necessary for social interaction (Craig-Unkefer & Kaiser, 2002; Hay et al., 2004), it is not unusual nor developmentally inappropriate for a preschooler to, for example, interrupt or have difficulty taking turns with a peer (Phillips & Lonigan, 2010; Zoromoski et al., 2015). As

such, it may not be the ability to inhibit or control behavior that is most central to children's early interactions with peers, but rather the skills to simply initiate and sustain these interactions (Acar et al., 2015). It makes sense, therefore, that children who display elevated levels of inattention face the greatest barriers to high-quality peer engagement, as they are more likely to wander off, miss social cues, or lose track of the interactions in which they are participating (Arnold et al., 2012; Brennan et al., 2015; Zoromoski et al., 2015). From the same notion, children who display hyperactive or impulsive behaviors tend to display more extroverted and outgoing qualities (Diamond, 2005), and this surgency may actually serve as a strength in their early interactions with peers. As such, our findings suggest a unique and nuanced picture of positive peer engagement during the preschool years for children who are perceived as disruptive – early peer engagement quality is most dependent on children's ability to attend to and actively engage with their peers, despite the presence of disinhibited behavioral tendencies.

Limitations

It is important to keep in mind the following study limitations when interpreting results. Regarding the study's sample, findings are limited to preschoolers whom teachers identify as displaying elevated levels of disruptive behavior; however, it is important to note the significant variability in perceived level of disruptiveness across classrooms and participating children. As selection of children was based on perceived behavior relative to classmates, it is possible that some children were selected for participation but otherwise would not be categorized as "disruptive." Furthermore, a small portion of students with the highest disruptive behavior ratings were not included in this sample due to lack of parental consent, and our sample may not reflect the most "disruptive" children in each classroom.

Nonetheless, our sample was large and diverse, and participating children's average disruptive behavior rating was significantly greater than that of non-selected children. Future studies, however, should consider limiting selection of children to those who meet a certain threshold for disruptive behavior.

With regard to methodology, we must be cognizant that our data only provide a glimpse into children's preschool experience. As such, we rely on the assumption that our data are representative of children's daily functioning in the preschool classroom. Children also varied in their number of observation cycles, and we therefore do not have equal representations of behavior for every child. Furthermore, interrater reliability varied across observed constructs on the inCLASS, which may reduce precision of measurement and underestimate the relationship between variables. As this study was part of a larger intervention study that focused on teacher-child relationships, it is also possible that treatment effects may have influenced observed classroom behavior. However, the intervention was not found to have a statistical association with any of the constructs measured in this study, and treatment condition was controlled for in analyses where possible. Finally, our study is descriptive in nature, and results only represent associations between variables and cannot be interpreted causally.

Implications and Future Directions

Our findings have multiple implications for teacher training and education. As stated by Brown and colleagues (2001), encouraging children's development of peer relationships is a "fundamental, programmatic goal for early childhood educators" (p. 171). Our findings suggest, however, that this goal is not translating to practice, and that peer interaction is not always taking center stage in the preschool classroom to the degree that

we had hoped. As such, there is a need for teacher training and pedagogy to place greater emphasis on the developmental importance of early peer interactions and the critical role that teachers have in facilitating these interactions, especially for preschoolers who display disruptive behaviors. In addition, it is important that teachers be provided with the strategies, techniques, and resources needed to facilitate peer engagement at both the structured and unstructured levels. For example, a preschool teacher should feel competent integrating activities in which peer interaction is a central goal into the classroom when appropriate (i.e., friendship-building activities, explicit teaching of social skills), while also being able to draw upon ways to naturally scaffold and encourage peer interaction consistently throughout the day (see Brown et al., 2001 for a review). It is particularly important to highlight the use of these skills in the context of free play and to help teachers recognize the unique influence of their role during these times (e.g., Ashiabi, 2007; Kwon et al., 2011).

Beyond implications for the preschool classroom as a whole, our study presents key findings regarding the peer engagement of preschoolers whom teachers perceive to display elevated levels of disruptive behavior. Despite the hyperactive, inattentive, and/or oppositional behaviors that this sample was reported to exhibit, children were not observed engaging in high levels of negative peer engagement. This suggests that, though disruptive social and behavioral patterns have begun to emerge, they have not yet begun to spark significant levels of negative peer engagement in the classroom (Brennan et al., 2015; Rimm-Kaufman & Pianta, 2000). This highlights the critical window that exists during the preschool years for both early detection of those who are vulnerable to social challenges

and early intervention to prevent further development of social challenges (Blair, 2002; Denham et al., 2003).

Our results also provide further insight into the nuanced nature of the relationship between the *type* of disruptive behavior displayed and peer engagement. Specifically, preschoolers who display inattentive tendencies are at the greatest risk for missing out on positive peer experiences. This is particularly important to highlight as the behavioral needs of these children tend to be less noticeable or disruptive to others and are more easily overlooked (Diamond, 2005). Our findings suggest, however, that teachers should pay special attention to the peer interactions of this subgroup, as they are the ones who may benefit most from active guidance and scaffolding. Consistent with previous research (e.g., Brennan et al., 2015), we also found that children's display of oppositionality was associated with a greater degree of negative peer engagement. As such, it is important that teachers place a specific emphasis on teaching social and problem solving skills to this subgroup and actively attune to their interactions with peers in order to intervene and scaffold when challenges arise.

Regarding future research, the descriptive nature of our study paves the way for a number of different areas pertaining to factors that influence peer engagement and management of the preschool classroom. First, as our findings highlight the variability across children's quality of peer engagement, future research should look to see what additional characteristics at the teacher (i.e., demographic characteristics, beliefs about children) and/or classroom (i.e., teacher support, demographic composition, type of center) levels may promote or inhibit children's opportunity for and quality of peer engagement. It is also important to examine this variability at the child-level to explore what protective

and/or risk factors influence children's peer engagement, specifically for those who display disruptive behaviors. Additionally, it would be beneficial to explore the peer engagement patterns of other subgroups of children (e.g., English-language learning, special needs populations) in order to develop a more nuanced understanding of the social development of these unique populations. Through further research in these areas, we can better understand the patterns related to children's early interactions with peers in the classroom. This information can then be used to better inform teacher and educational practice to meet the social, emotional, and academic needs of young children.

References

Acar, I. H., Rudasill, K. M., Molfese, V., Torquati, J., & Prokasky, A. (2015). Temperament and preschool children's peer interactions. *Early Education and Development, 26*(4), 479-495.

Altman, D. G. (1991). *Practical statistics for medical research.* London: Chapman and Hall.

Anastopoulos, A. D. (1998). *Oppositional defiant disorder/conduct disorder rating scale.* Unpublished manuscript, University of North Carolina at Greensboro.

Arnold, D. H., Kupersmidt, J. B., Voegler-Lee, M. E., & Marshall, N. A. (2012). The association between preschool children's social functioning and their emergent academic skills. *Early Childhood Research Quarterly, 27*, 376-386.

Ashiabi, G. S. (2007). Play in the preschool classroom: Its socioemotional significance and the teacher's role in play. *Early Childhood Education Journal, 25*(2), 199-207.

Barkley, R. A. (2003). Issues in the diagnosis of attention-deficit/hyperactivity disorder in children. *Brain and Development, 25*, 77-83.

Bell, E. R., Greenfield, D. B., Bulotsky-Shearer, R. J., & Carter. T. M. (2016). Peer play as a context for identifying roles of children and examining rates of growth in academic readiness for children enrolled in Head Start. *Journal of Educational Psychology, 108*(5), 740-759.

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist, 57*(2), 111-127.

Booren, L. M., Downer, J. R., & Vitiello, V. E. (2012). Observations of children's interactions with teachers, peers, and tasks across preschool classroom activity settings. *Early Education and Development, 23*(4), 517-538.

Brennan, L. M., Shaw, D. S., Dishion, T. J., & Wilson, M. N. (2015). The predictive utility of early childhood disruptive behaviors for school-age social functioning. *Journal of Abnormal Child Psychology, 43*, 1187-1199.

Brown, W. H., Odom, S. L., & Conroy, M. A. (2001). An intervention hierarchy for promoting young children's peer interactions in natural environments. *Topics in Early Childhood Special Education, 21*(3), 162-175.

Bulotsky-Shearer, R. J., Bell, E. R., Carter, T. M., & Dietrich, L. R. (2014). Peer play interactions and learning for low-income preschool children: The moderating role of classroom quality. *Early Education and Development, 25,* 815-840.

Bulotsky-Shearer, R. J., Bell, E. R., Romero, S. L., & Carter, T. M. (2012). Preschool interactive peer play mediates problem behavior in low-income children. *Journal of Applied Developmental Psychology, 33,* 53-65.

Bulotsky-Shearer, R. J., Domínguez, X., Bell, E. R., Rouse, H. L., & Fantuzzo, J. W. (2010). Relations between behavior problems in classroom social and learning situations and peer social competence in Head Start and kindergarten. *Journal of Emotional and Behavioral Disorders, 18*(4), 195-210.

Buysse, V., Goldman, B. D., & Skinner, M. L. (2003). Friendship formation in inclusive early childhood classrooms: What is the teacher's role? *Early Childhood Research Quarterly, 18,* 495-501.

Campbell, S. B., Denham, S. A., Howarth, G. Z., Jones, S. M., Whittaker, J. V., Williford, A. P., …Darling-Churchill, K. (2016). Commentary on the review of measures of early childhood social and emotional development: Conceptualization, critique, and recommendations. *Journal of Applied Developmental Psychology, 45*, 19-41.

Carpenter, J. L., & Drabick, D. A. G. (2011). Co-occurrence of linguistic and behavioural difficulties in early childhood: A developmental psychopathology perspective. *Early Child Development Care, 181*(8), 1021-1045.

Chen, C., McComas, J. J., Hartman, E., & Symons, F. J. (2011). A prospective sequential analysis of the relationship between physical aggression and peer rejections acts in a high-risk preschool sample. *Early Education and Development, 22*(4), 574-592.

Cicchetti, D., Bronen, R., Spencer, S., Haut, S., Berg, A., Oliver, P., & Tyrer, P. (2006). Rating scales, scales of measurement, issues of reliability: Resolving some critical issues for clinicians and researchers. *Journal of Nervous and Mental Disease, 194*, 557–564.

Cohen, J. S., & Mendez, J. L. (2009). Emotion regulation, language ability, and the stability of preschool children's peer play behavior. *Early Education and Development, 20*, 1016-1037.

Craig-Unkefer, L. A., & Kaiser, A. P. (2002). Improving the social communication skills of at-risk preschool children in a play context. *Topics in Early Childhood Special Education, 22,* 3-13.

Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., & Queenan, P. (2003). Preschool emotional competence: Pathway to social competence? *Child Development, 74*, 238-256.

Denham, S., Mason, T., Caverly, S., Schmidt, M., Hackney, R., Caswell, C., & DeMulder, E. (2001). Preschoolers at play: Co-socialisers of emotional and social competence. *International Journal of Behavioral Development, 25*(4), 290-301.

Diamond, A. (2005). Attention-deficit disorder (attention-deficit/hyperactivity disorder without hyperactivity): A neurobiologically and behaviorally distinct disorder from attention-deficit/hyperactivity disorder (with hyperactivity). *Developmental Psychopathology, 17*(3), 807-825.

Downer, J. T., Booren, L. M., Hamre, B., Pianta, R. C., & Williford, A. (2011). The Individualized Classroom Assessment Scoring (inCLASS). Unpublished technical manual, Curry School of Education, University of Virginia, Charlottesville.

Downer, J. T., Booren, L. M., Lima, O. K., Luckner, A. E., & Pianta, R. C. (2010). The Individualized Classroom Assessment Scoring System (inCLASS): Preliminary reliability and validity of a system for observing preschoolers' competence in classroom interactions. *Early Childhood Research Quarterly*, *25*, 1–16.

DuPaul, G. J., Power, T. J., Anastopoulos, A. D., & Reid, R. (1998). ADHD Rating Scale—IV: Checklists, norms, and clinical interpretation. New York: Guilford.

Eggum-Wilkens, N. D., Fabes, R. A., Castle, S., Zhang, L., Hanish, L. D., & Martin, C. L. (2014). Playing with others: Head Start children's peer play and relations with kindergarten school competence. *Early Childhood Research Quarterly, 29*, 345 356.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling, 8*(3), 430-457.

Fantuzzo, J., Sekino, Y., & Cohen, H. L. (2004). An examination of the contributions of interactive peer play to salient classroom competencies for urban Head Start children. *Psychology in the Schools, 41*(3), 323-336.

Gülay, H. (2011). Assessment of the prosocial behaviors of young children with regard to social development, social skills, parental acceptance-rejection and peer relationships. *Journal of Instructional Psychology, 38*(3), 164-172.

Harper, L. V., & McCluskey, K. S. (2003). Teacher-child and child-child interactions in inclusive preschool settings: Do adults inhibit peer interactions? *Early Childhood Research Quarterly, 18*, 163-184.

Hay, D. F., Payne, A., & Chadwick, A. (2004). Peer relations in childhood. *Journal of Child Psychology and Psychiatry, 45*, 84-108.

Hightower, A. D., Work, W. C., Cowen, E. L., Lotczewski, B. S., Spinnell, A. P., Guare, J. C., & Rohrbeck, C. A. (1986). The teacher-rating scale: a brief objective measure of elementary children's school problem behaviors and competencies. *School Psychology Review, 15*, 393-409.

Holmes, C. J., Kim-Spoon, J., & Deater-Deckard, K. (2016). Linking executive function and peer problems from early childhood through middle adolescence. *Journal of Abnormal Child Psychology, 44*, 31-42.

Jamison, K. R., Forston, L. D., & Stanton-Chapman, T. L. (2012). Encouraging social skill development through play in early childhood special education classrooms. *Young Exceptional Children, 15*(2), 3-19.

Kontos, S. (1999). Preschool teachers' talk, roles, and activity settings during free play. *Early Childhood Research Quarterly, 14*(3), 363-382.

Kwon, K., Elicker, J., & Kontos, S. (2011). Social IEP objectives, teacher talk, and peer interaction in inclusive and segregated preschool settings. *Early Childhood Education Journal, 39*, 267-277.

Ladd, G. W. (2005). *Children's peer relationships and social competence: A century of progress*. New Haven, CT: Yale University Press.

Landis, J.R., & Koch, G.G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*(1), 159-174.

Levine, S., Elzey, F., & Lewis, M. (1970). *California Preschool Social Competency Scale*. Palo Alto, CA: Consulting Psychologists Press.

Lillvist, A., Sandberg, A., Björk-Akesson, E., & Granlund, M. (2009). The construct of social competence- How preschool teachers define social competence in young children. *International Journal of Early Childhood, 41*(1), 51-68.

Mathieson, K., & Banerjee, R. (2010). Pre-school peer play: The beginnings of social competence. *Educational and Child Psychology, 27*(1), 9-20.

McArdle, J. J., Hamgami, F., Jones, K., Jolesz, F., Kikinis, R., Spiro, A., III, & Albert, M. S. (2004). Structural modeling of dynamic changes in memory and brain structure using longitudinal data from the Normative Aging Study. *Journals of Gerontology: Psychological Science, 59B,* P294-P304.

McGoey, K. E., DuPaul, G. J., Haley, E., & Shelton, T. L. (2007). Parent and teacher ratings of attention-deficit/hyperactivity disorder in preschool: the ADHD Rating Scale-IV Preschool Version. *Journal of Psychopathology and Behavioral Assessment, 29*(4), 269-276.

Milfort, R., & Greenfield, D. B. (2002). Teacher and observer ratings of Head Start children's social skills. *Early Childhood Research Quarterly, 17,* 581-595.

Miller, A. L., Gouley, K. K., Seifer, R., Dickstein, S., & Shields, A. (2004). Emotions and behaviors in the Head Start classroom: Associations among observed dysregulation, social competence, and preschool adjustment. *Early Education and Development, 15*(2), 147-166.

National Association for the Education of Young Children [NAEYC] (2009). *Position paper: Developmentally appropriate practice in early childhood programs serving children from birth through age 8.* Washington, DC: Author.

Phillips, B. M., & Lonigan, C. J. (2010). Child and informant influences on behavioral ratings of preschool children, *Psychology in the Schools, 47,* 374–390.

Purpura, D. J., Wilson, S. B., & Lonigan, C. J. (2010). ADHD symptoms in preschool children: Examining psychometric properties using IRT. *Psychological Assessment, 22*(3), 546-558.

Rimm-Kaufman, S. E., & Pianta, R. C. (2000). An ecological perspective on the transition to kindergarten: A theoretical framework to guide empirical research. *Journal of Applied Developmental Psychology, 21*(5), 491-511.

Ritchie, S., Howes, C., Kraft-Sayre, M. E., & Weiser, B. (2001). Emerging Academic Snapshot. Los Angeles: University of California (unpublished instrument).

Schaefer, D. R., Light, J. M., Fabes, R. A, Hanish, L. D., & Martin, C. L. (2010). Fundamental principles of network formation among preschool children. *Social Networks, 32,* 61-71.

Singer, E., Nederend, M., Penninx, L., Tajik, M., & Boom, J. (2014). The teacher's role in supporting young children's level of play engagement. *Early Child Development and Care, 184*(8), 1233-1249.

Stanton-Chapman, T. L. (2015). Promoting positive peer interactions in the preschool classroom: The role and responsibility of the teacher in supporting children's sociodramatic play. *Early Childhood Education Journal, 43,* 99-107.

Stanton-Chapman, T. L., Denning, C. B., & Jamison, K. R. (2012). Communication skill building in young children with and without disabilities in a preschool classroom. *The Journal of Special Education, 46*(2), 78-93.

Stanton-Chapman, T. L., & Hadden, S. D. (2011). Encouraging peer interactions in the preschool classroom: The role of the teacher. *Young Exceptional Children, 14*(1), 17-28.

Stanton-Chapman, T. L., & Snell, M. E. (2011). Promoting turn-taking skills in preschool children with disabilities: The effects of a peer-based social communication intervention. *Early Childhood Research Quarterly, 26*, 303-319.

Torres, M. M., Domitrovich, C. E., & Bierman, K. L. (2015). Preschool interpersonal relationships predict kindergarten achievement: Mediated by gains in emotion knowledge. *Journal of Applied Developmental Psychology, 39*, 44-52.

Vitiello, V. E., Booren, L. M., Downer, J. T., & Williford, A. P. (2012). Variation in children's classroom engagement throughout a day in preschool: Relations to classroom and child factors. *Early Childhood Research Quarterly, 27*, 210-220.

Vitiello, V., & Williford, A. P. (2016). Relations between social skills and language and literacy outcomes among disruptive preschoolers: Task engagement as a mediator. *Early Childhood Research Quarterly, 36*, 136-144.

Williford, A. P., LoCasale-Crouch, J., Whittaker, J. V., DeCoster, J., Hartz, K. A., Carter, L. M.,…Hatfield, B. E. (2017). Changing teacher-child dyadic interactions to improve preschool children's externalizing behaviors. *Child Development, 88*(5), 1544-1553.

Williford, A. P., Whittaker, J. E. V., Vitiello, V. E., & Downer, J. T. (2013). Children's engagement within the preschool classroom and their development of self-regulation. *Early Education and Development, 24*, 162-187.

Zoromoski, A. K., Owens, J. S., Evans, S. W., & Brady, C. E. (2015). Identifying ADHD symptoms most associated with impairment in early childhood, middle childhood, and adolescence using teacher report. *Journal of Abnormal Child Psychology, 43*, 1243-1255.

Table 1
Positive and Negative Peer Engagement Constructs as Described by the inCLASS

	Dimension	Description	Indicators[a]
Positive Peer Engagement	Peer Sociability	The degree to which the child experiences positive emotions and behaviors with other children, including the tendency to seek peer interactions, show social awareness, and respond in a manner that peers react positively to.	• Proximity Seeking • Shared Positive Affect • Cooperation • Popularity
	Peer Communication	The degree to which the child initiates and maintains conversation with other children while using language as a functional tool to make needs, emotions, and opinions known (e.g., requesting, commenting, questioning).	• Initiates Communication • Sustains Conversation • Varied Purposes of Speech
	Peer Assertiveness	The degree to which the child uses positive strategies to initiate and lead interactions with other children, and the degree to which those strategies are successful.	• Initiation • Leadership
Negative Peer Engagement	Peer Conflict	The degree to which the child's interactions with other children are characterized by tension, resistance, and negativity.	• Aggression • Negative Affect • Attention-Seeking • Confrontation

Note. Description and indicator information obtained directly from the inCLASS (Downer et al., 2010).

[a]Behavioral indicators used to describe and guide coding for each dimension.

Table 2
Average Positive and Negative Peer Engagement at the Cycle- and Child-Levels

	Cycle-Level (n = 10,203)	Child-Level (n = 428)
Positive Peer Engagement		
M (SD)	2.76 (1.34)	2.73 (.63)
Low-Range	58%	65%
Mid-Range	40%	35%
High-Range	2%	-
Negative Peer Engagement		
M (SD)	1.27 (.64)	1.29 (.28)
Low-Range	94%	99%
Mid-Range	6%	<1%
High-Range	<1%	-

Note. Percentages refer to percent of cycles (Cycle-Level) and percent of children whose average score (Child-Level) is within each range (low 1-2, mid 3-5, high 6-7).

Table 3
Mean Differences in Positive and Negative Peer Engagement Across Activity Settings

	Whole Group	Small Group	Free Play	Routines/ Transitions	Meals/ Snacks
Positive Peer Engagement	2.13 (0.99)$_{a}$	2.58 (1.24)$_{b}$	3.23 (1.41)$_{c}$	2.59 (1.16)$_{b}$	2.71 (1.33)$_{d}$
Negative Peer Engagement	1.18 (0.53)$_{a}$	1.24 (0.56)$_{a,b}$	1.37 (0.72)$_{c}$	1.29 (0.65)$_{b}$	1.12 (0.44)$_{d}$

Note. Different superscripts within a row indicate significant differences between activity settings (i.e., Means that share a superscript within a row do not statistically differ from one another).

Table 4
Multi-Level Model Predicting Positive and Negative Peer Engagement

	Positive Peer Engagement		Negative Peer Engagement	
	b	*SE*	*b*	*SE*
Within Level				
Small Group	.064***	.011	.013	.012
Free Play	.400***	.019	.119***	.019
Routines/ Transitions	.151***	.013	.051***	.014
Meals/Snacks	.159***	.015	-.050***	.012
Teacher Present/ Not Directing	.032*	.014	.019	.015
Teacher Absent	.193***	.017	.050**	.017
Between Level				
Total Disruptive	-.081*	.041	.195***	.039
Hyperactivity	.145**	.055	.124	.077
Inattention	-.222***	.053	-.027	.050
Oppositionality	-.038	.044	.134*	.061

Note. Models include child demographic covariates (gender, age, minority status, income-to-needs ratio, treatment condition). Referent group for activity setting is Whole Group; referent group for teacher involvement is Teacher Present/Directing.

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

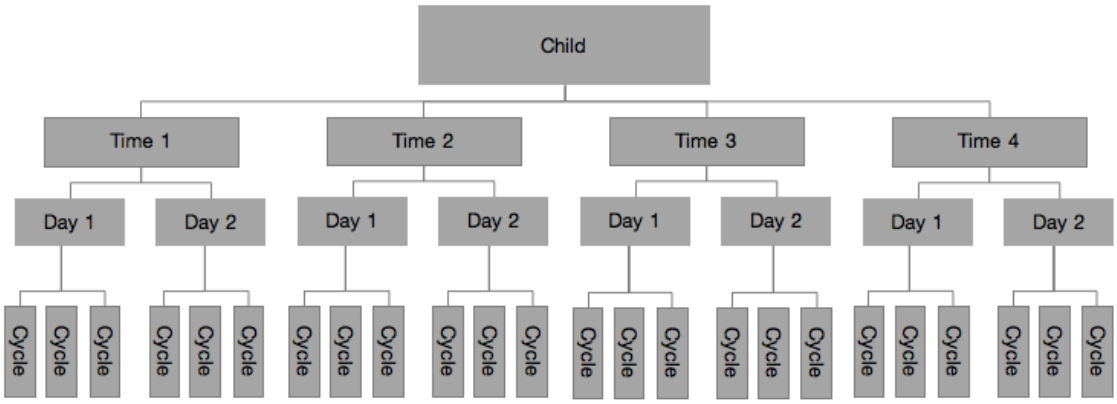

Figure 1. Sample data collection structure for a single participant.

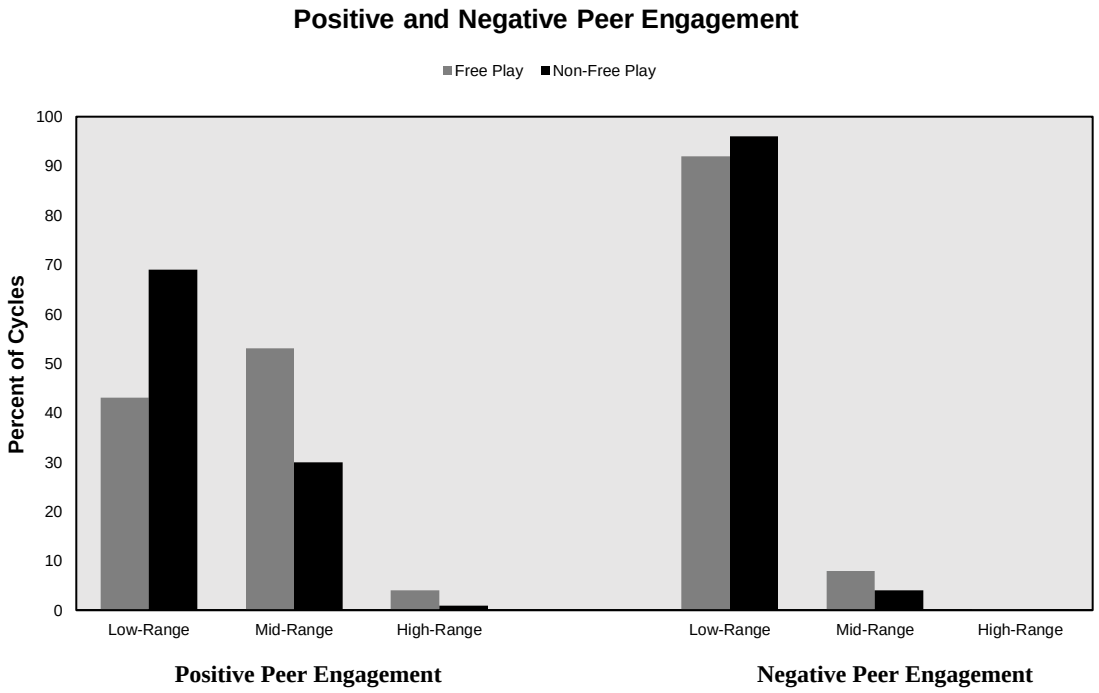

Figure 2. Positive and negative peer engagement during free play cycles compared to non-free play cycles (*Note*. Non-Free Play includes whole group, small group, routines/transitions, and meals/snacks).

Manuscript Three

The Role of Teacher Responsiveness and Classroom Management in the Peer Engagement of Preschoolers Who Display Disruptive Behaviors

Michelle L. Yoder & Amanda P. Williford
University of Virginia

(Approved by Dissertation Committee)

Abstract

The current study explored the relationship between teachers' level of classroom support and growth in positive peer engagement quality for preschoolers who display disruptive behaviors. Drawing from classroom observational data collected throughout the preschool year, children's sociability, assertiveness, and communication with peers were examined in relation to teachers' responsiveness and classroom management. Findings indicate that preschoolers did not experience gains in peer engagement quality over time on average. However, there was notable variability within individual children's trajectories of peer engagement quality across time. While teachers' warmth and sensitivity was unrelated to children's peer engagement quality, the degree to which teachers organized and productively managed their classroom was positively associated with children's overall peer engagement quality. There was no differential association in the relationship between teacher support and peer engagement based on severity or type of disruptive behavior displayed. Overall findings have implications related to the importance of examining young children's behavioral variability and highlighting the role of a well-organized classroom in promoting positive peer interactions for children who display disruptive behaviors.

The Role of Teacher Responsiveness and Classroom Management in the Peer Engagement of Preschoolers Who Display Disruptive Behaviors

Young children who display hyperactive, inattentive, and/or oppositional behaviors are at an increased risk for experiencing challenges with their peers (e.g., Acar, Rudasill, Molfese, Torquati, & Prokasky, 2015; Bulotsky-Shearer, Bell, Romero, & Carter, 2012; Denham, Bassett, Sirotkin, Borwn, & Morris, 2015; Yoder, Williford, & Vitiello, 2019). The preschool years, however, provide a unique window of opportunity with the potential to guide children toward positive social-emotional development before negative trajectories stabilize (Blair, 2002; Denham et al., 2003). With over half of all children between the ages of 3 to 6 attending center-based care prior to formal school entry (Federal Interagency Forum on Child and Family Statistics, 2017), the preschool classroom has been identified as both an important contributor to development and an ideal setting for early intervention (Broekhuizen, Slot, van Aken, & Dubas, 2017). This is particularly true with regard to children's peer engagement, as preschool provides ample opportunity to practice social and self-regulatory skills in the context of frequent and regular interactions with peers (Schaefer, Light, Fabes, & Hanish, 2010).

One factor believed to play an important role in the quality of preschoolers' experiences with peers is the support that they receive from teachers (e.g., Brophy-Herb, Lee, Nievar, & Stollak, 2007; Curby et al., 2009; Yudron & Jones, 2016). Beyond direct scaffolding of peer interactions, the degree to which teachers are responsive to children's needs and able to effectively manage the classroom impacts the frequency and quality with which preschoolers are able to positively and productively interact with their classmates (Downer, Sabol, & Hamre, 2010). With social and self-regulatory challenges more

prevalent for children who display hyperactivity, inattention, and/or oppositionality, teachers who are more sensitive to children's needs and who organize their classrooms effectively may play a particularly salient role in promoting positive peer interactions for this unique subgroup (e.g., Acar et al., 2015; Broekhuizen et al., 2017; Ramani, Brownell, & Campbell, 2010; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). Research, however, has yet to examine this relationship as measured both over time and as predicted by type of disruptive behavior displayed.

As the preschool year encompasses a time when foundational social-emotional skills begin to stabilize, identifying factors that contribute to preschoolers' developing peer interactions is important to both their concurrent and future social development (Blair, 2002; Denham et al., 2003; Phillips, Fox, & Gunnar, 2011). And with hyperactive, inattentive, and oppositional behaviors often presenting as barriers to positive peer engagement, a better understanding of how to best individualize and cater supports to ameliorate social challenges for children who display these behaviors is key to effective, targeted early intervention (e.g., Brennan, Shaw, Dishion, & Wilson, 2015; Yoder et al., 2019; Zoromoski, Owens, Evans, & Brady, 2015). As such, the aim of the current study was to examine the links between peer engagement and the quality of teachers' responsive teaching and classroom management as observed during the course of a preschool year for a sample of preschoolers whom teachers identified as displaying elevated levels of hyperactivity, inattention, and/or oppositionality.

Disruptive Behavior and Peer Engagement

Preschoolers' displays of hyperactivity, inattention, and oppositionality oftentimes serve as obstacles to their positive interactions with peers (Acar et al., 2015; Bulotsky-

Shearer et al., 2012; Denham et al., 2015). Though all are considered "disruptive behaviors," each contributes to peer engagement through unique pathways (Cordier, Bundy, Hocking, & Einfeld, 2010; Yoder et al., 2019). Children who display hyperactivity, for example, have greater difficulty inhibiting behavior and are more likely to intrude upon or interrupt their peers (Brennan et al., 2015; Diamond, 2005; Zoromoski et al., 2015). Children who exhibit inattention, on the other hand, are more easily distracted and subsequently less likely to attend to the social cues and behaviors of other children (Arnold, Kupersmidt, Voegler-Lee, & Marshall, 2012; Brennan et al., 2015; Diamond, 2005; Zoromoski et al., 2015). And children who display oppositionality are more likely to exhibit aggressive or defiant behaviors that violate the social norms of others (Brennan et al., 2015; Zoromoski et al., 2015). With the nature of social challenges dependent on the *type* of disruptive behavior(s) that children display, the type and level of social supports from which children most benefit are also likely to differ based on specific behavioral tendencies (Cordier et al., 2010; Diamond, 2005). A child displaying inattention, for example, may most benefit from explicit guidance in maintaining engagement in peer interactions, whereas a preschooler who exhibits oppositionality may need more support in resolving conflicts with peers (Brennan et al., 2015; Zoromoski et al., 2015). As such, differentiating between disruptive behaviors at the subtype level – as opposed to at the larger construct level (i.e., "disruptive behavior") – is important in both understanding behavior patterns with greater precision and tailoring early intervention efforts to best meet children's specific needs (Gartstein, Putnam, & Rothbart, 2012; Chacko, Wakschlag, Hill, Danis, & Espy, 2009).

Previous studies, though largely examining the broader construct of "disruptive behavior," have found evidence to support the link between disruptive behavior and peer engagement quality. The vast majority of these studies, however, have looked at this relationship as it exists concurrently (e.g., Hebert-Myers, Guttentag, Swank, Smith, & Landry, 2006; Miller, Gouley, Seifer, Dickstein, & Shields, 2004; Ramani et al., 2010) or as it predicts later social development (e.g., Acar et al., 2015; Bulotsky-Shearer et al., 2012; Denham et al., 2015). With preschool being a time of rapid development and malleability (Blair, 2002; Denham et al., 2003; Hay, Payne, & Chadwick, 2004), it is important to understand what factors contribute to children's development of positive peer engagement *during* this critical window (Eggum-Wilkens et al., 2014; Yudron & Jones, 2016).

While some studies have begun to consider this area of study, findings are limited in providing direction for early intervention. Cohen and Mendez (2009), for example, explored this relationship and discovered that preschoolers were more likely to decline in teacher-reported social competence when they displayed greater emotional lability. Such findings are an important first step in identifying the link between aspects of children's self-regulation and their peer engagement trajectories; however, there remains a need to better understand what *promotes* positive peer engagement for children who experience such social barriers (Phillips et al., 2011; Pluess & Belsky, 2009). Furthermore, previous studies have largely relied upon teacher-report data to measure children's classroom peer engagement quality (e.g., Campbell et al., 2016). While invaluable in the insight offered into how teachers perceive students' behavior, teacher ratings are naturally more subject to bias as a result of the personal interactions that teachers have with their students (Milfort & Greenfield, 2012; Yoder & Williford, 2019). Considering other methods of

measurement, such as naturalistic observation, is therefore important in contributing to a more holistic understanding of children's peer engagement (Booren, Downer, & Vitiello, 2012; Eggum-Wilkins et al., 2014; Yoder et al., 2019).

The Role of Teacher Support in Preschoolers' Peer Engagement

One factor repeatedly found to influence preschoolers' interactions with peers is the quality of support that they receive from their teachers (e.g., Brophy-Herb et al., 2007; Curby et al., 2009; Rimm-Kauffman et al., 2009; Yudron & Jones 2016). For young children who display hyperactivity, inattention, and/or oppositionality, such external emotional and behavioral supports may be especially important in ameliorating social challenges (Broekhuizen et al., 2017; Olivier & Archambault, 2017; Silkenbeumer, Schiller, & Kärtner, 2018). Studies have found, for example, that young children with more dysregulated temperaments are both more susceptible to the benefits of high quality teacher support and more vulnerable to the detriments of low quality teacher support compared to their peers (e.g., Belsky, 1997; Broekhuizen et al., 2017; Phillips et al., 2012; Pluess & Belsky, 2009). In particular, the degree to which teachers are responsive to children's needs (i.e., responsive teaching) and able to manage the classroom (i.e., classroom management) may be important to the peer engagement of children whose disruptive behaviors place them at risk for social challenges (Broekhuizen et al., 2017; Brown, Odom, & Conroy, 2001; Bulotsky-Shearer et al., 2012).

Responsive Teaching

Responsive teaching refers to how attuned teachers are to the social-emotional, behavioral, and learning needs of their students. Teachers who are responsive create classroom environments that promote student well-being and a strong sense of belonging

and support (Curby et al., 2009; Downer et al., 2010b; Pianta, Mashburn, Downer, Hamre, & Justice, 2008). Teachers' level of responsiveness is linked to the quality of children's interactions with peers, as the warmth and sensitivity that teachers model within their own interactions with students can "set the tone" for the general social climate of the classroom (Farmer, Lines, Hamm, 2011, p. 252; Yudron & Jones, 2016). Furthermore, when teachers are aware of and purposeful in individualizing support based on children's needs, preferences, and strengths, they are better able to support young children in their peer interactions (Acar et al., 2015; Brown et al., 2001; Bierman, 2011; Curby, Rudasill, Edwards, & Pérez-Edgar, 2011; Downer et al., 2010b). Studies have begun to examine the relationship between responsive teaching and peer engagement; however, findings have been mixed in either supporting (e.g., Burchinal, Vandergrift, Pianta, & Mashburn, 2010; Curby et al., 2009; Mashburn et al., 2008; Yudron & Jones, 2016) or opposing (e.g., Lippard, La Paro, Rouse, & Crosby, 2008) this theory. As such, there is need for further study to understand what may contribute to these discrepancies.

The degree to which teachers can draw upon such responsive practices may be especially important to the peer engagement of children who display disruptive behaviors. Hyperactive, inattentive, and/or oppositional behaviors tend to draw more attention and energy from teachers, who are then more likely to engage in negative exchanges with the child displaying these behaviors (e.g., Coplan, Bullock, Archbell, & Bosacki, 2015; Dobbs & Arnold, 2009). These strained teacher-child interactions may then influence how peers relate to that child, while also serving as a stressor to that child's own development of the self-regulatory skills that support positive peer interaction (Bierman, 2011; Hamre, Pianta, Downer, & Mashburn, 2008; Myers & Pianta, 2008). When teachers endorse a high level

of responsivity, however, the needs of children prone to exhibiting these behaviors are more likely to be noticed, responded to, and met *before* significantly interfering with peer engagement. In contrast, teachers who display lower levels of responsiveness may be less attuned to children's needs and may react more harshly when disruptive behaviors do occur (Carter, Williford, & LoCasale-Crouch, 2014; Coplan et al., 2015). This may be especially true for children who display elevated levels of oppositionality, as defiant behaviors tend to elicit the most negative and punitive responses from teachers (e.g., Coplan et al., 2015; Doumen, Verschueren, Buyse, Germeijs, & Luyckx, 2008). Studies, however, have yet to examine what the specific relationship between peer engagement and responsive teaching looks like throughout the preschool year for children displaying disruptive behaviors.

Classroom Management

While teachers' level of responsiveness has been shown to have the strongest relationship with young children's peer engagement quality (e.g., Downer et al., 2010b; Mashburn et al., 2008; McCoy & Wolf, 2018), teachers' organization and structuring of the classroom is also believed to play a role (Brown et al., 2001; Downer et al., 2010b; Pianta et al., 2008; Pluess & Belsky, 2009). When teachers are effective at both establishing and enforcing clear rules and expectations, children are more likely to behave in ways that are conducive to and supportive of positive peer engagement (Downer et al., 2010b; Farmer, Reinke, & Brooks, 2014). And, when teachers are intentional in their use of time, activities, and materials, children are more positively engaged in the tasks and interactions in which they are participating (Brown et al., 2001; Downer et al., 2010b; Farmer et al., 2014; Rimm-Kaufman et al., 2009). Similar to literature surrounding responsive teaching, previous studies have presented with mixed findings about whether

classroom management is related (e.g., Burchinal et al., 2008) or unrelated (e.g., Burchinal et al., 2010; Mashburn et al., 2008) to preschoolers' peer engagement, again pointing to the need for further study.

As children are more likely to exhibit disruptive behaviors when they are less engaged (Rimm-Kaufman et al., 2009), the degree to which teachers can effectively manage the classroom may play a particularly important role in the peer interactions of children who are prone to displaying hyperactive, inattentive, and/or oppositional behaviors. A teacher who structures the school day in ways that minimize wait and transition times, for example, is better able to prevent the emergence of dysregulated behaviors that may hinder peer engagement compared to a teacher whose classroom is less structured (Downer et al., 2010b; Vitiello, Booren, Downer, & Williford, 2012). In particular, children who have difficulty inhibiting impulses and/or sustaining attention during peer interactions may be especially responsive to teachers' effective management of the classroom, as increased structure and predictability has been repeatedly linked to decreased display of hyperactivity and inattention (e.g., Eiraldi, Mautone, & Power, 2012; Rimm-Kaufman et al., 2009). Here again, however, research has not yet examined the association between classroom management and peer engagement in conjunction with preschoolers' display of specific disruptive behaviors throughout the year.

The Current Study

The current study aims to fill a gap in the literature pertaining to the relationship between teacher support and peer engagement for preschoolers who display elevated levels of hyperactivity, inattention, and/or oppositionality. Previous studies have examined the associations between preschool disruptive behavior and peer engagement (e.g., Acar et al.,

2015; Bulotsky-Shearer et al., 2012; Ramani et al., 2010), peer engagement and teacher support (e.g., Brophy-Herb et al., 2007; Burchinal et al., 2010; Curby et al., 2009), and teacher support and disruptive behavior (e.g., Dominguez, Vitiello, Fuccillo, Greenfield, Bulotsky-Shearer, 2011). However, few studies have examined the relationship between all three factors. Of those that have (e.g., Broekhuizen et al., 2017; Pluess & Belsky, 2009), studies do not examine how teachers' support relates to preschoolers' development of peer engagement both over time and based on the nature of disruptive behavior(s) displayed by the student.

With literature frequently pointing to the importance of individualizing and catering support to meet children's unique needs (e.g., Blair, 2002; Brown et al., 2001; Yoder et al., 2019), understanding if and how the relationship between teacher support and peer engagement quality differs based on children's behavioral characteristics is essential in helping teachers promote students' peer engagement during the preschool year(s). To contribute to this knowledge base, we asked two primary research questions.

1. In a sample of preschoolers displaying disruptive behaviors, what association does teachers' observed responsiveness and classroom management have with children's observed positive peer engagement across the school year?
2. Does this association differ based on severity and type of disruptive behavior displayed?

Based on literature underpinning the importance of teacher support for children who display disruptive behaviors (e.g., Broekhuizen et al., 2017; Denham et al., 2015; Downer et al., 2010b; Farmer et al., 2014; Mashburn et al., 2008; Pluess & Belsky, 2009), we predicted both teachers' responsiveness and classroom management to have a positive

association with development of positive peer engagement across the year for this subsample. We specifically anticipated that responsive teaching would have a stronger relationship with children's development in peer engagement (e.g., Downer et al., 2010b; Mashburn et al., 2008; McCoy & Wolf, 2018). For the second research aim, we predicted that the association between teacher support and peer engagement would be stronger for children who displayed greater levels of overall disruptive behavior (Broekhuizen et al., 2017; Pluess & Belsky, 2008). We also hypothesized that teachers' responsiveness would be most important for the peer engagement of children who display oppositional behavior due to the tendency for teachers to perceive and respond more harshly to children's display of defiance (Coplan et al., 2015; Doumen et al., 2008). And, we predicted that children who display inattention and/or hyperactivity would benefit most from classroom management because of the link identified between increased environmental structure and decreased impulsivity and distractibility (Eiraldi et al., 2012; Rimm-Kaufman et al., 2009).

Method

Participants

Data for this study come from a larger efficacy trial that assessed an early teacher-child intervention aimed at improving behavioral outcomes in a sample of 470 preschoolers identified as displaying elevated levels of disruptive behavior (Williford et al., 2017). Forty-two children either did not have observational data or were replaced within the first half of the study; as such, the sample for the current analyses consists of 428 preschool children and 156 lead teachers. Sixty-five percent of the sample were boys and average age was 48.90 months (*SD* = 6.82). Children were racially and ethnically diverse (42% Black, 38% White, 20% Other), and families ranged in socioeconomic status (average income-to-

needs ratio [INR] of 1.91 (*SD* = 1.55)), but were primarily from low income backgrounds. With the exception of the subsample being more heavily comprised of boys (due to selection criteria), demographic characteristics did not statistically differ between participants and the full sample (*n* = 2,427).

Children were enrolled in classrooms from a range of programs (*n* = 89) including Head Start (27%), state-funded public (19%), and private (54%) programs serving children ages three through five for 5 days a week; average class size was 15.18 (*SD* = 3.64). Lead classroom teachers (*n* = 156) were majority female (97.4%) and were on average 40.63 years old (*SD* = 11.75). Teachers were racially diverse (53% White, 41% Black, 6% Other). Approximately 17% of teachers had less than a college degree, 15.7% had a two-year degree, 52.9% had a Bachelor's degree, and 14.4% had a Master's degree; 41.1% of teachers had majored in early childhood. On average, teachers had 12.04 years (*SD* = 9.27) of teaching experience. A summary of child and classroom demographic variables is presented in Table 1.

Procedure

Recruitment and selection criteria. Directors of public, private, and Head Start preschool programs from across two Mid-Atlantic states were recruited for participation in the study via email, phone, and/or in person. Once director approval was received, teachers were contacted to obtain consent and complete a disruptive behavior rating scale (see Measures for description) for each of their students. Caregivers of consenting teachers' students were then contacted to obtain consent for participation in the intervention (76% of families consented). The two or three children in each class with the highest rated level of disruptiveness and who had caregiver consent were then selected for participation in the

study. Twelve percent of children were rated by their teachers as having one of the highest disruptive behavior ratings in their class but did not have caregiver consent; in these cases, the child with the next-highest rating with caregiver consent was selected for participation. Selected children's total disruptive behavior score (M = 28.43, SD = 16.18) was significantly higher than that of non-selected children (M = 10.82, SD = 12.43; t(2369) = 24.92, $p < .001$).

Classrooms were randomly assigned to one of three conditions, including the teacher-child intervention of interest (Banking Time), a comparative teacher-child intervention (Child Time), and a business-as-usual control group. For those in either of the intervention groups, teachers were instructed to implement their assigned intervention with a single child during a window of seven consecutive weeks. After this window, the teacher would implement the same intervention with a second child for seven consecutive weeks, followed thereafter by the third child (if applicable) for seven weeks. The teacher-child intervention is not of interest in the current study, and analyses indicate no statistical association between the intervention and variables of interest (two-tailed correlation p-values > .05). Nonetheless, intervention status is controlled for where appropriate in analyses (for information regarding the intervention, see Williford et al., 2017).

Data collection. Within the first eight weeks of the preschool year, child characteristics were collected via family survey, and teacher and classroom characteristics were collected via teacher report. Additional teacher- and parent-report data pertaining to selected children's behavior were collected at the beginning of the year, as well as at pre-intervention, post-intervention, and end of year (EOY). Classroom and child observational data were collected at the beginning of the year and at these same three time points. Due

to the longitudinal nature of the study, attrition occurred as expected. Throughout the preschool year 80% of children and 79% of classrooms were retained. The vast majority of attrition at the teacher level was due to the teacher leaving the school and/or classroom; child level attrition was primarily in response to either the child or teacher leaving the school and/or participating classroom. For children who withdrew from the study or moved classrooms before their selected window (n = 29), the child with the next-highest rating and caregiver consent was selected for participation. There was no significant difference in demographic characteristics or behavior ratings between children who withdrew from the study and the overall sample (all p's > .05). All replacement children joined the study no later than the second data collection time point and were included in the present analyses in place of those whom they substituted.

Observational data were collected across multiple days throughout the school year by independent data collectors. Data collectors (n = 43) were trained on a child-level observational measure (the Individualized Classroom Assessment Scoring System [inCLASS]; Downer, Booren, Lima, Luckner, & Pianta, 2010) and/or a classroom-level observational measure (the Classroom Assessment Scoring System [CLASS]; Pianta, LaParo & Hamre, 2008). After successfully coding five training clips within one point of a master code on 80% of the measures' dimensions to obtain reliability, data collectors were assigned to school centers (n = 89). In order to maintain reliability, they participated in weekly calibration meetings for both measures. Observation days began in the morning and continued for 3-4 hours until mid-afternoon. For the inCLASS, participating children were observed in a series of alternating cycles, where data collectors observed one child for 10 minutes (i.e., one cycle) and immediately coded his or her observed behavior for 5

minutes, and then switched to observe the next selected child for one cycle, and so on. Each child was observed for an average of 24.06 cycles (*SD* = 7.81) and 7.66 days (*SD* = 2.63) across the preschool year. For the CLASS, teachers were observed for 15 minutes (i.e., one cycle) and then immediately rated, with each teacher observed for an average of 16.66 cycles (*SD* = 5.56) and 8.71 days (*SD* = 2.94) across the school year.

Measures

Demographic characteristics. Information pertaining to children's and teachers' demographic characteristics was obtained at the beginning of the school year from surveys completed by caregivers and teachers. To control for characteristics commonly associated with early childhood social-emotional development, child-level covariates included children's age (in months), gender, race/ethnicity, and family INR (calculated from family income and number of family members). Self-reported teacher demographic characteristics of age, gender, and race/ethnicity were included as teacher-level covariates, alongside type of preschool center (i.e., private, public, Head Start), class size, and average classroom age.

Cognitive skills. As a proxy of children's cognitive skills – another characteristic known to be associated with social-emotional development (Hay et al., 2004) – children's receptive vocabulary was included as a covariate in analyses. Receptive vocabulary was directly assessed at the beginning of the school year using the Peabody Picture Vocabulary Test, Third Edition (PPVT-3; Dunn & Dunn, 1997). The PPVT-3 is a clinical assessment tool that asks children to point to one of four images that corresponds with a word spoken by the examiner. Scoring is calculated by converting the total number correct (maximum 204) into one overall standard score that allows for evaluation of performance relative to

children's same-age population. The PPVT-3 has demonstrated acceptable reliability and validity (Chow & McBride-Change, 2003; Dunn & Dunn, 1997).

Disruptive behavior. To measure children's perceived level of disruptive behavior at the beginning of the year, teachers completed a rating scale containing all items from the ADHD Rating Scale-IV (ADHD-RS-IV; DuPaul, Power, Anastopoulos, & Reid, 1998) and the ODD Rating Scale (ODD-RS; Anastopoulos, 1998). The ADHD-RS-IV is an 18-item rating scale used to assess individual children's inattentive and hyperactive/impulsive behaviors on a four-point Likert-type scale. Sample items include "fails to give close attention to details or makes careless mistakes" (i.e., inattention) and "fidgets with hands or feet or squirms in seat" (i.e., hyperactivity; DuPaul et al., 1998). The ODD-RS is an 8-item rating scale that assesses for oppositional behavior using a similar Likert-type scale. Sample items include "loses temper," "argues with adults," and "is angry and resentful" (Anastopoulos, 1998). Both measures are psychometrically sound tools that have been used to measure externalizing behavior in clinical research and show validity and reliability with preschool-aged populations (e.g., McGoey, DuPaul, Haley, & Shelton, 2007; Purpura Wilson, & Lonigan, 2010). All items from the ADHD-RS-IV and ODD-RS were combined to create one 26-item disruptive behavior rating scale. Results from the combined scale are presented through a Total Disruptive Behavior score, as well as through three subscales of Hyperactivity (9 items), Inattention (9 items), and Oppositionality (8 items). Internal consistency for the overall scale (α = .96) and each of the subscales (α = .92, .93, and .93, respectively) was good in this sample.

Observed peer engagement. Participating children's classroom peer interactions were measured using the Individualized Classroom Assessment Scoring System

(inCLASS; Downer et al., 2010a). The inCLASS is an observational tool used to assess children's classroom behavior in relation to three broad domains: Teacher Interactions, Peer Interactions, and Task Orientation. Trained data collectors observe a child for 10 minutes and then rate his or her behavior on a scale from 1 to 7 across ten specific dimensions. The inCLASS has shown construct and criterion validity (see Downer et al., 2010a).

For the present study, three dimensions from the Peer Interactions domain (Sociability, Communication, and Assertiveness) were used. Peer Sociability captures the degree to which children engage and interact positively with peers; the total score is derived from scores across Proximity Seeking, Shared Positive Affect, Cooperation, and Popularity indicators. Peer Communication measures children's functional use of language with peers; the total score is derived from scores across Initiates Communication, Sustains Conversation, and Varied Purposes of Speech indicators. Peer Assertiveness reflects children's use and success in initiating and leading peer interactions; the total score is derived from scores from Initiation and Leadership indicators (Downer et al., 2010a). Inter-rater reliability was calculated across 20% of all observations with two data collectors independently observing and rating the same children. Intraclass correlation coefficients (ICCs; Sociability = .70; Communication = .71; Assertiveness = .66) for each dimension ranged from fair to good in this sample (Altman, 1991; Cicchetti et al., 2006; Landis & Koch, 1977). Internal consistency for the dimensions (Sociability α = .69-.74; Communication α = .70-.72; Assertiveness α = .70-.72) was acceptable.

Observed teacher responsiveness and classroom management. Responsive teaching and classroom management were measured using the Classroom Assessment

Scoring System (CLASS; Pianta et al., 2008). The CLASS is an observational tool used to assess teachers' average classroom-level interactions with children in relation to three broad domains: Emotional Support, Classroom Organization, and Instructional Support. Trained data collectors observe a classroom for 15 minutes and then provide ratings on a scale from 1 to 7 (1 = low quality, 7 = high quality) across ten specific dimensions. Numerous studies have demonstrated reliability and validity of the CLASS in preschool populations (e.g., Hamre et al., 2013; Mashburn et al., 2008). Inter-rater reliability was calculated across 20% of all observations with two data collectors independently observing and rating each classroom. ICCs (Emotional Support = .82; Classroom Organization = .76; Instructional Support = .73) ranged from fair to good in this sample (Altman, 1991; Cicchetti et al., 2006; Landis & Koch, 1977). Internal consistency (Emotional Support α = .83-.87; Classroom Organization α = .88-.96; Instructional Support α = .85-.93) was also good.

As CLASS domains tend to be highly correlated with one another (Hamre, Hatfield, Pianta, & Jamil, 2014), we used confirmatory factor analysis to create uncorrelated scales via a bi-factor model (Gest, Madill, Zadzora, Miller, & Rodkin, 2014). Our model replicated the one found by Hamre et al. (2014) and Williford et al. (2017) to best fit the data. This model showed acceptable model fit for our data (x_2[28] = 157.17, $p < .001$; Root Mean Square Error of Approximation (RMSEA) = .172; Comparative Fit Index (CFI) = .927; Tucker–Lewis index (TLI) = .883; Standardized Root Mean Square Residual (SRMR) = .035). The Responsive Teaching and Proactive Management and Routines (renamed "Classroom Management" for this study) factors were used to represent responsive teaching and classroom management constructs, respectively. Responsive

Teaching is a general factor with loadings from all CLASS dimensions that measures the degree to which teachers are attuned, sensitive, and responsive to children's unique social-emotional, behavioral, and learning needs. Classroom Management is a domain-specific factor that measures teachers' observed ability to positively manage classroom organization and routines after accounting for more general responsiveness; it is pulled from Positive Climate, Negative Climate, Teacher Sensitivity, Regard for Student Perspectives, Behavior Management, Productivity, and Instructional Learning Formats dimensions (Hamre et al., 2014).

Data Analysis

Analyses were conducted using SPSS version 25 and MPlus version 7. For the outcome of children's positive peer engagement, the inCLASS Sociability, Assertiveness, and Communication dimension scores were highly correlated (all rs $\geq .82$, $p < .001$), and scores were therefore aggregated across dimensions to create one overall Positive Peer Engagement composite score. For each child, a score was created at every data collection time point by aggregating scores from all cycles within said time point, resulting in four Positive Peer Engagement scores for each child to represent their peer engagement throughout the year. For each teacher, observed responsiveness and classroom management were measured by averaging CLASS dimension scores from all cycles across the year, and then creating uncorrelated Responsive Teaching and Classroom Management bi-factor scores, as described previously. Children's overall level of disruptive behavior was measured using children's Total Disruptive Behavior baseline score from the disruptive behavior rating scale. Disruptive behavior was also examined separately at the

subtype level using Hyperactivity, Inattention, and Oppositionality subscale scores. Use and inclusion of child- and classroom-level covariates are detailed below.

Missing Data

With regard to missing data, approximately 10.5% (n = 45) of children were missing data for one or more demographic variables (i.e., age, gender, race/ethnicity, INR, PPVT). Approximately 2.6% (n = 11) of children were missing data related to one or more classroom-level variables (i.e., teacher age, teacher gender, teacher race/ethnicity, class size). With regard to observational child-level data, 76% of children had Positive Peer Engagement scores from at least three time points. Fifty-seven percent were missing one time point, 12.9% were missing two, and 11.4% were missing three. To account for missing data, Full Information Maximum Likelihood (FIML) estimation with robust Standard Errors was used to estimate parameters. This type of estimation assumes missingness at random and uses all available data for each child when estimating parameters, therefore increasing the statistical power of estimated parameters (Enders & Bandalos, 2001; McArdle et al., 2004).

Examining Change in Positive Peer Engagement

To explore change in children's peer engagement quality over time, we first ran an unconditional growth model using children's four Positive Peer Engagement scores. Given results of this model (detailed below) indicating that only the intercept and variance around baseline scores were significant – and not the slope – we opted not to predict to the linear slope as an outcome. Instead, visual examination of the data (detailed below) prompted us to explore children's change in peer engagement by examining *variability* in positive peer engagement across the four time points. To do this, we first obtained a measure of

children's overall positive peer engagement quality by creating a Positive Peer Engagement Average score for each child using the mean of their inCLASS scores, computed from all observed cycles throughout the year. Then, we created a Positive Peer Engagement Variability score to measure within-child variability in peer engagement as observed across all cycles throughout the year. This involved computing a single standard deviation score for each child, with greater values indicating greater variability (Brock, Curby, & Cannell-Cordier, 2018; Curby, Rimm-Kaufman, & Abry, 2013; LoCasale-Crouch, Jamil, Pianta, Rudasill, & DeCoster, 2018). We also examined children's peer engagement quality at the beginning of the year by using each child's peer engagement score from the first time point as the Positive Peer Engagement Baseline score. Every child therefore had a score representing their average peer engagement across the year, as well as scores representing their baseline quality of peer interaction and degree of variability across the year.

Multilevel Regression Modeling

As calculation of ICCs of observed peer engagement indicated that 25-32% of variability in peer engagement was attributed to between-classroom factors (design effects 1.43-1.55), we used a multilevel regression model framework to explore predictors of children's peer engagement quality. This method allowed for the nesting of children (level 1) within classrooms (level 2). Level 1 covariates in all models included children's age (in months), gender (dummy-coded; 1=male, 0=female), race/ethnicity (two dummy-coded variables; 1=Black, 0=White/Other; 1=Other, 0=White/Black), family INR, and PPVT-3 score. To account for disruptive behavior, we ran two sets of models (including covariates) – one with Total Disruptive Behavior as a level 1 variable, and one with Hyperactivity, Inattention, and Oppositionality as level 1 variables. Level 2 covariates in all models

included teacher age, gender (dummy-coded; 1=male, 0=female), race/ethnicity (dummy-coded; 1=Non-White, 0=White), and intervention status (two dummy-coded variables, 1=Banking Time, 0=Child Time/Control; 1=Child Time, 0=Banking Time/Control). In addition, preschool center type (two dummy-coded variables, 1=Head Start, 0=Private/Public; 1=Private, 0=Public/Head Start), classroom size, and average student age (in months) were included as level 2 covariates.

To explore the relationship between teacher support and children's peer engagement, we added Responsive Teaching and Classroom Management variables as level 2 predictors. We ran three separate models, each including the same aforementioned child- and classroom-level covariates but predicting to different outcomes. First, we predicted children's baseline peer engagement quality by including their Positive Peer Engagement Baseline score as the outcome. Then, we predicted children's average peer engagement by including their Positive Peer Engagement Average score as the outcome. Lastly, we predicted variability in children's peer engagement across the year by including their Positive Peer Engagement Variability score as the outcome.

We then used a similar three-step process to test the moderating effect of children's overall disruptive behavior on the relationship between teachers' responsiveness and classroom management and children's peer engagement. Predictors were identical in all three models and included covariates and two cross-level interactions between children's Total Disruptive Behavior (level 1) and teachers' Responsive Teaching and Classroom Management (level 2; Singer & Willett, 2003). We predicted children's baseline, average, and variability in peer engagement using Positive Peer Engagement Baseline, Positive Peer

Engagement Average, and Positive Peer Engagement Variability scores, respectively, as outcomes in three separate models.

Finally, we explored this same moderating effect at the disruptive behavior subtype level by applying the aforementioned cross-level interaction framework between teacher support variables and Hyperactivity, Inattention, and Oppositionality in separate models. For the hyperactivity model, for example, we created two cross-level interactions between children's Hyperactivity (level 1) and Responsive Teaching and Classroom Management variables (level 2), while including Inattention and Oppositionality as level 1 covariates to control for the correlation between disruptive behavior subtypes (Evans, 1996). This was replicated in separate models for Inattention and Oppositionality variables. Positive Peer Engagement Baseline, Positive Peer Engagement Average, and Positive Peer Engagement Variability scores served as the outcomes in three separate sets of models for each subtype, resulting in a total of nine models at the subtype level.

Results

Descriptive statistics for predictor and outcome variables are summarized in Table 2. Children demonstrated significant variability in their baseline scores for Total Disruptive Behavior (M = 29.11, SD = 15.99), as well as for Hyperactivity (M = 12.00, SD = 6.90), Inattention (M = 10.17, SD = 6.36), and Oppositionality (M = 6.92, SD = 6.16). Though low on average, children's observed inCLASS Positive Peer Engagement scores varied at time points one (M = 2.74, SD = .76), two (M = 2.64, SD = .78), three (M = 2.78, SD = .80), and four (M = 2.83, SD = .75). Average positive peer engagement (M = 2.73, SD = .64) and children's variability in peer engagement across time (M = 1.13, SD = .31) showed

heterogeneity. Teachers' average CLASS Responsive Teaching demonstrated similar variability (M = .00, SD = .52) to CLASS Classroom Management (M = .00, SD = .46).

With regard to the unconditional growth model, model fit was acceptable ($\chi_2(5)$ = 13.27, $p < .05$, CFI = .97, RMSEA = .06, SRMR = .05). Analyses indicated that the intercept was significant (b = 2.71, SE = .04, $p < .001$) and the slope was marginally significant (b = .03, SE = .02, p = .051); on average, children trended toward growth but did not experience linear change in positive peer engagement across the year. However, while the variance component for the intercept was significant (b = .33, SE = .05, $p < .001$), it was not significant for the slope (b = .01, SE = .01, p = .70). This indicates that children differed in their baseline positive peer engagement but did not vary in their linear rates of change over time.

With the linear slope in the unconditional model emerging as non-significant, data were examined visually in order to get a sense of what peer engagement looked like across the year. To do this, three groups of 25 participants were randomly selected, and their four Positive Peer Engagement scores across the year were plotted on a graph (see Figure 1). Visual analysis showed that children's peer engagement did in fact vary throughout the year, but did so in a non-linear fashion. While some children experienced little to no observable change across time points, others fluctuated in their observed peer engagement quality. Results of regression models predicting this variability in peer engagement quality, in addition to children's average and baseline peer engagement quality, are presented in Table 3 and explained below.

Child and Classroom Characteristics

Baseline peer engagement. When examining children's positive peer engagement quality as observed at the beginning of the school year, results indicated that children who were older (b = .02, SE = .01, p < .05), female (b = -.24, SE = .07, p < .001), and who had higher socioeconomic status (b = .06, SE = .03, p < .05) engaged in higher quality peer engagement at the start of the year. In addition, though overall disruptive behavior was unrelated to baseline peer engagement quality (b = -.002, SE = .002, p = .50), children had higher initial peer engagement quality when reported to display greater levels of hyperactivity (b = .02, SE = .01, p < .05) and lower levels of inattention (b = -.03, SE = .01, p < .01). At the classroom level, children demonstrated lower quality peer engagement at the beginning of the year when in public centers compared to those in private or Head Start (b = -.39, SE = .11, p < .01) centers.

Average peer engagement. Interpretation of covariates indicated that children who were older (b = .02, SE = .01, p < .05) and female (b = -.14, SE = .05, p < .05) demonstrated higher quality positive peer engagement on average. Regarding disruptive behavior, overall disruptive behavior was unrelated to average peer engagement quality (b = -.001, SE = .002, p = .46), but children had higher average peer engagement quality when reported to display greater levels of hyperactivity (b = .02, SE = .01, p < .01) and lower levels of inattention (b = -.02, SE = .01, p < .001). At the classroom level, children who were in public centers had lower peer engagement on average compared to those in private or Head Start (b = -.42, SE = .09, p < .001) centers.

Variability in peer engagement. Children who were male (b = -.07, SE = .02, p < .001) and who had higher positive peer engagement on average (b = .34, SE = .03, p < .001)

showed greater variability in their observed peer engagement throughout the year. Overall disruptive behavior was unrelated to variability peer engagement quality (b = .000, SE = .001, p = .85), but children who were reported to display greater levels of oppositionality (b = .004, SE = .002, p < .05) demonstrated greater variability. At the classroom level, children were more likely to demonstrate greater variance in peer engagement patterns when class sizes were larger (b = .01, SE = .003, p < .01) and when the average classroom age was greater (b = .01, SE = .003, p < .05).

Responsive Teaching and Classroom Management

Results from all models indicate that teachers' level of responsiveness was unrelated to children's peer engagement quality. However, while teachers' classroom management was unrelated to baseline and variability in peer engagement, children displayed greater overall quality of peer engagement when their teacher demonstrated better classroom management skills (b = .16, SE = .07, p < .05). As such, the degree to which teachers organized and structured the classroom played a greater role in the average quality of peer engagement for this subgroup than did teachers' responsiveness.

The Moderating Role of Disruptive Behavior

Results from moderation models indicate that children's overall level of disruptive behavior did not moderate the association between responsive teaching and classroom management and children's peer engagement quality on average, at baseline, or over time. Similar results were discovered at the subtype level, where neither children's hyperactivity, inattention, nor oppositionality moderated the association between responsive teaching and classroom management and children's peer engagement quality at any time increment. The degree to which teachers displayed warmth in their interactions and effectively organized

the classroom was not more important to the peer engagement for some children versus others based on the severity *or* the nature of disruptive behavior displayed.

Discussion

With literature repeatedly highlighting the importance of children's early social interactions to their overall development (e.g., Hay et al., 2004), understanding how to best support those children who are at risk for peer challenges is a critical task for early childhood educators. The present study contributes to this aim by examining the relationship between teachers' responsiveness and classroom management and the positive peer engagement of preschoolers who displayed elevated levels of hyperactivity, inattention, and/or oppositionality. Findings highlight the variable nature of peer engagement quality for this subsample of preschoolers and the unique role of teachers' classroom management in encouraging positive interactions amongst children. Interpretations around significant findings, as well as around absence of predicted associations are explained below.

Overall Patterns in Preschool Peer Engagement

Based on both theory and research pointing to children's rapid and ongoing development of social-emotional skills during early childhood (e.g., Blair, 2002; Denham et al., 2003; Eggum-Wilkins et al., 2014; Hay et al., 2004), we predicted that our subsample of preschoolers would experience gains in peer engagement quality across the preschool year on average. While we found that preschoolers varied in both their initial and average peer engagement quality, there was little positive linear growth over time. Further, children did not vary from one another in their linear growth trajectories. Within individual children's peer engagement patterns, however, growth that was non-linear was apparent

and varied from one child to the next. Though inconsistent with previous studies identifying linear change in children's peer engagement quality across the preschool year (e.g., Barbu, 2003; Cohen & Mendez, 2009; Eggum-Wilkins et al., 2013; Persson, 2005; Yudron & Jones, 2016), interpretations and implications behind these patterns point to a number of important considerations.

In understanding the absence of linear growth patterns in our study, it is perhaps most important to consider the unique nature of our study's sample. Previous studies examining linear change in preschoolers' peer engagement quality have drawn from samples of children with a wider range of behavioral presentations (e.g., Barbu, 2003; Cohen & Mendez, 2009; Eggum-Wilkins et al., 2014; Persson, 2005; Yudron & Jones, 2009). As preschoolers in our sample were selected based on their reported display of hyperactivity, inattention, and/or oppositionality, the behaviors of our sample were intentionally skewed and homogenous in nature. It is therefore possible that children who display elevated levels of disruptive behavior do not change in their peer engagement quality over time with the same directionality, intensity, and/or consistency as their less disruptive peers. Findings therefore suggest an important consideration in understanding how social trajectories may present differently for certain groups of children, particularly those at risk for social-emotional challenges (e.g., Acar et al., 2015; Bulotsky-Shearer et al., 2012; Denham et al., 2015). However, as this is the only study known to authors to explicitly examine growth in peer engagement quality for a targeted preschool subsample of this nature, replication of our findings with similar samples will be important in understanding whether our findings reflect true differences in peer engagement trajectories for children based on their display of disruptive behavior.

Though our findings did not suggest patterns of linear change over time, we did find evidence of variability in individual children's peer engagement trajectories. That is, some children's peer engagement quality tended to fluctuate throughout the year more so than others. First and foremost, this finding highlights the value of examining patterns of children's behavior beyond using just their mean or "average" scores (Brock et al., 2018; Curby et al., 2013; LoCasale-Crouch et al., 2018). Particularly during early childhood when development is rapidly changing, assuming a linear, stable way of interaction (i.e., via the use of average scores) may not always be the most accurate way to capture children's developing behavior patterns, especially when examining the behavior of young children who are more dysregulated (Curby et al., 2013; de Weerth & van Geert, 2002). In fact, literature suggests that behavioral variability is a "stable characteristic of any developing behavior" (van Dijk & van Geert, 2014, p. 38) and that it is typical for young children to display a combination of stable and changing behavior patterns as they react to and learn how to navigate their environment (Curby et al., 2010; Persson, 2005).

So, what does it mean if preschoolers demonstrate greater intraindividual variability in their peer engagement compared to their peers? While literature posits a number of theories – ranging from greater disorganization of behavior (e.g., Lewis, Lamey, & Douglas, 2001; van Dijk & van Geert, 2014) to developmentally appropriate responses to environmental cues (e.g., de Weerth & van Geert, 2002; Vitiello et al., 2012) – research has yet to empirically examine this association in preschoolers. Further study is therefore needed to build upon the field's knowledge of both the nature and implications of intraindividual variability for children's social-emotional development. Specifically, studies are encouraged to explore this variability in more representative samples of

preschoolers in order to determine how the level of inconsistency observed in our study compares to the peer engagement of preschoolers more broadly. Furthermore, it will be important to examine patterns *within* children's variability across time (i.e., overall higher quality versus overall lower quality) in effort to understand how these patterns may differentially relate to children's outcomes (van Dijk & van Geert, 2014). Finally, research would benefit from examining the longitudinal relationship between children's intraindividual variability in peer engagement and their social-emotional development in effort to understand the implications of this variability for children's peer relationships and development more broadly. As such, while our findings are important in identifying the presence of variability in this sample's peer engagement quality, additional study is needed to understand what exactly this means for preschoolers' development.

Factors Associated with Positive Peer Engagement

In addition to findings describing the *nature* of children's change in peer engagement over time, results provide insight into child and classroom factors that contribute to preschoolers' peer engagement quality. At the child-level, children experienced higher peer engagement quality both at the beginning of the year and on average when they were older, female, and when they attended Head Start or private preschool centers in comparison to public centers. In addition, children's perceived disruptive behavior was associated with baseline and average peer engagement, with children engaging in higher quality peer interaction when reported to display greater levels of hyperactivity and lower levels of inattention. With the exception of socioeconomic status, which was positively related only to peer engagement at the beginning of the year, patterns were similar for children's baseline and average peer engagement. This suggests

that how children begin the preschool year may oftentimes forecast their overall peer engagement quality throughout the year (Acar et al., 2015). Specifically, our findings shed light on the importance of considering the role that children's age, gender, and classroom setting may have in shaping the quality of preschoolers' peer interactions.

In examining variability in peer engagement across time, we found that children who were female, who had higher average peer engagement quality, and who displayed greater levels of perceived oppositionality tended to vary more in their peer engagement across the year. In addition, children were less consistent in their peer engagement quality when in classrooms that were larger and comprised of older preschoolers. Findings here suggest that factors associated with average peer engagement levels are not necessarily the same as those that contribute to variability across time. Though examining these individual associations is beyond the scope of the present study, these patterns collectively point to the importance of adopting a holistic, child-centered approach in conceptualizing how children develop peer interactions (Brophy-Herb et al., 2007; Hamre et al., 2008). Efforts are encouraged to further explore these and other pertinent associations, particularly as it relates to variability in peer engagement quality – an area not yet extensively explored.

Linking Responsive Teaching, Classroom Management, and Peer Engagement

Above and beyond the aforementioned implications of study findings, our primary research aim was to examine how teachers' emotional responsiveness and classroom management related to peer interactions over time for this subgroup of preschoolers. With previous literature highlighting the association that children's peer engagement has with teachers' quality of classroom support (e.g., Curby et al., 2009; Downer et al., 2010b; Yudron & Jones, 2016) and the particularly protective role of this support for children who

display disruptive behaviors (e.g., Broekhuizen et al., 2017; Phillips et al., 2012; Pluess & Belsky, 2009), we anticipated that the degree to which teachers were attuned to children's needs and able to effectively manage the classroom would each be positively associated with peer engagement throughout the year for preschoolers who display disruptive behaviors. Contrary to expectations, however, only teachers' classroom management skills were related to children's peer engagement quality. This pattern was particularly surprising in light of previous literature linking teachers' emotional responsiveness as the stronger predictor of children's social engagement (e.g., Downer et al., 2010b; Mashburn et al., 2008; McCoy & Wolf, 2018; Rimm-Kaufman et al., 2009). Nonetheless, our findings support the notion of understanding teacher support as comprised of interrelated yet distinct facets (Rimm-Kaufman et al., 2009), and point to how such supports relate to the peer engagement of children who display disruptive behaviors.

Specifically, results shed light on the unique role of teachers' external and co-regulatory supports in the overall peer engagement quality of children who tend to lack self-regulatory skills (Broekhuizen et al., 2017; Curby et al., 2014; Olivier & Archambault, 2017; Silkenbeumer et al., 2018). That is, what seems to be more important to the peer interactions of children who display hyperactivity, inattention, and/or oppositionality is whether or not their teacher structures and organizes the classroom in ways that decrease self-regulatory demands that may otherwise tax preschoolers' ability to engage positively with peers (Curby et al., 2014; Eiraldi et al., 2012; Rimm-Kaufman et al., 2009). Of additional importance is the finding that classroom management only significantly predicted children's *average* peer engagement quality, not baseline quality. In conjunction with other identified associations at the child- and classroom-levels, this finding highlights

the importance of teachers' classroom management practices as one of the only factors in our study predicting peer engagement above and beyond how children initially began the school year.

Further, though preschoolers' overall quality of peer engagement was more likely to be higher when their classroom was more organized and structured, children in these classrooms were still just as likely to demonstrate variability in their peer engagement quality as were those in less-organized classrooms. This again points to the variable nature of peer interaction quality for preschoolers who display disruptive behaviors and suggests that classroom-level organizational supports do not seem to play a role in constraining this variability over time. Overall findings suggest that while teachers' degree of warmth and sensitivity may be more important to the peer engagement of preschoolers more broadly (e.g., Downer et al., 2010b; Mashburn et al., 2008; McCoy & Wolf, 2018; Rimm-Kaufman et al., 2009), it is more so the opportunities available for positive peer engagement – as created through teachers' intentional organization of activities and environments – that best situate this group of preschoolers for overall social success.

The Moderating Role of Disruptive Behavior

With regard to our second research aim, we predicted that teachers' warmth and sensitivity would be most important to the peer engagement of children who display oppositionality (Coplan et al., 2015; Doumen et al., 2008), and that teachers' organization of the classroom would be most important for children who display hyperactivity and/or inattention (Eiraldi et al., 2012; Rimm-Kaufman et al., 2009). Counter to hypotheses, however, the peer engagement of children who displayed greater levels and/or certain types of disruptive behavior did not benefit from either type of teacher support more so than their

peers. This finding was surprising based on both theory (e.g., Belsky, 1997; Olivier & Archambault, 2017; Phillips et al., 2012; Silkenbeumer et al., 2018) and research (e.g., Broekhuizen et al., 2017; Pluess & Belsky, 2009) attesting to children's differential susceptibility to teacher support. Here again, however, consideration of our study's unique subsample may help to shed light on these results.

Studies that have previously identified a stronger link between teacher support and peer engagement for children with more challenging behaviors have drawn from samples of preschoolers with a wider range of behavioral presentations (e.g., Broekhuizen et al., 2017; Pluess & Belsky, 2009). Our study, as previously mentioned, examines this association in a sample of preschoolers whose behaviors were more homogenous in nature due to intentional sample selection based on perceived behavior. It may therefore be that the disruptive behavior and/or peer engagement ratings of our subsample were too narrow in range to detect differential associations based on disruptive behavior presentation (e.g., Broekhuizen et al., 2017). As literature has recognized the importance of considering thresholds in determining the effects of teacher support (e.g., Burchinal et al., 2010), this may indicate that teachers' responsiveness and classroom management play less of a role in peer engagement once children display a certain level of dysregulation. Such an association may emerge, however, in a more representative sample of preschoolers displaying greater variability in behavioral patterns. As such, while our findings did not support the notion that certain types of supports are more important for children's peer engagement depending on the nature of their disruptive behavior, literature would benefit from continued exploration into if there are more targeted ways to promote the positive

peer experiences for certain children based on their behavioral presentations (Blair, 2002; Brown et al., 2001; Yoder et al., 2019).

Limitations

In interpreting our findings, there are several limitations worth noting. With regard to methodology, children's disruptive behavior was measured using teacher report at the beginning of the year. We must therefore caution against the assumption that ratings objectively capture children's behavior due to potential teacher bias and/or the use of a single rating at the start of the year to represent behavior across the year (Yoder & Williford, 2019). Second, though literature has identified teachers' level of support to remain fairly stable over time (e.g., Curby et al., 2010), our study's use of average scores to represent teachers' observed responsive teaching and classroom management does not allow for consideration of potential variability in these ratings throughout the year and how this may relate to growth in peer engagement (McCoy & Wolf, 2018). Regarding observational measures more broadly, we must also recognize that there is variability both in the number of cycles observed and in the activity settings during which these observations took place that may contribute to unequal representations of teachers' and children's classroom experiences. Similarly, though often cited as one of the most preferred ways to assess children's social behaviors with peers (Barbu, 2003; Eggum-Wilkins et al., 2014), observational measures rely on brief snapshots of children's behavior that are highly influenced by context and therefore only represent a sampling of children's peer engagement (Milfort & Greenfield, 2002; Yoder et al., 2019).

Regarding study and analytical design, it is important to note that analyses were part of a larger intervention study that focused on teacher-child relationships, and it is

possible that treatment effects may have influenced observed classroom behaviors. However, the intervention was not found to have a statistical association with any of the constructs measured in this study, and treatment condition was controlled for in all analyses. It is also necessary to recognize the presence of missing data and the use of FIML to estimate these missing values. In addition, the nature of these analyses only allows for interpretation of associations between variables, as opposed to identifying causal relationships.

Lastly, there are important points worth noting pertaining to theoretical and analytical considerations. That our results identified the absence of linear change but the presence of intraindividual variability in children's peer engagement quality sheds light on a variety of additional factors worth considering in examining preschoolers' peer engagement quality. For example, examining additional classroom (e.g., activity setting, time of day, average class behavior) and/or teacher (e.g., reported well-being, professional background) factors may have helped to explain this variability with greater precision and nuance (Booren et al., 2012; Vitiello et al., 2012; Yoder et al., 2019). We therefore recognize that while our findings are novel and add to the field's knowledge around a number of characteristics that contribute to variability in preschoolers' peer engagement, there are other potential factors to be considered that may explain this variability with equal and/or greater specificity.

Summary and Implications

Findings from our study highlight important considerations related to both the nature of peer engagement quality for preschoolers who display disruptive behaviors, and how this quality relates to aspects of teacher support. Specifically, our study draws

attention to the importance of examining not only average levels of functioning for young children, but also the *variability* around this functioning (van Dijk & van Geert, 2014). Especially for children who are younger and/or who display more dysregulated behaviors, understanding both how their behavior varies over time and what contributes to this variability may help to provide information about how to guide preschoolers toward positive social experiences that would otherwise be overlooked with more traditional methods of measurement (Brock et al., 2018; Curby et al., 2013; LoCasale-Crouch et al., 2018). Future research is encouraged to replicate and build upon our study by examining intraindividual variability in peer engagement quality in order to better understand the nature of peer interactions during preschool and its links to social development, both in samples of children with similar disruptive presentations and with more representative samples of preschoolers.

Study findings also emphasize the unique social-emotional needs of preschoolers prone to displaying hyperactivity, inattention, and/or oppositionality. Most notably, we discovered that teachers' organization and structuring of the classroom played a greater role in this sample's peer engagement quality than did teachers' level of warmth and sensitivity. While literature has largely identified teachers' responsiveness as more important in promoting social interaction than classroom management (e.g., Downer et al., 2010b; Mashburn et al., 2008; McCoy & Wolf, 2018; Rimm-Kaufman, 2009), our findings highlight the unique role of teachers' external regulation and provision of structure to the quality of peer interactions for children with diminished self-regulatory skills (Broekhuizen et al., 2017; Curby et al., 2014; Olivier & Archambault, 2017; Silkenbeumer et al., 2018). This has direct implications for teacher practice in drawing attention to the importance of

a well-organized and predictable classroom in promoting positive social experiences for children more vulnerable to self-regulatory and social challenges (Curby et al., 2014; Eiraldi et al., 2012; Rimm-Kaufman et al., 2009). Continued study into both what supports teachers can provide to promote positive peer engagement and how to best implement these supports is encouraged in providing much needed clarity around how teachers can best facilitate the positive peer engagement of young children who display disruptive behaviors.

References

Acar, I. H., Rudasill, K. M., Molfese, V., Torquati, J., & Prokasky, A. (2015). Temperament and preschool children's peer interactions. *Early Education and Development, 26*(4), 479-495.

Altman, D. G. (1991). *Practical statistics for medical research.* London: Chapman and Hall.

Anastopoulos, A. D. (1998). *Oppositional defiant disorder/conduct disorder rating scale.* Unpublished manuscript, University of North Carolina at Greensboro.

Arnold, D. H., Kupersmidt, J. B., Voegler-Lee, M. E., & Marshall, N. A., (2012). The association between preschool children's social functioning and their emergent academic skills. *Early Childhood Research Quarterly, 27*, 376-386.

Barbu, S. (2003). Stability and flexibility in preschoolers' social networks: A dynamic analysis of socially directed behavior allocation. *Journal of Comparative Psychology, 117*(4), 429-439.

Belsky, J. (1997). Variation in susceptibility to rearing influences: An evolutionary argument. *Psychological Inquiry, 8,* 182–186.

Bierman, K. L. (2011). The promise and potential of studying the "invisible hand" of teacher influence on peer relations and student outcomes: A commentary. *Journal of Applied Developmental Science, 32*, 297-303.

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist, 57*(2), 111-127.

Booren, L. M., Downer, J. R., & Vitiello, V. E. (2012). Observations of children's interactions with teachers, peers, and tasks across preschool classroom activity settings. *Early Education and Development, 23*(4), 517-538.

Brennan, L. M., Shaw, D. S., Dishion, T. J., & Wilson, M. N. (2015). The predictive utility of early childhood disruptive behaviors for school-age social functioning. *Journal of Abnormal Child Psychology, 43*, 1187-1199.

Brock, L. L., Curby, T. W., & Cannell-Cordier, A. L. (2018). Consistency in children's classroom experiences and implications for early childhood development. In A. J. Mashburn, J. LoCasale-Crouch, & K. C. Pears (Eds.), *Kindergarten transition and readiness: Promoting cognitive, social-emotional, and self-regulatory development* (pp. 59-83). Cham, Switzerland: Springer Publishing.

Broekhuizen, M. L., Slot, P. L., van Aken, M. A. G., & Dubas, J. S. (2017). Teachers' emotional and behavioral support and preschoolers' self-regulation: Relations with social and emotional skills during play. *Early Education and Development, 28*(2), 135-153.

Brophy-Herb, H. E., Lee, R. E., Nievar, M. A., & Stollak, G. (2007). Preschoolers' social competence: Relations to family characteristics, teacher behaviors and classroom climate. *Journal of Applied Developmental Psychology, 28*, 134-148.

Brown, W. H., Odom, S. L., & Conroy, M. A. (2001). An intervention hierarchy for promoting young children's peer interactions in natural environments. *Topics in Early Childhood Special Education, 21*(3), 162-175.

Bulotsky-Shearer, R. J., Bell, E. R., Romero, S. L., & Carter, T. M. (2012). Preschool interactive peer play mediates problem behavior in low-income children. *Journal of Applied Developmental Psychology, 33*, 53-65.

Burchinal, M., Vandergrift, N., Pianta, R., & Mashburn, A. (2010). Threshold analysis of association between child care quality and outcomes for low-income children in pre-kindergarten programs. *Early Childhood Research Quarterly, 25*, 166-176.

Burchinal, M., Howes, C., Pianta, R., Bryant, D., Early, D., Clifford, R., & Barbarin, O. (2008). Predicting child outcomes at the end of kindergarten from the quality of pre-kindergarten teacher-child interactions and instruction. *Applied Developmental Science, 12*(3), 140-153.

Campbell, S. B., Denham, S. A., Howarth, G. Z., Jones, S. M., Whittaker, J. V., Williford, A. P., & Darling-Churchill, K. (2016). Commentary on the review of measures of early childhood social and emotional development: Conceptualization, critique, and recommendations. *Journal of Applied Developmental Psychology, 45*, 19-41.

Carter, L. M., Williford, A. P., & LoCasale-Crouch, J. (2014). Reliability and validity of a measure of preschool teachers' attributions for disruptive behavior. *Early Education and Development, 25*, 949-972.

Chacko, A., Wakschlag, L., Hill, C. Danis, B., & Espy, K. A. (2009). Viewing preschool disruptive behavior disorders and attention-deficit/hyperactivity disorder through a developmental lens: What we know and what we need to know. *Child and Adolescent Psychiatric Clinics of North America, 18*, 627-643.

Chow, B. W. Y., & McBride-Chang, C. (2003). Promoting language and literacy development through parent-child reading in Hong Kong preschoolers. *Early Education and Development, 14*(2), 233-248.

Cicchetti, D., Bronen, R., Spencer, S., Haut, S., Berg, A., Oliver, P., & Tyrer, P. (2006). Rating scales, scales of measurement, issues of reliability: Resolving some critical issues for clinicians and researchers. *Journal of Nervous and Mental Disease, 194*, 557–564.

Cohen, J. S., & Mendez, J. L. (2009). Emotion regulation, language ability, and the stability of preschool children's peer play behavior. *Early Education and Development, 20*, 1016-1037.

Coplan, R. J., Bullock, A., Archbell, K. A., & Bosacki, S. (2015). Preschool teachers' attitudes, beliefs, and emotional reactions to young children's peer group behaviors. *Early Childhood Research Quarterly, 30*, 117-127.

Cordier, R., Bundy, A., Hocking, C., & Einfeld, S. (2010). Comparison of the play of children with attention deficit hyperactivity disorder by subtypes. *Australian Occupational Therapy Journal, 57*, 137-145.

Curby, T. W., Downer, J. T., & Booren, L. M. (2014). Behavioral exchanges between teachers and children over the course of a typical preschool day: Testing bidirectional associations. *Early Childhood Research Quarterly, 29*, 193-204.

Curby, T. W., Grimm, K. J., & Pianta, R. C. (2010). Stability and change in early childhood classroom interactions during the first two hours of a day. *Early Childhood Research Quarterly, 25*, 373-384.

Curby, T. W., LoCasale-Crouch, J., Konold, T. R., Pianta, R. C., Howes, C., Burchinal, M.,…Barbarin, O. (2009). The relations of observed pre-k classroom quality profiles to children's achievement and social competence. *Early Education and Development, 20*(2), 346-372.

Curby, T., W., Rimm-Kaufman, S. E., & Abry, T. (2013). Do emotional support and classroom organization earlier in the year set the stage for higher quality instruction? *Journal of School Psychology, 51*, 557-569.

Curby, T. W., Rudasill, K. M., Edwards, T., & Pérez-Edgar, K. (2011). The role of classroom quality in ameliorating the academic and social risks associated with difficult temperament. *School Psychology Quarterly, 26*(2), 175-188.

de Weerth, C., & van Geert, P. (2002). Changing patterns of infant behavior and mother-infant interaction: Intra- and interindividual variability. *Infant Behavior and Development, 24*, 347-371.

Denham, S. A., Bassett, H. H., Sirotkin, Y. S., Brown, C., & Morris, C. S. (2015). "No-o-o-o peeking": Preschoolers' executive control, social competence, and classroom adjustment. *Journal of Research in Childhood Education, 29*, 212-225.

Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., & Queenan, P. (2003). Preschool emotional competence: Pathway to social competence? *Child Development, 74*, 238-256.

Diamond, A. (2005). Attention-deficit disorder (attention-deficit/hyperactivity disorder without hyperactivity): A neurobiologically and behaviorally distinct disorder from attention-deficit/hyperactivity disorder (with hyperactivity). *Developmental Psychopathology, 17*(3), 807-825.

Dobbs, J., & Arnold, D. H. (2009). Relationship between preschool teachers' reports of children's behavior and their behavior toward those children. *School Psychology Quarterly, 24*(2), 95-105.

Dominguez, X., Vitiello, V. E., Fuccillo, J. M., Greenfield, D. B., & Bulotsky-Shearer, R. J. (2011). The role of context in preschool learning: A multilevel examination of the contribution of context-specific problem behaviors and classroom process quality to low-income children's approaches to learning. *Journal of School Psychology, 49,* 175-195.

Doumen, S., Verschueren, K., Buyse, E., Germeijs, V., & Luyckx, K. (2008). Reciprocal relations between teacher-child conflict and aggressive behavior in kindergarten: A three-wave longitudinal study. *Journal of Clinical Child and Adolescent Psychology, 37*(3), 588-599.

Downer, J. T., Booren, L. M., Lima, O. K., Luckner, A. E., & Pianta, R. C. (2010a). The Individualized Classroom Assessment Scoring System (inCLASS): Preliminary reliability and validity of a system for observing preschoolers' competence in classroom interactions. *Early Childhood Research Quarterly*, *25*, 1–16.

Downer, J., Sabol, T. J., & Hamre, B. (2010b). Teacher-child interactions in the classroom: Toward a theory of within- and cross-domain links to children's developmental outcomes. *Early Education and Development, 21*(5), 699-723.

Dunn, L. M., & Dunn, D. M. (1997). *Peabody Picture Vocabulary Test* (3rd ed.). Circle Pines, MN: American Guidance Services.

DuPaul, G. J., Power, T. J., Anastopoulos, A. D., & Reid, R. (1998). ADHD Rating Scale—IV: Checklists, norms, and clinical interpretation. New York: Guilford Press.

Eggum-Wilkens, N. D., Fabes, R. A., Castle, S., Zhang, L., Hanish, L. D., & Martin, C. L. (2014). Playing with others: Head Start children's peer play and relations with kindergarten school competence. *Early Childhood Research Quarterly, 29,* 345-356.

Eiraldi, R. B., Mautone, J. A., & Power, T. J. (2012). Strategies for implementing evidence-based psychosocial interventions for children with attention-deficit/hyperactivity disorder. *Child & Adolescent Psychiatric Clinics of North America, 21*(1), 145-159.

Eisenberg, N., Guthrie, I. K., Murphy, B. C., Shepard, S. A., & Cumberland, A. (1999). Consistency and development of prosocial dispositions: A longitudinal study. *Child Development, 70*(6), 1360-1372.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling, 8*(3), 430-457.

Evans, J. D. (1996). *Straightforward statistics for the behavioral sciences*. Pacific Grove, CA: Brooks/Cole Publishing.

Farmer, T. W., Lines, M. M., & Hamm, J. V. (2011). Revealing the invisible hand: The role of teachers in children's peer experiences. *Journal of Applied Developmental Psychology, 32,* 247-256.

Farmer, T. W., Reinke, W., M., & Brooks, D. S. (2014). Managing classrooms and challenging behavior: Theoretical considerations and critical issues. *Journal of Emotional and Behavioral Disorders, 22*(2), 67-73.

Federal Interagency Forum on Child and Family Statistics (2017). *America's children: Key national indicators of well-being, 2017.* Washington, DC: U.S. Government Printing Office.

Gartstein, M. A., Putnam, S. P., & Rothbart, M. K. (2012). Etiology of preschool behavior problems: Contributions of temperament attributes in early childhood. *Infant Mental Health Journal, 33*(2), 197-211.

Gest, S. D., Madill, R. A., Zadzora, K. M., Miller, A. M., & Rodkin, P. C. (2014). Teacher management of elementary classroom social dynamics: Associations with changes in student adjustment. *Journal of Emotional and Behavioral Disorders, 22*(2), 107-118.

Hamre, B. K., Pianta, R. C., Downer, J. T., DeCoster, J., Mashburn, A. J., Jones, S.,...Hamagami, A. (2013). Teaching through interactions – Testing a developmental framework for understanding teacher effectiveness in over 4000 classrooms. *Elementary School Journal,* 113, 461–487.

Hamre, B. K., Pianta, R. C., Downer, J. T., & Mashburn, A. J. (2008). Teachers' perceptions of conflict with young students: Looking beyond problem behaviors. *Social Development, 17*(1), 115-136.

Hay, D. F., Payne, A., & Chadwick, A. (2004). Peer relations in childhood. *Journal of Child Psychology and Psychiatry, 45*, 84-108.

Hebert-Myers, H., Guttentag, C. L., Swank, P. R., Smith, K. E., & Landry, S. H. (2006). The importance of language, social, and behavioral skills across early and later childhood as predictors of social competence with peers. *Applied Developmental Science, 10*(4), 174-187.

Howes, C. (1983). Patterns of friendship. *Child Development, 54*, 1041-1053.

Landis, J.R., & Koch, G.G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*(1), 159-174.

Lewis, M. D., Lamey, A. V., & Douglas, L. (1999). A new dynamic systems method for the analysis of early socioemotional development. *Developmental Science, 2*(4), 457-475.

Lippard, C. N., La Paro, K. M., Rouse, H. L., & Crosby, D. A. (2018). A closer look at teacher-child relationships and classroom emotional context in preschool. *Child Youth Care Forum, 47*(1), 1-21.

LoCasale-Crouch, J., Jamil, F., Pianta, R. C. Rudasill, K. M., & DeCoster, J. (2018). Observed quality and consistency of fifth graders' teacher-student interactions: Associations with feelings, engagement, and performance in school. *SAGE Open,* 1-11.

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A, Bryant, D.,…Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development, 79*(3), 732-749.

McArdle, J. J., Hamgami, F., Jones, K., Jolesz, F., Kikinis, R., Spiro, A., III, & Albert, M. S. (2004). Structural modeling of dynamic changes in memory and brain structure using longitudinal data from the Normative Aging Study. *Journals of Gerontology: Psychological Science, 59B,* P294-P304.

McCoy, D. C., & Wolf, S. (2018). Changes in classroom quality predict Ghanian preschoolers' academic and social-emotional skills. *Developmental Psychology, 54*(8), 1582-1599.

McGoey, K. E., DuPaul, G. J., Haley, E., & Shelton, T. L. (2007). Parent and teacher ratings of attention-deficit/hyperactivity disorder in preschool: the ADHD Rating Scale-IV Preschool Version. *Journal of Psychopathology and Behavioral Assessment, 29*(4), 269-276.

Milfort, R. & Greenfield, D. B. (2012). Teacher and observer ratings of Head Start children's social skills. *Early Childhood Research Quarterly, 17*, 581-595.

Miller, A. L., Gouley, K. K., Seifer, R., Dickstein, S., & Shields, A. (2004). Emotions and behaviors in the Head Start classroom: Associations among observed dysregulation, social competence, and preschool adjustment. *Early Education and Development, 15*(2), 147-166.

Myers, S. S., & Pianta, R. C. (2008). Developmental commentary: Individual and contextual influences on students-teacher relationships and children's early problem behaviors. *Journal of Clinical Child and Adolescent Psychology, 37*(3), 600-608.

Olivier, E., & Archambault, I. (2017). Hyperactivity, inattention, and student engagement: The protective role of relationships with teachers and peers. *Learning and Individual Differences, 59*, 86-95.

Persson, G. E. B. (2005). Developmental perspectives on prosocial and aggressive motives in preschoolers' peer interactions. *Journal of Behavioral Development, 29*(1), 80-91.

Phillips, D., Crowell, N. A., Sussman, A. L., Gunnar, M., Fox, N., Hane, A. A., & Bisgaier, J. (2012). Reactive temperament and sensitivity to context in childcare. *Social Development, 21*(3), 628-643.

Phillips, D. A., Fox, N. A., & Gunnar, M. R. (2011). Same place, different experiences: Bringing individual differences to research in child care. *Child Development Perspectives, 5*(1), 44-49.

Pianta, R., La Paro, K., & Hamre, B. (2008). *The Classroom Assessment Scoring System Pre-K Manual*. Baltimore, MD: Brookes.

Pianta, R. C., Mashburn, A. J., Downer, J. T., Hamre, B. K., & Justice, L. (2008). Effects of web-mediated professional development resources on teacher-child interactions in pre-kindergarten classrooms. *Early Childhood Research Quarterly, 23*, 431-451.

Pluess, M., & Belsky, J. (2009). Differential susceptibility to rearing experience: The case of childcare. *The Journal of Child Psychology and Psychiatry, 50*94), 396-404.

Purpura, D. J., Wilson, S. B., & Lonigan, C. J. (2010). ADHD symptoms in preschool children: Examining psychometric properties using IRT. *Psychological Assessment, 22*(3), 546-558.

Ramani, G. B., Brownell, C. A., & Campbell, S. B. (2010). Positive and negative peer interaction in 3- and 4-year-olds in relation to regulation and dysregulation. *The Journal of Genetic Psychology, 171*(3), 218-250.

Rimm-Kaufman, S. E., Curby, T. W., Grimm, K. J., Nathanson, L., & Brock, L. L. (2009). The contribution of children's self-regulation and classroom quality to children's adaptive behaviors in the kindergarten classroom. *Developmental Psychology, 45*(4), 958-972.

Schaefer, D. R., Light, J. M., Fabes, R. A, Hanish, L. D., & Martin, C. L. (2010). Fundamental principles of network formation among preschool children. *Social Networks, 32*, 61-71.

Santos, A. J., Vaughn, B. E., Peceguina, I., Daniel, J. R., & Shin, N. (2014). Growth and social competence during the preschool years: A 3-year longitudinal study. *Child Development, 85*(5), 2062-2073.

Shin, N., Vaughn, B. E., Kim, M., Krzysik, L., Bost, K. K., McBride, B.,...Coppola, G. (2011). Longitudinal analyses of a hierarchical model of peer social competence for preschool children. *Merrill-Palmer Quarterly, 57*(1), 73-103.

Silkenbeumer, J. R., Schiller, E., & Kärtner, J. (2018). Co- and self-regulation of emotions in the preschool setting. *Early Childhood Research Quarterly, 44*, 72-81.

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York: Oxford University Press.

van Dijk, M., & van Geert, P. (2014). The nature and meaning of intraindividual variability in development in the early life span. In M. Diehl, K. Hooker, & M. J. Sliwinski (Eds.), *Handbook of intraindividual variability across the life span* (pp. 37-58). Abingdon: Routledge.

Vaughn, B. E., Azria, M. R., Krzysik, L., Caya, L. R., Bost, K. K., Newell, W., & Kazura, K. L. (2000). Friendship and social competence in a sample of preschool children attending Head Start. *Developmental Psychology, 36*(3), 326-338.

Vitiello, V. E., Booren, L. M., Downer, J. T., & Williford, A. P. (2012). Variation in children's classroom engagement throughout a day in preschool: Relations to classroom and child factors. *Early Childhood Research Quarterly, 27*, 210-220.

Williford, A. P., LoCasale-Crouch, J., Whittaker, J. V., DeCoster, J., Hartz, K. A., Carter, L. M.,…Hatfield, B. E. (2017). Changing teacher-child dyadic interactions to improve preschool children's externalizing behaviors. *Child Development, 88*(5), 1544-1553.

Yoder, M. L., & Williford, A. P. (2019). Teacher perception of preschool disruptive behavior: Prevalence and contributing factors. *Early Education and Development, 30*(7), 835-853.

Yoder, M. L., Williford, A. P., & Vitiello, V. E. (2019). Observed quality of classroom peer engagement in a sample of preschoolers displaying disruptive behaviors. *Early Childhood Research Quarterly, 47*, 206-217.

Yudron, M., & Jones, S. M. (2016). Developmental trajectories of children's social competence in early childhood: The role of the externalizing behaviors of their preschool peers. *Journal of Cognitive Education and Psychology, 15*(2), 268-292.

Zoromoski, A. K., Owens, J. S., Evans, S. W., & Brady, C. E. (2015). Identifying ADHD symptoms most associated with impairment in early childhood, middle childhood, and adolescence using teacher report. *Journal of Abnormal Child Psychology, 43*, 1243-1255.

Table 1
Child, Classroom, and Teacher Demographic Characteristics

	Percent	M	SD	Range
Child demographics (*n* = 428)				
Age (in months)		48.90	6.82	30-66
Gender (% Male)	65.4			
Ethnicity				
Black	41.5			
White	37.8			
Multiracial	9.8			
Latino	8.1			
Asian	1.7			
Native American	0.5			
Other	0.5			
Income-to-needs ratio		1.91	1.55	0.20-6.15
Classroom demographics (*n* = 156)				
Average Class Size		15.18	3.64	5-25
Center Type				
Private	53.9			
Head Start	26.9			
Public	19.2			
Teacher demographics (*n* = 156)				
Age (in years)		40.63	11.75	21-67
Gender (% Female)	97.4			
Ethnicity				
White	52.9			
Black	41.2			
Multiracial	2.6			
Latino	1.3			
Asian	0.7			
Native American	0.7			
Other	0.7			
Years Education		15.44	1.59	12-18
Years Teaching Experience		12.04	9.27	0-43

Table 2
Descriptive Statistics and Correlations for Predictor and Outcome Variables

	M (SD)	Range	1	2	3	4	5	6	7	8	9	10	11
Peer Engagement													
1. Time 1	2.74 (.76)	1.00 – 4.74	-	-	-	-	-	-	-	-	-	-	-
2. Time 2	2.64 (.78)	1.04 – 5.19	.55***	-	-	-	-	-	-	-	-	-	-
3. Time 3	2.78 (.80)	1.04 – 5.21	.52***	.52***	-	-	-	-	-	-	-	-	-
4. Time 4	2.83 (.75)	1.14 – 5.49	.48***	.49***	.47***	-	-	-	-	-	-	-	-
5. Average	2.73 (.64)	1.00 – 4.55	.84***	.83***	.80***	.77***	-	-	-	-	-	-	-
6. Variability	1.13 (.31)	0 – 2.07	.64***	.61***	.58***	.58***	.73***	-	-	-	-	-	-
Disruptive Behavior									-	-	-	-	-
7. Overall	29.11 (15.99)	0 – 78	-.11*	-.15*	-.09	.01	.01	-.01	-	-	-	-	-
8. Hyperactivity	12.00 (6.90)	0 – 27	-.06	-.05	-.03	.01	-.04	-.08	.89***	-	-	-	-
9. Inattention	10.17 (6.36)	0 – 27	-.19***	-.21***	-.13*	-.08	.04	.04	.81***	.64***	-	-	-
10. Oppositionality	6.92 (6.16)	0 – 24	-.01	-.09	-.05	.12	.03	.02	.76***	.53***	.33***	-	-
Teacher Support													
11. Rsp Tch	.00 (.52)	-.97 – 2.26	.16**	.14*	.07	.10	.17**	.11*	-.07	-.07	-.12*	.03	-
12. Cls Mgmt	.00 (.46)	-1.14 – 1.38	.07	.12	.13*	-.06	.11*	.04	-.04	-.02	-.03	-.06	.05

Note. Rsp Tch = Responsive Teaching; Cls Mgmt = Classroom Management. *p<.05, **p<.01, ***p<.001.

Table 3
Multilevel Model Predicting Positive Peer Engagement

	Baseline		Average		Variability	
	b	*SE*	*b*	*SE*	*b*	*SE*
Child Factors						
Age	.02*	.01	.02*	.01	-.001	.003
Male	-.24***	.07	-.13*	.05	-.07***	.02
Race: Black	.12	.09	.02	.07	.02	.03
Race: Other	.11	.10	.04	.08	.01	.03
SES	.06*	.03	.03	.03	.01	.01
PPVT	.004	.003	.004	.002	<.001	.001
Hyperactivity	.02*	.01	.02**	.01	-.001	.002
Inattention	-.03**	.01	-.02***	.01	-.002	.002
Oppositionality	.01	.01	-.004	.01	.004*	.002
Average Peer	-	-	-	-	.34***	.03
Classroom Factors						
T Age	.002	.003	.002	.003	<.001	.001
T Male	.05	.17	.10	.28	.003	.06
T Race: Non-White	-.08	.09	-.08	.08	.01	.03
Head Start	-.16	.12	-.17	.11	-.02	.04
Public	-.39**	.11	-.42***	.09	-.03	.03
Class Size	-.01	.01	-.004	.01	.01**	.003
Average Age	.02	.01	.02	.01	.01*	.003
Banking Time	.05	.09	-.001	.08	.004	.03
Child Time	.10	.09	.05	.07	-.01	.03
Responsive Teaching	.08	.09	.04	.06	-.01	.02
Classroom Management	.12	.09	.16*	.07	-.01	.03

T=Teacher. *p<.05, **p<.01, ***p<.001.

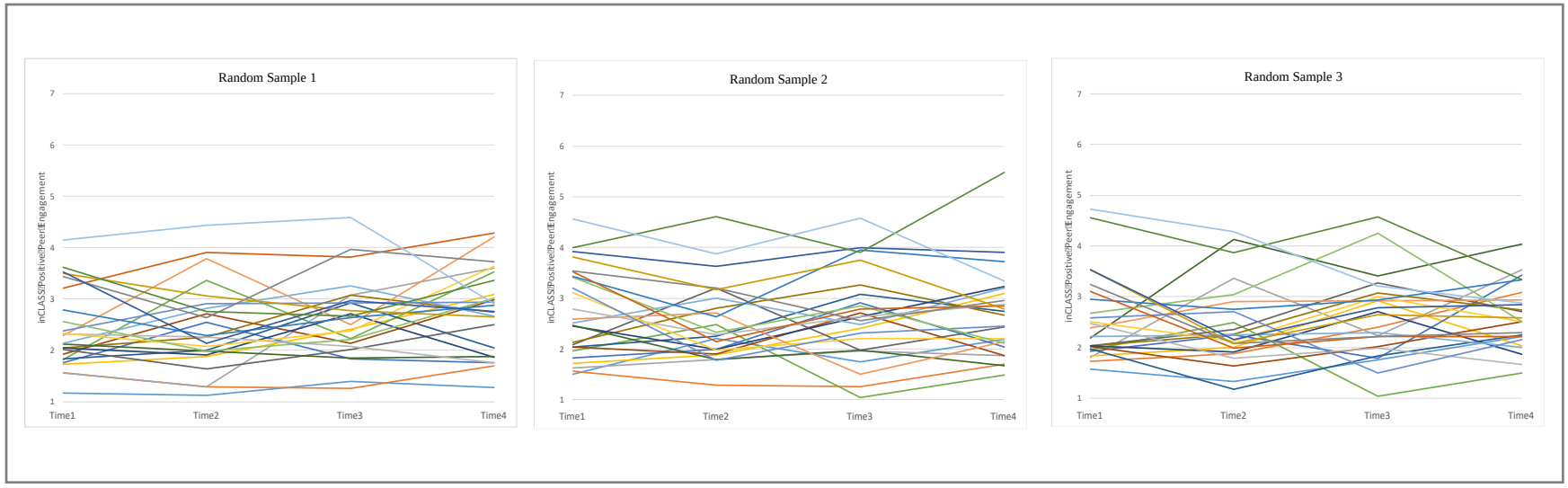

Figure 1. Observed positive peer engagement across time as measured by the inCLASS for three random samples of 25 children (*Note*. Each line represents a single participant's peer engagement over time).