“I’M SO HAPPY YOU’RE PLAYING WITH ME”: A MIXED METHODS APPROACH TO EXPLORING HOW TEMPERAMENT PREDICTS PEER ENGAGEMENT

BY

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THESIS

Submitted in partial fulfillment of the requirements for the degree of Master of Science in Educational Psychology in the Graduate College of the University of Illinois at Urbana-Champaign, 2020

Urbana, Illinois

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ABSTRACT

This study explores how preschoolers with different temperamental traits experience peer engagement, and whether a new qualitative tool provides additional information about peer interactions to existing measures. Using data from a sample of 106 children (44.8% males) participating in a larger National Science Foundation project, quantitative analyses provided evidence that temperamental traits predicted peer engagement; children with higher effortful control, lower surgency/extraversion, and lower negative affectivity were perceived by teachers to be more interactive and less disruptive. Qualitative observations on a subsample of four temperamentally diverse children provided data which revealed inhibition in children who may be quantitatively rated as easygoing and how they can thrive with particular supports, the effect of preferred peers on high surgency/extraverted children and how calming spaces/activities can help them constructively engage with peers, and finally the significance of detecting quiet negative affect, which is often overlooked. The importance of understanding context and content of peer interactions for children with different temperamental traits is also discussed, especially for practical application in the classroom.
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CHAPTER 1: INTRODUCTION

Temperament is known to be one of the more biologically based individual differences in behavior, which together with environmental and contextual experiences, including peer engagement, help shape personality across the lifespan (Kagan & Snidman, 1999; Rothbart, 2007; Thomas et al., 1970). Several longitudinal studies have clearly demonstrated that temperamental characteristics show considerable continuity over time and can predict later behavioral patterns (Caspi, 2000; Kochanska et al., 2007; Shigeto et al., 2014). Rothbart (2007) in fact defines temperament as an “initial state” from which personality develops and then evolves to include everything from cognition, to values, attitudes, and even coping strategies. Furthermore, another essential part of every individual’s life are peers, with friends frequently acting as protective factors against negative outcomes (Bollmer et al., 2005; Criss et al., 2017; Laursen et al., 2007; Rubin & Coplan, 1998). Given that temperament and peer engagement are such central elements of individual development, it is not surprising that they also affect each other.

Existing research examining temperament and peers has found clear links between the two. For example, in a study of 140 elementary school children, Gülay (2012) reported that children with difficult or inhibited temperamental characteristics face a greater chance of peer exclusion and peer victimization than do children exhibiting easy temperamental characteristics (e.g., with high level of approach, persistence, and rhythmicity). Similarly, studies show that children with inhibited temperamental traits are frequently less socially integrated, have lower access to valued resources (such as the ability to attend special events, or play with a desired toy), and are sometimes friendless, as compared to highly exuberant children (Tarullo et al., 2011). Although a few studies highlight the importance of temperament in the development of interpersonal
interactions, there is little research examining how different temperamental characteristics might predict a range of peer engagement quality indicators such as extent of peer engagement, or efficacy in making stable friendships. In fact, most studies on peer engagement utilize temperament as a control variable rather than the main predictor or outcome or look at problems rather than strengths. The primary research question in such studies are usually focused on things like examining cultural differences in peer engagement (for example, differences in aggressive tendencies; Russell et al., 2003), the role of attachment in peer acceptance (Szewczyk-Sokolowski et al., 2005), and/or bullying and peer victimization (Gunnar et al., 2003) as the markers of peer engagement rather than on temperament itself.

Despite clear links between temperament and peer engagement, there are also a fair number of inconsistencies in research findings. Although existing measures of temperament and peer engagement provide valuable information about these associations, there are some significant limitations to these tools. Perhaps most notably, many of these measures decontextualize interactions and fail to capture essential content of the interactions peers engage in. As a result, we often do not have a full understanding of why a child might behave in a specific way. Importantly, the majority of existing tools are either quantitative or are qualitative tools whose data are commonly quantified. This means we may miss out on the rich information about peer engagement that a qualitative tool provides. Given that there does not appear to be any well-known qualitative tool that examines peer engagement in a manner that would offer practical insight into when and under what circumstances children successfully navigate situations allowing peer engagement and when they do not, a specific qualitative tool was created for the purpose of this study.

Hence, we will examine how children with certain combinations of temperamental traits (i.e., effortful control, surgency/extraversion, and negative affectivity) interact with their peers,
what kind of patterns emerge, and how the addition of a qualitative observation tool enhances the data we have from existing measures.
CHAPTER 2: LITERATURE REVIEW

Temperament

Historically, temperament researchers have been unable to reach a consensus on a definition of temperament. For example, Thomas and Chess (1977) defined temperament as unique, individual differences in how a child reacts to his/her environment and described it as something that could be equated to a ‘behavioral style’. Mary K. Rothbart, another prolific temperament researcher, believed temperament should be understood more through a constitutional approach (Rothbart & Derryberry, 1981). More specifically, she defined temperament as individual differences in emotional, motor, and attentional reactivity. These individual differences are, in turn, measured by latency, intensity, and recovery of response. All these traits are assumed to have a constitutional basis, wherein ‘constitutional’ refers to the enduring biological traits of individuals which are influenced by context over time (Rothbart et al., 2000; Rothbart & Derryberry, 1981). In 1987, following a discussion between several key temperament researchers of the time (namely H. H. Goldsmith, A. H. Buss, R. Plomin, M. K. Rothbart, A. Thomas, and S. Chess), a consensual definition of temperament was developed. Specifically, this group noted that temperament “consists of relatively consistent, basic dispositions inherent in the person that underlie and modulate the expression of activity, reactivity, emotionality, and sociability” (Goldsmith et al., 1987). The explanation also states that while temperament is believed to be relatively impervious to context early in life, context and experiences may become far more salient over time.

With additional research, however, this definition was contested. In particular, researchers speculated as to what other traits could be added to the ones listed in the definition above (Rothbart
et al., 2007), noted the lack of complexity in this definition around biological factors affecting development, and questioned whether temperamental traits were actually continuous (Shiner, 2015). As such, work towards a general definition of temperament continued. More recently, Shiner and colleagues (2012), in their article discussing the Goldsmith et al. (1987) definition of temperament on its 25th anniversary, provided a revised definition of temperament, describing it as early-emerging basic dispositions which are a product of interactions between biological and contextual/environmental factors over time. Despite repeated efforts, there is still no consensus on the definition of temperament. As a result, researchers have used different definitions and various inherent traits to suit their study; the result has often been inconsistency in the links between temperament and other developmental traits. For the purposes of this current study, we have defined temperament as Rothbart did – focusing on effortful control, surgency/extraversion, and negative affectivity.

**Temperamental traits**

Following efforts to identify a global definition of temperament, researchers shifted their focus to specific traits they believed reflected an individual’s temperament. One of the first classifications of temperament was provided by Thomas, Chess, and Birch (1970), where they describe nine dimensions or temperamental traits, including sensitivity, intensity of reaction, activity level, adaptability, approach/withdrawal, persistence, rhythmicity, quality of mood, and distractibility. They suggested that individuals fall along a continuum on each of these traits, resulting in innumerable possible combinations and thus a wide variety of temperaments (Thomas & Chess, 1977). They subsequently suggested that these nine traits can be further grouped into three typologies: Easy (adjust easily to new situations, quickly establish routines), Difficult (slow to adjust to new experiences, likely to have intense, negative reaction to some stimuli), and
Inhibited or Slow-to-warm (mild negative responses to new stimuli, but slowly adjusts with repeated exposure). Although Thomas and Chess paved the way towards a focus on temperamental traits, the extensive number of possible combinations of traits made it difficult to identify an individual’s temperament and thus a more simplified approach was needed.

Following up on the work of Thomas, Chess, and Birch (1970), Rothbart suggested that temperament could instead be described in terms of three main traits: Effortful Control, Surgency/Extraversion, and Negative Affectivity (Rothbart, 1981; Rothbart et al., 2001). Effortful control includes inhibitory control, attention focusing, perceptual sensitivity, and low intensity pleasure (Rothbart & Putnam, 2002) and reflects a child’s ability to make decisions without giving in to impulsive urge. Children with high effortful control are able to effectively plan future actions by modulating their behavior (Rothbart, 2007). Surgency/extraversion can be identified by high activity level, impulsivity, and high-intensity pleasure-seeking and reflects children who tend to be highly active, constantly exploring, and may disregard rules (Rothbart & Putnam, 2002). Negative Affectivity is comprised of sadness, frustration, fear, and difficulty in soothing and reflects (Rothbart & Putnam, 2002). Although Rothbart’s typology provides a more simplified approach to understanding temperamental traits than did Chess and colleagues’ nine dimensions while at the same time offers far greater specificity in the behaviors and traits deemed central to an individual’s temperament than do the categories of easy, difficult, and slow to warm. As such, it is commonly used by researchers in studies of temperament.

*Temperamental continuity over the lifespan*

Temperament can be observed in children as young as two to four months of age and is therefore referred to as one of the more biologically based individual traits (Kagan, 1997; Thomas et al., 1970). In fact, temperament is thought to be the initial state from which personality develops
There is a significant body of literature demonstrating the stability of temperamental traits across the lifespan. For example, in one of the most well-known longitudinal studies of temperament, Caspi (2000) used the Dunedin Study (a sample of over 1,000 children, followed from birth to adulthood) to show that temperamental traits measured at three years of age predict personality and behavioral outcomes such as self-control, harm avoidance, stress reaction, and well-being across adolescence and young adulthood. Similarly, Shigeto et al. (2014) showed that family characteristics and child temperament measured at 13 months of age predicted child behavior with parents at 36 months of age. In yet another article, Kochanska et al. (2007) reported that children with a ‘fearless temperament’ had more positive relationships with mothers as they grew up. Extensive data presented by Roberts and DelVicchio (2000) in a meta-analysis of 152 longitudinal studies showed substantial consistency in personality and temperamental traits in childhood, as well as later in life. Given that temperamental traits show considerable continuity over time, they may be particularly useful for early identification of individuals who may be at risk for poor outcomes later in life. As such, careful consideration of environmental factors that may support the development of individuals with various temperamental traits is essential. One of the first, and most influential, environmental factors children experience outside of the home that might influence the expression of temperamental traits is peers.

**The Development of Peer Engagement in Early Childhood**

Preschool is usually the first time children begin experiencing stable engagement with peers, but research has shown that interactions with peers begin in a basic form during infancy (Brownell & Brown, 1992; Williams et al., 2010). Some researchers believe that for infants born in a hospital, the first interaction with other infants is the matching of negative affect, which is
termed “contagious crying” – when one baby cries in the nursery, other babies begin crying as well (Sagi & Hoffman, 1976). Subsequently, babies as young as 2 months of age can share mutual glances and by 6 months they can babble and smile at peers (Hay et al., 1982; Mueller & Vandell, 1979; Vandell et al., 1980). Around the age of 18 to 24 months, a large proportion of peer engagement can be considered negative (e.g., poking a peer in the eye or pulling his/her hair) but peer researchers believe that all types of interactions – positive or negative – are important signs of social interest among children this age (Brownell, 1990). Once children reach preschool, however, negative engagement typically drops significantly in favor of more positive social behaviors (Radke-Yarrow et al., 1983; Vandell et al., 2006).

In addition to more positive interactions, studies have shown that the frequency of engagement also increases during preschool, refuting the theory forwarded originally by Piaget (1959), which suggested preschoolers were socially unaware. Parten (1932) was one of the first to describe different categories of ‘social participation’ among children. She suggested that social participation exhibits a developmental progression from non-social interactions (such as engaging in solitary play or being an onlooker while others play) to substantially more social behaviors (beginning from parallel play and moving up to cooperative group play). Rubin and Coplan (1998) modified the five categories of social participation that emerged out of Parten’s (1932) work to reflect more recent understandings of development and engagement. The first category they suggest is ‘unoccupied behavior’, where a child is explicitly seen to have an absence of intent in their actions, which is usually observed as blankly staring at something/someone, or as aimlessly walking around the space they are in. Second is ‘onlooker behavior’, which can be observed when the child is looking at and listening to other children’s play, but not attempting to get actively involved in the same. The third category is ‘solitary play’, where the child is playing by
him/herself, at least three feet away from any other child, and paying little to no attention to anyone else. Fourth is ‘parallel play’, where the child is playing within three feet of another child, but the two are not actively playing with each other (this is the most common form of play for preschoolers). The last category is ‘group play’, where the child is actively playing with others in a group and everyone is acting towards a common goal for the game being played (Rubin & Coplan, 1998).

Children are more likely to engage in behaviors from the latter categories of peer social engagement as they grow up because they begin playing in “cognitively and socially more mature fashions” (Rubin & Coplan, 1998). With time, play transitions from the relatively simplistic parallel play to complex cooperative play, with the children following mutually agreed upon scripts, including pretending to cook meals for each other, taking care of ‘babies’ (dolls), driving to work by car (chairs set up in two rows to mimic car seats), etc. (Rubin et al., 1998). With age, the complexity of these roles and scripts increases (Levin & Rubin, 1983; Mueller, 1972; Vandell et al., 2006). These instances of pretend play can provide children a safe space to learn how to articulate and communicate to their peers what they mean, how to compromise and negotiate with others, and how to deal with conflicts if they arise (Howes et al., 1992; Vandell et al., 2006). Indeed, peer groups in early childhood are a way to acquire and implement social skills. For example, peer engagement provides a unique learning environment in which children can learn how to take other’s perspectives, how to cooperate and resolve conflicts, and how to understand concepts such as mutual respect, reciprocity, and fairness (Rubin & Coplan, 1998). Of course, with the growing complexity and refinement in preschoolers’ peer engagement comes an increase in relational aggression, especially in the context of a child trying to gain control of an interaction by
showing negative affect. Such interactions, however, need not be seen as problematic, necessarily, as they may be a sign of important cognitive and social development (Vaughn et al., 2003).

Preschoolers’ peer engagement can also be understood through Kohlberg’s (1966) cognitive-developmental theory. According to this theory, preschoolers are able to recognize the differences between sexes and begin to identify what is considered ‘appropriate’ for males or females in terms of appearance (e.g., girls wear dresses, boys do not), behavior (e.g., it is acceptable for girls to cry if they are hurt, but boys should not cry), or play (e.g., girls can play with dolls, but boys should not). This recognition gives rise to growing preferences for same-sex peers, which begins increasing slowly from around age 3 years, but becomes quite pronounced around age 5 (Howes, & Phillipsen, 1992; LaFreniere et al., 1984). These peer preferences are driven, in large part, by a developing understanding of gender consistency (that is when the child realizes that he/she belong to one gender and that does not change). With this comes identification with others of the same gender and adhering to certain activities which, societally speaking, are associated with their gender. As a result, there is a much higher chance that children play with same-sex peers because they find similar themes of play to be interesting.

**Importance of Peer Engagement for Development**

Studies have shown that high-quality friendships can help reduce bullying behaviors in children with existing externalizing problems (Bollmer et al., 2005) and that prosocial peer behavior may stop adolescents in dangerous and violent neighborhoods from engaging in antisocial behaviors (Criss et al., 2017; Smith et al., 2001). Laursen et al. (2007) corroborate these findings in a sample of seven to nine-year-old Finnish children. Specifically, they found friendship to be a buffer against possible social isolation and internalizing/externalizing problems. There is also evidence to show that overall peer acceptance can facilitate academic skill development
For example, Kiuru and colleagues (2015) followed a sample of 625 Finnish children from Kindergarten to fourth grade, and found that peer acceptance positively predicted students’ academic skills (such as reading fluency and arithmetic fluency) in fourth grade as compared to Kindergarten. Research has also demonstrated strong detrimental effects on children’s behavioral outcomes and mental health when they face peer rejection (Hay et al., 2004). For example, Trentacosta and Shaw (2009) found a positive association between peer rejection and antisocial behavior in a sample of boys ages 8 to 11. Coie and colleagues (1992) found that peer rejection and childhood aggression in third grade predicted adolescent maladjustment (Coie et al., 1992).

Early childhood is a fundamental time in an individual’s life as it is when children begin to learn how interpersonal relationships are formed and maintained, something that affects the person for their whole life (Christenson & Hawsy, 2004; Hartup, 1989; Piaget, 1926, 1932). Preschoolers who tended to spend time in closer proximity to peers were also more likely to have reciprocated friendships as compared to children who did not (Santos et al., 2015). Vaughn and colleagues (2016) also found that when preschool aged children engaged with peers socially they exhibited more socially competent behavior and were more accepted by peers. Children who do not experience adequate peer engagement during early childhood may be at risk of developing externalizing (e.g., aggression, delinquency) and internalizing problems (e.g., depression, low self-esteem) later in life (Bollmer et al., 2005; Rubin & Coplan, 1998). For example, “dependable and enduring peer affiliations” in Kindergarten can attenuate depressive behaviors at an older age, while peer disengagement in Kindergarten may predict depressive behaviors in higher grades (Schrepferman et al., 2006). Effects such as these can be seen within fairly short periods of time as well. Preschool children who faced peer rejection were more likely to participate in relational
victimization during peer engagement within a few months of initial observations (Godleski et al., 2015). Although considerably more research on the importance of peers has been conducted with older children, it is evident that early peer engagement sets the stage for later social interactions. Yet researchers have only recently begun to explore the effects of individual differences in more biologically based traits like temperament on the formation and maintenance of these relationships among preschool-aged children – something we explore further in the current study.

**Temperament and Peers**

Studies have suggested that temperament essentially acts as an important factor to increase “goodness of fit” of the child with his/her environment (Thomas & Chess, 1977). Included in this ‘environment’ are peers and there are some studies that have found associations between children’s temperament and their frequency and quality of interaction with peers (Acar et al., 2015; Degnan et al., 2010; Keogh & Burstein, 1988). Indeed, children with overall difficult or inhibited temperamental traits face challenges in their peer engagement and these challenges may have lifelong consequences. For example, in a study by Gülay (2012), Kindergarten-age children with more difficult/inhibited temperamental traits (high levels of aggression, asocial behavior, and fear-anxiety) faced peer exclusion and peer victimization, while children with easier temperamental traits (such as high level of approach, persistence, and rhythmicity) displayed more prosocial behavior. Using samples of four-year-old Chinese and Canadian children, Chen, Wang, and DeSouza (2006) found that children high on ‘shyness-inhibition’ were far more likely to receive negative responses from peers during play than were non-shy children. Szewczyk-Sokolowski and colleagues (2005) also found in a study of 98 preschoolers in the United States that children with difficult temperamental traits were more likely to get negative nominations from peers on sociometric tests.
These negative experiences with peers may be explained, in part, by how difficult or inhibited children attempt to engage with peers (Neuharth-Pritchett, & Ma, 2006; Pekdogan, & Kanak, 2016). For example, difficult children may be too aggressive in their interactions, hence making peers feel disinterested in responding (Gunnar et al., 2003; Rubin et al., 2005). The aggression exhibited may manifest in varied ways, including relational aggression (such as telling peers to not talk to a certain child) and physical aggression (Russell et al., 2003). Inhibited children, on the other hand, may be so tentative in their interest in peers that their peers do not understand how to react, or simply overlook them; the inhibition is seen as fearfulness or a lack of confidence, and such children are far more likely to face rejection from their peers (Rubin et al., 2005). Clearly there is an ample body of research on temperament and peers, but the majority of this research has focused on how children with more ‘challenging’ temperamental traits experience trouble in social relationships. More importantly, much of the research in this area has focused on these associations without considering how environmental or social contexts affect peer engagement. One reason for this gap may be limitations in the tools that are used to measure both temperament and peer engagement.

**Existing Tools for Studying Peer Engagement and Interaction**

The study of peer engagement has been an important component of psychology research for a long time. As discussed above, researchers have explored both the predictors and consequences of peer engagement in these studies and have frequently employed a common set of measures to understand various associations. The majority of these tools have been quantitative and have focused on specific behaviors or skills regularly observed during peer engagement. Further, the majority have been parent, teacher, or self-report. In this section, I discuss some of these tools in an effort to demonstrate that while valuable, they are missing some critical
information about peer engagement – namely the environmental and social contexts in which these interactions occur. This is by no means an exhaustive list of all tools measuring peer engagement but more so a sampling of the measures that I have most frequently come across during the course of this work.

We begin with the purely quantitative tools, namely the *Penn Interactive Peer Play Scale* (PIPPS; Castro et al., 2002), and the *Preschool Social Behavior Scale – Teacher Form* (PSBS-T; Crick et al., 1997). PIPPS is a popular teacher-reported paper and pencil measure used to study peer interactions. Teachers are asked to score children, using a scale ranging from 1 (Never) to 4 (Always), on three aspects of play – interaction (how well does the child interact with others), disruptiveness (how disruptive is the child during group activities), and disconnectedness (does the child remain aloof from others). The PSBS-T was constructed for a specific study on relational aggression amongst peers, and focuses on that particular aspect. Out of the 23 items on the form, 8 assess relational aggression, 8 assess overt aggression, four assess prosocial behavior, and three assess depressed affect. The scores were on a scale from 1 (never or almost never true of this child) to 5 (always or almost always true of this child), and teachers from one classroom were asked to meet as a group, discuss each child, and then fill out the form based on their discussion. Both of these tools are teacher-rated and the resultant data is quite decontextualized. As such, it can be difficult to extrapolate from that data, especially for cases where the child is acting differently than expected. Hence it can be difficult to determine the reasoning behind why or under what circumstances something is occurring with these decontextualized tools.

If we look at more observation-based tools, there is the *Play Observation Scale* (POS) by Rubin (1989), and the *Child-Peer Observation Code* (C-POC; Snyder et al., 2003). The POS is designed to help “assess the structural components of children’s play nested within social
participation categories” (Rubin, 1998). Using this tool, a child is observed for 10-second intervals (a total of 1 minute along with preliminary setup and coding time, repeated for 5 minutes), and then the observation is coded for ‘social participation’ (i.e., was the nature of interaction solitary play, parallel play, or group play) and ‘cognitive quality of child’s play’ (i.e., was the play constructive, dramatic, functional, exploratory, or games; Rubin & Clark, 1983). The C-POC codes child behavior on the playground into one of seven hierarchical categories – negative interaction, rough play, positive interaction, parallel play, solitary play, unfocused, and other. The observations are for 10 seconds, repeated 30 times for a total of five minutes of observation, and the tool is administered by trained observers. This tool provides information on peer victimization and codes the information into whether or not a child is experiencing physical or verbal aggression from peers. Both of these tools are observer-rated, and are based on real time observations as compared to providing a rating based on past experience with a child. Although more helpful than the first two tools, these tools still utilize a scoring system, and they both observe each child for a very short span of time. Consequently, much of the essence of the interaction is stripped away, and we are left with a very fleeting image of what the child was doing.

Another tool that has recently emerged is The Individualized Classroom Assessment Scoring System or inCLASS (Downer et al., 2010), which provides far more focused and personalized observations in the classroom, and, most importantly, has a component measuring peer interactions. This component includes four dimensions – Peer Sociability, Peer Assertiveness, Peer Communication, and Peer Conflict. Using this tool, a child is observed for 10 minutes and then scored on a 7-point scale based on their behavior as compared to the behavioral markers laid out in the manual. The inCLASS combats a number of the issues that other tools have by employing a longer observation time (compared to other tools) and being administered by third-
party observers (which reduces the chance of bias). Hence, it might furnish more comprehensive data about peer engagement. However, even though this tool employs a more qualitative approach to data collection, in the end it still provides scores on a quantitative scale. This means that we still cannot extrapolate additional details, if so desired, from those scores.

Therefore, based on the tools discussed above, which were selected to illustrate the limitations of existing measures, it is clear that there is a dearth of tools which can bring together not just ‘what’ is happening, but also ‘why’ it is happening. The absence of context in these tools means that they cannot provide information about why a particular action or behavior occurred, and that is why these tools cannot completely answer the questions that this current study wishes to explore. Furthermore, these tools do not record the content of children’s interactions which can sometimes help explain why an interaction progressed in a certain manner.

The Current Study

Our discussion thus far reveals two main points – first, although there is ample research on both temperament and peers and some research on how peer engagement is affected by temperament, there is still a lack of information regarding the contextual basis for such engagement. In other words, we do not have a clear understanding of why children behave as they do in some social contexts while they behave quite differently in others nor do we fully understand what contexts or experiences trigger specific behaviors. This results in an inability to explain why some children with specific temperamental traits thrive and why some struggle in their engagement with peers. Second, the tools used to study peer engagement do not commonly provide essential information about the environmental or social contexts in which this engagement occurs, nor do we get a good sense of the content of the conversation. Indeed, the majority of observational tools offer average behaviors across children or classrooms and not information about specific children.
Yet, the context and content of interactions may be central to understanding the circumstances under which children with specific temperamental traits can successfully engage with their peers and those circumstances that make successful engagement more challenging. With these limitations in mind, the goals of the current study were 1) to use quantitative data to examine the links between temperamental traits and peer engagement among a sample of diverse preschool children and 2) to develop and subsequently use a qualitative tool that provides rich data not only on the type of peer engagement and the affect present in that engagement but also the content of the conversation during the engagement, and the environmental and social contexts in which the engagement occurs. Such a tool could go a long way towards advancing our understanding of how to support children with varying temperamental traits to successfully engage with peers. More specifically, I aimed to address the following research questions:

1. How does peer engagement differ for preschoolers with different temperamental traits?
2. Does a qualitative observation tool identify meaningful differences in peer engagement styles in addition to what the existing paper and pencil measures already find?
CHAPTER 3: METHODS

Research Methodology

A mixed methods research design was used for this study. The choice to use mixed methods in this study stemmed from the need to expand upon existing data by developing a deeper understanding of peer engagement for children with different temperamental traits. To accomplish this, I introduced a qualitative observational tool to investigate whether it provides a deeper understanding of how temperamental traits and peer engagement associated over and above that provided by the quantitative tools. In the spirit of complete transparency and clarity, it is important to acknowledge the paradigmatic foundation of this study, which is a Dialectical stance. This paradigm aims to uphold the integrity of the different paradigms from which the different methods traditionally emerge (for example, a more Positivist paradigm for quantitative research, and more Critical Theory or Constructivist paradigm for qualitative research), and assumes that all paradigms have something to offer. It is through the interaction and juxtaposition of these different paradigms that we can reach a more holistic understanding of the matter being studied (Teddlie & Tashakkori, 2010). As Greene (2007) puts it, “important paradigm differences should be respectfully and intentionally used together…to achieve dialectical discovery of enhanced, reframed, or new understandings”. Ultimately, the goal for the current study is moving towards a deeper understanding of peer engagement and explore whether our understanding of how temperamental traits are expressed during peer engagement can help us identify and subsequently support the development these critical relations during early childhood. To do this, it is important to use a multiplicitic approach with the different paradigms so that all the questions may be
answered satisfactorily and the differences between methodological approaches can be clearly acknowledged while still reaching a consensus (Greene, 2007).

In the current study, while the quantitative measures have a more Positivist background, the qualitative measure is more Constructivist in nature. The Positivist paradigm suggests that knowledge is based upon natural phenomena and the interactions these phenomena have with their environment. Hence, this knowledge can be ‘discovered’ by the researcher and is not typically seen as something produced by the subjects. For the quantitative tools used in this study, while they do not necessarily subscribe to the Positivist idea of data being factual and unaffected by the subjects, the way the data from these tools is usually analyzed is reductionist – the different elements of certain behaviors are measured separately, and analyses are done separately as well. As a result, these tools do not focus much on the experience of each individual child because of the focus on treating these concepts as a separate generalizable entity to be studied. The qualitative tool, on the other hand, is based on the Constructivist paradigm. The underlying basis of Constructivism is that knowledge is constructed by the individuals being studied, based on their experiences. The researcher’s role here is to attempt to understand how the individuals being studied are constructing their knowledge.

It is through the dialectical conversation between these two paradigms that I intend to answer my research questions; a dialectical discussion between these paradigms aims to make sure that the core ideas of both are respected and acknowledged, while also understanding how they might conflict with each other. It is important to note that there might be divergence between the two paradigms. For example, data gathered on a measure aiming to assess peer engagement (filled out by the teacher) might show that a child is rated high on disruptiveness by the teacher. The same child, when observed using the qualitative tool, may be seen to be disruptive only when playing
with a certain friend. In such a case, it is important to acknowledge the emerging contradictions, and move forward with the research armed with the new information. The aim is to be respectful towards the differences and explicitly state them, not to try and resolve them. In this way, we can ensure an unambiguous dialogue through which we acquire information from various points of view, hence enriching the overall study.

The study design was a component design, as the quantitative and qualitative tools and data are mostly separate throughout the study, but are brought together in the results for two seemingly contradictory reasons – first to provide clarity on how the tools differ from each other in terms of the information they unearth, and second, to assimilate the data acquired from both the quantitative and qualitative tools to create a complete picture of what peer engagement looks like for children with different temperamental traits. This design shows the importance of both the quantitative and qualitative data, illustrates their significance as separate entities, and demonstrates how they complement each other to help answer the research questions most effectively. It is important to note, however, that the current study is not a standard mixed methods study. The primary goal of the study was to develop a new qualitative tool which would offer novel information on the content of interactions during peer engagement and the context in which those interactions occur. The sample for the qualitative observation tool was chosen using quantitative data about the children’s temperamental traits, but the qualitative tool itself was designed based on my own experiences with existing observation tools and the limitations I saw in them. Additionally, the data from the different tools do not mix with each other until the very end, when they are presented together in case studies. Hence, mixing mainly happens in the case studies section.

The main purpose of mixing methods in this study is for complementarity. The reason for this is that while the study begins with the collection of quantitative data, the qualitative
observation tool is used with the aim of explaining the phenomenon more clearly, and to supplement the information acquired from the quantitative piece with additional information (especially in terms of content and context), which may not always be apparent from the quantitative data alone. In addition to this, there is an unequal status to the different pieces of data, as the qualitative data is given more importance than the quantitative data here. The reason for this is that while there are some analyses from the quantitative data, it is used to finalize the sample for the qualitative tool and case studies. The tools were used in a concurrent manner – the quantitative data was collected first over a school year, and the qualitative data was collected subsequently over the next year.

**Participants**

Data from a diverse sample of 106 Head Start children ages 3 to 5 years old (38-68 months old; M = 56.82, SD = 8.03) who were participating in a larger project funded by the National Science Foundation (GRANT #NSF BCS 1651189) were used in the current study. Participants were recruited from several Head Start settings located in one mid-western state. The full sample consists of 55.2% girls and 44.8% boys. The racial distribution is 50.9% African American, 16% Latino, 7.5% Asian, 5.7% White, 16% Multiple races, and 3.8% Other. Four children from one classroom were selected for a set of qualitative case studies based on their temperamental traits (see below for a detailed description of the selection process). The final qualitative sample included two boys and two girls. Two of the children were African-American, one child was Latina, and one child was White. Two of the children were 4 years old and two were 5 years old at the time they were observed using the qualitative tool.
Measures

Both quantitative and qualitative tools were used for the current study. I first describe the quantitative tools that were used and subsequently describe the development of the qualitative observation tool.

Outcome variables

Peer engagement. Children’s interactive peer play competencies were measured using the teacher-reported *Penn Interactive Peer Play Scale* (PIPPs; Castro et al., 2002). This scale was developed particularly for Head Start classrooms. It assesses children’s competencies within play and helps distinguish between children who exhibit positive peer engagement and those who are less successful at engaging with peers. The measure consists of 32 items, scored on a four-point Likert scale (“never, seldom, often, always”). Sample items included: ‘Shares toys with other children’, ‘Is ignored by others’, and ‘Starts fights and arguments’. Based on exploratory factor analyses of the scale, three underlying dimensions of peer play were identified – Play Interaction (indication of a child’s strengths during play, such as prosocial behaviors which includes comforting peers, showing creativity in play, encouraging others to play), Play Disruption (indication of a child’s antisocial play behaviors, and aggression during play), and Play Disconnection (indication of withdrawn behavior and nonparticipation in play). High reliability was found for Play Interaction ($\alpha = .92$), Play Disruption ($\alpha = .91$), and Play Disconnection ($\alpha = .8992$). Interrater reliability between teachers and assistant teachers was also high ($r = .85$). Support for concurrent validity was also found when compared with the Social Skills Rating Scale (SSRS; Gresham & Elliot, 1990) with positive correlations between the SSRS scales and the PIPPS factors (Castro et al., 2002).
**Predictor variable**

**Temperament.** Children’s temperamental reactivity and regulation was measured using the teacher version of the *Child Behavior Questionnaire* (CBQ; Rothbart, Ahadi, Hersey, & Fisher, 2001). Teachers were asked to respond to a set of 94 questions about the child’s behaviors in the past 6 months using a 7-point Likert scale (1 = extremely untrue of this child to 7 = extremely true of this child). Sample items included: ‘Seems to be at ease with almost any person’, ‘Is quite upset by a little cut or bruise’, and ‘Often rushes into new situations’. Initially, a total of 15 subscales scales reflecting a range of traits are derived from the tool. These scales can be grouped into the three higher order constructs reflecting Effortful Control (Attentional Focusing, Inhibitory Control, Low Intensity Pleasure, Perceptual Sensitivity, and Smiling/Laughter), Surgency/Extraversion (Activity Level, High Intensity Pleasure, Impulsivity, Positive Anticipation, and reversed dimension of Shyness), and Negative Affectivity (Anger, Discomfort, Fear, Sadness, and reversed dimension of Soothability). The CBQ provides “a highly differentiated assessment of temperament in children” (Rothbart, Ahadi, Hershey, & Fisher, 2001) and demonstrates adequate reliability (α = 0.75; Clark, Prior, & Kinsella, 2002; Langua, 2003). In the current sample, reliabilities are: .67 for effortful control, .86 for surgency/extraversion, and .67 for negative affect. Convergent Validity based on parental agreement was also found to be adequate: correlations between parent ratings on different scales had a mean agreement of .51, and similar results were observed over three independently assessed samples.

**Control variables**

The variables of Child Sex, Age, and Classroom were used as controls. Child sex was coded ‘1’ for Female and ‘0’ for Male. Age was recorded in months. Given the small number of classrooms, I was not able to conduct multi-level modeling to account for the nesting of children
within classrooms. Instead, a set of dummy variables reflecting each of the classrooms in the sample was included to control for possible differences across classrooms.

**Qualitative Observational Tool**

The observational tool, called the Peer Engagement Qualitative Tool (PEQT), was created specifically for this study, and is designed to look at peer engagement in terms of three main aspects:

1) The general **context** in which the interaction occurs, including the **situational context** (where the interaction is occurring, for example, a specific play center like blocks or writing, at mealtime, during carpet time, etc.) and the **social context** (e.g., with peers or adults). The context will provide key information about where the interaction occurring, with whom it is occurring, and who else is in the vicinity during the interaction. This part of the tool helps capture the sometimes swiftly changing context of a child who is moving around the classroom a lot and finds themselves in a variety of settings within a short span of time. It also helps keep track of the different people with whom the child interacts within this time span, which may provide a deeper understanding of why the interaction might change given the different people involved in the interaction.

2) The **affective cues** displayed in the interaction, including **emotional** (e.g., happy, sad, angry, interested, fearful etc.) and **behavioral** (e.g., acting out/in, approach, avoidance, impulsive, neutral etc.). This section of the tool intentionally goes into a great amount of detail towards understanding the child’s affect during the interaction. The aim is to look beyond simply the valence (positive or negative) of the affect by incorporating information about both the emotional and behavioral aspects of affect. For example, a child who exhibits a ‘happy’ emotional affect could display a range of behavioral affects, such as
being open to approaching others, or could be avoidant of others as they prefer to play by themselves at that moment. Hence, the bifurcation of affect into emotional and behavioral also helps reveal more information from the interaction.

3) The specific content of the interaction, including the type of conversation or interaction it is (e.g., a simple conversation, argument, negotiation, role play, or parallel play) as well as specifically what is being discussed in the interaction. Examining the content of an interaction when a child is engaging with a peer can add a large amount of meaning to why the child behaves a certain way. Although this section does focus on verbal interactions, non-verbal cues should also be recorded. This is particularly important for preschool age children, as parallel play is common, and during those times there might not be much verbal conversation, but the child might perform certain actions or react to actions performed by the peer. These actions hold a lot of meaning and could be the difference between understanding why the child reacts in a certain manner right after the parallel play.

The tool breaks up the process of data collection into easily manageable chunks of time. Each child is observed for a minimum of one 60 minute cycle, over a total of 12 slots of 5 minutes each. Additional time is required to note down the observations after each 5-minute observation, and hence the total time required to complete one observation cycle is slightly higher than an hour. For the current study, I observed each of the four children chosen for the case studies for two full cycles, so a total of more than 8 hours of observations. Details on the creation of the tool and subsequent issues are discussed below in the procedure.

Procedure

Demographic data were collected via teacher reports in the fall of 2017. Teacher reports of temperamental traits, peer play competencies, and child-reported sociometric interviews were
collected at this time as well. The qualitative observation tool was designed, piloted, and modified over the summer and fall of 2018. Finally, the qualitative tool was implemented in the Spring of 2019. Based on the quantitative data acquired from the Child Behavior Questionnaire which provided scores on three temperamental traits, purposive sampling was employed to select four children who exhibit various combinations of scores on the central temperamental constructs of effortful control, surgency/extraversion, and negative affect. Qualitative observational data was collected in the spring of 2019. The qualitative observation tool was used to collect 8 hours of observation data across 6 days for these four children.

The data collection tools used in the current study were administered according to the timeline shown in Table 1. The collected quantitative data was analyzed through descriptive statistics, correlations, and by fitting a series of regression models in which I regressed Peer Engagement on Temperament, controlling for child sex, age, and classroom.

**Creation of the tool**

Given that the existing measures already provided quantitative data on the phenomenon, it seemed useful to bring in a tool which could provide qualitative data as a supplement. In order to address the limitations of the existing tools, I decided to develop a new tool. Existing tools may look at context, affect and content of peer engagement, but the tool created for this study needed to furnish a level of detail that could help clarify any doubts left behind from the data collected by the other tools. For example, affect needed to be explored in more detail, so that, when seen in conjunction with the child’s other actions, it gave meaning to why we were seeing that affect at that point of time. There are existing measures which discuss the context of a child’s interactions, but the current tool can help draw deeper meaning from this context. In particular, as discussed in the description of the tool in the section above, the people who get involved or are simply present
in the vicinity of a child during an interaction, might change how the interaction occurs. It is important to have that information and look at it in connection with the general area in which the interaction is occurring. Therefore, the main impetus for forming this tool came from the leftover questions and doubts from existing tools, and the details in this tool aim to clarify most of those doubts.

Observations were chosen as the data collection method for this tool as it is a lengthy, but information-rich way to note interactions. The three major aspects being observed – affect, content, and context – were chosen as they can encapsulate the main tangible components of an interaction, especially to the extent one can observe an interaction which they are not an active part of. Having decided upon this breakup of components to look at, the next step was to further break apart the underlying constructs within these three components. After going into the classrooms with this basic version of the tool and intensive discussions about the same, it eventually became easier to see that there were certain ways in which these components could be split. The context helps us understand the physical environment the child is in, the affect component is used to record what kind of emotional affect and behavioral affect the child is exhibiting to help us understand their state of mind, and the final component is content, where the bulk of the data comes in based on what form the peer engagement took. Altogether, this resulted in a tool which takes about 90 minutes per child, which includes the time for observing and also for recording.

Analyzing the qualitative data

The data derived from the PEQT was recorded in a spreadsheet which incorporated different pieces of the data for each observation cycle together. Then, I examined the data for common patterns, stark discrepancies, and intriguing narratives within peer interactions which illustrated temperamental differences.
Quantitative Findings

Descriptive analyses

Descriptive statistics on key outcome, predictor and control variables are presented in Table 2. Mean scores for all three temperamental traits – Effortful Control, Surgency/Extraversion, and Negative Affect – show more middle to high range scores for the sample, suggesting that children in general have moderate to high effortful control, exhibit moderate to high levels of surgency/are more extroverted, and display moderate to high negative affect. Teachers indicated that children displayed modest levels of interaction with peers (M = 14.85) with some variability around the mean (SD = 5.55). Children displayed relatively low levels of disruptiveness (M = 13.48) but there was considerable variability around the mean as evidenced by a standard deviation of 8.9. Similarly, children were not reported by their teachers to be particularly disconnected from peers (M = 7.42) and there was far less variability in disconnectedness (SD = 4.51). It is interesting to note that some children received scores of “0” on the disruptive and disconnectedness scale, suggesting that some children displayed an absence of disruptiveness and disconnectedness with peers; the minimum value for Interaction was 2.00, suggesting interaction skills were not evaluated by teachers to be completely absent in any child.

Correlations between children’s temperamental traits (i.e., effortful control, surgency/extraversion, and negative affect), and peer engagement (i.e., interaction, disruptiveness, and disconnectedness) are presented in Table 3. Children’s effortful control was strongly and positively associated with their level of interaction such that children who were rated by teachers as exhibiting greater effortful control interacted more with their peers than did children who
exhibited lower effortful control. Children’s surgency/extraversion and negative affect were both strongly and positively correlated with disruptiveness. That is, children with higher levels of surgency/extraversion or negative affect were rated as more disruptive by teachers.

**Predictive analyses**

To investigate whether temperamental traits were associated with children’s peer engagement in preschool, I fit a set of regression models, in which we regressed each of the four indicators of peer interaction (i.e., Interaction, Disruptiveness, and Disconnectedness) on each temperamental trait (i.e., Effortful Control, Surgency/Extraversion, and Negative Affect). All models controlled for the effects of child sex, age, and classroom. Results are presented in Table 4. Effortful control was a significant predictor of interaction and, along with child sex and age, accounted for 40% of the variance in interaction ($F [3, 96] = 21.435, MSE = 18.045, p = .000$). Similarly, surgency/extraversion significantly predicted interaction and accounted for 38% of the variance in interaction ($F [3, 96] = 5.675, MSE = 25.594, p = .001$). Finally, negative affect significantly predicted interaction and accounted for 52% of the variance in interaction ($F [3, 96] = 11.897, MSE = 21.966, p = .000$). Children who exhibited higher effortful control were reported by teachers to interact more with peers while children who displayed more surgency/extraversion or negative affect were reported to interact less with peers (see Table 4).

Effortful control, surgency/extraversion, and negative affect were also significantly associated with disruptiveness (see Table 4). Children who exhibited high effortful control were perceived by teachers to be far less disruptive than children who exhibited higher levels of surgency/extraversion or negative affect, even after accounting for child sex and age. All three models accounted for a large amount of variance in disruptiveness. Specifically, effortful control accounted for 54% of the variance in disruptiveness ($F [3, 94] = 13.155, MSE = 58.490, p = .000$),
surgency/extraversion accounted for 58% of the variance in disruptiveness ($F[3, 94] = 16.028$, $MSE = 54.943$, $p = .000$), and negative affect accounted for 63% of the variance in disruptiveness ($F[3, 94] = 21.108$, $MSE = 49.620$, $p = .000$).

Finally, findings for disconnectedness were similar, although the amount of variance explained was somewhat lower. Specifically, effortful control (as well as sex and age) accounted for 39% of the variance in disconnectedness ($F[3, 96] = 5.832$, $MSE = 17.511$, $p = .001$) as did surgency/extraversion ($F[3, 96] = 5.868$, $MSE = 17.494$, $p = .001$). Finally, negative affect accounted for 43% of the variance in disconnectedness ($F[3, 96] = 7.399$, $MSE = 16.814$, $p = .000$). Children with higher levels of effortful control or surgency/extraversion were reported to be less disconnected, whereas children who exhibited higher levels of negative affect were reported to be more disconnected (see Table 4).

**Case Studies**

For the purpose of providing a rich understanding of the data acquired from the qualitative observation tool, I present below case studies of four children. The criteria for choosing these children was based on their scores on the Child Behavior Questionnaire. Children whose scores exhibited large variations or reflected varied combinations of the major temperamental traits (i.e., Effortful Control, Surgency/Extraversion, and Negative Affectivity) were picked for more extensive observation. The scores for the four children are presented in Figure 1. Their names have been changed to protect confidentiality. These case studies help illustrate the nuanced differences between these four children as well as the differences between the data acquired (and conclusions drawn) from the quantitative measures (as reported by the teachers) and the qualitative observation tool (as observed by the author). It is important to note that the intent of these case studies is not to comment on the quality of information provided by the teachers, but rather to provide a look at
how quantitative measures, such as the *Child Behavior Questionnaire* or the *Penn Interactive Peer Play Scale*, may not provide a full picture of how a child interacts with his/her peers. In addition to that, the tool utilizes an immersive approach to a child’s interactions, and that data can be used to offer suggestions or explanations as to why a child is interacting in a certain way; integrating evidence about the context in addition to the content of the interaction leads to much richer data, and makes far more in-depth analyses possible. Uncovering student behaviors not detected by the quantitative measures is expected given that it is not always possible for raters to attend to each and every behavior that occurs in the classroom. Hence, when we look at the data acquired from the paper and pencil measures, it may provide us with incomplete (though no less important) information about a child. The case studies help juxtapose the data we acquired from the quantitative measures with that gathered from the qualitative observational tool to see whether there are any differences in information obtained and the conclusions drawn. More specifically, the intention of the current study is to explore whether my qualitative tool helped enrich and/or expand our understanding of the selected children’s peer engagement.

*Rhea: “What do you want to do now?”*

Rhea was one of the older children in the classroom, at 5 years old. Based on the CBQ, her Effortful Control score was 6.5, the highest among the subsample of children chosen for observations. Her score on Negative Affect was low to moderate (2.66), and her Surgency/Extraversion score was moderate (3.27) as well. Teachers rated Rhea with a high Interaction score (24), a low Disruptiveness score (3), and a moderate Disconnectedness score (6). Based on these numbers, it appears that teachers believed Rhea to be one of the ‘easier’ children in the classroom temperamentally. She was able to manage and control her emotions and reactions, less likely to have a tantrum or exhibit negative emotions than other children, and not overly
fidgety or overactive. With peers, teachers believed her to be socially skilled and adept at engaging with peers – they saw her as highly interactive and felt that she never disrupted group activities or caused issues playing in a group, but also that she sometimes became detached or disconnected from her peers. Altogether, Rhea was typically more likely to help a teacher in the classroom than cause a situation which would need adult support to resolve.

On average, Rhea was more likely to spend time silently observing and listening in on a conversation between peers before she entered the interaction herself. This was interesting to note, as teachers rated her as being highly interactive, which would suggest that both initiating and joining play was more typical behavior for Rhea. However, when observed with the qualitative tool, Rhea exhibited a high level of hesitancy in her interactions, especially with same-age peers. For example, during one interaction, Rhea was at the art center along with Kevin and some other classmates. All of the children except Rhea were discussing what they were drawing; Rhea was mostly quiet. At one point, Kevin said, “I am best friends with Jake, and Nisha, and Rhea” referring to all the children at art center at that time. Rhea’s face lit up and she smiled slightly when she heard that. After a moment, she joined in the conversation herself, sharing a story about what she had done the last evening. Based on this observation, it seems that Rhea is more hesitant in engaging with peers than would be expected based on the teacher reports and that she prefers her peers initiate the conversation. This hesitance in social situations suggests that Rhea’s temperament could be broadly categorized as inhibited/slow-to-warm, although this differs from the picture that the quantitative measures provided of Rhea – that of an easy child.

A specific example of Rhea’s inhibited nature can be observed in an interaction with Kayla. Before beginning to play with Kayla, Rhea spent a considerable amount of time playing by herself (in Kayla’s vicinity), observing what Kayla was doing and who she was playing with. Rhea seemed
highly interested in observing Kayla’s activities, even stopping what she was playing just to see what Kayla was doing, meaning that she was very distracted. Once Kayla approached Rhea to ask her to play, she agreed readily, instantly displaying a happier emotional affect, and an approach behavior. This example underlines two significant common threads in Rhea’s interactions – her inhibited temperament, and the inclination towards having the peer initiate the conversation.

Rhea took the position of being one of the older children seriously – she made sure the newer, younger children were doing what they were supposed to, and if they were not, she would communicate that to a teacher; as a result, teachers often asked Rhea to be a guide for such younger children – for example, showing them where things are kept, telling them where to get a book when the teacher says, “you can get a book and read on the carpet now”, teaching them class rules (e.g., “you only get one scoop of fruits to begin with” during breakfast), or just holding their hand when they were walking to the playground. Each of these behaviors set an example for how the younger child should act both inside and outside the classroom). Even in conversations with adults, Rhea was more likely to be serious and composed than other children. Given her high Effortful Control score, these observations provide an example of how Rhea’s ability to regulate her behaviors and emotions makes her the ‘ideal student’ – one who the teachers turn towards when they require support in the classroom. Interestingly, children Rhea’s age are typically exploring, discovering things, and making mistakes (and subsequently learning from them). Rhea is so efficient at controlling her impulses/reactions that she often suppresses urges which might actually be helpful (or even necessary, from a developmental standpoint) in terms of learning outcomes or in terms for social interaction for a child her age. Hence, the high effortful control score, paired with Rhea’s position as a teachers’ helper, could potentially suggest overregulation on her part.
Knowing this is important as overregulation may be detrimental to the achievement of some general developmental milestones, as the child may be hesitant to act outside their comfort zone.

It is important to note, however, that Rhea was also more than capable of being silly, suggesting that she was not always overcontrolled or overregulated. One day she spent a considerable amount of time sitting on a teacher’s lap, acting as if she was asleep. When the teacher asked if she was awake, she simply smiled. Once the teacher realized that Rhea was pretending, she tickled her. Rhea tried to control her laughter but eventually gave up. This observation adds more dimension to our understanding of Rhea and shows that not all her interactions are hesitant and/or inhibited. Once she feels comfortable in a social situation, she becomes more interactive. This example also helps us see the depth of information that the qualitative tool provides relative to the quantitative tools. We saw in the last example that Rhea might overcontrol her emotions and behaviors in some circumstances, something that is further supported by her high Effortful Control score on the teacher reported measure. Because of the more holistic nature of the qualitative observations, however, we see that overcontrol may not be the norm for Rhea. This is particularly important to note, because it reminds us that quantitative tools like the CBQ are designed to pick up average patterns of behavior, often outside of the context in which that behavior occurs, and thus may lead us to draw conclusions about children that are not entirely accurate or complete. Indeed, while we might be concerned about an overcontrolled or over-regulated child, these observations illustrate how critical it is to take into consideration the context in which these behaviors occur.

Another pattern that was observed in Rhea’s interactions was that a large part of her conversations with friends included negotiating and discussing each other’s opinions on whatever activity they were doing. For example, while playing with Kayla one day, Rhea made sure to
discuss with Kayla every time she wanted to decide on something – from how they would clean up a center (the division of tasks) to which center they would move to next (choice of activity). This meant that there was much less of Rhea spontaneously choosing something, and much more of a discussion and negotiation around what both peers wanted to do, and then reaching a compromise about differing views. Although negotiation is a positive trait in any communication, it is especially essential for inhibited/slow-to-warm children who feel unsure of themselves in novel situations as it helps peers perceive them to be more approachable. This information about Rhea’s behavior during peer play would be difficult to capture through quantitative measures and lends further support to the need for a qualitative tool to provide these subtle nuances in Rhea’s behavior.

On paper Rhea is perceived as a child who can easily interact with others but based on data gathered using the qualitative tool, it is evident that this might not always be the case. Although she might ultimately be able to converse with peers, it takes a lot of preparation on her part to do so. If we look at Rhea simply based on our quantitative measures, it seems like she should be a confident, gregarious child who can easily interact with everyone. However, it appears that unless the other person initiates a dialogue which explicitly includes Rhea, she may have trouble engaging with others. In all of the qualitative observations, Rhea spoke to a same-age peer only when the peer began the interaction. In most of these cases, Rhea showed a high level of interest in what her peers were doing, but did not actually go up and talk to them. If we were to use the quantitative tools only, we would not necessarily think Rhea needed any supports in the classroom; fortunately for her, in this classroom, her peers included her in conversations often enough that she did not seem isolated. However, the information unearthed by the qualitative observations gives a richer, fuller understanding of Rhea as a person, and provides information which could be important in
supporting Rhea to develop positive peer relations in the classroom. This could be crucial for someone with inhibited/slow-to-warm temperamental characteristics such as Rhea, as these positive instances of peer engagement could be the difference between whether or not Rhea becomes socially isolated. This case study also highlights a few peer engagement patterns which might be observed in inhibited/slow-to-warm children – such as hesitancy in initiating interactions, or waiting for another person to initiate the conversation.

**Kevin: “I’m so happy you’re playing with me…”**

This case study is about a 4-year old boy, Kevin. Among the children chosen for qualitative observation, Kevin had the highest score in the group for Surgency/Extraversion (5.89), the lowest score for Effortful Control (2.42), and a middle range score for Negative Affect (2.25). His score for Interaction on the PIPPS was 11 (the lowest amongst the subsample chosen for observation), with a moderate Disconnectedness score of 6. Interestingly, teachers did not see Kevin as disruptive, giving him a score of 0 on this scale. These numbers tell us that teachers perceived Kevin to be a somewhat difficult child temperamentally – he was likely to be fidgety, found it difficult to control his emotions and impulses, and was more likely to exhibit negative emotions than other children. With his peers, teachers noted he was not very interactive, and in fact, was generally quite disconnected from them.

In the classroom, Kevin played with a particular set of peers more than others, but he was generally willing to interact briefly when engaged by any classmate. If his preferred peers were not present, he would typically play by himself. When playing by himself, Kevin was usually subdued and quiet, not interacting much with others. He would look over at other children playing at centers, but he did not make any effort to engage with peers even if he spent time observing them from a distance. His affect during these situations was usually neutral. So, although he was
curious about what others were doing, he did not necessarily join the play group. Also, at such times, or even when playing by himself, Kevin was never extremely active or noisy. Considering his high surgency/extraversion score on the teacher-reported temperament measure, we would have expected to see a child who is very frequently highly active and/or impulsive, regardless of the peer situation. The qualitative observations provide a different picture, however – one of a child who is mostly quiet and calm when by himself. Given that the quantitative measures capture an average and general description of the child’s overall behavior (e.g., across peer contexts), it is important that the qualitative tool offers greater specificity about Kevin’s behavior in preferred peer groups as compared to non-preferred peer groups. Such information helps us better understand when and why Kevin might display more surgency/extraversion and allows us to better support him when he needs it – in settings where he is less socially inhibited.

It is interesting to note that Kevin did not display any prolonged negative affect, emotionally or behaviorally, in any of the conversations with either preferred or non-preferred peers. Based on the quantitative measures, and specifically on his moderate score on the Negative Affect scale, we would have expected to see more pronounced, outright negative affect when interacting with peers. That is not what was observed with the qualitative tool, however. Although there was one instance of Kevin frowning when caught and scolded by a teacher for speaking during group time in the library, it was a momentary reaction, and he resumed his neutral affect very soon after. Hence, Kevin appears to recover quickly from negative affect.

The quantitative measure also suggests that Kevin exhibits low effortful control and high surgency/extraversion, but we miss out on the fact that Kevin showed such behavior primarily when paired with another peer whom he considers a preferred peer – something the qualitative observational tool revealed. When playing with his preferred peers, Kevin frequently got into
trouble, and exhibited a fair amount of impulsive behavior (characterized by having trouble controlling impulses, and finding it difficult to inhibit the desire to engage in activities even if they know that they should not, even when they have been told to stop). Usually they began playing in either the blocks play center or using carpet toys, but they would change centers frequently, and end up playing games in which he and his peers ran around the classroom, yelled at each other across the room, or played games that involved throwing toys. At such times, even his playmate would be in an overenthusiastic state, and their energy levels almost reflected off of each other. There were several times when Kevin and his playmate had to be told to play separately, or made to sit on the carpet for a while to calm down as their activity level was too high for a classroom.

Considering the highly surgent/extraverted behavior they usually exhibited, an interesting conversation between Kevin and Xavier occurred one day when they were sitting at the writing center and discussing what they were writing about. Kevin was called to go use the bathroom and he left after telling Xavier to wait for him to come back. Once he got back and saw Xavier still sitting at the writing center, he said, smiling and looking extremely pleased, “I’m so happy you’re playing with me, Xavier”. Xavier, who was not as expressive as Kevin, did not respond much to that statement except to agree and say that Kevin was his friend. This interaction shows that when engaged in an activity that requires staying in one place, Kevin and Xavier were capable of having a long conversation and being calm. Here, the qualitative tool provides more context to Kevin’s actions and interactions with his preferred peers. It also showcases an important point – there might be certain activities which help conventionally ‘difficult’ children calm down physically and emotionally and still interact positively with peers. Hence, spaces such as a writing center, or an arts center may help children like Kevin interact with peers in a calmer fashion and direct their energies more constructively. This knowledge could help teachers strategize and, rather than
separating them and disrupting potentially beneficial peer engagement, move or re-direct high surgency/extraversion children to other constructive activities – for example, at centers such as for writing, or art - when they think it is required.

In addition to the significance of the environment in which the interaction occurs, we saw the effect that having a preferred peer who is also high on surgency/extraversion had on Kevin. However, it is interesting to note that with another peer who is not as high on surgency/extraversion as Xavier, Kevin still displayed high surgency/extraversion traits. For example, Kevin and Noah (one of Kevin’s preferred peers) were told to clean up a toy on the carpet (an unstructured play center) before they moved to another toy. Although Noah began cleaning, Kevin kept playing and also began distracting Noah from cleaning, and then the two began play-fighting. At this point the teacher came over and told them strictly that they should not be play-fighting in school and that they should be cleaning. Noah was more inclined to listen to the teacher when they were told that they were too loud, but while Noah tried to calm himself down, Kevin did not stop. He instead enticed Noah back into playing with him. Because of this, Kevin and Noah were scolded by the teacher again and were made to sit down on two ends of the carpet for ‘time out’. This incident aptly showcases the nature of a child with low effortful control. During another instance at the library, Kevin once again tried distracting Noah from listening to the teacher telling a story. When Noah did not respond to him, Kevin tried distracting Nisha as well, but she did not engage with him either. At this point, Kevin resigned himself to looking at books on the bookshelf by himself. This further illustrates the importance of peers engaging with Kevin for him to display high surgency/extraversion behaviors.

Overall, Kevin’s temperamental characteristics, as measured by the CBQ, match up with some of his interactions observed when using the qualitative tool, but we are able to develop a
richer understanding of the potential contexts in which a highly surgent/extraverted, low effortful control child such as Kevin might be successful. Indeed, the qualitative tool suggests that Kevin’s surgency/extraversion is particularly prominent under specific social circumstances – those with a preferred peer. In fact, we saw little evidence of this behavior when Kevin was not engaged with preferred peers. The quantitative tools alone would lead us to conclude that Kevin might struggle in all social interactions. This is clearly not the case. The qualitative tool provides essential information about possible triggers that lead Kevin to behave more impulsively, including access to preferred peers and the open space or unstructured activities provided by some centers such as carpet toys. These insights can help teachers develop constructive and innovative ways to calm such a child down, including encouraging them to use a center which requires them to sit down with a peer or find a preferred peer who is less physically energetic. For Kevin, the presence of a preferred peer and the context in which the peer engagement occurred were crucial factors in shaping how he would behave. As a result, knowing about these factors can help teachers figure out potential strategies for children displaying high surgency/extraversion characteristics such as Kevin, and provide them with alternative activities which are more constructive and help the children practice more effortful control – a trait that will be increasingly expected of them as they go into Kindergarten.

**Jim: “Trevor said he doesn’t want to play with me.”**

Jim was a 5-year-old boy, and chosen for this subsample because he had the lowest score on Negative Affect (1.58) within the subsample of children chosen for qualitative observations. He had the second lowest score on Effortful Control (2.62) and the second highest score on Surgency/Extraversion (5.43) within the subsample. On Interaction (12), he scored slightly below the overall sample average. His Disruptiveness (14) and Disconnectedness (12) scores were both
above the sample averages, with the disconnectedness score being a full standard deviation above
the sample mean. Based on these scores, we can say that, temperamentally, teachers saw Jim as
someone who did not express intense negative emotions or throw tantrums, but he was fidgety,
unable to control his impulsive urges, and quite full of energy. Teachers also felt that, with peers,
Jim was less interactive than the average child, and in fact tended to cause disruptions in group
activities when he did engage.

Given Jim’s fairly high disconnectedness score, we would expect him to have trouble
interacting with peers. However, the qualitative data showed that he actually had a favorite peer –
Trevor – who was the same age as Jim, and treated Jim as his favorite peer as well. The two friends
spent most of their time together, and did not seem inclined to interact with other peers. But, as in
any friendship, they had their differences. During center time, Jim and Trevor were involved in
imaginative play with some building blocks, where they spent time negotiating whose story they
would play out. When Trevor suggested a different game and Jim did not want to change what
they were playing currently, Jim began sulking (a clear display of negative affect, although not
disruptive). Trevor, in turn, said, “Fine! We can play your game then!” Jim stopped sulking, happy
that they could continue with his game. He also looked up at Trevor and saw that he was smiling
and didn’t look upset, which seemed to add to his positive mood. As Trevor readily agreed to Jim’s
demands, Jim did not hold on to his negative emotion for too long. This example shows that Jim
is readily able to connect with a peer and hence unlikely to be disconnected to the degree that the
PIPPS score suggests. Further, in direct contrast to the teacher reports, it appears that Jim does
express some negative affect but that when given what he wants, he is quick to recover from his
emotions and demonstrates little disruptive behavior. Both of these points would be difficult to
infer from the quantitative data alone.
Jim’s case is particularly interesting because he experienced a significant change in his peer group after he was absent from school for several weeks. During Jim’s absence, Trevor began playing more with Xavier and Kevin. One morning, after he returned to school, Jim called out to Trevor across the carpet in an attempt to divert Trevor’s attention from other peers. Jim got increasingly worked up as Trevor refused to acknowledge him. When a teacher finally asked Jim to stop yelling across the carpet and asked Trevor to reply, Trevor said that he did not want to talk to Jim right then. Jim seemed quite surprised and noticeably sad. Later, on the playground, Jim began by playing on the swing by himself, and then eventually he played with Noah. He tried once more to ask Trevor whether he would play with him, but Trevor refused. At this point, he turned around, saw me (the observer) nearby and told me sadly, “Trevor said he doesn’t want to play with me.” I told him that it would be fine, and he could find some other friends to play with; he nodded and walked away. He spent a few minutes sitting quietly with a teacher and then went and joined Nisha at the seesaws. Noah came and joined them. Jim appeared happy to see him and asked him, “What would you like to play?” It was interesting to see Jim trying to seek his peers’ opinion and ask what they wanted to play, given his adamant refusal to change games when Trevor had asked him during the previous observation. Although Jim responded to his disappointment with quiet negative affect (e.g., sadness, playing by himself, sitting with the teacher, etc.), his affect was not disruptive to others, though it would have been expected based on his fairly high disruptiveness score, and he recovered quickly, which might not have been expected given his surgency/extraversion scores.

In the understandably distressing situation Jim was faced with once he returned to school, he had to come to terms with the fact that his best friend did not want to play with him anymore. Based on his scores on the quantitative measures, we would have expected an inability to connect
with or interact with other peers. In contrast to his moderately high Disconnectedness score, he began reaching out to other peers. This is also in contrast to his lower than average Interaction score, which would suggest that he does not interact easily with others. This case illustrates how context and circumstances may affect a child’s interaction styles and how they engage with others. Although this cannot be considered a generalizable pattern given the small number of interactions, it does demonstrate that some children may be capable of modifying their behaviors to better adapt to a social situation. Because quantitative tools typically ask about a child’s average behavior over a specific period of time (e.g., past month), they frequently miss behaviors that are situation-specific. This specificity is best identified with a qualitative tool designed to consider behavior in context.

Further, we also see a difference in the kind of affect Jim exhibits related to this new situation where he had lost a friend. Although the quantitative measures indicate that Jim is quite low on Negative Affect, the qualitative observations show that Jim does exhibit some negative affect, though the affect exhibited in both of the examples described above was quiet, non-disruptive, and did not require much intervention from teachers. As a result, it might go unnoticed. As the issue which caused the negative affect was resolved in between the peers, it would be difficult to know that the event had transpired unless someone was observing very closely. The quantitative tools would likely fail to pick up on quiet negative affect or rapid recovery from negative affect as much as a qualitative tool can. Indeed, the quantitative measures request that teachers comment on fairly explicit, obvious actions such as throwing a tantrum or crying). This excludes “quieter” ways in which children may exhibit negative affect – including sulking, disengaging from peers, etc. – that still have an important impact on the child. The qualitative tool, by its very nature, can help pick on such quieter variations of affect.
The qualitative observations appear to have picked up on quite a significant discrepancy between teacher reports and Jim’s behaviors and show that he might actually exhibit traits of a ‘difficult’ child only in certain contexts/situations. Jim is seen to be an overall difficult child based on the quantitative ratings. However, the qualitative observations show that Jim in fact can handle difficult, distressing situations quite well, and may not necessarily require adult intervention when faced with such situations. This does not mean that he is not disruptive in the classroom, and it does not make him an overall ‘easy’ child either. However, the knowledge that Jim can actually deal with difficult situations himself can be essential to a teacher and they can change their approach to help Jim develop those skills even further. The qualitative tool also reveals a significant finding about the importance of considering quiet negative affect. In Jim’s case overlooking his quiet negative affect does not necessarily have an adverse impact on him, but we can imagine a child who shows quiet negative affect but does not recover from it as easily as Jim. Such a child could easily face peer rejection because peers sometimes do not know how to approach such a child, and also prefer peers who display more positive affect overall. Also, because they are quiet and do not affect the classroom proceedings, children who display quiet negative affect may not get the support they require to deal with these negative emotions. In the long run, such children might face serious challenges in terms of emotion regulation, stress, and anxiety. Therefore, the rich data provided by a qualitative tool that takes into consideration the content and context of peer engagement and responses could provide essential information to help avoid such outcomes by offering these children more support in the classroom.

**Shannon: “Am I being good?”**

Shannon was a 4-year old girl and was regularly seen interacting with peers both younger and older than herself. Based on the CBQ, her Effortful Control score was 5.3, the second highest
score in the subsample chosen for qualitative observation. Her score on Negative Affect was low (1.83) and her Surgency/Extraversion score was moderate (3.56). For the peer play component, teachers rated Shannon with a fairly high Interaction score (18), a high Disruptiveness score (19; highest for the subsample chosen for qualitative observations), and a low Disconnectedness score (1). Based on these scores, temperamentally Shannon appears to be a fairly active child with generally positive affect, who is well able to manage her impulses; in other words, an ‘easy’ child. With peers, teachers saw Shannon as an interactive child who also regularly caused disruptions within group activities.

In general, the qualitative observations align with teacher ratings regarding Shannon’s disruptive behavior. When the lead teacher (with whom Shannon was most comfortable) was absent, Shannon was far more likely to test the authority of the other teachers. For example, during carpet time, Shannon was trying to gain the attention of her preferred peer, Deana, who was seated across the carpet, by yelling along with the songs. The teacher told her to stop, but she did not listen for a while, until the teacher told her that Shannon would not receive a reward at the end of the week unless she was behaving well. On hearing this, Shannon protested that she wanted the reward and quieted down. Although there was not any peer engagement per se in this scenario, it is still a good example to show that Shannon can be disruptive and distracting to others in a group situation. During another instance, she threw sand on her peer, Amyra, at the sensory table, even after Amyra asked her to stop. This displays antisocial behavior (which is a classic example of being disruptive during play) as she ignored Amyra’s attempts to communicate her displeasure at Shannon’s actions. Hence, it is clear from both the quantitative and qualitative data that Shannon can be disruptive in the classroom.
Although disruptiveness is easy to observe for Shannon, it was difficult to see clear signs of Shannon’s high effortful control in the observations, and in fact she seemed to act in a manner very much the opposite in some instances. For example, once during breakfast the teacher asked Shannon to not bang her spoon on the table and Shannon mimicked her, which made her peers laugh. The teacher expressed that she did not find this funny, and that she should stop, but Shannon mimicked her again, getting more giggles from the table. It was only when the teacher told her she would have to leave the table unless she listened to her that Shannon stopped mimicking her. She repeated this behavior during carpet time as well. Overall, there was no evidence from the qualitative observations to show that Shannon exhibited high effortful control, and in fact, there seemed a fair amount of evidence to the contrary. Hence, this brings up the question of why there is such a discrepancy in what the quantitative and qualitative data reveal, and we discuss this below.

From what we know, the broad characteristics of high effortful control (such as inhibitory control and low intensity pleasure) might not apply to Shannon, but there appears to be one major reason teachers rated her as such – her ability to quickly recover from a conflict situation. This is significant because it shows that while she has trouble controlling her impulses, she also has the skills to calm herself down and control her emotions and behaviors very quickly. For example, when the teacher told Shannon that if she continued to mimic her during carpet time she would not get the special reward that everyone was supposed to receive at the end of the week. At that point, Shannon said, “No!” sadly, and then quietened down when the teacher said that she just had to keep quiet if she wanted the reward. She seemed quite sad and anxious and asked the teacher after a while if she was “being good”. When the teacher said that she was, Shannon looked happier, and remained quiet and attentive throughout the rest of carpet time. This instance shows Shannon
managing her emotions and behaviors quite well and recovering from the brief disappointment quickly and without much adult intervention. In another incident, Shannon had been playing at the playdoh center when Deana came into the classroom and went to talk to Shannon. Deana tried to take some playdoh from her. Shannon immediately got angry and raised her hand as if to hit Deana. Deana let go of the playdoh and tried to change the conversation to the bracelet that Shannon was wearing. Shannon replied that she had just gotten it, but she wouldn’t give it to her. Kayla, who had been sitting at playdoh center as well asked if Shannon would give her the bracelet. Shannon replied that she would, but she just wouldn’t give it to Deana. Deana began crying and a teacher came over to console her. Shannon and Deana observed each other for a while and soon Shannon began trying to engage Deana in a conversation. There didn’t seem to be any residual negative affect from the original interaction, and both began playing soon.

In the latter example above, Shannon’s initial behavior seems more characteristic of a difficult child than an easy child, especially with the sudden, angry reaction to her peer trying to take her things. However, contrary to the usual difficult child, Shannon was able to calm herself down from the heightened emotional reaction quite quickly (within the span of five minutes) and engage with her peer in a calmer manner. Being able to regain control of one’s emotions quickly and with little adult support could be considered a sign of high effortful control, especially for a teacher in a classroom, because a quick and independent recovery means the teacher has to de-escalate such situations far less frequently. Therefore, although the qualitative tool does not necessarily support or refute the quantitative ratings, it does provide critical context for understanding how teachers might evaluate a child’s skills or behaviors in a social setting. It also reminds us that there are many different ways in which a child can exhibit these temperamental traits. This teacher may have recognized Shannon’s quick recovery as a skill while another teacher
might have rated her as a child with low effortful control based on her responses to her peers. This highlights the need to interpret quantitative scores such as those obtained from the CBQ or PIPPS in context. Without the extra information from the observations, it would seem that Shannon is temperamentally an easy child, who in turn should not have any issues connecting with her peers. However, the example detailing the interaction with Deana while at the playdoh center shows that Shannon does have trouble controlling her impulsive reactions sometimes, but is able to eventually calm herself down.

Clearly Shannon’s temperament and behavior with peers is far more complicated than the scores on the paper and pencil measures would suggest. Although she has a tendency to be disruptive and finds it difficult to control her impulses, she can typically recover quickly and without adult support from those transgressions. This case also points out that although high scores on certain constructs (such as interaction) are thought to be beneficial for a child, we should always seek to understand the contexts and circumstances under which those constructs occur and how they manifest in various situations in order to best support the child and his/her peer relations. This is information that a quantitative tool cannot necessarily pick up but a qualitative tool that considers both content and context as well as affect can provide valuable information that can support the child. Shannon’s case is somewhat different from the others in that we are not really learning anything new from the qualitative tool. Instead, the tool offers insight into why a teacher might perceive Shannon to be an easier child. Discrepancies between the quantitative and qualitative data do not necessarily mean one type of data is incorrect. Trying to understand such discrepancies can actually reveal important information about a child and his/her behaviors. The intensive qualitative observations can be key to clearing up any differences between measures as they may offer insight into the reason Shannon is rated as she is on quantitative measures.
CHAPTER 5: DISCUSSION

The significance of peer engagement and the role of peers in achieving desirable outcomes is very well established (Hodges et al., 1999; Vaughn et al., 2016). There is also evidence to suggest that temperamental traits may affect the way in which peer interactions occur (Acar et al., 2015; Szewczyk-Sokolowski et al., 2005) as well as whether or not these peer relationships are sustained. Because a child’s temperament and peer interactions have each been shown to affect critical aspects of his/her development, such as mental health (Bollmer et al., 2005; Grant et al., 2009) and academic achievement (Johns et al., 2019), understanding how they work together may be important for supporting positive development. Yet, we know little about how the environmental or social context, or the specific content of peer interactions might vary based on temperamental traits. One of the reasons for this gap in our knowledge has to do with the limitations in existing peer engagement measures. Indeed, the majority of existing tools are quantitative and thus provide an average picture of a child’s temperament or the child’s behaviors with peers across settings, time, etc. Although these measures offer important information about child temperament and peer interactions, they commonly do not offer the in-depth information needed to understand children’s behavior within the environmental or social context, nor do they offer insight into how temperamental traits may influence these interactions. Thus, the goals of the current study were to investigate whether and how peer interactions differ for children based on different temperamental traits among a sample of diverse, low-income preschool children and explore whether a new qualitative tool helps detect information about these interactions beyond what existing quantitative measures already identify.
Quantitative Results from Existing Measures

Analyses of the quantitative data suggested that children’s peer interactions were higher if they showed higher effortful control and lower if they showed more negative affect and surgency/extraversion. These findings are similar to past research in this area, which show that attentional focusing (a subconstruct of Effortful Control) predicts higher peer sociability, and also that surgent children are more likely to be rejected by peers (Acar et al., 2015; Gunnar et al., 2003). Results also showed children who were rated as more ‘difficult’ (i.e., low effortful control, high surgency/extraversion, and high negative affect) were perceived by teachers to be more disruptive, which is also demonstrated by the work of others (Rubin et al., 2005). Existing research has shown that children with higher reactivity (similar to surgency/extraversion and negative affectivity) are perceived to have lower social competence (including cooperation with peers; Pekdogan & Kanak, 2016). Results also showed that children with higher levels of surgency/extraversion were rated by teachers to be less disconnected, in line with findings from a study by Mathieson and Banerjee (2010). This could be because surgent/extraverted children are typically more likely to reach out to peers or teachers and are hence more likely to take part in social interactions. As a result, their high surgency/extraversion may act as a protective factor against disconnection from others. In sum, and not unexpectedly, the quantitative findings from this diverse sample of preschool children can be added to the existing body of work demonstrating the links between temperament and social interactions among young children.

Qualitative Results from New Tool

There are three main inferences which can be made from the PEQT data. First, children who are more inhibited may require additional support to engage with their peers in the classroom, but with such supports are able to successfully connect with their peers. Indeed, work by Gülay
(2012), Chen et al. (2006), and Santos et al. (2015) all illustrate how shy/withdrawn children face peer rejection because peers do not know how to approach them, or are disinterested because of the lack in response from the inhibited child. The data also illustrated that inhibited children can still thrive when given the appropriate supports (e.g., when they have several peers who continue to interact with them). For example, Rubin et al. (2006) state how withdrawn children are more likely to be able to maintain friendships when in a “familiar setting, such as school”, even though they might have difficulty in engaging with peers in a different setting such as a camp. Because children who are inhibited do not always express their distress in social situations, they might be at risk of being overlooked or rejected because of this lack of expression. Thus, identifying these children early may offer important avenues for preventing long-term inhibitory behaviors.

Second, the qualitative tool provided new insight into the effect that having interactions with a preferred peer can have on a child who is more surgent/extraverted; although we know that having friends is important, this finding illustrates the challenges in navigating friendships when a child is high on surgency/extraversion. In almost all the cases, the presence of a preferred peer changed the way in which the child expressed him/herself – children were more enthusiastic or active, more talkative in some cases, and more likely to become agitated if they did not get a response. Although there is ample research illustrating the impact that having good quality friendships has on long-term academic achievement and psychological outcomes (Criss et al., 2017; Schrepferman et al., 2006; Smith et al., 2001), few studies have investigated whether the benefits look the same for children with different temperamental traits. It may be that for a child high on surgency/extraversion, preferred peers act as catalysts for more impulsive and agitated behaviors. Indeed, Frick and colleagues (2018) have shown how higher surgency is related to more hyperactive/impulsive behavior. This impulsivity or agitation, in turn, often leads to upheaval in
the classroom and thus require the teacher’s attention and resources to resolve. The qualitative observations showed, however, that certain play centers (e.g., writing center, art center) that do not involve high-energy activities, can offer children high on surgency/extraversion with a space to work calmly and constructively with their preferred peer. This finding suggests that intentional use of calming activities by teachers may help engage high surgency/extraversion children constructively, which has been shown to work in studies regarding mindfulness when used with preschoolers (Razza, 2015; Zelazo & Lyons, 2011).

Third, for children who exhibited negative affect, the tool provided evidence for ‘quiet’ negative affect – behaviors that are characterized as negative affect but are not reflected in existing measures, including sulking, and disengaging from peers. Not unlike “quiet behavior problems”, “quiet negative affect” may often go unnoticed because it is not disruptive (Weissbourd, 2009). It might be crucial in some cases for the teacher to know that a child displays negative affect for a sustained period of time, even if that affect is quiet, as it might predict internalizing problems for the child. There is already ample research to show that children with behavioral difficulties (e.g., anxious or hostile children) in preschool may grow up to have internalizing disorders (Klein et al., 2019; Olsen & Rosenblum, 1998; Slemming et al., 2010), and even though we know that negative affectivity has an effect on children’s outcomes, it is easy to overlook it when it is non-disruptive (Stormont et al., 2015). The PEQT provides evidence that such quiet negative affect behaviors can be detected, and hence it can be an essential tool for identifying such children early and preventing long-term depression or anxiety associated with this early negative affect.

Limitations

Despite the many benefits described above, it is also important to acknowledge the limitations of this tool. First, the conclusions from the qualitative tool are derived from quite a
small sample. This means we must view these interpretations with caution as some components of these results may be applicable to only these particular cases. Nevertheless, even with the limited number of cases, I was able to identify some unique patterns of findings that were not evident from the quantitative tools. This provides some preliminary evidence for the efficacy of this tool but future studies should include more children in an effort to further validate the tool. Relatedly, while the PEQT utilizes a much longer observation period as compared to other quantitative tools (e.g. total of five minutes per child using the C-POC or the POS), two hours per child is still a short period of time from which to gather generalizable or even consistent patterns of behavior, especially among preschool children. Hence, future studies should use larger samples, a random sampling approach to selecting participants, and consider the possibility of increasing the time span of observation. Future research needs to address the issues of a small sample, short observation times, and purposive sampling. In order to verify this tool as a viable method of understanding peer engagement, more research is needed with these specific limitations in mind.

It is also worth noting that the children included in this study were intentionally selected based on their quantitative ratings on temperament and peer interactions. As a result of this intentionality, I may have seen behaviors that I might not have picked up on with a sample of children that were more temperamentally similar. Because the goal of this project was to demonstrate the sensitivity of the measure to differences in the context and content of peer interactions for children with different temperamental traits, this concern is less relevant here. However, it is important to acknowledge that I do not know how sensitive the tool is to these interactions among children with more similar temperamental traits. Finally, it is important to keep in mind that this qualitative tool requires a significant amount of time be spent observing every child; hence if it is to be used for a large sample, a substantial number of observers would be
required. Therefore, it may not always be feasible or beneficial for a study with a very large sample. If, however, the goal is to develop a rich perspective on children’s peer interactions or a deep understanding of the content of those interactions, as many qualitative studies aim to do, this tool may be far more beneficial than existing tools.

Also, sometimes it becomes necessary to stand quite close to the child being observed to hear them better, and this might cause the child to become more aware of the observer’s presence and might cause a child to change his/her behavior (i.e., the Hawthorne Effect; Roethlisberger & Dickson, 1939). In terms of the current study, while it was sometimes difficult to hear what a child and their peers were discussing, standing close enough to hear their conversation may make the child self-conscious. This was not always the case however, and at the most, sometimes it might be required to do one observation cycle again if the child became too curious and engaged with the observer.

Finally, in the interest of maintaining clarity and transparency, it is also important to note that I, the observer, knew the children before I began using the observational tool. More specifically, I was observing them for another larger project being conducted by my advisor. It is possible that my prior knowledge of the children influenced how I interpreted some of their interactions. For an observer coming into the classroom without any prior knowledge on the children, this should not be an issue. Also, because of my prior knowledge of the children’s behaviors, I chose the children for the case study in a way that would potentially provide the most variance in observations. It is important to acknowledge these factors for the current study so that the analyses can be considered in light of this fact.
Conclusions

The ultimate goal that I wish to achieve through this tool is to support teachers by providing insights on different students so that it is easier to recognize strategies which would work for each child. Overall, the PEQT offered valuable insight into how children with different temperamental traits navigate peer engagement, and the possible challenges they might face. A significant contribution of the tool was the added richness of data, particularly about the environmental/social context and content of the interactions, and how this information could help teachers deal with the potential challenges in the classroom. For example, for a child who is inhibited and hesitant to enter conversations, but does eventually engage well with peers, the context is an essential factor for them to successfully engage with peers. Having such information as a teacher can be valuable, as it can help teachers create opportunities for such a child to engage in activities. For children with high surgency/extraversion, it may be especially important to understand the effect of preferred peers, and redirect them towards activities that are more structured and calmer. Finally, while looking at children’s affect as a whole, it is important to pay attention to whether there is quiet negative affect which is going unnoticed, because though it is quiet and undisruptive, it can have long-term detrimental effects on the children. In addition to learning these specific details from the tool, an important point brought forward by these findings is the mutability of temperament – the idea that while temperament is a relatively stable element of our behavior, it can affect different people differently based on their context. In the long-term, a tool like the PEQT can be help identify and assist children who are at risk of becoming socially isolated in preschool and ideally avoid the potential long-term consequences that such children face without any supports.
Although we have clear evidence from research and practice that a one-size-fits-all approach to prevention and intervention in not appropriate or effective, yet we regularly treat temperament as a trait that looks similar for all “easy”, “difficult”, and “slow to warm” children. Findings from this exploratory work clearly suggest this should not be the case. Indeed, when it comes to temperament, we must take an individualized and contextualized approach to understanding it so that we can best support the development of children with all different temperamental traits.
CHAPTER 6: TABLES AND FIGURE

Table 1
*Timeline for administration of measures for current study*

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<th>Measure</th>
<th>Fall 2017</th>
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<th>Spring 2019</th>
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<td>Penn Interactive Peer Play Scale</td>
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<td>Peer Engagement Qualitative Tool</td>
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Table 2
*Descriptive statistics for key predictors (Effortful Control, Surgency/Extraversion, Negative Affect), outcome variables (Interaction, Disruptiveness, Disconnectedness), and control variables (Child Age, Sex)*

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<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
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Table 3
Correlations for measures of child temperamental traits (Effortful Control, Surgency/Extraversion, Negative Affect) and peer interaction (Interaction, Disruptiveness, Disconnectedness)

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<th>Effortful Control</th>
<th>Surgency/Extraversion</th>
<th>Negative Affect</th>
<th>Interaction</th>
<th>Disruptive -ness</th>
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<td>Surgency/Extraversion</td>
<td>-.375**</td>
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<td>Negative Affect</td>
<td>-.366**</td>
<td>.313**</td>
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<td>-.140</td>
<td>-.372**</td>
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<td>Disruptiveness</td>
<td>-.536**</td>
<td>.534**</td>
<td>.585**</td>
<td>-.332**</td>
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<tr>
<td>Disconnectedness</td>
<td>-.373**</td>
<td>-.207*</td>
<td>.279**</td>
<td>-.339**</td>
<td>.307**</td>
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</tbody>
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Table 4
Regression analyses of peer interaction measures (Interaction, Disruptiveness, Disconnectedness) on child temperamental traits (Effortful Control, Surgency/Extraversion, Negative Affect)

<table>
<thead>
<tr>
<th></th>
<th>Interaction</th>
<th>Disruptiveness</th>
<th>Disconnectedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effortful Control</td>
<td>3.114*** (.597)</td>
<td>-4.644*** (-.529)</td>
<td>-1.161* (-.268)</td>
</tr>
<tr>
<td>Surgency/Extraversion</td>
<td>-.966* (-.214)</td>
<td>4.281*** (.566)</td>
<td>-.981* (-.262)</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>-2.149*** (-.407)</td>
<td>5.291*** (.593)</td>
<td>1.353** (.309)</td>
</tr>
</tbody>
</table>

Note: All regression analyses controlled for child age, sex, and classroom. Significant at p < 0.05 level
Figure 1

CBQ main construct scores for the four children chosen for qualitative tool
REFERENCES


https://doi.org/10.1177/0265407513490586


https://doi.org/10.1037/14343-004


https://doi.org/10.1007/s00787-010-0128-2


# APPENDIX A: PEER ENGAGEMENT QUALITATIVE TOOL

First version of PEQT (first page of complete tool)

<table>
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<th>Date:</th>
<th>Affect</th>
<th>Content</th>
<th>Context</th>
<th>Social</th>
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</thead>
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<td></td>
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<td>No. of children c/in</td>
<td>3 feet:</td>
<td>Where:</td>
</tr>
<tr>
<td></td>
<td>OBS 2</td>
<td>No. of children c/in</td>
<td>3 feet:</td>
<td>Where:</td>
</tr>
<tr>
<td></td>
<td>OBS 3</td>
<td>No. of children c/in</td>
<td>3 feet:</td>
<td>Where:</td>
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<tr>
<td></td>
<td>OBS 4</td>
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<td>3 feet:</td>
<td>Where:</td>
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<td>Child:</td>
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<table>
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<td>Sad</td>
<td>Acting in</td>
<td>Angry</td>
<td>Approach</td>
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<tr>
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<td>Role play</td>
<td>Distracted</td>
<td>Parallel play</td>
<td>Impulsive</td>
<td>Distressed</td>
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<tr>
<td>Unhappy</td>
<td>Role play</td>
<td>Distracted</td>
<td>Parallel play</td>
<td>Impulsive</td>
<td>Distressed</td>
</tr>
</tbody>
</table>

<table>
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<th>Context</th>
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<td>Art Blocks</td>
<td>Science</td>
<td>Art Blocks</td>
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<tr>
<td>Housekeeping</td>
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**Final version of PEQT (first page of complete tool)**
APPENDIX B: IRB APPROVAL FORM

IRB Approval Letter

Human Research Protection Program

APPROVAL OF MODIFICATION AND CONTINUING REVIEW

October 3, 2019

Dear Kristen Bub:

On 10/3/2019, the IRB reviewed the following submission:

<table>
<thead>
<tr>
<th>Type of Review:</th>
<th>Modification and Continuing Review</th>
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<tbody>
<tr>
<td>Title of Study:</td>
<td>Social Competence and Executive Functioning During Early Childhood</td>
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<tr>
<td>Investigator:</td>
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<td>IRB ID:</td>
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Modification to study team reviewed: Removal of Mary Hall Slaughter and Bethany Hoff. Addition of Michelle Reed.

Modification to protocol reviewed: Removal of parent questionnaires and parents as research subjects.

The IRB approved the protocol from 10/3/2019 to 10/2/2020 inclusive. Before or within 30 days of study closure, whichever is earlier, you are to submit a continuing review with required explanations. You can submit a continuing review by navigating to the active study and clicking Create Modification / CR.

If continuing review approval is not granted before the expiration date of 10/2/2020 approval of this study expires on that date.