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Increasing Teacher-Student Relationships and Classroom Engagement: The Effects of Modifying Existing Tier Two Intervention on Adolescent Students and Their Teachers

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A Dissertation Presented

by

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ABSTRACT

INCREASING TEACHER STUDENT RELATIONSHIPS AND CLASSROOM ENGAGEMENT: THE EFFECTS OF MODIFYING EXISTING TIER TWO INTERVENTION ON ADOLESCENT STUDENTS AND THEIR TEACHERS

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The purpose of this study is to examine the effect of a Tier II behavior intervention, Check-in/Check-out (CiCo), on student engagement, and if a modification to the intervention that includes teacher use of microaffirmations improves the teacher-student relationship (T-SR) and thus, increases student engagement in class. It utilized multiple baseline design, and the study sample consisted of three fifth grade students from an urban school district in Southeastern Virginia. All three students were paired with one of their teachers to serve as the mentor for the intervention. Student engagement was measured directly using the Behavioral Observation System for Students (BOSS; Shapiro, 2004, and the Inventory of Teacher-Student Relationships (IT-SR: Appendix A; Murray and Zvoch, 2011) was used as a student report measure of the quality of T-SR's between the mentor and students. Visual inspection was used to analyze the data, and Tau-U (Parker et al., 2011) was calculated to measure effect size. The results of Percent of All Nonoverlapping Data (PAND) analysis found overall small effects in the data from baseline to intervention phases (*phi* .30). Results of the Tau-U indicated that one student saw no effect (*phi* .06) and two saw medium to large effect sizes, although one significant effect was for data trending in an undesirable direction (*phi* .60; -.71). Results on the IT-SR were variable with

some increases in the quality of the T-SR, and some reported decreases in the quality of the relationship. This study contributes to the research base by providing a replicable model for implementing an intervention aimed at increasing student engagement with T-SR's as a moderating factor, as well as for adapting the well-known CiCo program to not only improve student classroom behavior, but also target the T-SR. This study used teacher training on the importance of T-SR's and the use of microaffirmations with students as an intervention to increase teacher-student relationships, which not only contributes to a methodological gap in the research where discussions about microaffirmations in schools and teacher training is largely conceptual, but it is also easily applied to the school setting where this intervention is intended to be used.

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CHAPTER 1

STATEMENT OF THE PROBLEM

Overview

Children and adolescents arrive at today's public schools with any number of socio-economic, societal, and familial obstacles and risks associated with negative academic and social outcomes. While many factors are associated with the resiliency of disadvantaged students that leads to positive adjustment and outcomes, a finding that is consistent in risk and adaptation literature is that positive adult-child relationships promote social, emotional and academic adjustment in students exposed to multiple risks (Dubow, Tisak & Causey, 1991; Karcher, Davis & Powell, 2002; Murray & Malmgren, 2005; Roorda, Koomen, Spilt & Oort, 2011). The National Research Council found that in general, adult relationships with students have a significant effect on the success of students in various settings (NRC, 2003). One of these important adult-child relationships is the one that exists between teachers and their students. Teacher-student relationships have been shown to reduce dropout rates, and serve as a preventative buffer for students at risk (Hamre & Pianta, 2001; Murray & Malmgren, 2005). In classrooms, interventions targeting the relationships between teachers and their students have created positive group changes such as improve overall climate, and in cohorts of student-teacher dyads has been shown to increase academic achievement, and adjustment in school, develop prosocial skills, and increase engagement (Anderson et al., 2004; Murray & Malmgren, 2005; Hughes, Cavell & Willson, 2001; Portilla et al., 2014). A meta-analysis of research studies examining the connection between teacher-student relationship and engagement and academic achievement by Roorda and colleagues in 2011 found medium to large effect sizes for the effect of the quality of teacher-student relationships on school engagement. These relationships can be

especially helpful for students with existing emotional and behavioral problems and those at risk for academic failure (Hamre & Pianta, 2001; Hughes Cavell & Jackson 1999; Murray & Malmgren, 2005; Murray & Zvoch, 2011; Smokowski, Reynolds & Bezruczko, 1999), however, few schools focus on this relationship as a locus for intervention and prevention.

Teacher-student relationship conceptual background

Many social and developmental theories have been applied to teacher-student relationships to help explain the concept and potential outcomes for students. The relationship between teacher and students has been described as an interpersonal relationship (Frymier & Houser, 2000), much like friendships, that also serves to buffer against life stress and to help teach prosocial skills, like a parent-child relationship (Dubow et al., 1991; Hartup & Lempers, 1973; Hughes, Cavell & Wilson, 2001; Lynch & Chicchetti, 1993; Wang & Eccles, 2012; Wolchiket al., 1989). Frymier and Houser suggest that the support provided through positive social experiences with adults affects a child's personal adjustment and reactions to adversity (2000). Social support is described as information or behaviors that leave a subject feeling cared for, valued, and that they belong to a network with mutual obligation (Cobb, 1976). This type of perceived social support is the cognitive recognition that one is reliably and consistently connected to another (Barrera, 1986). In more recent years, social support has been applied to relationships outside of parent-child and peer relationships to relationships between children and "others", such as mentors and teachers. Defining the teacher-student relationship as an interpersonal relationship, like Frymier and Houser did, expands the social role of teacher to a student beyond just providing instructional support and praise. Older students have indicated that in addition to providing effective instruction, the other, most important support that teachers can provide in the classroom is ego support, or the ability to make another person feel good about themselves. Ego support is a construct that is mostly applied to research on peer relationships,

but was found to be an important feature of teacher-student relationships as well (Burelson & Samter, 1990; Frymier & Houser, 2000). In fact, it was shown to be a significant indicator of learning and motivation in first-year college classrooms and has also been shown to increase middle school students' feelings of subjective well-being (Suldo et al., 2009). Ego support is often accessed through immediacy, the perceived closeness between people. Immediacy behaviors used by teachers have been shown to facilitate student learning in secondary classrooms (Christophel, 1990; Frymier, 1994).

The extended attachment theory of relationships has also been frequently applied to teacher-student relationships. Extended attachment theory implies that teachers can provide security within the educational setting, allowing children to interact within this context freely and securely (Birch & Ladd, 1998; Pianta, 1999). Increasing this secure relationship in school has had positive effects on academic achievement as well as social-emotional adjustment (Hamre & Pianta, 2001). When middle school teachers demonstrated emotional warmth toward their students through acceptance and being regularly available for personal conversations, this perceived supportive relationship has been shown to increase students' academic and social motivation (Baker, 1999; Hamre & Pianta, 2001; Harter, 1996. Pianta (1999) proposed a conceptual model of the teacher-student relationships based on Developmental Systems Theory in which the primary components of the relationship include (1) features of the individuals and their representation of the relationship, (2) processes by which information is shared between relationship participants and (3) external influences of the system in which the relationship is embedded. Focusing on the second component of this theory (how information is shared between relationship participants), will help researchers and educators understand how the interactions between teacher and student can have a positive or negative effect on the quality of teacher-student relationships.

When considering the teacher-student relationship as an interpersonal relationship (Birch & Ladd, 1996), a key interactive component of relationships that increase perceived support is immediacy. Frymier and Houser (2000) define immediacy based on Mehrabian's initial exploration of the topic as follows: "Verbal immediacy consists of behaviors such as calling students by name, asking students about themselves and asking for student's opinions. Nonverbal immediacy consists of behaviors such as smiling at students, making eye contact, moving about the room, and using vocal variety" (Mehrabian; 1971). These are behaviors that can be easily implemented and applied to mentoring and positive classroom management procedures in a systematic way. In addition, the Developmental Systems Theory of teacher-student relationships as proposed by Pianta (1999) has suggested several methods to increase positive adult-child relationships school-wide. These peer-reviewed methods for increasing teacher-student relationships include: (1) teaching students and teachers about social-emotional development, (2) engaging in frequent social interaction with students (3) being available to students who are in need, (4) demonstrating interest in students' perspectives and ideas, (5) using positive behavior management strategies to increase caring (Hamre & Pianta, 2001). These methods closely mirror practices in more recent research regarding micro-affirmations. Micro-affirmations emerged to counteract micro-inequities, which are covert, unintentional behaviors that serve to corrode relationships and undermine the abilities and equality of others (Rowe, 1990), through mentoring. Rowe defined Micro-affirmations as "apparently small acts, which are often ephemeral and hard to see, events that are public and private, often unconscious but very effective, which occur wherever people wish to help others succeed." (Rowe, 2008). Although research on micro-inequities and micro-affirmations were born out of racial and gender inequalities in various career fields, these same factors are at play in classrooms where relationships between teachers and students may be a barrier to success. Most of the behaviors

exhibited by teachers that either degrade or build relationships in the classroom are often covert, rarely overt, aggressive, or degrading, and may affect the student's behavior slowly over time. In addition, the definition of micro-affirmations provided by Rowe encompasses the behaviors identified within the teacher-student relationship research to improve adult-child relationships.

Intervention and Teacher-Student Relationships

While interventions exist and are increasing in use to improve overall classroom climate through teacher praise, very few directly and systematically target teacher-student relationship quality for at-risk students (Anderson et al., 2004; Murray & Malgram, 2005). Demonstrating personal interest and disclosure through non-contingent adult-child interactions is one method to improve the relationship between students and their teachers, although more research is needed to confirm its use as an evidence-based practice (Hamre at al., 2013; Dobransky & Frymier, 2004; Hamre & Pianta, 2001; Murray & Greenberg, 2001; Sabol & Pianta 2012). Pianta, Hamre and Allen (2012) found that when teacher interactions with students are targeted, student engagement increases. They further note that relationships and engagement can be measured through observations of teacher-student interactions in class, and not just from teacher or student report measures. However, a gap in the research exists in identifying the result of targeting teacher-student relationships on more observable measures of student engagement, such as participation and on-task behavior in class, as opposed to relying on teacher and student reports. In fact, research suggests that when looking at more broad measures of student success over time (i.e. grades, scores, dropout etc.), mediating factors such as the quality of teacher-student relationships, on-task behavior, and academic engagement in class may actually be the key predictors of student success (Roorda et al., 2011). As such, observing a student's academic on-task and engagement behaviors may be a better measure of both student achievement and the

quality of teacher-student relationships than more typically used measures (i.e. teacher report measures and high-stakes outcomes such as grades and graduation rates).

As one intervention example, Check-in/Check-out is a known, research-based, positive behavior management strategy for students needing targeted behavioral interventions (Hawken & Horner, 2003). It is a one-to-one positive behavior intervention that naturally provides education on social and emotional development, and provides a teacher-student meeting structure in which to apply the other methods suggested by Pianta (1999) to improve these relationships. The Check-in/Check-out intervention was developed as a Tier II intervention within a school-wide system of positive behavior and supports (Hawken & Horner, 2003). It is a time and cost efficient, targeted intervention to reduce problem behavior, with a goal to increase prompts for appropriate behavior, increase adult feedback, enhance daily structure, and to increase home-school communication about student behavior (Filteret al., 2007). The intervention has been shown to be effective at both elementary and secondary educational settings to reduce problem behaviors in the classroom (Cheneyet al., 2010; Horner, Sugai & Anderson, 2010; Mccurdy, Kunsch & Reibstein, 2007; Simonsen, Myers & Briere, 2011; Todd et al., 2008) and increase academic engagement (Hawken & Horner, 2003). In fact, a study examining the therapeutic mechanisms of a very similar Tier II intervention, "Check, Connect, and Expect" (CCE), found that the significant moderating effect between the CCE intervention and positive student outcomes was a positive teacher-student relationship based on student reports of relationship perceptions (Stage and Galanti, 2017). Typically, a check-in/check-out intervention is behavior focused, meaning that behavioral expectations are reviewed during check-in times, with additional pre-teaching of the expectations for the day. During check-out, the student's points are tallied, and the mentor provides praise and encouragement as well as strategies to improve future behavior for areas where the student had more trouble obtaining points (Sailor et al., 2009).

However, the check-in/check-out intervention also provides a forum for twice-daily non-contingent interactions between teachers and students. Using this opportunity of increased interactions between teachers and students, and tailoring these interactions to draw on what is known about the features of positive interpersonal relationships, may increase the therapeutic effect of the intervention, providing the additional stress-buffering features of teacher-student relationships in addition to decreasing problem behaviors.

Other studies have explored interventions that may improve the quality of adult-child relationships within the school setting. Murray and Malmgren (2005) used an intervention specifically targeting teacher-student relationships in order to increase student engagement and achievement. They found that student grade point averages increased by implementing a Check and Connect mentoring program that used praise for student's positive attributes related to personal and academic goal-setting. Similarly to the techniques used by Murray and Malmgren, researchers have used Check and Connect with students who are at-risk for disengagement from school to increase relationships with an adult or mentor in the school while increasing academic engagement and achievement (Anderson et al., 2004; Karcher, Davis & Powell, 2002). The "connect" component of this intervention refers to personal connection, or relationships between program staff and students, which is integrally important to the success of the program. Anderson et al. (2004) found that closer, higher quality relationships between mentors and high-risk students as measured by the *Monitor-Student Relationship Survey*, were associated with improved teacher-reported engagement in school. Karcher et al. (2002) utilized high school mentors to implement the Check and Connect program with fifth-grade at-risk students, still measuring the quality of the relationship and academic achievement as outcomes. They found that the mentoring program generally promoted the mentees' connectedness to others even beyond the mentoring dyad, and improved spelling scores (Karcher et al., 2002). Pianta and

colleagues have used education and professional development about teacher-student relationships, as well as increasing non-contingent adult-child interactions to improve the quality of relationships (Hamre & Pianta, 2001; Pianta & Hamre, 2009).

Student Outcomes of Teacher-Student Relationship Interventions

Student engagement is the behavioral outcome that is expected to change as a function of improved teacher-student relationships. When a student feels more socially supported by an adult, it is hypothesized that they will be more likely to engage in lessons, and to demonstrate increased motivation on academic tasks (attending to lesson, asking/answering questions, on-task during independent work) (Hamre & Pianta, 2001; Pianta, 1999; Roorda, Koomen, et al., 2011). This will be assessed through the Behavioral Observation System for Schools (BOSS), which measures time spent passively or actively engaged in the lesson, as well as motor, verbal and passively off-task behaviors, (BOSS; Shapiro, 2004). This will provide data on any changes in student engagement, as well as the type of engagement, and any increases or decreases in externalizing behaviors. Research has shown that teacher-student relationship quality and academic success (grades, test scores, graduation etc.) are moderately correlated. High quality relationships between teachers and their students are more strongly linked to academic engagement (on-task behavior, attendance, participation etc.), and factors like grades and academic achievement are distally related, increasing potentially as a function of improved engagement (Bloom, 1971; Pianta, 1999; Roorda, Koomen et al., 2011).

In order to help delineate the role of the quality of teacher-student relationships within the intervention in regard to academic engagement, a measure of relationship quality will be included as an outcome measure. While psychometrically strong measures exist to assess the quality of teacher student relationships through observation (Classroom Assessment System, CLASS; Hamre, Pianta & Choomat-Mooney, 2009), the participants' perceptions of the

relationship is arguably more important than observable behaviors of a supportive relationship, especially when these teacher behaviors are the target of intervention. The Inventory of Teacher-Student Relationships (IT-SR: Appendix A; Murray and Zvoch, 2011) assesses student perceptions of trust, communication and alienation in the teacher-student relationship. The IT-SR has been validated by the authors, and its psychometric properties analyzed. It has been used in other studies to measure the effect of teacher-student relationships on student engagement and achievement. This survey will be given to students before the onset of the intervention, and after the intervention is complete to identify if the quality of the teacher-student relationship has improved, along with or contrary to any changes in student classroom behavior and engagement.

Proposed Study

This study will serve to assess the efficacy of a Tier-II intervention that is widely employed by school districts across the country on improving teacher-student relationships, and thus student engagement and achievement. Check-in/Check-out is a standard Tier-II procedure for a school implementing school-wide positive behavior supports, a number of schools that is increasing each year. This study will first identify if modifying an already widely adopted procedure to target teacher-student relationships, may be a promising and cost-efficient way for schools to add an additional layer of social-emotional support to an already psychometrically strong behavioral intervention. Secondly, the proposed study will identify if increasing teacher-student relationships through Check-in/Check-out will have an effect on student behaviors in class related to academic engagement and achievement, such as on- and off-task behavior.

While studies have looked at the effect of teacher-student relationship on grades, climate, and long-term goals like graduation rates, this proposed study will contribute to the literature on the effect of teacher-student relationship quality on student outcomes by using objective or

observable variables as outcome measures instead of relying on more subjective or tertiary outcomes. Many of these studies use teacher or student-report measure outcomes, which may inherently lack validity, or may have unknown or unclear effects on student achievement. While it is important to know if a teacher or student perceives that the relationship has improved, these do not provide any additional information regarding student outcomes. Grades are widely considered subjective measures, and attendance and graduation rates are heavily influenced by other factors over time. Contrastingly, classroom engagement and behavior is an immediate outcome, directly linked to a student's accessing instruction and classroom material, which then leads to student achievement. Contributing to this research base will increase the evidence of positive effects of interpersonal relationships on outcomes beyond school climate. With this, schools may begin to see the merit in this free resource and its importance to school success beyond just a beginning of the year professional development.

Research Questions

Relationship-focused Check-in/Check-out

- What is the effect of relationship-focused Check-in/Check-out program on rates of student engagement in class?
    - Hypothesis: It is hypothesized that participation in a relationship-focused Check-in/Check-out program will increase rates of a student's engagement from baseline rates.

Teacher-Student Relationship

- What is the effect of relationship-focused Check-in/Check-out program on student perceptions of the teacher-student relationship?

    - Hypothesis: It is hypothesized that participation in a relationship-focused Check-in/Check-out program will increase student perceptions of the teacher-student relationship.
- What is the connection, if any, between changes in teacher-student relationship quality and observed student behavior in class?
    - Hypothesis 1: It is hypothesized that increases in student perceptions of the quality of the teacher-student relationship will occur with decreases in problem behavior.
    - Hypothesis 2: It is hypothesized that increases in student perceptions of the quality of the teacher-student relationship will occur with increases in student engagement in class.

Past research regarding teacher-student relationships, the effect that these relationships have on student outcomes, interventions targeting teacher-student relationships, and the Check-in/Check-out program were extensively reviewed and will be presented in Chapter 2.

CHAPTER 2

LITERATURE REVIEW

Much of the research done regarding teacher-student relationships (TS-R) is grounded in early psychological research examining the psychological and behavioral effects of parental-child relationships (Bowlby, 1969; Bandura, 1986; Ryan & Deci, 2002). Toward the end of the 20th century researchers like Brophy and Pianta began to conceptualize the relationship between teacher and student as a de facto parental relationship within the school environment. From that point researchers began to apply the various camps of relational theories within the parent-child dyad, outside of the familial unit to relationships with other important adults, such as teachers (Bronfenbrenner, 2005). While the theoretical basis of the present study relies more heavily on the tenets of attachment theory, social support theories and self-determination theories of adult-child relationships also contribute to the links between teacher-student relationship and outcomes such as classroom engagement and academic achievement. This section will establish a theoretical basis for utilizing attachment theory while conceptualizing interventions around TS-R, provide evidence for the importance of considering the quality of TS-R as variables that contribute to student outcomes, as well as present the research used to guide the development of the intervention used in this study to increase the TS-R to examine its effect on engagement.

Attachment Theory

Attachment theory posits that attachment is an innate drive that humans have to form attachments with caregivers (Bowlby, J., 1969). While psychoanalysts and behaviorists theorized that attachment was a learned behavior reinforced by feeding received from the mother (Freud, 1946; Erikson, 1950; 1959; Mahler, 1965; & Skinner, 1938), Bowlby and other attachment

theorists found that even feeding did not relieve insecurity and emotional responses that came with being separated from their parent (Bowlby, 1969; Harlow, Dodsworth, & Harlow, 1965). His initial work with homeless and orphaned youth suggested the importance of the safety and comfort obtained through the attachment to a parental adult on emotional and psychological wellbeing. A main guiding principle of attachment theory is that humans show a preference for one primary attachment figure above all others. He adds that this is most often the biological mother, but can take the form of anyone providing a long-term commitment of care to the child. From his text *Separation*: *Volume II* Bowlby (1973) indicates that children actually need multiple attachment figures outside of the primary person, but that these relationships fall in a hierarchy. He believed that the availability and responsiveness of the primary attachment figure had an effect on the anxiety, security and distress of the child. Attachment theory indicates a deep bond that connects one person to another that is not equated with dependency, but rather, a security that allows children to feel comfortable exploring their world (Bergin & Bergin, 2009)

Mary Ainsworth took John Bowlby's theory of attachment and endeavored to add an empirical basis to the theory. She explained attachment as a "secure base from which an infant can explore the world." She introduced the concept of maternal sensitivity to infant signals of need, and the role that plays in creating attachment patterns between mother and baby. Her initial research was on "security theory," which posits that children need to develop a secure dependence on their parents before exploring new and unfamiliar situations (Ainsworth, 1969; Blatz, 1940). Without this attachment, children lack a "secure base" from which to develop new skills and explore their world. Bowlby's initial work and exploration of the topic focused on the interactions between family members and the effect that had on the psychology of individual members. At the time, these interactions and relationship patterns between people were not seen as particularly relevant to psychologists and researchers. He began by focusing on mother-child

separations, which was a concrete and undeniable event, and the effect that these separations had on the children and the child-parent relationship. Based on all of Bowlby's research, he concluded that from infancy to early childhood, the child should experience a relationship with their caregiver that is continuous, warm, and intimate, and that offer both parties satisfaction and enjoyment (Bowlby, 1951). Although it is sometimes not mentioned in discussions of attachment theories, Bowlby emphasized the importance of social-networks, the existence of "substitute mothers" and the importance of the mutual enjoyment in a relationship (Bowlby, 1951; Bretherton, 1992). Other research has also highlighted the importance of children having an "other" adult outside of the familial unit for all children (Radke-Yarrown, & Brown, 1993). A review of studies related to parent and teacher relationships with children found that children with insecure attachment to parents can, and often do form secure attachments to teachers (Bergin & Bergin, 2009). Even still, other research has suggested that children's attachment to parents has an effect on their social behavior, confidence in the classroom, and thus, relationship to teachers in early schooling that could be positive or negative (Erickson & Pianta, 1989; Lynch & Cicchetti, 1992; Ryan, Stiller, & Lynch, 1994). Either way, children with both secure and insecure attachments with their parents and familial adults are likely to seek out and develop relationships with their teachers and other caregivers outside of their family.

Attachment Theory in Schools

Alfred Bandura posited that in addition to children learning through observation, they would observe and mirror most closely adults with whom they had an affinity (1986). For many children, teachers may represent the first meaningful bond a child may make with an adult outside of their familial unit. His self-efficacy theory states that self-efficacy is affected by social-comparative information, and that people are heavily dependent on feedback from others (Bandura, 1986). Hamilton and Howes suggested that in the early years of school, teachers

assume a surrogate parent role, and that their relationships with children are particularly important (1992). Teachers are the social model for the educational setting, and another adult to provide learning through observation. However, if Bandura's theories on social learning were to be accepted, the child would first need an affinity for, or relationship with, their teacher for this to convey. Relationships formed during the early school years have a long lasting effect on future schooling (Pianta, 2000). Research shows that teacher-student relationships in preschool affect relationships in kindergarten and first grade (Hamre & Pianta, 2001; Lippard et al., 2018; Pianta, 1997). These early teacher-student relationships correlate closely with risk factors for school failure and drop out such as discipline issues, truancy, and poor school attachment (Birch & Ladd, 1998, Hamre & Pianta, 2001), as well as protective factors such as school engagement (Verschueren, & Koomen, 2012)

This research is important as school-age children spend much of their time with their teachers throughout the year. Many of the student's social interactions are governed and supervised by this adult. T-SR are unique from peer, parent and mentor relationships, and are the only relationships related to school bonding, and are more highly correlated to problem behaviors than parent and peer relationships (Collins, 1997; Pham & Murray 2006; Uslu, & Sidika, 2016). Teacher-student relationships may also have a unique interaction with academic stress, as parental warmth alone, absent of a positive teacher-student relationship, did not indicate lower levels of academic stress in middle and high schoolers (Luo, Deng, & Zhang, 2020). Research on the qualities and specific features of adult-child relationships show that T-SRs are unique in that the attachment is not enduring and long lasting like a relationship to a parent, making it a non-traditional attachment (Verschueren & Koomen, 2012). However, within the unique setting of school, teacher-student relationships still provide a "secure base" for students to explore the school specific environment (Bergin & Bergin, 2009) as Mary Ainsworth

described in her research (Blatz, 1940). While research may be mixed, studies have shown that attachment to mothers may have an effect on children's attachment and proximity seeking with their teacher (Erickson & Pianta, 1989; Lynch & Cicchetti, 1992; Ryan, Stiller, & Lynch, 1994). Likewise, maltreated children have been shown to have less relatedness with their teacher and relationships characterized by negativity (Lynch & Cicchetti, 1992). Children with insecure parental attachments, who went on to have secure attachments and positive interactions with teachers in early schooling were still shown to have more positive outcomes in future school experiences than children without a secure T-SR (Pianta & Walsh, 1996). T-SR in early childhood forms the "developmental infrastructure" upon which school experiences build (Pianta & Walsh, 1996), which builds off of Hinde's exploration of adult-child relationships, that defined relationships as a dyadic system (1987), and more than just the sum of interactions but rather a relationship between two people that has its own identity.

During adolescence, individuals are developing autonomy and begin to "detach" from parents, their primary adult relationship. Collins and Repinsky theorized that closeness to parents decreasing leads to increased closeness to peers and extra-familial adults (such as teachers and mentors) (1994). This suggests that the decrease in closeness perceived by parents and other relationship partners during adolescence may be due to developmental changes. When the child is developmentally seeking more autonomy, and biologically going through hormonal changes, their behavior seems to suddenly diverge from parental expectations for their child (Collins, 1997; Collins & Repinsky, 1994). Teachers of adolescents do not face this seemingly sudden change in the child's behavior and priorities, which may open the opportunity for more closeness and less conflict in the teacher-student dyad during this time. Some research on early schooling shows that children's relationships with teachers may actually be a stronger predictor of their interactions and relationships with peers than relationships with their parents (Howes, Hamilton,

& Matheson, 1994). Research has even shown that when using student reports of the quality of teacher-student relationship, this relationship, when compared to parent and peer relationships, contributed to unique variance in life satisfaction, problem behaviors and school bonding (Pham & Murray, 2016). So it seems while the T-SR is "non-traditional" in that the relationships may only last a school year, they are a particularly important attachment for school-age children to have to feel secure and benefit from adult relationships within the school setting.

In fact, in a longitudinal study of hundreds of early childhood students, first grade antisocial and prosocial behavior was closely correlated to TS-R in kindergarten, and whether that relationship had features of dependency, conflict, or closeness (Birch & Ladd, 1998). In 1969, Brophy was one of the first to consider the teacher-student relationship as a dyadic relationship, and attempted to use observation to study this relationship by coding interactions between the child and teacher. He used quantifiable, observable definitions for different types of behaviors that would be observed, and included subcategories for teacher behaviors such as "warnings," "praise," and "criticism" (Brophy & Good, 1969). Pianta was the first researcher to intentionally apply attachment theory to educational settings in his research of early childhood settings. He noticed that children with secure attachment with adults allow them to be more socially confident and exploratory in early schooling, thus creating more positive relationships with peers and teachers in school (Hamre, Pianta, Verschueren, & Koomen, 2012). The child's behavior then in turn has an effect on the teacher's motivation to spend more time engaging in behaviors with the child that may make them more successful in future schooling and less likely to face negative outcomes in school (i.e. retention) (Pianta et al., 1995).

The TS-R must be observed over time and from different angles. Methods to explore and assess child-parent relationships are more sophisticated than those for child-teacher relationships, but should be given the same level of importance (Pianta, 1999). Pianta suggests that research

needs to focus on more measurable features of adult child relationships with clearer thresholds and parameters given that we know how important it is and how closely it is linked to outcomes (Pianta, 1999). Through the literature in social support theory, combined with research on attachment, there emerges a need for research on effective means of measuring overall T-SR across grade levels, as well as identifying the "building blocks" of relationships that increase positive outcomes so that these may become subjects of intervention. School climate literature contains many studies that without outwardly stating this are measuring and intervening on teacher-student relationship in some part. In his literature review in 1982 of school climate research to date, Anderson conceptualized climate as either an "albatross" or a "unicorn". Climate, when it is not positive, may be an albatross or a burden on the policymakers and stakeholders in a school. If climate can become a focus of study, to define the parts that have the strongest effect on climate, the "unicorn", the hard to define, shapeless idea of climate can be intervened on and improved. At the time, he suggested that relationships between teachers and students were likely one of the more important features that effects school climate, and equated a student's perception of their relationship with their teacher as a sort of "quality of life" indicator as far as school life was concerned (Anderson, 1982). The 2010 school climate research survey found that relationships were a key indicator of climate quality and social-emotional functioning of students (Cohen & Geier, 2010). In addition, teacher behavior has been linked to student academic achievement and not just teaching quality (Brophy & Good, 1984). School climate and quality, which includes indicators such as teacher-student relationship, has even been linked to more broad outcomes such as economic growth (Holen, Waaktaar & Sagatun, 2018).

Protective Factors of the Teacher-Student Relationship

Social support has long been seen as a major protective factor in the face of life stress both small and large (Cobb, 1976; Bernard, 1995). Social support was defined by Cobb as "information leading the subject to believe that he is cared for, loved, esteemed, and a member of a network of mutual obligations (1976)". Life stress includes those experiencing both pathological and psychological crises (Cobb, 1976). School can certainly serve as a proxy for a network of mutual obligation to which a student belongs. For social support to be achieved, the student would need to feel cared for, loved and respected as a member of the classroom and school network. It has been found that teacher policy and practices alone are not enough to have a positive effect on academic outcomes, but that these policies are likely mediated by student perceptions of teacher-student relationships (Barileet al., 2012). More broadly, positive teacher student relationships have been shown to increase student's overall happiness (Froiland, Worrell, & Oh, 2019) and reduce levels of school anxiety (Romanoet al., 2020). When students' levels of school anxiety were lower, they also reported reduced levels of academic "burnout". Students who had more positive perceptions of teaching climate had lower rates of dropout (Barile, Donohue, Anthony, Baker, Weaver, & Henrich, 2012), and other studies have shown high quality teacher-student relationships were associated with increased chances of high school completion (Burns, 2020). Positive outcomes related to TS-R are not limited to academic outcomes, as studies have shown that increases in TS-R are associated with improvements in academics and problematic behaviors across elementary school (Maldonado-Carreno, & Votruba-Drzal, 2011; Murray, & Malgrem, 2005). These effects have been shown to be true for current teacher-student dyads, as well as future teacher and student pairings in subsequent grades (Lippard, et al., 2018; Thornberg- et al., 2020) meaning positive teacher student relationships can have a lasting effect on a student throughout schooling. Teacher-student relationships have even

been shown to have an effect on brain development through working memory scores, which then have an effect on academic achievement (Vandenbroucke et al., 2018). Support has been conceptualized as a buffer to students' normative declines in academic achievement (Hughes & Cao, 2018). Schools that reported higher quality teacher-student relationships on climate surveys also had lower incidences of problem behavior, and reduced rates of depression and student-reported low self-esteem (Thapa et al., 2013). In addition, many studies have shown that the quality of T-SR with a focus on teacher behavior can create mutual respect between teacher and student, and have a longitudinal effect on prosocial behaviors with peers and peer acceptance (Battistitchet al., 2001; Watson, Solomon, & Schaps, 1989), academics (Decker, Dona, & Christenson, 2007; Gehlbach et al., 2016; Hamre & Pianta, 2001; Midgley, Feldlaufer & Eccles, 1989; Murray, & Greenburg, 2001; Portilla et al., 2014), and social-emotional adjustment (Donget al., 2021; Murray, & Greenburg, 2001; Murray, Kosty, & Hauser-McLean, 2016). In addition to these more traditional school-based outcome measures, T-SR has also been shown to influence less studied variables as well. One study linked positive teacher-student relationships to what the researchers called "flourishing", or growth in academic achievement. This was especially true for students who had lower levels of emotional intelligence to begin with (Chamizo-Nieto et al., 2021) This suggests that students who may struggle with managing their emotions and reacting to those of others may benefit especially from high quality teacher-student relationships. Positive T-SRs have even been shown to reduce the impact of peer victimization in adolescents, as those who report stronger relationships with their teachers reported less negative psychosocial effects of victimization by peers (Sulkowski, Simmons, 2007). One study found that social support from adults in school accounted for 16% of the variance of student's wellbeing in school, and emotional support was found to be a predictor of overall subjective well-being (Suldo et al., 2009). Contrastingly, when student perceptions of teacher-student

relationships are mostly low in a school, it can have more negative outcomes on overall climate and engagement (Martin & Collie, 2019). This is true even when comparing student ratings to teacher ratings of teacher-student relationships (Berg & Aber, 2015).

Research has documented natural decreases in overall relationship quality from kindergarten to high school that are often accompanied by decreases in closeness and supportiveness, as well as increases in conflict (McGrath & Van Bergen, 2015; Riley, 2008). Declining teacher-student relationships in middle school have been associated with increasing reports of depression and lower self-esteem (Reddy, Rhodes & Mulhall, 2003). High levels of teacher-student conflict have also been linked to negative achievement emotions such as boredom and anxiety, whereas that same study found that higher levels of teacher-student closeness were positively associated with achievement enjoyment (Clem et al., 2021). Student perceptions of low quality TS-R have even been linked to teacher-directed aggression the following year (Hughes, Cavell, & Jackson, 1999). Teacher-student relationships have also been shown to mediate more broad antecedents and student success outcomes. For example, school climate and student conduct in class were shown to be mediated by measures of teacher affiliation measured through direct observation and teacher survey (Brackettet al., 2011). During the transition to middle school, student perception of support from their teacher is related to academic outcomes such as intrinsic motivation and value of math (Midgley, Feldlaufer, & Eccles, 1989). The value of learning science was linked to a student's perception of their teacher's friendly and helping behaviors (Smart, 2014). An additional national longitudinal study found that for students at risk of dropping out, if they had a teacher who cared, their math achievement was substantially better. A positive relationship in this study was defined as having a teacher who listened, was interested, and praised their efforts (Muller, 2001). Promisingly, recent research has suggested that the positive effects of a strong teacher-student relationship are

more impactful than the limiting factors of a negative teacher-student relationship (Martin, & Collie, 2019).

Adolescents have reported that one of the most common factors associated with positive outcomes is the individual believing that they had a supportive relationship with an adult (Resnick et al., 1997). Positive T-SRs have even been linked to health outcomes completely unrelated to academics or social-emotional outcomes. Relationship quality between adolescents and adults has also been shown to have an effect on stress and emotions that may cause health problems later in life (Ryzin, & Nowicka, 2013), as well as to reduce health risk behaviors in adolescence (Resnick, Bearman, Blum, et. al., 1997). When adolescents feel cared for by people at their school and feel like a part of school they have been shown to be less likely to use substances, and engage in violence and risk taking (McNeely, Nonnemaker, & Blum, 2002). This same study which used data from a national longitudinal study also found that harsh discipline leads to lower levels of school connectedness, smaller schools lead to higher levels of school connectedness, and more empathetic classroom management also correlated to higher levels of school connectedness (McNeely, Nonnemaker, & Blum, 2002). This would leave one to assume that feelings of fairness, more opportunities to interact with teachers and higher degrees of empathy in the face of problematic behaviors would help to bolster feelings of connection in school. In addition, students report more secure attachments in elementary school than secondary school, and more experienced teachers tend to have more secure attachments with their students than new teachers (Riley, 2008). Caring relationships have been identified for decades as a protective factor to support resilience (Bernard, 1995). Unlike peer relationships, teacher-student relationships have been shown to have a significant effect on student competence, relatedness and autonomy (Bakadorova, & Raufelder, 2018). Longitudinal studies of kindergarteners through their eighth grade year of schooling found that teacher-student relationships in

kindergarten and early grades were correlated to academic grades, standardized test scores, work habit ratings and discipline records in eighth grade (Hamre &Pianta 2001), again supporting the notion that one strong teacher-student relationship has positive outcomes that endure over time while the student is in school.

Teacher-Student Relationship and Resiliency

Research on resiliency factors, and why some children who come from high-risk situations can still demonstrate adaptive behaviors where others have serious problems, found that having a positive and secure relationship with *any* adult can provide resiliency and help promote adaptive behaviors in the face of adversity (Radke-Yarrown, & Brown, 1993). Ryan, Stiller and Lynch found that for students who have poor relationships with their parents, may be most in need of teacher-student relationships as both adult relationships have a strong correlation to school connectedness and motivation where peer relationships did not (1994). They also found that students have an easier time building relationships with teachers when they have positive relationships with their parents. Students who report positive teacher-student relationships have been shown to have protection against poor school performance that may stem from poor relationships end environment at home (Cicchetti & Lynch, 1993; Hughes, Cavell, & Jackson, 1999). A longitudinal study of students in preschool through third grade found that high-quality teacher-student relationships acted as a buffer for the negative effects of poor parental relationships as it pertains to achievement (O'Conner, & McCartney, 2007) Teachers may need to put in more effort and be more intentional in their efforts to build relationships with students who they may not have strong relationships with initially (Ryan, Stiller, & Lynch, 1994). Not only does support from a teacher correlate to academic achievement, but studies also show that this is particularly important for disadvantaged students who may lack other protective factors for school success (Battistitch et al., 1997; Burns, 2020; Elias & Haynes, 2008; Holen, Waaktaar

& Sagatun, 2018; Hughes, Cavell, & Jackson, 1999; Murray, & Zvoch, 2011). Students with mental health problems have reduced drop-out rates when they perceive themselves as having strong teacher-student relationships (Holen, Waaktaar & Sagatun, 2018). This suggests that using teacher-student relationships as a target for interventions may help to reduce dropout among students who struggled with mental health problems. Related to the importance of TS-R for disadvantaged students is the findings that teacher expectations affect their own behaviors in the classroom. Teachers are less likely to praise students for whom they have lower expectations, and levels of praise were shown to have an effect on student engagement (Brophy & Good, 1970). If teachers praise students less when they have low expectations, for instance if a student has known mental health disorders or is otherwise disadvantaged, they are less likely to give them positive feedback and students will be less engaged, and thus confirm teachers' low expectations of those students. In this study, teachers reported not being aware of the differences in their behavior or their lower expectations. This is compounded by the previously mentioned research suggesting that the quality of teacher-student relationships trends down, or decreases across school years (Mason et al., 2017; McGrath & Van Bergen, 2015; Reddy, Rhodes &Mulhall, 2003; Riley, 2008). McGrath and Van Bergen found in their literature review that time in schooling (i.e. a student's grade level) was one of the characteristics that increases risk for a student having a poor teacher-student relationship. Other predictive characteristics included having a poor attachment relationship in prior years of school, being male and having a familial low socioeconomic status (2015). When exploring factors that contributed to a higher or lower T-SR quality in kindergarten classes, Pianta and colleagues found that children in poverty were at a higher risk for poor TS-R, and thus, further academic and social difficulties (Pianta, la Paro et al., 2002). When considering the negative effect that behavior problems like inattention and impulsivity have on the quality of T-SR (Portilla et al., 2014), it is easy to see how quickly

teacher-student relationship and problem behavior can snowball over time with bi-directional exacerbation of both. Teacher-student relationships are of great importance whether external or intrinsic child factors preceded the poor quality T-SR, or if a suffering T-SR led to behavior difficulties which made relationships with teachers harder to establish in future years. Furthermore, once a negative teacher-student relationship has been established, student classroom qualities and behavior may be affected, thus affecting future relationships. it would be beneficial to develop systematic interventions to target the T-SR specifically and stop any negative behavior-relationship spiral from establishing.

Teacher-Student Relationship and Underserved Groups

Teacher-student relationship is just as important across ethnic groups (Decker, Dona, & Christenson, 2007; den Brok et al., 2010; Elias, & Haynes, 2008; Froiland, Worrell, & Oh, 2019; Schneider, & Duran, 2010). One study found that being African American alone, with or without learning difficulties or a low socioeconomic status uniquely predicted conflict trajectories with teachers across years of school, and as a result increased the risk of poor academic achievement in middle school (Spilt & Hughes, 2015). A survey conducted in an ethnically diverse sample found that increased closeness between teachers and students and less conflict led to higher levels of student motivation (den Brok et al., 2010). In addition, as teacher reports of teacher-student relationships increased between teachers and behaviorally at-risk African American students, so did prosocial behaviors, engagement, and positive academic outcomes (Decker, Dona, & Christenson, 2007). In this same study, students rated that they wanted to be closer to their teacher, which supports that at-risk students value the importance of TS-R, despite their in-class behavior and performance. Hispanic adolescent students report that personal relationships with their teachers are more important to a positive school climate than teachers modeling positive behaviors (Schneider & Duran, 2010). In this study, students in all ethnic groups

reported that teacher-student relationship was important in some way, but Hispanic students preferred staff to attend to the personal needs of students, whereas white and Asian students emphasized the importance of having one adult who takes a personal interest in them.

Student Engagement

Social support in general, as well as teacher-student relationships specifically, has a significant effect on academic achievement and engagement, which has been well documented in research (Chen, 2005; Cook et al., 2018; Dennie et al., 2018; Dubow et al., 1991; Engles et al., 2021; Kosir, Socan, & Pecjak, 2007; Lan & Moscardino, 2019; Maldonado-Carreno & Votruba-Drzal, 2011; Martin, & Collie, 2019; Pham, Murray, & Gau, 2021; Roorda et al., 2011; Roorda et al., 2017; Stewart, 2003; Thornberg et al., 2020; Xerri, Radford, & Shacklock, 2017). Results of a meta analysis found medium to large effect size for both positive and negative relationship with engagement levels (Roorda et al., 2011; Roorda et al., 2017). While support of parents, peers and teachers all had a generally positive effect on adolescents who experienced stressful life events, the presence of supportive teachers during the initial time point of the longitudinal study, as well as increases in social support over time were significantly related to improvement in behavioral and academic adjustment (Dubow, et al., 1991). This is also true for the effect of teacher-student relationships on emotional and cognitive engagement at school longitudinally (Pianta, Hamre, & Allen, 2009; Wang, & Eccles, 2012). Students who have better relationships with their teachers are more engaged, and research has linked this engagement to better academic outcomes such as grades and graduation rates (Chen, 2015; Engles et al., 2021; Hughes, Luo & Koca, 2016; Kwok & Lloyd, 2008; Quin, 2017). Researchers have theorized that the social relationships with teachers may not be directly linked to academic achievement, but rather that academic engagement serves as a mediator (Engles et al., 2021; Pianta, Hamre, & Allen, 2009; Wentzel, 1999). Specifically, social encounters and experiences with teachers, parents and peers,

may influence the adoption of societally valued goals that positively influence their engagement in school and class (Wentzel, 1999). When students perceived their teachers as "caring", the students had higher motivation in school (Wenzel, 1997). Similarly, student behavior, more specifically if they are exhibiting engaged behavior or not, may have a negative effect on their relationship with their teacher (Murray, & Murray, 2004). In addition, a lack of nurturance and excessive negative feedback from teachers was correlated with decreases in academic performance and prosocial behaviors (Wentzel, 2002). Students who like school tend to do better and have better outcomes. Longitudinal studies show that students who perceive their teachers as caring, supportive, and who praise them are more apt to like school than those who report less of those teacher qualities (Hallinan, 2008).

Self-Determination Theory

Self-determination theory suggests that students are motivated to learn when adults support their need to feel competent, positively related to others, and autonomous (Connell & Wellborn, 1991; Ryan & Deci, 2000; 2002). Broadly, this theory draws a connection between a student's meaningful relationships and their psychological needs of relatedness, autonomy and competence being met (Bakadorova & Raufelder, 2018; Ryan & Deci, 2000; 2002). Self-determination theory helps to provide a theoretical framework between teacher-student relationships and classroom engagement. For example, a recent study showed that a positive teacher-student relationship at the beginning of 8th grade had a significant effect on their feelings of competence, autonomy and relatedness at the end of ninth grade, whereas peer relationships did not show this same effect (Bakadorova & Raufelder, 2018). A different study looking at student perceptions of T-SR and student engagement with psychological needs (motivation, cognition and well-being) mediating found that the quality of T-SR influenced a student's

reporting of psychological needs and also effected their classroom engagement and grades (Dennie et al., 2018). In addition to student psychological well-being having a positive effect on engagement and grades, it has also been shown to increase student reports of overall happiness (Froiland, Worrell, & Oh, 2019). This was found to be true for ethnically diverse students, and their psychological wellbeing was influenced by the reported quality of teacher-student relationships (Froiland, Worrell, & Oh, 2019). Connell and Wellborn sought to explicitly define student motivation to learn through "engaged student prototypes" (1991), or a set of behaviors to look for in students who are engaged in their learning. In other words, they described how to observe engagement, and what it looks like, in an effort to make "student motivation" more objective and less of a subjective idea. This study found that the degree of emotional security experienced by children in their interactions with teachers was directly correlated to their engagement behaviors in school. This systems-process model helps to link the psychological need for relatedness to engagement through motivation research. For example, one such study found that when students can identify a teacher that they like in school, they have higher levels of academic motivation (Raufelder, Sherber, & Wood, 2016).

In Bandura's work on self-efficacy, he found that social persuasion, or influence occurring from relationships with others, has an effect on self-efficacy, which is shown to have a positive effect on academic performance and success in school (1986). Goodenow looked at student reports of support and belonging, and tied these results to teacher reports of effort and academic success (1993). He found that interpersonal support from teachers, and a sense of belonging were important in fostering academic achievement and motivation in 6th to 8th graders (Goodenow, C., 1993). This study suggested that to increase academic motivation and achievement, interpersonal support and student sense of belonging in school should be increased as well. This connection between teacher-student connection, motivation and engagement has

been established in culturally diverse groups of students as well. A study including 275 African American high school students found that positive motivational patterns in class were more closely linked to teacher variables than their perceived academic ability for that class (Gladney, & Greene, 1997). Additionally, reciprocal effects were found between student motivation and teacher behavior. Students who were motivated received more teacher support with autonomy and students who were less behaviorally engaged in class received teacher responses that further undermined motivation (Skinner & Belmont, 1993).

Teacher-Student Relationship as a Target of Intervention

T-SR has been established as an important measure of the quality of student's experience in school, as well as contributing significantly to the levels of student motivation, engagement, and thus, academic outcomes (Hayes, Emmons, & Ben-Avie, 1997; Wubbels & Brekelmans, 2005). Many studies have suggested that being able to affect or change the quality of teacher-student relationship through intervention may be an important factor in increasing positive student outcomes and for next directions in research (Bergin & Bergin, 2009). In their review of teacher-student relationships through the lens of an attachment theory perspective, Bergin and Bergin suggest twelve approaches to promoting "attachment-like relationships with teachers and school bonding" (2009). These twelve approaches include six suggestions for individual teachers based on research, and six systemic changes. Of these, several of them align with the processes involved in the current study including: increasing warmth, positivity and positive interactions between teachers and students, providing choice, explaining the reasons for rules and clearly defining consequences, and implementing individual interventions for specific difficult relationships (between teachers and students) that employ strategies where the teacher convey acceptance, interest, and safety to the child (Bergin & Bergin, 2009). In addition, they suggest

"continuity of people and place" which supports this study's use of current teachers as mentors, instead of assigning a mentor outside of the child's direct teacher (Bergin & Bergin, 2009).

Positive student outcomes have been shown to increase through the use of a mentor-like relationship in schools (Anderson et al., 2004; Karcher, Davis, & Powell, 2002). Anderson et al. found that pairing a student with a mentor improved the quality of the relationship with the adult, as well as the student's academic engagement (2004). A key feature of this intervention includes consistent positive feedback from the adult, similar to the Check-in/Check-out program used in this study (Anderson et al., 2004). The use of an adult mentor paired with high school students with disabilities also increased adjustment and life satisfaction as well as school connectedness (Pham & Murray, 2016).

Part of the difficulty in intervening on the already hard to define concept of teacher-student relationship (T-SR), is understanding the concrete behaviors occurring within the TS-R dyad that have an effect on the subjective quality of the TS-R. Student perception of the quality of their relationship with a teacher or mentor was shown to be more influential on the effect of a tier-2 behavioral intervention than the daily behavior report card itself (Stage & Galanti, 2007). Student reports on the quality of TS-R have suggested what can be described as "immediacy," or verbal and nonverbal communicative behaviors that decrease the psychological and emotional distance between people (Anderson, 1979; Mehrabian, 1968) may be key in intentionally increasing adult-student relationships. Students often report immediacy behaviors in their teachers as closely linked to their motivation and learning (Bainbridge & Houser, 2000; Lind, Poppen, & Murray, 2017). Interestingly, students did not name immediacy as one of the more important factors in motivation (when immediacy behaviors were defined), however, students' ratings of immediacy with their teachers was still linked to higher levels of academic outcomes when observed objectively (Bainbridge & Houser, 2000). This suggests that some students may

not even be aware of how important these adult factors are. Specifically, increasing teacher praise has been used as an intervention to improve the relationships between teachers and students and to help students meet their goals (Lind, Poppen, & Murray, 2017). The target for this intervention was "supportive interactions", which were systematically increased by providing examples of such supportive interactions with teachers. Supportive interactions included things such as smiling and nodding for active listening, and not being distracted with other tasks while talking with students. Another study showed that when teachers mirrored students body language and behavior, students reported higher levels of rapport with that adult and more confidence in their abilities on an academic task (Zhou, 2012). Likewise, qualitative research supports the need to fulfill adolescent's developmental needs through fostering autonomy, competence, and connection (Vincent et al., 2018). They categorized behaviors that would meet these developmental needs into "teacher noticing" of a student's presence and needs, and "teacher investment," or connecting with students through encouraging growth and learning (Vincent et al., 2018). Others have conceptualized "teacher sensitivity" as a determining factor in the quality of T-SR (Spilt, Hughes et al., 2012). Students have reported that they perceive teachers as "supportive" when they attempt to connect with students on an emotional level, acknowledge their academic success, are fair, and foster an environment where questions are encouraged (Suldoet al., 2009). Emotional connection was another factor that students reported as being important in the T-SR, and that bond created a better working relationship between students and teachers (Toste et al., 2015).

An American Education Research Association study on caring school communities found that sense of community could be increased through relationship features such as warmth and supportiveness, encouragement of cooperation, eliciting expression of student ideas and allowing for extrinsic student control in the classroom (Battistitch et al., 1997). Similarly, a "democratic

school climate", such as student participation in forming rules, freedom of expression and perceived fairness of rules and policy, have been identified in students' feelings of school connectedness (Vieno et al., 2005). Increases in teacher behaviors that support these features also increased student engagement in school (Battistitch et al., 1997). The importance of what teachers say and how they say it has been linked to student motivation (Brophy, 1993). For example, if a teacher says that students won't like an assignment before it is given out, they show less motivation for the activity, whereas if they link the assignment to students' personal lives or interests, motivation tends to be higher. This suggests that what teachers say and how they say it has a direct effect on student behavior and something as abstract as student motivation (Brophy, 1993). Sharing similarities between adults and students may be important to the quality of T-SR. When students were informed of five similarities that they had with their teacher, both teachers and students reported increases in relationship quality, and those students had higher grades five weeks after the intervention occurred (Gehlbach et al., 2016). Hamre and Pianta have taken concepts that contribute to positive teacher-student relationships and turned them into defined behaviors that can be observed in classrooms, and used surveys to measure the quality of TS-R over time (2006). They were among the first to actively and directly intervene on T-SR by changing teacher-student relationship, and show an increase in relationship quality through these interventions (Hamre & Pianta, 2006). Liked teachers use affective strategies such as intimacy, effective instruction, positive personality traits and happiness, supporting students and the perceived control of students in class (Eryilmaz, 2014). This body of research helps to guide potential interventions by offering behaviors to include in teachers' repertoire when engaging with at-risk students.

Micro-Affirmations

Micro-Affirmations have been defined as "apparently small acts, which are often ephemeral and hard-to-see, events that are public and private, often unconscious but very effective, which occur wherever people wish to help." Training regarding Micro-Affirmations have been used with companies and organizations to improve interpersonal relationships, as well as a way to reinforce employees and others effectively for positive behavior and effectiveness (Rowe, 2008; Rowe & Scully, 2009). Topor and colleagues sought out to concretely define "little things" to be used in research with individuals in recovery, and through thematic analysis found that welcoming words, words that show active listening, being responded to, and body language that shows full attentiveness (i.e. not reading an email or responding to another interrupting person) constituted micro-affirmations (2017). In addition, these were micro-affirmations that were found through therapy to rebuild positive sense of self, convey unconditional positive regard, and the importance of the receiving person and what they have to say (Topor et al., 2017). These behaviors (micro-affirmations) and relational outcomes are similar to teacher behaviors and qualities and student outcomes found in research regarding T-SRs. Although research on micro-affirmations in K-12 schools is limited, it has been suggested in the literature to include micro-affirmations in teacher training, as opposed to only providing teacher professional development on avoiding using microaggressions (Pittinsky, 2016). This includes behaviors such as nodding when a student is talking, using the student's name, and using inclusive language. The author suggests that not only does this model the use of micro-affirmations for students, but although the effects of these actions are small, they add up over time and may have a positive cumulative effect on students. To further explore the use of micro-affirmations in schools, a conceptual manuscript suggests adding micro-affirmation training to teachers' professional development related to culturally relevant training. The authors posit that

this will support a diverse body of students and also have the potential to affect both student and teacher development (Samuels et al., 2020).

Check-in/Check-out (CiCo)

Positive Behavior Interventions and Supports (PBIS) have been shown to broadly have a significant effect on the climate of a school and outcome of its' students (Bradshaw et al., 2009; Sailor et al., 2009). A large volume of research shows the positive effect of PBIS in elementary schools, and research has more recently expanded to include the effect on middle and high schools (Calderalla et al., 2011; Sailor et al., 2009). The U.S. Department of Education has even supported school-wide interventions like PBIS, including instructing teachers in how to engage with their students, in order to improve school climate (U.S. Department of Education, 2014). Check-in/Check-out (CiCo) is a targeted, or Tier 2, behavioral intervention, usually used within a PBIS framework that provides additional opportunities for behavioral feedback and praise from teachers (Fairbanks et al., 2007; Hawken & Horner, 2003). It is a time and cost efficient, targeted intervention with a goal to increase prompts for appropriate behavior, increase adult feedback, enhance daily structure, and to increase home-school communication about student behavior (Filter et al., 2007). The intervention is structured so that the student receiving the targeted intervention is paired with a mentor who checks in and out with them daily to provide behavioral feedback and encouragement. The intervention has been shown to be effective at both elementary and secondary educational settings to reduce problem behaviors in the classroom (Cheney et al., 2010; Horner, Sugai & Anderson, 2010; Mccurdy, Kunsch & Reibstein, 2007; Simonsen, Myers & Briere, 2011; Todd et al., 2008; Wolfe et al., 2016) and increase academic engagement (Hawken & Horner, 2003). It has even had an effect on other academic outcomes like math achievement (Mong, Johnson, & Mong, 2011). Check-in/Check-out (CiCo) has been

used as an intervention specifically to target academic engagement as well, and was shown to do so when matching student need through a functional assessment to the CiCo intervention (March & Horner, 2002). While some research suggests that CiCo may be more effective when functional assessment shows problem behaviors are maintained by teacher attention (March, & Horner, 2002; Wolfe et al., 2016), research on the effect of CiCo in a residential facility showed that problem behaviors were reduced for adolescents with both escape, and adult attention maintained behavior (Swoszowski et al., 2012).

The interactions in the check-in/check-out intervention are primarily behavior-focused, centering around pre-teaching and instruction of the behavioral expectations in that school or classroom. The technical purpose of the check-out phase is to tally points and for the mentor to provide praise and/or strategies to improve future behavior for areas where the student had more trouble obtaining points (Sailor et al., 2009). The importance of consistent feedback on behavior, as seen in CiCo has been shown as an "active ingredient" in the efficacy of these interventions through research (Andersone et al., 2004). However, a study examining the therapeutic mechanisms of a very similar Tier II intervention, "Check, Connect, and Expect", found that the significant moderating effect between the intervention and positive student outcomes was a positive teacher-student relationship based on student reports of relationship perceptions (Stage & Galanti, 2017).

Measurement

A meta-analysis found that of all behavioral outcomes that are affected by teacher-student relationships, engagement had the highest correlation (Cornelius-White, 2007). This was helpful in deciding variables to measure for this research, and the selection of engagement as the primary outcome. There are some measures of teacher-student relationship that have been well vetted

throughout research (Pianta, 1999). However, very few existed that were student-report measures and not qualitative in design, teacher report, or based on complex observation protocols. Research suggests that when dealing with adolescents in teacher-student relationships, student perceptions of adult-child relationships are far more accurate (Roorda et al., 2011; Roorda\ et al., 2017). Discrepancies have been noted in adult-report measures of adult-child relationships, and adults tend to overestimate their relationships with children as reports of their practices come with obvious bias (Domitrovich, & Bierman, 2001; Feldman, Wentzel & Gehring, 1989).

The primary delivery for the intervention in this study is providing information to the teacher on teacher-student relationships (T-SR), micro affirmations, and to provide a script or potential options of things to say and do that might help to improve their relationship with students. Past research has shown that providing scripts around routines to teachers can help improve classroom management (Emmer & Stough, 2001; Pianta & Hamre, 2009). In addition, teacher coaching has a direct effect on observed dimensions of positive teacher-student relationship in class (Hamre, et al., 2013; Pianta, Hamre, & Allen, 2009; Sneyers, Jacobs, & Struyf, 2016; Wubbels & Brekelmans, 2005). Sneyers and colleagues found that teacher professional development on teacher-student relationships increased teacher knowledge and changed their interactions with their students (2016). Trends in research over the past few decades support the training of teachers from a "relational perspective", emphasizing building relationships with students as a basis for classroom management (Sabol & Pianta, 2012). The script presented during the teacher training phase of this study was created using constructs developed from studies on teacher-student relationship quality that measure the relationship through observation (Pianta & Hamre, 2009). Researchers like Pianta and his colleagues have been researching teacher-student relationships for decades and validated a measure of teacher-student relationship quality based on observation of the interactions between teachers and their

students (2009). Through these observations, certain social behaviors were identified in important for positive T-SR, and it was these behaviors that teachers were coached on in their research (Hamre, et al., 2013; Pianta, Hamre & Allen, 2009). Their confirmatory factor analysis found that emotional support was one of three domains that create the best structural model for teacher effectiveness. The observable behaviors from this emotional support domain were used as part of the coaching and script building in this study.

Measuring Engagement

The primary student outcome for this study is student engagement. School engagement, attachment, and bonding have all been used interchangeably and in research for decades. A meta-analysis of these terms, and the way these constructs were defined and measured found the most consistent definition for student engagement, and the one being used for this study, as "the extent to which students are motivated to learn and do well in school" (Libbey, 2004, p. 278). Finn defined behaviors associated with this construct as attendance, preparation for class, participation in class, and compliance (1993). CiCo has been shown to reduce problem behavior, and this is typically why CiCo is implemented–in order to decrease the number of problem behaviors occurring in the classroom. However, student engagement as documented above, has been shown to be a mediating variable between student interventions and academic achievement. A student can reduce their problematic behaviors, but still not experience an increase in academic outcomes if they are not also becoming more engaged in classroom instruction. While CiCo is research that shows reduction in problem behaviors as an outcome is more common, it has also been shown to increase academic engagement (Hawken & Horner, 2003). March and Horner used student engagement as an outcome measure in their study examining the effects of CiCo on problem behavior in school (2002).

Teacher Consultation

Murray and Malgrem used teacher consultation around adult-child relationships and the potential benefits of increasing T-SR through information sessions as a method of intervention to increase academic, social, emotional and behavioral outcomes in students (2005). The current dissertation modeled the process for delivering the intervention on this study. The main difference being that the teacher consultation and information sessions about T-SR has been embedded into the CiCo program which is already commonly implemented in some form in many schools. Other studies have also used forms of teacher feedback and consultation as the method of intervention to target teacher-student relationships (Cook et al., 2018).

Pre- and Post-Intervention Survey

A pre- and post-intervention survey, the Inventory of Teacher-Student Relationships (Murray, & Zvoch, 2011a) was selected to be used alongside observations of student engagement. A factor analysis of the data identified a three factor structure including “communication”, “trust”, and “alienation” (Murray & Zvoch, 2011a; Pham, Murray, & Gau, 2021). It has been used in studies measuring the effect of interventions on teacher-student relationships, and is one of the few validated student report measures of teacher-student relationship that is not wrapped up in a larger measure like school climate (Chamizo-Nieto et al., 2021; Murray & Zvoch, 2011a; Pham & Murray, 2016; Pham, Murray, & Gau, 2022). Studies have shown that predictions may be more powerful or accurate when observation and student feedback are combined as outcome measures, and that evaluating classroom quality should include more than just observations. The student experience should be measured and considered in addition to other outcomes or in the place of teacher perception (Kane & Staiger, 2012; Mitchell, Bradshaw, & Leaf, 2010; Reddy, Rhodes & Mulhall, 2003). Collecting student perception, or student report of the teacher-student relationship has been shown to be an especially important factor in estimating positive and

negative outcomes (Barile et al., 2012; Berg & Aber, 2015; Hughes, Cavell, & Jackson, 1999). Some studies had shown low agreement in T-SR when comparing teacher and student ratings (Hughes, Cavell, & Jackson, 1999). Research has shown the importance of using various data sources, and obtaining information about teacher-student relationships from students, as opposed to through teacher reports. This is due to examples of teachers and older students disagreeing on relationship quality, and the likelihood of teachers to over or under estimate how they are relating to students (Brekelmans et al., 2011). Teachers also tend to view their own learning environment more "favorably" and believe they are closer to the "ideal" teacher than their students do (Fisher, Fraser, & Cresswell, 1995). In addition, Stage and Galanti found that the student perception of teacher-student relationship specifically had the most significant mediation effect between Check and Connect, a mentoring program very similar to Check-in/Check-out, and reductions in problem behavior (2017). This was instead of the assumed therapeutic mechanism of the daily behavior report cards included in the intervention (Stage & Galanti, 2017).

Social Validity

A final unit of measurement used in this study was a very brief intervention acceptability survey completed by the teacher mentors at the conclusion of the study. The survey used was adapted from an already established teacher acceptability survey used in another study on the effects of CiCo (Todd et al., 2008). This is to gauge teacher perception of the enhanced CiCo process including the script, and the effect the teacher felt it had on the process. Teacher acceptability surveys have been used in research on the effectiveness of CiCo (Todd, et al., 2008), as well as studies using other interventions to increase T-SR (Cook et al., 2018).

CHAPTER 3

METHODOLOGY

Participants and Setting

Participants for this study were recruited from an elementary school, and include students in fifth grade from an urban public school district located in the Southeastern United States. The school district serves 30,087 students, 58% of whom are African American or Black, 21% of whom are Caucasian or White, 10% of whom are Hispanic, 6% are multiracial and 2% are Asian; 72% of the students in the district come from low-income families. The school the students were enrolled in is a k-5 school with 646 students. The students at this school are 35% white, 33% black, 18% Hispanic, 10% of the students are two or more races, 4% are Asian or Pacific Islander. At this school, 58% of the students come from low-income families.

Initially, four students were recruited for the study, so that one student would have each of the four fifth grade teachers as their mentor. However, one of the participants never returned the signed consent form and did not return phone calls or messages from the teacher or experimenter. The three students were in fifth grade, Participant 1 and 3 were male, and Participant 2 was female. Participant 3 learned English as a second language, although at the time of the study, it was his primary language. Tagalog is the language spoken most often in the home. None of the students received special education services. All three students had been at the school for the entire school year.

Permission was granted from the school district to conduct research within its schools, and approval was obtained from the building principal prior to beginning the study. Participants were recruited first by an informal email distributed to all teachers. The purpose of the email was to identify the level of need in the school, and if participants would be willing to commit to the

study procedures. This email explained the study purpose, and briefly included the basic procedures of the study. It explained the purpose as "testing the effectiveness of a positive behavior management strategy for difficult students". The procedures highlighted focused on the commitment of teachers to attend a training with the researcher, and allow an observer to enter the classroom regularly for a period of seven weeks to collect student data. A group meeting was held with the fifth grade teachers who responded to the email. This meeting served to identify specific students who may be in need of this particular behavioral intervention, if obtaining adult attention as a function of the student's problematic behaviors, and if the level of existing teacher-student relationship perceived by the teacher as at-risk.

Once potential students were identified, consent forms were sent home to parents requesting that their child participate in a research study as part of their tier-II intervention plan. The consent form explained that data would be collected through observations of their student in class, and through the regularly planned daily report. It also described that their students will be asked to complete two brief surveys at the beginning and the end of the study. The participants, teachers and parents were informed that data for each student will be de-identified and coded so that no one but the researcher will be able to link the data to specific students. In addition, the consent included specific information regarding the content of observations conducted within each classroom, and how the data of each student will be protected throughout all phases of the study.

Independent Variable

The intervention training consisted of two components. The first of which involved teachers attending a one-time group training session of Check-in/Check-out (CICO), which was followed by a training wherein the experimenter meets with each teacher to train them to

implement the Check-in/Check-out program with relationship-building tailored scripts with the target student. The second component involves introducing the specific sample scripts, the use of microaffirmations, and how they aim to improve teacher-student relationships. It was spaced after the initial general training so that the introduction of these topics does not have unintended effects on the classroom or target student prior to the completion of the baseline phase. Both components of the training are defined below.

Check-in/Check-out (CICO)

Check-in/Check-out (CICO) is a tier-II intervention included in a school-wide positive behavior intervention and support system (Hawken & Horner, 2003). CICO is intended for those students who are unresponsive to school-wide behavioral supports, and is standardized, efficient and cost-effective. According to research conducted by the program's creators, critical features of the program that are beneficial to student success include embedded social skills training, frequent behavior feedback, positive reinforcement contingent on behavior, and increased positive interactions between students and adults (Filter et al., 2007).

During the baseline data collection period, all recruited teachers met as a group to be trained on the tenets and procedures of CICO and receive training materials including a CICO manual, CICO "cheat-sheet" to keep on their desk, and sheets of the CICO daily implementation fidelity checklist (See Appendix B). As a follow-up to this training, each teacher scheduled a time to meet with the experimenter in order to go over the training and ensure that the steps to CICO implementation are fully understood. In addition, the experimenter reviewed the intended use of the daily implementation checklist, including that they are to be dated, filled out completely, and returned to the experimenter along with the student's daily CICO data.

The group training consisted of a PowerPoint including the following components: 1) Brief theory/rationale behind tiered behavioral support 2) defining CICO 3) Theory/rationale

behind the program 4) examples of CICO from the field 5) How to implement CICO 6) Video of CICO implementation in a school 7) Opportunity for questions 8) Goal setting/expectations for the study. Components of this training were based on presentations available through PBIS.org to train teachers and staff members on Behavior Education Programs, or Check-in/Check-out, Tier 2 supports (Hawken, 2007). The example video clip of CICO implementation from a school was taken from https://www.youtube.com/watch?v=vP7GJ72UxsA. Teachers were provided with a copy of the presentation after the training session to reference as needed.

Scripted Check-in/Check-out

Check-in/Check-out (CICO) procedures can vary greatly depending on the personal interaction style of each coordinator, the person responsible for checking-in and out the student. Some coordinators may naturally use the check-in and check-out times to find out more about the student and forge more positive relationships, while others may keep the conversations behaviorally oriented. It is not currently known if having coordinators focus on relationship building, as well as prosocial behavior skill building will have a different effect on students' behavior in the classroom. Some CICO implementation guides include sample scripts of how to positively frame behavior feedback, and greet students at the beginning of the day (Sailor et al., 2009). Other studies using similar mentoring programs suggest that teachers keep a list of positive character traits and attributes to fuel praise during daily meetings (Murray & Malmgren, 2005).

Check-in/Check-out scripts for this study used some of the previous examples, as well as phrases and questions generated specifically for this study based on the research of interpersonal interactions that help to establish personal interest and connectedness between teachers and students (Burelson & Samter, 1990; Frymier & Houser, 1999; Pianta, 1999). Due to the good fit between the types of behaviors that will be included in the script, and the definition provided by

Rowe for microaffirmations (2008), this term is used throughout this dissertation to refer to the small, covert behaviors of teachers, that may be public or private, that are intended to improve relationships and foster academic and behavioral success. The scripts were included in the CICO instructions and the fidelity checklist, which were provided to each teacher at the beginning of the intervention phase (See Appendix B). Examples of these scripts using micro-affirmations include "Good morning! What did you do this weekend?"; "Hi ____, how was [insert activity] last night?"; "[name], you seem frustrated this morning, what can we do to help start your day off right?" The purpose of these questions is to increase immediacy and show the student that the teacher is invested in the student's personal interests, well-being, and activities outside of merely their achievement and behavior in the classroom. As the teacher finds out more about the student, the questions and topics could be tailored as needed, but teachers kept track of their daily conversations for fidelity checks. The teachers were asked to place a checkmark next to, or circle the micro-affirmation used that day, or write their own discussion point in on the daily CICO fidelity checklist as a measure of personal accountability.

Treatment Integrity of Intervention Components

Measures of treatment integrity were included to ensure that both training and check-in/check-out (CICO) procedures were implemented consistently across teachers. Teachers were provided checklists after training to use during every CICO session. However, the data were not consistently returned to the examiner, so they were not tracked over time. Student point cards (See Appendix C) were collected at the end of the week to ensure that they were being used and completed with fidelity, but again these were not always returned to the examiner. The examiner reached out to the teacher of Participant 2 via email to problem-solve the use of the daily point card as the student was not bringing it to her other teachers to be completed and was not interested in the points. Through a brief conversation in person, the examiner encouraged her to

use the point card and offered to have a conversation with the participant about the purpose of the point card.

Dependent Variables

Due to practical constraints on resources and realistic investigations of interventions conducted within the school setting, this research study utilizes a continuous dependent measure of student behaviors that indicate engagement, which was collected by a single, well-trained observer during recurring observation periods. In addition, teacher-student relationship was measured through pre- and post-test surveys administered to students before the intervention begins, and after the data collection period ends. While various methods and measures have been used to evaluate the quality of teacher student relationships including observation systems and various questionnaires (Classroom Assessment System, CLASS; Hamre, Pianta & Choomat-Mooney, 2009), research shows that one of the strongest indicators of relationship quality as it pertains to engagement is subjective self-report measures (Pianta; 1999; Roorda et al., 2011). In addition, the student perception of the quality of a relationship between teacher and student may be more important when assessing its relationship to effects in the classroom than an outside observer's analysis of interactions between individuals.

Student Engagement

The primary intent of the intervention in this study is to increase teacher-student relationships, and thus improve student engagement in class. A very common indicator of overall student engagement in school used in educational and behavioral science research, is on-task behavior (Shapiro, 2004). Time spent on-task, versus off-task (motor off-task, passive off-task, verbal off-task) provides a ratio, or percentage of time, during an observation when the student is engaging in expected on-task behavior. This percentage indicates time the student spent

attending to class materials and participating in academic tasks. A well-established measure with strong psychometric properties, the Behavioral Observation System for Students (BOSS), was used to conduct each classroom observation (BOSS; Shapiro, 2004). The BOSS assigns codes to various classroom behaviors exhibited by the target student, includes peer comparisons, and measures on- and off-task behaviors through momentary time sampling. It also includes partial interval recording for more discrete student behaviors that may occur to provide additional data. Each behavioral code to be used during the observation is clearly defined in the BOSS user's manual (See: BOSS; Shapiro, 2004). On-task behavior, which provided the overall measure of student engagement in this study, is defined as times the student is either actively or passively attending to their assigned work (i.e. student sitting in their seat with their eyes on the speaker, with their hands and feet to themselves, engaging in any task demands such as writing, raising their hand, or silently reading class material).

Quality of Teacher-student Relationship

Teacher-student relationships have been measured using various methods in educational and social science research. A meta-analysis of studies measuring the quality of teacher-student relationship and its effect on academic outcomes indicated that measures coming from multiple sources (i.e. self-report surveys and observations from an outside observer) provide a better analysis of the correlation between the relationship and student outcomes. This is compared to analysis of two measures from the same source (i.e. teacher-report surveys and grades) (Roorda et al. 2011). Since one outcome measure obtained through direct observation is continuous, a supplementary student self-report will be collected in order to provide useful and informative data on student perceptions of teacher-student relationships. This is consistent with recommendations in single subject research (Kazdin, 2011).To assess the changes in the quality of teacher student relationships, The Inventory of Teacher-Student Relationships (IT-SR; Murray

and Zvoch, 2011) was administered to students both pre- and post-intervention. This is a validated measure that assesses student perceptions of trust, communication and alienation in the teacher-student relationship. Students will rate items designed to measure interpersonal aspects of their relationship with their teacher through a series of Likert-scale items (see Appendix A for survey).

Intervention Acceptability Measure

Teachers who participated as mentors were asked to complete an "acceptability survey" in order to assess the social validity of the Check-in/Check-out program using micro-affirmations. This social validity assessment was designed based on recommendations of Hawken, MacLeod, and Rawlings and their use of acceptability surveys with Behavior Education Programs, an intervention that is very similar to CiCo (2007). The survey was eight items and items were scored on a Likert Scale of 1 (Strongly Disagree) to 6 (Strongly Agree).

Experimental Design and Procedure

A multiple-baseline design across individuals was used to examine the effects of the intervention on student behaviors in the classroom. In order to establish baseline data for the purpose of comparison, and assess the effects of the specialized Check-in/Check-out (CICO) procedures using scripts to increase teacher-student relationships, the study was divided into two successive phases that were initiated at different points in time for each teacher-student dyad. Multiple-baseline design has been used widely in research on CiCo, including those that show an effect on student engagement (Hawken & Horner, 2003; March & Horner, 2002; Mong, Johnson, & Mong, 2011; Todd, Campbell, Meyer, & Horner, 2008), making the design ideal for the current study.

Phase 1: Baseline

During the baseline phase, data on selected student's behavior was collected over a period of time, prior to intervention implementation. The teacher-student dyads were observed in the classroom daily, when feasible, and the plan was for observations to continue until a relatively stable pattern of student behavior data was established. However, student's behavior did not neatly stabilize during baseline, and due to time constraints, the intervention phase was initiated after at least five baseline data points were obtained, and so that intervention phases were staggered.

Phase 2: Training and Scripted Check-in/Check-out

At the start of each intervention phase, the experimenter held an individual training session with the teacher on implementing a Check-in/Check-out intervention with a focus on increasing teacher-student relationships. After the training, classroom observation data collection continued. Teachers' intervention checklists and students' daily point cards were collected to evaluate the fidelity of the intervention.

Data Analytic Plan

The primary outcome of this study was individual students' engaged behaviors in class measured at baseline and after a targeted intervention. In addition, student reports of the quality of teacher-student relationships were measured both pre- and post-intervention. It was hypothesized that the intervention, using specific teacher behaviors during typical check-in/check-out procedures to increase relationship building, will result in increased student engagement in that classroom. In addition, it was expected that student reports of the teacher-student relationship would increase over the course of the intervention. Based on recommendations for analyzing single case research, visual inspection was the primary analysis of data. Emphasis was placed on changes in level ("jumps" in data), and trend (slope of the data),

from baseline to intervention phases (Kazdin, 2011; Kratochwill et al., 2010). Changes in mean across phases helped to identify any overall shifts in the rates of engaged behavior, provided that there are no major outlying data points to skew the mean (Kazdin, 2011). Assessing the slope or trend from baseline to treatment highlights differences in the direction of behavior change, and any systematic increase or decreases over time, even in the absence of a change in level or an unreliable mean due to significantly outlying data points. All data was entered into a spreadsheet on Excel, which was used to graph all data to aid in visual inspection.

Due to its utility specific to multiple-baseline single-case designs, the percent of all non-overlapping data (PAND) was calculated to estimate the effect of data change (*phi*) across phases. PAND utilizes all data points as opposed to relying on one data point as the metric for non-overlap that is common with the percent of non-overlapping data (PND or *R*) calculation, and is more useful with variable data (Parker, Hagain-Burke & Vannest, 2007; Parker, Vannest & Davis, 2011). Scruggs and Mastropieri (1994) suggested interpretation guidelines that have been used in single-case research since then, including in research involving Check-in/Check-out interventions (Parker, Hagan-Burke & Vannest, 2007; Mong, Johnson & Mong, 2011). According to these guidelines, a PND>70 indicates an effective intervention, 50<PND<70 indicates questionable intervention effect, and a PND<50 suggest an intervention with no observed effect (Scruggs & Mastropieri, 1994).

The planned sample of four students and schedule for collecting observation data was chosen in order to be compliant with the standards associated with best practice in single-case research designs (Kratochwill et al., 2010), as well as to adhere to the requirements for calculating the PAND (Parker, Hagan-Burke & Vannest, 2007). Standards from Kratochwill and colleagues suggest a minimum of three phases, and a minimum of five data points per phase in order to make an adequate attempt to demonstrate intervention effects (2010). In addition, in

order to calculate the PAND, a minimum of 20-25 data points are required, as opposed to PND which can be used with shorter data sets.

In the event that baseline data indicated a positive trend, an alternate statistical analysis was selected to use. Tau-U has been included in single-case research as another statistical analysis to aid in visual inspection of data (Parker et al., 2011). Specifically, Tau-U has shown utility in cases when data collection yields an undesirable positive baseline trend, as it is more sensitive and controls for the trend in baseline data. Tau-U indicates the percent of data that shows an improvement between baseline and treatment phases, but within the treatment phase, and does not have the ceiling limitations associated with PND and PAND (Parker, Vannest & Davis, 2011, Parker et al., 2011). A systematic literature review of the empirical support for Check-in/Check-out calculated the Tau-U in addition to visual inspection of data (Wolfe et al., 2016). Following their methods and according to methods suggested by Parker et al. (2011), an online Tau-U calculator was used to compute the contrast values for all comparisons from baseline to treatment (http://www.singlecaseresearch.org/calculators/tau-u). Much like other effect size statistics, a Tau-U statistic indicates a percentage of data in the treatment phase that suggests improvement (or decrease) from the baseline phase, taking into account trend and non-overlap. A Tau-U of ≥80% indicates a statistically significant increase in data, and a score of ≤50% indicates a chance effect (Parker, Vannest and Davis, 2011; Parker et al., 2011).

This study included an additional pre- and post-test using a self-report of student perceptions of the quality of teacher-student relationships. This provided information about the quality of the relationship between teacher and student dyads, to enhance the analysis of, and discussion about, changes in student engagement.

Current research on the effect of Check-in/Check-out on student behavior in class indicates the intervention produces moderate to significant changes in problem behavior

according to percent of non-overlapping data calculated with a multiple-baseline design (PND=63%, 75% and 100%; Mong, Johnson and Mong, 2011). In addition, mean differences of engaged behavior between baseline and treatment suggest around 30% increases in academic engagement based on direct observation. A meta-analysis of single subject research on the effect of Check-in/Check-out on student behavioral outcomes in the classroom measured by direct observation indicated Tau-U scores for multiple-baseline studies ranging from approximately .50 to .90 (Wolfe et al., 2016). With most reaching statistically significant improvements (Tau-U ≥ .80) using direct observation to measure outcomes (Fairbanks et al., 2007; March and Horner, 2002; Mong, Johnson, and Mong, 2011; Swoszowski et al., 2012). Results of this meta-analysis also suggest that modifying check-in/check-out produced varying effects on the outcome data, and that further modifications to the interventions may provide insights as to its utility. In addition, the authors noted that very few of the included studies measured student engagement as an outcome, and effects were typically not as strong as other outcomes, and that direct measurement of student engagement along with modifications to check-in/check-out to prompt this outcome specifically may contribute to the literature (Wolfe et al., 2016).

CHAPTER 4

RESULTS

Data Analysis

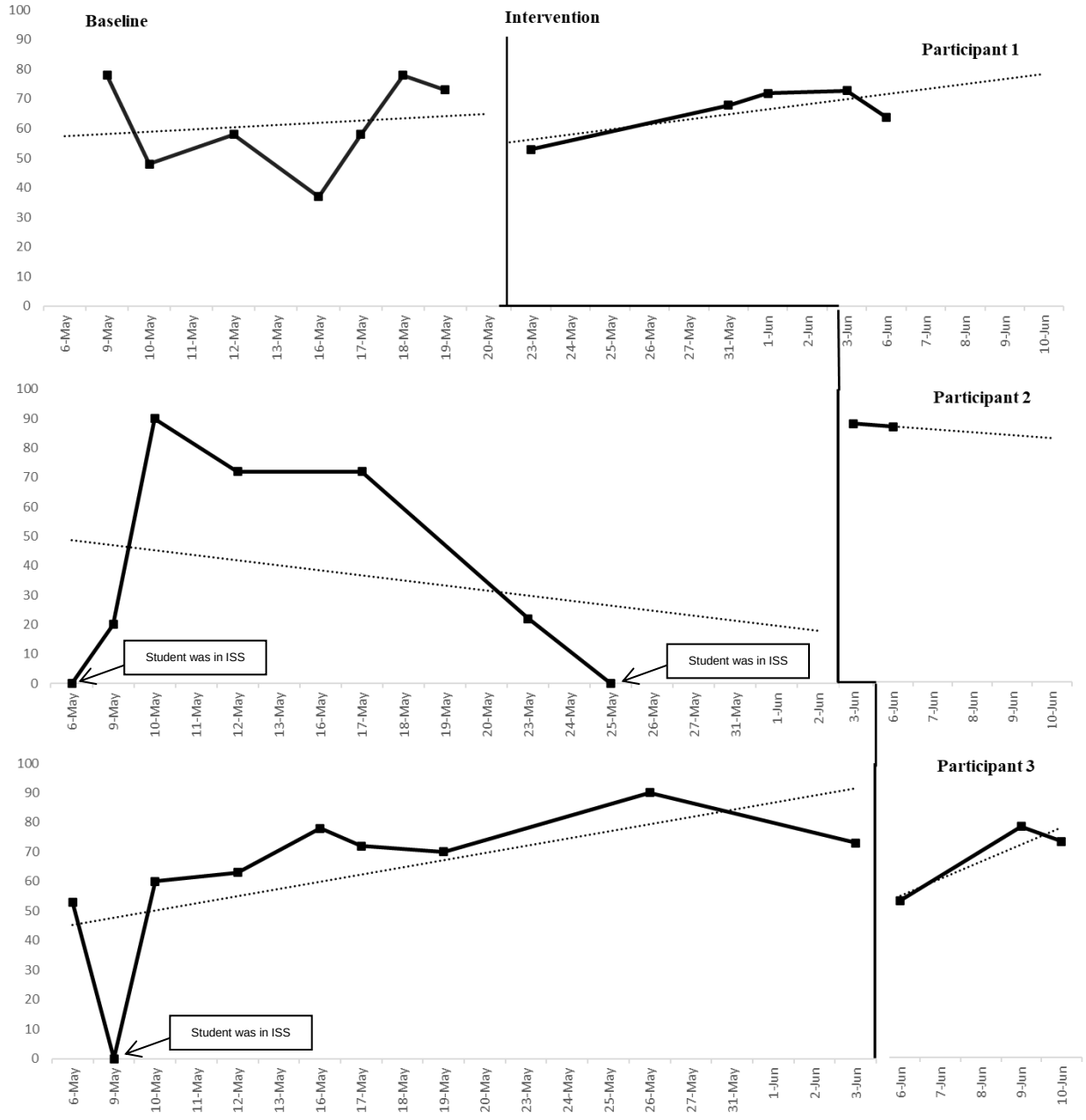
Consistent with set standards for single-case research design, the primary method of analysis for data derived from direct observation of student behaviors, which was used in this current study, is visual analysis (Horner, Carr, et al., 2005). Visual analysis was conducted utilizing standards described by Kratochwill and colleagues (2013). This includes both (a) examination of baseline and intervention phase patterns of data and (b) consideration of within- and between-phase features of the outcome measure, specifically level and trend. However, it should be noted that this study violates the requirement of visual analysis from these standards in that two of the phases have less than five data points, which is identified as a requirement for multiple baseline design.

Data points from the main dependent measure of engaged behavior were graphed over time for each of the three students. Data were examined for patterns and variability including changes in level and trend from baseline to the intervention phase. Immediacy and latency of data change was also noted as each intervention phase began. Although best practice in single subject design still supports the primary method of data evaluation for single-case research be visual inspection, this method can be subject to a fair amount of bias and subjectivity (Kazdin, 2011). This is especially true in applied settings, such as classrooms, where data begins to diverge from the ideal "patterns" (i.e., stable baselines, little overlap, small effect etc.), it becomes more difficult to reliably agree on effect (Kazdin, 2011). It is suggested that in these cases, it may be best to complement visual inspection with an appropriate statistical analysis to evaluate effect size more reliably.

Visual analysis of the data suggests slight increases in the level of engagement from baseline to intervention phase for all three participants (see Figure 1.). However, two of the three participants had positive baseline trends that continued, so it is not likely that the shift in mean is significant and not due to continuation of baseline trend. Additional analyses below help to determine the probability that any datapoint from the intervention phase would have occurred by chance. The Tau-U analysis described below will help to determine whether or not the increase from baseline to intervention was significant or not through specialized nonparametric effect size. In addition, the Tau-U will correct for any baseline trends that are significantly positive (Parker et al., 2010).

Data from single-case designs tend to violate the basic assumptions of parametric statistical analyses such as t-tests, analyses of variance and least squares regressions, so a nonparametric effect size specific for single case research was selected for this study. This statistic, known as Percent of All Nonoverlapping Data (PAND), is especially useful in multiple baseline designs. Its metric, *phi*, is an estimate of the effect of data change across phases. It is different from Percent of Nonoverlapping Data (PND) or *r* in that it utilizes all data points as opposed to using one data point as the metric for all nonoverlap. PAND is found by identifying the minimum number of data points that need to be removed from either the baseline or treatment phases to eliminate all overlap, and then dividing the number of remaining data points by the total number of data points across both phases. This number represents the overlap and subtracting this number from 100 will provide the percent of nonoverlap (Parker et al., 2010). Calculating PAND will be particularly useful in this study due to the unequal data series, as well as short and variable baseline and intervention phases that make it difficult to infer a stable trend, making analyses that generate R^2 impossible since it requires controlling the trend.

Figure 1. Percent of Engaged Behavior During Classroom Observation



The overlapping data points were mapped carefully using a transparent ruler and found to be 4 for Participant 1, 1 for Participant 2 and 4 for Participant 3. This totals 9 overlapping data points for the entire data set, or 9/33 = 27.27 percent of overlapping data. Therefore, PAND is 100 - 27.27 = 72.73, and the PAND beyond chance (50%) is found by subtracting 50 from that

number, 72.73 - 50 = 22.73%, suggesting 22.73% of data occurred beyond chance levels. Due to the small amount of data, it was possible to calculate PAND by hand with a 2 x 2 table to generate *phi*. First, the proportion of data belonging to each baseline and intervention data set are calculated by simply dividing the number of data points in each phase by the total number of data points in the set: BL: 23/33 = 69.69, Intervention: 10/33 = 30.30. These totals go into the bottom of the corresponding columns. Then the percent of overlapping data (27.27) is divided in half, between cells b and c: 13.64 in each cell. Cells c and d are then filled in by subtraction to keep the table completely balanced 30.30 - 13.64 = 16.66, 69.69 - 13.64 = 56.05. From here, a Pearson effect size can be calculated by finding a difference between the ratio of both cells [a/(a + c)] – [b/(b +d)] (Parker, Hagan-Burke & Vannest, 2007). In this study: 16.66/30.30 - 13.64/56.05 = .55 - .243 = .307, so *Phi* = .30. The *Phi* coefficients suggest that there is little to no effect on intervention data from baseline data.

As outlined in the proposed data analytic plan, and especially due to the limited data points in the intervention phase for participant 2 and 3, Tau-U was used to calculate the effect from baseline to intervention for all participants. Tau-U is a method for measuring data non-overlap between two phases that is “distribution free” and also a nonparametric technique. Tau-U has a statistical power of 91% to 95% of (OLS) linear regression when data conform to parametric assumptions (Parker et al., 2010). In single case research when data are likely to be non-conforming, the power of Tau-U can be greater than other parametric techniques (Parker et al., 2010). Since the Tau-U is an adjusted Mann-Whitney U and depends on both the Mann-Whitney U and Kendall’s R, p-values and confidence intervals are also available (Parker et al., 2010). The calculator used in this data analysis evaluates baseline data for an undesirable positive trend, indicating that the calculation will need to correct for that trend in determining effect size. When evaluating baseline trend, Participant 3 had a Tau-U score of .64, and a z-score

of 2.23, with a corresponding P value of .026, suggesting that there was a significant positive trend in baseline data, which should be corrected for when calculating the Tau-U. Tau-U scores for all three participants were as follows: Participant 1 = .06, Participant 2 = .6, Participant 3 (corrected for positive baseline Trend) = -.71. These scores suggest virtually no effect for Participant 1, and large effect sizes for Participant 2 and 3, although the negative Tau-U for the data of Participant 3 suggests a significant decrease in the dependent variable which is not desired.

Student Behavior

The overall focus of this study was to assess the effectiveness of the Check-in/Check-out Tier II intervention on increasing student engagement in class. Specifically, the research question related to student behavior was:

- What is the effect of a relationship-focused Check-in/Check-out program on rates of student engagement in class?

Findings specific to this dependent measure for each student participant across each baseline to intervention phase of the experiment are shown in Figure 1. Although data points are connected by a continuous line, there were gaps in data collection caused by interruptions such as schedule changes, standardized testing days and teacher absences. In one instance, the teacher of Participant 3 was out for an extended period of time due to a COVID-19 quarantine. There are also three instances in which the graph indicates “0% engagement”, once for Participant 3 and once for Participant 2 these were used as a data collection placeholder due to the students being in in-school suspension (ISS). This “0% engagement” did not affect the calculation of PAND and was excluded from reported phase means and Tau-U calculations. Also, due to scheduling conflicts in holding the teacher-student relationship training with teachers, student absences, and the proximity to the end of the school year, both Participant 2 and 3 have very short intervention

phases with less than 5 data points. Data analysis proceeded as planned, however, results should be interpreted with that in mind as data sets with less than 5 data points increase error for both visual inspection and calculating the Percent of All Non-overlapping Data (PAND).

Additional interpretation of visual analysis of the graphs, as well as PAND and Tau-U effect sizes will be discussed in the following sections. Due to this study being a multiple-baseline time series design, the behavior of each student should shift at each point the intervention is introduced.

Engagement

During baseline, students were using the daily point cards associated with the Check-in/Check-out program and were meeting with their teachers briefly twice daily to get their point card for the day and to have their daily points tallied. As seen, all of the students had some level of engagement some days during the baseline period, and no student was consistently disengaged. Participant 3 had the highest level of engagement at baseline overall with a mean of 69.8% engagement during the 10-minute observations. The slope of Participant 3's baseline was also significantly positive, causing an issue with further interpretation of the effect of the intervention on the dependent variable. Participant 2 had the lowest level of overall engagement at baseline with a mean of 55.2% engaged during observations. Participant 1 had a baseline phase mean of 61.4%. Across all participants the introduction of teacher training on teacher-student relationships, and the addition of a script to the teacher's daily check-ins with the students saw a general increase in the mean for engaged behavior. However, lack of stability in baseline, and problematic positive trends during baseline make this increase subject to error and a relationship between onset of the use of micro-affirmations during check-in and check-out by the teacher and increases in engaged behaviors of the student was not easily established.

Student 1

After the teacher info session on teacher-student relationship and a script for check-in and check-out were provided, there was no immediate noticeable increase in engagement from Participant 1. However, over time, there was less variability in their engaged behavior, and their engagement was generally higher than it was at baseline. This participant tended to engage with his peers during instructional and independent work time, thus becoming disengaged. The Tau-U effect size for the data from Participant 1 was .06, which is an effect size that suggests little to no effect. Four out of the 12 total data points for Participant 1 were overlapping, indicating 33% overlapping data (4/12 = .33, .33 x 100 = 33%) and 67% nonoverlapping data. This indicates that 17% of the data occurred beyond chance levels in this data set. The mean for the baseline of participant 1 was 61.42, and it was 66.0 for the intervention phase, so average engagement did increase over time, although effect sizes would suggest not significantly.

Student 2

The second participant had the most variable baseline data, and the shortest intervention phase. The student had in-school suspension twice during the baseline phase. After the intervention when her teacher was encouraged to use relationship building tactics at check-in/check-out, the highest levels of engagement were observed for Participant 2 throughout the whole study and across all participants. Participant 2 had the most volatile relationship with her teacher of all three participants. She also incidentally formed the closest relationship with the primary investigator through pre- and post-intervention survey collection and weekly check-ins regarding her progress on check-in/check-out and to collect and earned incentives. She would often talk to the experimenter about her difficulty with her teacher. Examination of her pre-and post-survey data will shed more light on whether her change in behavior was potentially due to

changes in perception about her teacher or potentially her relationship and willingness to please the experimenter. The Tau-U effect size for the data from Participant 2 was .60, which is a medium to large effect size. One out of the 9 total data points for Participant 2 were overlapping, indicating 11% overlapping data (1/9 = .11, .11 x 100 = 11%) and thus 89% nonoverlapping data. This indicates that 39% (.89 - .50) of the data occurred beyond chance levels in this data set. The mean for the baseline of Participant 2 was 55.2, and it was 88.5 for the intervention phase, suggesting an increase in overall engagement over time.

Student 3

Upon visual inspection, the third participant had the most consistently engaged behavior from the outset of data collection. The mean for the baseline of Participant 3 was 69.88, the highest of any of the three participants. However, his mean for the intervention phase was 68, which is slightly lower. The Tau-U effect size for the data from Participant 3 while correcting for a significantly positive baseline trend was -.71, which is a large effect size, but in the unintended direction given the intervention focus to increase student engagement. Out of the 12 total data points for participant 3, 4 were overlapping, indicating 33% overlapping data (4/12 = .33, .33 x 100 = 33%) and thus 67% nonoverlapping data. This suggests that again only 17% of the data in the intervention phase could have occurred beyond chance given the high levels of engagement already present at baseline.

Teacher-Student Relationships

The applied importance of this study was also examined using surveys completed by all participants. The students completed self-report measures of their perceived relationship with teachers using the Inventory of Teacher-Student Relationships (IT-SR; Murray and Zvoch, 2011). This helps to evaluate whether the changes in behavior are important, or whether they make a difference that is important to those involved in the study, in this case, students. The secondary focus of this study was to examine the quality of teacher-student relationship as it

might relate to changes in in-class behavior. Specifically, the research question related to teacher-student relationship was:

- What is the connection, if any, between changes in teacher-student relationship quality and observed student behavior in class?

Findings specific to this dependent measure for each student participant across each baseline to intervention phase of the experiment are shown in Figure 2. The IT-SR has three clusters of items pertaining to feelings of Trust, Communication, and Alienation. The items that correspond to each of the three factors can be seen in Table 1. It should be noted that the factor Alienation has favorable results that are in the negative range due to Alienation detracting from teacher-student relationship rather than enhancing it. The lower the negative number, presumably the better the relationship, or the less alienation that is present in that relationship. Results of this survey will be interpreted qualitatively below for each student.

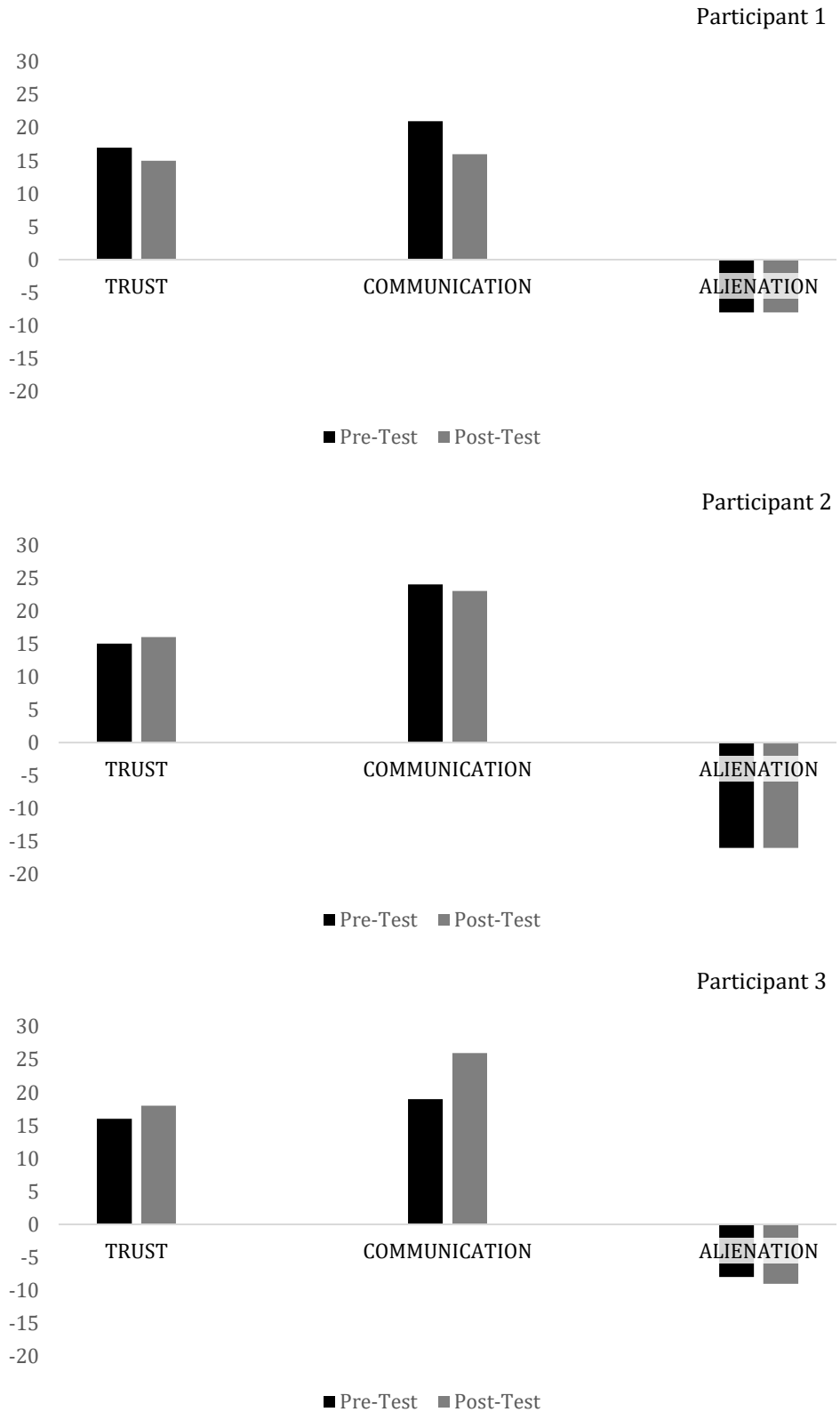
Student 1

As seen in Figure 2, pre- and post- survey data for Participant 1 decreased on the trust and communication measures, and stayed the same in the area of alienation. Their score in Trust decreased from 17 to 15, Communication decreased from 21 to 16, and Alienation stayed the same at -8. This data is reflective of the behavioral observation data that also did not increase significantly, and stayed relatively stable from baseline to intervention phase. Improvements were noted on the following three items: “My teacher trusts my judgment”, “My teacher doesn’t understand what I’m going through”, and “I can count on my teacher when I need to get something off of my chest”. See Table 2 for student responses to all items.

Student 2

Pre- and Post- survey data for Participant 2 indicated a slight increase in the area of Trust, a slight decrease for Communication and again stayed the same in the area of Alienation (see Figure 2). The score on Trust increased from 15 to 16, Communication decreased from 24 to 23,

Figure 2. Inventory of Teacher-Student Relationship Pre- and Post-Intervention Data



The possible range scores for each scale are as follows: Trust: 5-20; Communication: 8-32; Alienation: 4-16.

Table 1. Items on the Inventory of Teacher-Student Relationship (IT-SR)

Communication
9. I tell my teacher about my problems and struggles
4. My teacher can tell when something is upsetting me
8. My teacher helps me understand myself better
17. If my teacher knows something is bothering me, they ask me about it
11. My teacher understands me
15. I can count on my teacher when I need to get something off of my chest
12. When I am angry, my teacher tries to be understanding
10. My teacher encourages me to talk about my difficulty
Trust
3. My teacher accepts me as I am
1. My teacher respects my feelings
2. I feel my teacher is successful as a teacher
13. I trust my teacher
7. My teacher trusts my judgment
Alienation
6. I get upset a lot more than my teacher knows about
16. I feel that no one understands me
5. I get upset easily at school
14. My teacher doesn't understand what I'm going through

and Alienation was consistent pre- and post-data collection at a score of -16, which is the maximum number of points in this area suggesting a high perceived level of alienation that did not change after intervention. Participant 2 was the only one whose data suggested an increase from baseline to intervention, although there were only two data points in the intervention phase, so these results should be interpreted with caution. From pre- to post- intervention survey administration, increases were seen for participant two on the following two items: "My teacher helps me understand myself better" and "My teacher encourages me to talk about my difficulties". See Table 2 for student responses to all items.

Table 2. Student Responses on the IT-SR for Participants 1, 2, and 3

	Participant					
	1		2		3	
Question	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
My teacher respects my feelings.	3	2	3	4	4	4
I feel my teacher is successful as a teacher.	4	4	4	4	4	4
My teacher accepts me as I am.	4	3	4	4	3	3
My teacher can tell when something is upsetting me.	3	2	3	3	3	3
I get upset easily at school.	-2	-2	-4	-4	-2	-2
I get upset a lot more than my teacher knows about.	-1	-1	-4	-4	-2	-3
My teacher trusts my judgement.	2	3	2	2	1	3
My teacher helps me understand myself better.	1	1	4	3	4	4
I can tell my teacher about my problems and troubles.	4	3	1	1	3	3
My teacher encourages me to talk about my difficulties.	2	2	4	3	2	4
My teacher understands me.	3	1	2	3	2	4
When I'm angry, my teacher tries to be understanding.	3	2	4	4	1	3
I trust my teacher.	4	3	2	2	4	4
My teacher doesn't understand what I'm going through.	-3	-1	-4	-4	-1	-3
I count on my teacher when I need to get something off my chest.	2	3	2	2	2	3
I feel that no one understands me.	-2	-4	-4	-4	-3	-1
If my teacher knows something is bothering me, they ask me about it.	3	2	4	4	2	2

Note: On all items, 4 = Always or Almost Always True; 3 = Often True; 2 = Sometimes True; 1 = Never or Almost Never True. Items that contribute to the Alienation score were assigned a negative value due to the items relating to alienation detracting from the quality of teacher-student relationship.

Student 3

As seen in Figure 2, pre- and post- survey data for Participant 3 increased on both the Trust and Communication measures, and also increased negatively in the area of alienation, indicating worsening feelings of alienation. Their score in Communication increased from 16 to

18, Communication decreased from 19 to 26, and Alienation increased from -8 to -9. Increases in ratings occurred for the following items: “My teacher trusts my judgment”, “My teacher encourages me to talk about my difficulties”, “My teacher understands me”, “When I’m angry my teacher tries to be understanding”, “I count on my teacher when I need to get something off my chest”, and there was a negative increase in the score for the item with text “I feel that no one understands me”. Participant 3 had the highest baseline data, and a decrease in Tau-U scores from baseline to intervention when correcting for the positive baseline trend. This all suggests generally high engagement to begin with and that continued through the intervention. However, the change in scores pre- to post- may suggest changes in student perception of the teacher-student relationship, especially in the areas of trust and communication.

Social Validity

In a continuation of examining the applied importance of this study, the teachers also completed surveys to evaluate whether any changes in behavior are important, make a difference in the lives of any participant, and whether that difference is important to any involved in the study. After final observations were completed, the teachers were emailed an electronic version of the social validity survey to complete and responses were automatically sent to the experimenter . The questions were either related to the implementation of Check-in/Check-out (CiCo) as it was designed in this study, or about their perception of the outcomes for the specific students they were paired with. The surveys completed by the teachers also help to answer questions about how teachers felt about the current intervention—if they felt it was helpful, easy to implement, and worth the time of implementation. Each teacher’s responses to all social validity survey items, as well as the overall means for the quantitative Likert-scale items are provided in Table 3. In general, teachers’ responses to the survey suggest that they found the

intervention to be mostly successful, and easy enough that they would recommend relationship focused CiCo to other teachers.

Table 3. Teacher Responses on Social Validity Questionnaire

Question	Teacher			MEAN
	1	**2**	**3**	
Problem Behaviors have decreased since enrollment in the CiCo Program.	5	2	6	**4.33**
Appropriate classroom behaviors have increased since enrollment in the Check-in/Check-out program.	3	2	6	**3.67**
I feel my relationship with this student has improved since enrollment in Check-in/Check-out (CiCo).	5	2	6	**4.33**
It was relatively easy (e.g., amount of time/effort) to implement the CiCo program	6	6	6	**6**
The CiCo Program helped to decrease this student's number of absences and tardies.	N/A	N/A	N/A	—
The CiCo process for this student was worth the time and effort.	5	2	6	**4.33**
I would recommend that other schools or classrooms use the CiCo Program.	6	5	6	**5.67**
The information on teacher-student relationships provided to me was helpful.	6	5	6	**5.67**

Note: On all items, 6 = Strongly Agree; 5 = Agree; 4 = Slightly Agree; 3 = Slightly Disagree; 2 = Disagree; 1 = Strongly Disagree. N/A was used as a placeholder for the response "Student did not have an attendance issue at the beginning of the study"

All teachers agreed strongly that the intervention was relatively easy (in terms of time and effort) to implement the CiCo program. All three teachers would also recommend to other classroom teachers and schools to use the CiCo program. Lastly, all teachers agreed that the information on teacher-student relationships provided through the information session with the experimenter was helpful. The item that scored the lowest was whether appropriate classroom behaviors have increased since implementing the intervention. While the teacher of Participant 3 indicated that she strongly agreed that appropriate behaviors increased, the overall mean for that item was a 3.67, and both teachers for Participants 1 and 2 disagreed to varying degrees that

“appropriate classroom behaviors have increased since enrollment in the Check-in/Check-out program”.

Interestingly, the teacher with the most negative responses was the teacher of Participant 2, who had a noticeable increase in engagement from baseline to intervention. Incidentally, this student also rated her relationship with her teacher as having the highest level of Alienation of all participants. This teacher also found that CiCo specifically for the student she was paired with was “not worth the time and effort” of implementation, and she did not feel that her relationship had improved with this student. These results suggest that the behavioral observations of Participant 3 were not socially validated by the teacher as she did not perceive an improved relationship, despite some of the student ratings of relationship (specifically trust) increasing. She also did not perceive the student’s behavior improving, even though her behavior during the intervention phase was improved from baseline.

CHAPTER 5

DISCUSSION

The primary purpose of this study was to investigate the relationship between a tier II behavioral intervention, teacher-student relationship, and engagement. Specifically it aims to determine if Check-in/Check-out (CiCo) with a focus on teacher-student relationship will have an effect on student engagement in class after the teacher receives information regarding the importance of teacher-student relationship and how it could be incorporated into the CiCo program by using a script. This study was also designed to explore if relationship-focused CiCo would increase student perception of the teacher-student relationship. Lastly, teachers' perceptions of the intervention were assessed to determine if it is socially valid, effective, and worth applying to school practices.

Summary of Findings

Somewhat surprisingly, the use of micro-affirmations during Check-in/Check-out to enhance teacher-student relationships did not have a significant effect on student engagement in the classroom outside of chance. Overall, when examining the results of this study it cannot be determined that the independent variable alone had an effect on the dependent variable. However, there are several promising findings within this study that lend themselves well to future research once the limitations, which will be described in the following section, are accounted for.

Overall, student data from behavioral observations show an increase in engagement from the beginning of the observation period to the end. However, only one participant demonstrated significant changes in data from baseline to intervention phases. Participant 1 showed a slight

increase in mean from baseline to intervention, but the Tau-U *phi* score was .06, which indicates little to no effect size. Participant 2 showed the most significant increase in engagement during classroom observations and had a Tau-U score of .60 which suggests a large effect. Interestingly, this student's teacher had the most negative view of the study on the social validity scale and perceived the least amount of effectiveness of all three teachers. This student also reported the highest levels of Alienation on the Inventory of Teacher-Student Relationships (IT-SR), although she did rate slightly higher scores on the "Trust" measure post-intervention. It should be noted that the intervention phase data set for Participant 2 was extremely small (for further discussion see "Limitations" section). Participant 3 had the highest levels of engagement throughout data collection, and as such, actually had a *phi* of -.71, suggesting a strong negative effect of the intervention on student engagement, although levels of engagement remained relatively high. This Tau-U score was correcting for a significant positive trend in baseline data as recommended by the authors (Parker et al., 2011). Due to these scores, a determination cannot be made that any change in engagement occurred due to the intervention of teacher increasing the use of micro-affirmations during check-in and check-out. However, this should not undermine the potential effect that CiCo had on increasing classroom engagement for this participant. The teacher and mentor of Participant 3 had the highest ratings of social validity at the end of the observation periods, and felt the intervention was effective, helpful, increased positive behavior and improved relationships and was worth the effort of implementation. This student also reported the largest increase in his perception of the quality of his relationship with his teacher based on IT-SR scores from pre-to post-intervention.

While no formal implementation fidelity data was obtained as part of the data collection for this study, intervention implementation information can be gleaned from the permanent products of the Check-in/Check-out (CiCo) program. For example, some of the CiCo daily point

cards (See Appendix C) were returned to the examiner, although it was inconsistent within and between participants. From 5/2/22 to 5/12/22, seven point cards were returned to the examiner for Participant 1, and he met his goal five out of the seven times (71.4%). His daily point cards were always 100% completed with points for all class periods accounted for, and his parents signed the bottom indicating that they were sent home. In addition, the teacher for Participant 1 returned the CiCo daily checklist (See Appendix B) given at the intervention phase. His teacher checked that she used the microaffirmations/ relationship building during check-in and/or check-out on 5/20/22 and 5/23-5/25/22. She did not mark whether she did or not on 5/26/22, and indicated that the student arrived to school late on 5/27/22 so she was not able to check-in with him until 2:00 pm. No other teachers returned the CiCo daily checklist as requested. Twenty-one daily behavior point cards were returned for Participant 3, five of which were incomplete. For the completed cards, the student always met his point goal for the day. It seemed like the point cards from 6/2/22 to 6/14/22 were completed at one time (circling the entire column of points for each period in the same pen color) rather than being filled out by each teacher at the conclusion of their class period. For Participant 2, seven point cards were returned between 5/3/22 and 5/12/22 with one additional undated card. Participant 2 met her behavior goal 6 times during this period, and did not meet her goal on 5/4/22.

Across participants, on days when the daily behavior point cards were completed, the students were mostly meeting their behavior goals and expectations. Participant 3 and his teacher adhered to the daily point cards portion of the intervention, but it is unknown whether or not the teacher used microaffirmations during check-in and check-out. Participant 1 implemented the intervention of using microaffirmations at check-in and check-out as a relationship building strategy as indicated by the CiCo daily checklist. However, after a strong initial adherence to implementation fidelity for the daily point cards, it is unknown if the same level of

implementation fidelity continued past 5/12/22. Like Participant 1, Participant 2 and her teacher had a good initial adherence to the CiCo daily point card implementation, but it is unknown whether this continued past 5/12/22. There is no permanent product to confirm that the teachers of Participant 2 or 3 used microaffirmations or relationship building strategies with their students due to them not returning the CiCo Daily Checklist.

One thing that can be taken from this study is that, as expected based on previous research of CiCo, implementing the popular tier II intervention does seem to be related to improved levels of classroom engagement alone. This is true even if it is difficult to determine if an intervention aimed at improving teacher-student relationships had an additional, positive, significant effect on levels of engagement in the classroom. This study also suggests that CiCo, with or without encouraging teachers to use micro-affirmations during check-ins and check-outs with the goal of improving their relationship to the student, is easy enough for teachers to implement and all three teachers would be willing to recommend the intervention to other teachers and schools. There was also some suggestion that CiCo implemented with micro-affirmations from a teacher mentor during check-in and -out may result in increases in student perception of certain aspects of the teacher-student relationship. The results of this study also suggest that including a relational component to the check-in and check-out procedure, which deviates from the traditionally strict behavioral focus of the intervention, does not negatively effect student engagement or the positive outcomes on student behavior.

Limitations

Important limitations need to be considered when evaluating and interpreting findings in the current study. As with most single-case design experiments, especially those conducted within a school setting, this study was subject to many threats to internal and external validity.

The current study is limited in its generalizability due to a few reasons. First, generalizability is always difficult in single-subject design because of limited applicable statistical techniques, and sample sizes that often cannot match the larger population. Also, the teacher-student relationship data was only collected pre- and post-data, which was helpful for qualitative information regarding each student, but not sufficient to make any meaningful analysis about the link between student engagement and the teacher-student relationship. Also, the teachers who were involved in this study were willing volunteers, and helped to nominate the students who were enrolled in the study. It is unclear if teachers who did not volunteer would be as responsive to this kind of an intervention if they were required to implement it, or if student behavior and reports of teacher-student relationship (T-SR) would have been similarly affected if they were assigned to teacher rather than being nominated. This is especially true given the importance of the dyadic relationships in this study, which is dependent on genuineness in interactions and willingness to use communication strategies such as micro-affirmations.

Reactivity effects also contribute to the limitations that are inherent in the design of the study due to the presence of the experimenter completing observations in the classroom during all phases of the study and her role in meeting with the participants at the end of the week to discuss if they met their weekly goal and earned a behavioral incentive. Fortunately the experimenter was the school's psychologist so she was a familiar face and often observed in classrooms for other reasons. She also did not interact with any students while observing and the frequency of observations meant that the classes quickly became accustomed to the experimenter being in the room. Nevertheless, the possibility that the presence of the experimenter during observations may have influenced student behavior at some time cannot be completely eliminated.

It is also important to consider the fact that due to limited district resources the only data collector across participants and phases was the experimenter. Despite every effort to adhere to operationally defined definitions of student behavior and to be as objective as possible, the results of observations may have been subconsciously influenced by the experimenter's prior knowledge of the study, and expectation of intervention outcomes and effectiveness. Due to school resources and conditions of approval for the study being completed within the approving school district, interobserver agreement could not be obtained for any observation of any phase. This is a significant limitation of data collection that is inconsistent with best practices in single subject research. In addition, the experimenter acted as the CiCo organizer for the school. As such, the students were bringing their point cards to her weekly to tally their total points, review their progress that week, and to turn in any points they earned that week for planned incentives. The participants obviously also knew the experimenter was conducting the study as she had to seek consent from the students prior to implementing, and the students completed the pre-intervention survey with her as well. It is possible that this involvement in CiCo may have influenced the students' behavior in class during observations, and this adds to the possibility that the experimenter's presence during observations may have altered students' behavior. In particular, Participant 2 seemed to form a positive relationship with the experimenter as she was seeking her out during the school day to discuss how things were going or to ask for help. This may have affected this student's behavior during observations because she was seeking to be seen favorably by the experimenter due to their relationship, rather than because of her relationship with her teacher.

In addition to the obvious limitation of a positive trend during baseline for some participants, baseline phases tended to be variable. Means at baseline were lower than intervention phase means across all participants, but some only by a few points, and the means

do not capture the data variability well. One significant threat to the validity of the data is the fact that at baseline, participants were still receiving an intervention (CiCo), and the intervention phase was the implementation of a relatively minor change to that intervention. This made it difficult to make causal comparisons between phases, and difficult to identify if changes in data were due to the effect of CiCo on student engagement alone, or if it was due to the change made to the CiCo program at the point of the intervention phase.

While baseline phases were of sufficient length for multiple baseline designs, the intervention phases for Participants 2 and 3 were very short, and they also occurred very close to one another. One of the key assumptions of multiple baseline design is that the continued baseline phase of a participant who has not received the intervention acts as a "reversal" would during an ABAB experimental design. Such that during a reversal you would typically expect behavior to return to baseline, as with multiple baseline designs, you would expect the baseline behavior levels to continue until the intervention is implemented for that participant. At that point one would expect the behavior to improve or reduce depending on the conditions, ideally to a similar significance as it did for previous participants who had already experienced the intervention. When one student receives the intervention and then very closely after another student receives the intervention, enough time has not passed in between to determine continued baseline stabilization. Due to proximity to the end of the year and availability of students for observation, the intervention phases needed to be initiated for participant 2 and 3 before baseline could be properly stabilized. A secondary limitation related to this timing issue was the fact that the intervention phases for Participants 2 and 3 were shorter than recommended (Kazdin, 2011; Kratochwill et al., 2013). This makes it extremely difficult to draw any reliable conclusions from interpretation of those data.

Limitations may also exist regarding the dependence on relationship change to alter student behavior over such a short period of time. Even though the intervention of increasing micro-affirmations and communication designed to increase teacher-student relationships occurred at time X, does not mean that that relationship was immediately improved and evident to the participant. It is reasonable to assume that changes in a teacher's interactions with a student in an attempt to improve the quality of their relationship may precede any subsequent behavior change or even perception of that relationship from the student by days, weeks, or even months. Also, this study was conducted at the end of the school year, where there were eight previous months of school that may have cemented a teacher-student relationship in such a way that it was much more difficult to change than if the study was conducted earlier in the school year. A future study that collected observation data over a longer period of time, or collected maintenance data regarding teacher-student relationship for regular intervals over a longer period of time may be able to impart and identify more changes in relationship quality.

In addition, perceptions of teacher-student relationships could be effected by "nonspecific factors" as defined in decades of research regarding the efficacy of psychotherapy (Kazdin, 2007; Rosenthal & Frank, 1956). Researchers discuss the "placebo effect" of therapy as the qualities of the relationship itself between the client and therapist that influence the outcome of therapy (Shapiro & Morris, 1978). Sometimes, even after decades of research, there is little to no research-based explanation for why an intervention is successful sometimes and unsuccessful others. This body of research suggests that the interpersonal relationship is a nonspecific factor, that is difficult to measure or define, but has a significant effect on the outcome of an intervention (Kazdin, 2007). It is possible that the efficacy of Check-in/Check-out is also influenced by nonspecific factors, that may not be measurable by a traditional survey on relationship quality. In addition, the lack of effect of the intervention on the dependent variables

for this study may be due to the fact that nonspecific variables in the relationship between the teacher and student may have had a more significant effect on student engagement than the increase in microaffirmations during the intervention phase. This makes both phase comparisons difficult, and also makes it difficult to draw conclusions about the role teacher-student relationships have in the efficacy of CiCo. This is seen in some of the qualitative pre- and post-survey data from this study that show a mismatch between the student perceptions of the relationship and effect sizes in the student engagement data.

There were some inherent limitations in conducting classroom observations toward the end of the school year. Not all observation sessions were conducted during instructional time. Many of the periods were review periods, or times when students were working independently. Occasionally the students were allowed to work independently on something if the rest of their work was done and they were quiet, so any quiet time engaging in an expected task or event was coded as engaged. The experimenter made every effort to stick to the behavioral definition of engagement based on the expectation for that student during that class period. If students were working together in small groups, it was hard to discern at times if they were engaged or if their conversation with peers was off-topic.

It is worth noting that the effects of the COVID-19 pandemic present a history threat to the validity of this research data. The study was conducted so late in the school year due to the effect of the pandemic that continued well into January of 2022, resulting in several grade-level quarantines in the Fall and Winter of that school year. This was the first time where all students were brought back to the classroom in person after the governor of the state in which it was conducted closed all schools due to the pandemic in March of 2020 (a portion of students returned part-time in March of 2021). It was a very difficult transition back to school for many

students and teachers, and was characterized by increases in behavior difficulties and mental health concerns for students.

Although it is often a concern with multiple-baseline designs (MBD) (Kazdin, 2011), interdependence of baselines was not a concern due to the students all being in separate classrooms during the observation, and being paired with three separate teachers means the teachers did not use the strategies learned with any of the other students in the study. Although it is always possible that the Teacher 1 or 2 spoke to the other teachers about the content of the information session regarding teacher-student relationships prior to them receiving the information and before their student was moved out of the baseline phase. Prolonged baselines were also not a problem during this study, although it is typically of concern for MBD, because the baseline phase still included the intervention of CiCo without the use of micro-affirmations so treatment was not completely withheld.

Contributions to the Research Base

While the many limitations of design and data collection with this study make it difficult to draw reliable conclusions from these data, it does make some notable contributions to the field. Findings from this study contribute to the extensive literature supporting the efficacy of Check-in/Check-out (CiCo) in not only decreasing problematic behaviors, but increasing positive behaviors such as engagement (Cheney et al., 2010; Hawken & Horner, 2003; Horner, Sugai & Anderson, 2010; Mccurdy, Kunsch & Reibstein, 2007; Simonsen, Myers & Briere, 2011; Todd et al., 2008; Wolfe et al., 2016). This study provides evidence that CiCo results in less variable and more consistently high levels of student engagement. At baseline, all students were participating in CiCo. Participant 1 and 3 both had positive trends in their baseline data which, while potentially problematic for determining intervention effectiveness, speaks to the effect of

CiCo on student engagement. The results of this study extend the findings from Hawken and Horner who also found that CiCo implementation saw an increase of mean levels of engagement, despite some variability in the data (2003).

In addition, this study provides very preliminary evidence to suggest that a relationship-focused CiCo may lead to increases in student perception of the teacher-student relationship in some areas. Research shows that teacher-student relationships (T-SR) inherently decrease the later on in schooling a student gets (McGrath & VanBergen, 2015). The pre- and post-test data from the current study did reflect lower ratings of T-SR based on student perception, and these scores only increased for one student from pre- to post-test. Participant 2 did rate her perceptions of the T-SR on the post-test as higher than pre-test in the area of "trust". This student also saw the most dramatic shift change in levels of engagement after the intervention. This reflects similar outcomes in Stage and Gallanti's research which found student perceptions of the quality of T-SR was more influential on student outcomes than a daily behavior report card alone (2017).

This study also adds to the growing body of school-based intervention research that employs the use of study acceptability measures (Cook et al., 2018; Todd et al., 2008). Teachers in this study reported that CiCo was easy to implement, and they would recommend its use to other teachers and schools. Study acceptability measures are particularly important for school-based research as interventions are only useful to schools if the stakeholders involved are willing to implement them with fidelity. Like other research examining the efficacy of CiCo (Todd et al., 2008), the study acceptability questionnaire results from this study support its use as a socially valid tier II intervention for behavior. In addition, this study closely aligns with the work of Cook and colleagues, who used a social validity measure in their research examining an intervention to increase teacher-student relationships in schools (2018). Studies such as the current one

contribute to the research base by providing a model for the use of study acceptability measures, so that more interventions designed to be used in school are not only shown to be effective, but actually useful to teachers, administrators, and students. Although this study did not find conclusive results on the effects of micro-affirmations on student engagement and perception of their relationships with their teachers, it did set a precedent for the intentional use of micro-affirmations for relationship building in schools. Micro-affirmation research is limited, especially in its use within school settings (Pittinsky, 2016; Samuels et al., 2020). This study, despite its limited effects, suggests that micro-affirmations can and should be used in schools as it may contribute to improved student perceptions of their relationship with their teacher (as seen in Participant 3), as well as increased levels of student engagement. This was seen in Participant 2 in the current study as they had a downward trend in baseline data, but at the point of intervention, had a shift change to notably increased levels of engagement. Most of the school-based research surrounding micro-affirmations suggests its use in teacher trainings (Pittinsky, 2016) and professional development (Samuels et al., 2020). This study provides an example of how to incorporate microaffirmations into already established Tier II interventions for schools implementing Positive Behavior Interventions and Supports (PBIS), as well as a method for delivering the professional development to teachers, through an information session and providing a script/example microaffirmations to teachers for use with their students.

This study also contributes to the body of research using scripts and consultation with teachers and mentors as an intervention to improve teacher-student relationships (T-SR). Like the intervention in the research of Emmer and Stough (2001), this study provided scripts to teachers to encourage them to interact with their students in a more meaningful way, and thus improve their behavior. Cook et al. found moderate effects on student engagement after engaging teachers in information sessions on teacher behavior, and providing a checklist to encourage

them to use those behaviors in class. The current study also used an information session and a checklist to remind teachers to use the phrases in their script with students. For one participant, this had a moderate effect on student engagement. Likewise, this study provides additional support for providing teacher information on adult-child relationships in order to increase T-SR like the research done by Murray and Malmgren (2005). Their study used teacher report outcomes, but also had inconsistent results on the effect of T-SR on behavior.

From a methods standpoint, this research adds to a relatively small number of studies that utilize the Inventory of Teacher-Student Relationships (IT-SR) as a means for gathering student report data on the quality of teacher-student relationships. It is a quick measure that is easy for adolescent students to complete on their own (Murray, & Zvoch, 2011; Pham, Murray & Gau, 2021). This research extends current uses of the IT-SR to fifth grade students as previous studies were done with middle and high school students. The reading level was appropriate for fifth graders, and they were able to independently complete the IT-SR for both administrations.

The current study used Tau-U due to small intervention phases for two of the participants, which is a suggested usage from the author (Parker et al., 2010), and it also used the positive baseline correction suggested with the Tau-U. Both of these analyses add to the research base of studies demonstrating the usefulness of this metric in interpreting otherwise difficult to analyze single subject research data. The Tau-U metric is especially important to be included in school-based research due to the potential for the positive trend in baseline data prior to an intervention being implemented.

Finally, this study contributes to the growing body of research on the importance of Teacher-Student Relationships (T-SR) and developing interventions that can be used to increase these relationships. Many studies have examined the T-SR from both teacher and student perspectives (Kaine & Staiger, 2012; Mitchell, Bradshaw & Leaf, 2010; Reddy, Rhodes &

Mulhall, 2003 & Stage & Galanti, 2017; Roorda, Koomen et al. 2011) and through direct observation (Hamre & Pianta, 2006; Pianta, 1999). A limited number of studies have attempted to improve the quality of the relationship through an intervention as this study did, and using student report of the quality of the T-SR. This study found very small effects of the intervention on T-SR. Participant 1 decreased in their ratings of the quality of their T-SR. Even in the case of Participants 2 and 3 where their ratings improved in one or more of the three areas of the Inventory of Teacher-Student Relationships (IT-SR), it decreased in others. This may be true even for students with the highest levels of engagement, or for those with the most significant change in behavior from baseline to intervention. It further highlights the importance of collecting student perceptions of the T-SR as is mentioned in the literature (Kaine & Staiger, 2012; Mitchell, Bradshaw & Leaf, 2010; Reddy, Rhodes & Mulhall, 2003 & Stage & Galanti, 2017; Roorda, Koomen et al. 2011). If the goal is to increase T-SR, even if the student's behavior has improved, it cannot be assumed that the T-SR has improved as well according to the student. Correcting for the methodological and data collection-based limitations in this current study for future research studies will contribute greatly expanding evidence of the effect of teacher-student relationship on engagement, interventions to increase teacher-student relationship, and the use of micro-affirmations to increase teacher-student relationships.

Directions for Future Research

Given the continued popularity of Positive Behavioral Interventions and Supports (PBIS) in schools (Bear, 2010; Horner, Sugai et al., 2005), it is important for research to continue to examine the effectiveness of tier II behavioral interventions that can be used within this framework. In addition, as schools and students' needs change, and as research surrounding related contributing variables to student behavior, such as teacher-student relationships, it is

important to identify how Check-in/Check-out (CiCo) and other similar interventions can be modified to meet these needs as this current study attempted to do. As is typical with single-case research, the current study can be corrected and strengthened by replicating its design and expanding to other populations. Recruiting more participants and expanding phases will help to make findings more conclusive.

In addition to expanding the evidence base around CiCo, there are directions future research can take to specifically build upon findings from this current study. One major step would be to improve the methodology to reduce threats to internal and external validity of the present findings, and to make the data set more in-line with best practices for single-case research. Future research should be sure to collect inter-observer agreement due to the inherent subjectivity involved in measuring the behavior of another person. It will also allow for all phases to reach at least five data points and to allow for the baseline trend to stabilize between phases. The use of zoom to conduct observations may reduce reactivity effects, better simulate a "typical" classroom environment, and will ensure the observer's physical presence in the classroom does not inadvertently affect student behavior. In addition, as mentioned previously, expanding the time between the pre- and post- IT-SR administration and even the adding in maintenance phase behavioral observations may allow for changes in relationship that may be more latent in nature, rather than expecting the relationship to change as soon as teachers beginning using micro-affirmations in their interactions with students.

Due to somewhat conflicting evidence on the best way to measure teacher-student relationships (T-SR), future research may include teacher-report measures of the quality of T-SR, in addition to the student report IT-SR. This could expand current findings and begin to explore if changes in student engagement are more closely related to teacher perceptions of the quality of T-SR, or student perceptions of the quality of T-SR. While the IT-SR is a promising measure, the

items look at features of the teacher-student relationship such as “communication” “trust” and “alienation”. It does not, however, ask pointed questions about the student’s perception of their relationship with their teacher (i.e. “I feel like my relationship with my teacher has improved”). It might be interesting to ask social validity questions such as this to students as well as teachers, especially if this intervention is being used with adolescents.

In discussing measurement, this study also highlights the importance of the selection of the dependent variable, and a future direction of this research would be to expand the dependent variables to correct for mono-operation bias (Shadish et al., 2002). Limitations related to mono-operation bias occur when a variable is defined and operationalized only one way, so that it does not accurately capture all instances of the variable, or it may include irrelevant data. While the current study is high in external validity in that it is easily applicable to real-world settings, there are many threats to internal validity such as those mentioned in the limitations section as well as mono-operation bias discussed here. The dependent variable of student engagement is not directly linked to teacher-student relationships, and was only measured through classroom observation. This may not have captured all instances or ways the participants’ engagement may have increased (i.e. teacher perception of engagement, class work completion, engagement outside of observations etc.), and also contains data irrelevant to the teacher-student relationship. In addition, the T-SR was only measured pre- and post-intervention, and only using a student-report measure survey. It might have been more valuable to measure both engagement and relationship through direct observation, and to expand the use of surveys to gather teacher perceptions of the T-SR and of student engagement. This would allow for more instances of change to the dependent variables to be captured through data collection, expand the operationalized definition of the variables, and increase confidence in the results regarding whether the intervention had an effect on T-SR or student engagement.

Considering the variability and general positive trends in baseline data, it may be helpful to include additional aspects of student behavior in the observations. It may have been that student engagement might be a more frequently occurring behavior that is less sensitive to change. Including problem behaviors as an outcome measure, as is frequently done in CiCo research, will add additional data to examine changes from baseline to intervention and from which inferences can be drawn.

Overall, encouraging teachers to use communication strategies that are aimed at increasing their relationships with their students has resulted in some improvements to student engagement as well as student perceptions of teacher-student relationships, although these results are limited in their strength and validity. Even still, it is important for researchers to continue to identify effective and efficient strategies for teachers to intentionally improve their relationships with their students. Even more beneficial would be to increase the practicality of these strategies by embedding them within interventions that are widely adopted by schools already and within the framework of PBIS due to its ease of implementation and reduced burden on school resources and teams. In addition, expanding this research by seeking to answer additional questions about the effect of T-SR on student outcomes such as engagement, will support the need for these types of interventions in schools. In their research, March and Horner used function-based analysis to explore if tailoring CiCo to student needs would lead to better student outcomes. This study provides a template intervention for schools if traditional CiCo is unsuccessful, and lack of relationship is perceived as a function of, or contributing factor to, the student's problem behavior. As demonstrated here, the intervention used in this study was largely socially valid, easy to implement and worth the time and effort, and showed emerging success in improving student engagement.

APPENDIX A

INVENTORY OF TEACHER-STUDENT RELATIONSHIPS

		Never or Almost Never True	Sometimes True	Often True	Always true or Almost Always
1.	My teacher respects my feelings.	1	2	3	4
2.	I feel my teacher is successful as a teacher.	1	2	3	4
3.	My teacher accepts me as I am.	1	2	3	4
4.	My teacher can tell when something is upsetting me.	1	2	3	4
5.	I get upset easily at school.	1	2	3	4
6.	I get upset a lot more than my teacher knows about.	1	2	3	4
7.	My teacher trusts my judgement.	1	2	3	4
8.	My teacher helps me understand myself better.	1	2	3	4
9.	I can tell my teacher about my problems and troubles.	1	2	3	4
10.	My teacher encourages me to talk about my difficulties.	1	2	3	4
11.	My teacher understands me.	1	2	3	4
12.	When I'm angry, my teacher tries to be understanding.	1	2	3	4
13.	I trust my teacher.	1	2	3	4
14.	My teacher doesn't understand what I'm going through.	1	2	3	4
15.	I count on my teacher when I need to get something off my chest.	1	2	3	4
16.	I feel that no one understands me.	1	2	3	4
17.	If my teacher knows something is bothering me, they ask me about it.	1	2	3	4

APPENDIX B

TEACHER DAILY CHECKLIST WITH SAMPLE SCRIPT

Check-In/Check-out Checklist

	AM CHECK-IN						PM CHECK-OUT		
				Ready for School					
Day	Positive Greeting	Used relationship building during check-in	Review Behavior Expectations for the day	Pencil	Notebook/ folder/etc	Chromebook/ charger	Used Relationship Building During Check-out	Review CiCo Card Points	Positive Praise/Gentle Corrective Feedback
6/7									
6/8									
6/9									
6/10									

Relationship Building Communication

- Use the student's name during greetings
- Ask student about themselves (i.e. interests, activities over the weekend, sports, hobbies, etc.)
- Ask student their opinion (daily/upcoming events, things that happened in current or school events, random topics etc.)
  - "What do you think about ____ happening today?"; "Do you think we should do _____ or ____ on Wednesday?"; "Did you hear about ___? What did you think about that?"
- Smile, make eye contact, use vocal variety (increases feelings of genuineness)
- Follow-up from topics of interest from a prior check-in/out (i.e. follow-up about an exciting event, sports game, idea, worry, etc.)
  - "I know you were worried about ___ happening this past weekend, how did that go?"; "How was the party/sports game/beach this weekend?"; "Did you ever talk to ___ about that idea you had?"
- Use self-disclosure to share light, personal, appropriate information about your own interests and activities
  - "I also love ___, I will be doing that this weekend too!"; "I never really got into ____ but my favorite thing to do is ___"; "I have ___ coming up this week and I've been worried about it so I will be happy to get that over with"
- "I have noticed you have a hard time with [specific behavior expectation], what could we do to help you earn those points?"
- "You have been doing awesome in ____, keep up the good work!"
- "Have a great weekend, ____. Have fun with [planned activity]"
- "What are your plans for the weekend/afternoon/etc? I think I will be doing _____."
- "I saw that you helped _____ today with ___. Thank you so much for doing that, that was very kind of you."
- "I watched/ate/did ___ this weekend/last night. Have you ever done/watched/eaten that before?"

APPENDIX C

DAILY CHECK-IN/CHECK-OUT CARD

CHECK IN CHECK OUT POINT SHEET

Be Respectful
Speak kindly to others, listen

Be Responsible
Work hard, stay focused

Be Safe
Hands and feet to self, stay in your seat

Points Possible ____

Points Received ____

% of Points ____

Goal Met ____

2 – Great Job!
1 – So, so
0 – Doesn't meet goal

Name: _____
Date: ___/___/___

GOALS:

Target Behaviors	BLOCK 1	BLOCK 2	LUNCH	BLOCK 3	BLOCK 4	RESOURCE/ SEL
Respectful	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0
Responsible	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0
Safe	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0

Parent Signature: _____

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